CITY OF NORCO
CITY COUNCIL / HISTORIC PRESERVATION COMMISSION
SPECIAL JOINT MEETING
AGENDA

Wednesday, October 28, 2015
City Hall Conference Rooms A and B, 2870 Clark Avenue, Norco, CA 92860

CALL TO ORDER: 4:00 p.m.

ROLL CALL:
Herb Higgins, Mayor
Kevin Bash, Mayor Pro Tem
Kathy Azevedo, Council Member
Berwin Hanna, Council Member
Greg Newton, Council Member
Matthew Potter, Chair
Diane Stiller, Vice Chair
Patricia Overstreet, Commissioner
Mark Sawyer, Commissioner
Teresa Edwards, Commissioner

PLEDGE OF ALLEGIANCE: Mayor Pro Tem Kevin Bash

BUSINESS ITEM:

1. Review of the Draft Norconian Property Historic Resources Survey and Evaluation Report and Authorization for National Register Nomination. (Historic Resources Consultant Bill Wilkman)

   At its June 4, 2014 meeting, the City Council unanimously authorized the preparation of a historic resources survey and evaluation of the Norconian property for its Naval Hospital and Guided Missile eras. Wilkman Historical Services (WHS) completed this work earlier this month and the document is ready to be submitted to the California State Historic Preservation Commission for consideration of the property's listing on the National Register of Historic Places for the significance of these eras.

   Recommended Action: That the City Council and the Historic Preservation Commission concur in the qualification of the Norconian property for National Register listing in relation to its Naval Hospital and Guided Missile eras and that staff and the Cultural Resources Consultant be directed to work with the Historic Preservation Commission in the preparation and submission of a National Register Nomination to the State Historic Preservation Commission.

ADJOURNMENT

In compliance with the Americans with Disabilities Act, any person with a disability who requires a modification or accommodation in order to participate in this meeting, please contact the City Clerk's office, (951) 270-5623, at least 48 hours prior to the meeting to make reasonable arrangements to ensure accessibility. Staff reports are on file in the City Clerk's Office. Any writings or documents provided to a majority of the City Council regarding any item on this agenda will be available for public inspection at the City Clerk's Counter in City Hall located at 2870 Clark Avenue during normal business hours.

CITY OF NORCO
STAFF REPORT

TO: Honorable Mayor, Members of the City Council, and Members of the Historic Preservation Commission

FROM: Andy Okoro, City Manager

PREPARED BY: Bill Wilkman, Cultural Resources Consultant

DATE: October 28, 2015

SUBJECT: Review of Draft Norconian Property Historic Resources Survey and Evaluation Report and Authorization for National Register Nomination

RECOMMENDATION: That the City Council and the Historic Preservation Commission concur in the qualification of the Norconian property for National Register listing in relation to its Naval Hospital and Guided Missile eras and that staff and the Cultural Resources Consultant be directed to work with the Historic Preservation Commission in the preparation and submission of a National Register Nomination to the State Historic Preservation Commission.

SUMMARY: At its June 4, 2014 meeting, the City Council unanimously authorized the preparation of a historic resources survey and evaluation of the Norconian property for its Naval Hospital and Guided Missile eras. Wilkman Historical Services (WHS) completed this work earlier this month and the document is ready to be submitted to the California State Historic Preservation Commission for consideration of the property's listing on the National Register of Historic Places for the significance of these eras.

BACKGROUND/ANALYSIS: The City of Norco has been deeply involved in the objective historical documentation and evaluation of the Norconian property for decades. While the City has been involved in the recognition of the Norconian's historic significance in a number of ways, the property's qualification for listing on the National Register of Historic Places has been a significant issue that the City has dealt with. The history of Norco's involvement in the historical significance of the Norconian property is multi-faceted and complex. For the sake of simplicity, only the two following events are summarized.

In 1998, when a Navy historic resources survey and evaluation of the Norconian's Resort Era found nothing of national historical value, the City of Norco hired, at its own expense, Knox Mellon and Associates to independently survey and evaluate the property. The result was a determination that nineteen resources qualified it for listing on the National Register of Historic Places as the Norconian Resort Era Historic District. In 2000, the

property was formally listed per this report. More recently, another Navy funded historic resources survey found nothing of national historical value for the property's Naval Hospital and Naval Guided Missile Research, Development, Testing & Evaluation (RDT&E) eras. The City's comments regarding this finding were either rejected out of hand or ignored by the Navy. Consequently, the City found itself once again in a position where it needed to spend city funds to independently document and evaluate the property. At its June 4, 2014 meeting, the City Council unanimously approved the engagement of Wilkman Historical Services (WHS) for this purpose. Recently, WHS completed well over a year's worth of research and evaluation work, in the form of an approximately 300 page report that thoroughly documents these two historical eras. As a result of this extensive research and evaluation work, WHS found the Norconian property eligible for National Register listing in relation to both eras.

To help the City Council and the Historic Preservation Commission navigate the rather complex Naval Hospital and Naval Guided Missile RDT&E histories, WHS developed the attached summary report. The Council and Commission will also find it useful to read the Executive Summary sections of the full historic resources survey and evaluation and to examine the full report where there are many more details about the property, including illustrative photographs, charts, maps, and tables.

FINANCIAL IMPACT: WHS is under contract to see this project through to National Register listing for a not to exceed fee of $25,000. Thus far, $10,000 has been invoiced.

Attachments: Summary of the Historic Resources Survey and Evaluation
Norconian Property Historic Resources Survey and Evaluation, Full Report

SUMMARY OF THE HISTORIC RESOURCES SURVEY AND EVALUATION OF THE NORCONIAN PROPERTY'S HISTORY AS NAVAL HOSPITAL CORONA AND DETACHMENT CORONA

Prepared for the Joint Meeting of the Norco City Council and the Norco Historic Preservation Commission October 28, 2015

The following is a summary of the approximately 300 page draft report entitled *Norconian Property Historic Resources Survey & Evaluation: Hospital Era (1941-1957) Guided Missile RDT&E Era (1951-Present,* dated October 1, 2015. This summary is basically a distillation of the two Executive Summaries (one for the Naval Hospital Era and the other for the Naval Guided Missile RDT&E Era) in the full report.

NAVAL HOSPITAL ERA

The active history of Naval Hospital Corona extends from 1941 - 1957. The U.S. Navy created Naval Hospital Corona (NHC) by converting and expanding a massive luxury resort originally developed by entrepreneur Rex Clark in 1929. Unfortunately, the Norconian Resort Supreme, as it was known, was completed shortly before the onset of the Great Depression, and it suffered economic challenges throughout the 1930s.

In 1941, the federal government recognized that its entry into World War II would necessitate a need for many thousands of hospital beds. One way in which it sought to satisfy this need was to take control of luxury hotels and resorts throughout the United States for conversion to convalescent hospitals. The Norconian property was unique in this regard, as it was converted into a Naval General Hospital, providing primary treatment for a wide array of illnesses and injuries. The Norconian was also the only resort purchased fee-simple by the federal government. All of the others were leased and returned to their owners after the war. While located within the community of Norco, the naval hospital was identified with Corona, the City immediately to the south of Norco. Naval Hospital Corona (NHC), was fully functional from 1941 through1949 and then from 1951 through 1957. To allow the property to operate as a fully functional general hospital, the Navy expanded the original Norconian resort with new, largely permanent buildings designed to complement the Spanish Colonial Revival design of the existing resort buildings and to reflect California's traditions related to this style.

NHC benefitted greatly from the organizational, knowledge, and medical talents of two teams of doctors from the Mayo Clinic. Arriving in 1942, the final team of doctors left NHC in 1944 for service at the front lines. Because of this pool of talent, NHC quickly became a highly respected Naval hospital.

Ultimately, the Navy developed the Norconian property into three "units" each organized as an essentially independent hospital. Unit 1 was the central general hospital where the command center was located and where sailors and marines received medical treatment and rehabilitation therapy. Unit 2 was devoted entirely to tuberculosis

treatment. Unit 3 was largely devoted to the treatment of rheumatic fever, but also treated patients suffering from other medical conditions, such as polio, syphilis, cord bladder issues, malaria, jungle diseases, and overflow tuberculosis patients from Unit 2. Unit 3 was the only part of the Norconian property developed with temporary buildings not designed in the Spanish Colonial Revival style.

NHC was the designated center for a number of problematic diseases and injuries. It was the West Coast (Pacific Theater) center for the treatment of tuberculosis, polio, and cord bladder issues, and it was the national center for the treatment of rheumatic fever. NHC had priority access to the "miracle" drugs, penicillin and streptomycin. Working with the highly regarded doctors and scientists at Olive View Sanitarium in Monrovia, California, NHC achieved significant advances in the treatment of tuberculosis and rheumatic fever through the use of these newly emerging "wonder drugs."

Rehabilitation was another important aspect of NHC. Improved procedures to evacuate and provide quick medical treatment for World War II's wounded resulted in the survival of many combatants who, during World War I, would have died on the battle field. Corpsmen got injured soldiers off the battlefield to field hospitals that provided emergency care.

NHC was one of three military hospitals where wheelchair basketball was pioneered and perfected in the mid-1940s. Birmingham Veterans' Hospital in Van Nuys, California organized the first wheelchair basketball team, with the first documented game played in November of 1946. This game, as with all early games pitted wheelchair bound patients against able bodied persons in wheelchairs. A wheelchair basketball team from Cushing Veterans' Hospital in Framingham Massachusetts played the second documented wheelchair basketball game against the Boston Celtics in December of 1946. Dr. Gerald Gray formed the Rolling Devils wheelchair basketball team at NHC after seeing the wondrous benefits the sport had achieved for Birmingham's wheelchair bound patients. The Rolling Devils gained significant notoriety, winning all but one of its games and being the first wheelchair basketball team to travel by air to distant games. Most significantly, the gymnasium at NHC was the venue of the first wheelchair basketball game between two paraplegic teams. This gym remains essentially unchanged from the day that groundbreaking basketball game was played. Of the three venues where wheelchair basketball was pioneered, only NHC remains intact. Wheelchair basketball has gone on to become a major paraplegic sport, with organizations and teams engaged in the sport all over the world. Wheelchair basketball has also gone on to become a major form of rehabilitation for service men and women suffering from paralysis.

While NHC was built as a permanent Naval hospital intended for use well beyond the end of World War II, it was decommissioned on November 1, 1949. It's decommissioning was short-lived, however, as NHC Units 1 and 3 were recommissioned in 1951 to treat the sick and wounded from the Korean War. NHC remained in service after the Korean War as a general hospital with a service area covering several hundred square miles. Unlike its mission during World War II, NHC's

post-war mission included medical care to both military and civilian patients.

Despite the fact that NHC was built to serve as a long-term permanent flagship hospital, it was closed in 1957. Multiple efforts to keep NHC alive as a veterans' hospital were, unfortunately, unsuccessful.

Qualification for the National Register

NHC qualifies for listing as a Historic District on the National Register of Historic Places, spanning a period of significance from 1941 through 1957. The property type is Naval General Hospitals, and it is significant as a Historic District at the National level under Criteria C and A as follows:

Criterion C:

District Continuity of Architectural Style: There is a distinct continuity of the Spanish Colonial Revival style throughout Units 1 and 2,

Rare Example of a Resort-Based Naval Hospital: NHC is the only remaining, intact, example in the United States of a resort based Naval hospital.

Rare Example of an Intact World War II Built Hospital: NHC is the only remaining, intact example in the Western United States of a Naval general hospital that retains integrity to its World War II form. (Ongoing research may prove NHC to have this distinction nation-wide.)

Rare Intact Example of World War II Pavilion Site Planning: Units 2 and 3 of NHC are excellent examples of the military pavilion style site planning employed during World War II.

Work of a Master Architect: NHC's designer, Claud Beelman, was a master architect of the twentieth century with at least a dozen buildings on the National Register of Historic Places representing a broad range of architectural styles.

Criterion A:

Establishment by Mayo Clinic Specialists: NHC is unique for having been established by the largest contingent of Mayo Clinic doctors assembled up until that time outside of the Mayo Clinic itself.

Disease Testing and Treatment: NHC was the Pacific Theater center for the treatment of tuberculosis, poliomyelitis, and cord bladder conditions, and the national center for the treatment of rheumatic fever. Significant experimentation was conducted on both humans and animals in the treatment of these diseases, including groundbreaking work in partnership with Olive View Sanitarium and the National Institute of Public Health.

Rehabilitation: NHC was a major center for the rehabilitation of patients suffering from paralysis, amputations, and muscles weakened by polio. Its resort heritage left it with a legacy of spa facilities, beautiful resort grounds, and numerous sports facilities that proved ideal for both physical and mental rehabilitation.

NHC was of singular importance regarding the development and advancement of wheelchair basketball. Of the three military hospitals that pioneered wheelchair basketball, only NHC remains intact to its World War II form. Birmingham Hospital in Van Nuys, CA and Cushing Hospital in Framingham, MA are both gone. The NHC Rolling Devils was significant for doing the most to garner national awareness of wheelchair basketball, for being the first to use specially equipped airplanes to transport it to distant games, and for hosting and participating in history's first documented wheelchair basketball game between two paraplegic teams.

Integrity

NHC easily meets the seven aspects of integrity necessary to qualify for listing on the National Register. The seven aspects of integrity consist of Location, Design, Setting, Materials, Workmanship, Feeling, and Association.

The next section explores the Norconian property's history as a Naval guided missile RDT&E facility.

NAVAL GUIDED MISSILE RDT&E ERA

In 1951, the National Bureau of Standards (NBS) relocated its Washington D.C. based guided missile research branch to NHC's Unit 2. Like the naval hospital, the National Bureau of Standards' laboratories were identified with the City of Corona, carrying the name National Bureau of Standards, Corona Laboratories.

About a year after moving into the old Unit 2 buildings, the Corona labs were transferred to the Department of Defense (DoD), and placed under the direct command of the U.S. Navy. In recognition of this change, it became known as Naval Ordinance Laboratories, Corona (NOLC.) Over the years, the name of the weapons RDT&E operations at the former naval hospital property changed several times. For the reader's sake, the generic term "Detachment Corona" is used to identify the property.

Detachment Corona made significant contributions to the Cold War, playing a prominent role in the development of effective Navy guided missiles. At the peak of its operations toward the end of the 1960s, Detachment Corona was organized into two basic entities. The first was its guided missile RDT&E function and the second was its Guided Missile Independent Assessment Agency (IAA) function.

Guided Missile RDT&E Working Groups: The following is a summary of the working groups that made up the guided missile RDT&E aspect of Detachment Corona:

- **Fuse Department:** Detachment Corona was best known for its work on proximity fuzing. In February of 1954, the Department of Defense (DoD) designated NOLC as the *Technical Director of all Navy fuze work.* The successful management of this mission required intensive laboratory and test related work in electronic circuits, microwaves, electromechanics, and component miniaturization. To accomplish this, sophisticated equipment was developed and put into use, including drop towers, massive computers, environmental laboratories, simulation laboratories, telemetering equipment, radar systems, and the like.

- **Missile Systems Department:** This department had overall responsibility for the development of Navy guided missiles, with primary responsibility for the technical direction of the Standard ARM missile program. This department operated the Simulator and Hybrid Computer Facility, which included one of the largest Government-owned analog computers in the Western United States.

- **Advanced Systems Group:** This group was in charge of determining the requirements of future Navy guided missile systems, formulating the parameters of such systems, and assessing the feasibility of these systems.

- **Research Department:** NOLC's Research Department pioneered numerous technologies that significantly contributed to U.S. efforts to protect its citizens and allies around the world. Technological advancements were made in such fields as telemetry systems, countermeasures, anti-radar guidance systems, computer component development, infrared spectroscopy and detectors, polymer chemistry, radio frequency transmission, and microwave radiometry.

  The Director of the Research Department, the renowned scientist Dr. Curtis Humphries, was responsible for numerous significant advancements.

  An extensive Technical Library housed technical documents that were available to all of Detachment Corona's working groups and all other branches of the military. Within the library, a Technical Information Division provided services for document editing, photography, copying, and Illustration.

  A Fabrication Services division also served the needs of all of Detachment Corona's working groups. It was staffed by skilled craftsmen, who created components, parts, and assemblies.

  All working groups also had access to Detachment Corona's highly sophisticated computers. Computer services were also offered to military branches outside of Detachment Corona.

The above RDT&E working groups were disestablished at Detachment Corona 1971 and transferred to other locations.

Guided Missile Independent Assessment Agency: Starting out as an integral part of Detachment Corona's RDT&E working groups, the Guided Missile IAA group was physically and organizationally separated from these groups in 1964. When the RDT&E working groups left Detachment Corona in 1971, the missile evaluation group remained, taking over the entire Detachment Corona campus.

Its job was to provide objective evaluations of the performance of all Navy guided missiles. The necessity of evaluation services was learned during World War II, when torpedoes were plagued with performance problems. In too many cases, these torpedo failures caused of loss of life of our military personnel and the destruction of our ships.

In 1964, missile evaluation at NOLC took on a level of importance never before realized, when it was reorganized as the Fleet Missile Systems Assessment and Evaluation Group (FMSAEG). With the creation of FMSAEG, naval guided missile evaluation was given complete independence from intermediate management, allowing its findings to be sent directly to the DoD. This eliminated a previous tendency to compromise the objectivity of these reports, a tendency that often led to loss of life and waste of federal funds when defective weapons were allowed to continue in use.

Government Industry Data Exchange Program (GIDEP) and Failure Rate Data Program (FARADA): By the late 1950s, NOLC had acquired extensive information on the reliability of electronic and mechanical components. In 1959, this resulted in the establishment of the Inter-Service Data Exchange Service (IDEP.) In 1970, IDEP was consolidated at Detachment Corona as a part of FMSAEG. At this point the program was renamed the Government-Industry Data Exchange Program (GIDEP.)

In the early 1960s, another data exchange program, the Failure Rate Data (FARADA) program was established. FARADA simplified the problem of determining the reliability of components by making the most current failure rate data available to military and space contractors. Initially, FARADA was simply located in the same building as GIDEP. In 1973, the two programs were merged as one coordinated entity.

Qualification for the National Register

The Guided Missile IAA aspect of Detachment Corona qualifies the property for listing on the National Register of Historic Places as a Historic District on the basis of National Register Criterion C (architecture and physical design) and Criterion A (association with events significant in history.

Criterion C:

Three of the buildings occupied by Detachment Corona, the Resort era Pavilion, Chauffeurs' Quarters, and the Garage/Laundry were designed by Master Architect

Dwight Gibbs and are already listed as contributors to the Norconian's Resort Era National Register Historic District.

The vast majority of the other buildings occupied by Detachment Corona were designed by Master Architect Claud Beelman for patients suffering from tuberculosis. Beelman chose the Spanish Colonial Revival style both to coordinate with the architecture of the existing Norconian Resort and to reflect the traditions of California's cultural heritage.

Tying the District together is a landscape consisting of 60-acre manmade lake, surrounding formal landscaping, and a natural area of hills and valleys referred to here as the Southwest Landscape.

The following Criterion C related factors support the eligibility of Detachment Corona for National Register listing as a Historic District:

> **District Continuity of Architectural Style:** Beelman's use of Spanish Colonial Revival architecture is found in all of the major NHC buildings used by the Guided Missile IAA group. The theme is carried out in the use of red clay tile roofs, stucco finished exterior walls, Spanish style cupolas for attic ventilation, and many other design details in the buildings throughout Detachment Corona.
>
> **Rare Intact Example of World War II Pavilion Site Planning:** Unit 2 is a rare surviving example of military pavilion site planning that retains integrity to its World War II origins.
>
> **Work of a Master Architect:** Claud Beelman, the architect of NHC's Units 1 and 2, was a master architect of the twentieth century with at least a dozen buildings on the National Register of Historic Places. He was a highly versatile architect with National Register listed buildings representing a wide range of architectural styles. The Norconian property is the only example of a large Beelman designed complex using Spanish Colonial Revival architecture.

Criterion A:

Numerous events could be cited as contributing to Detachment Corona's qualification for the National Register, including the accomplishments of its Fuze and Research Departments. Unfortunately, almost all of the testing structures used by these departments are no longer present on the property. This compromises the integrity of the property to its historic period of significance, 1951-1971. Detachment Corona's Guided Missile IAA operations did not make extensive use of these testing structures, however, and therefore is not dependent upon them to represent its historic importance.

Of particular importance is the evaluation work accomplished by FMSAEG. Overall, FMSAEG was a totally unique function in the Navy, a function that was created and operated exclusively at Detachment Corona. FMSAEG's operations as a purely independent entity ended on June 30, 1971 when it became an Annex of the Naval

Weapons Station, Seal Beach. Nonetheless, the role of Detachment Corona as the site of the Navy's central Guided Missile IAA function has not changed and remains in effect to this day.

Integrity

As noted earlier, the history of Detachment Corona as a Navy weapons RDT&E facility is clearly significant. Unfortunately, the significance the RDT&E program is diminished by the removal, starting in 1971, of the vast majority of the testing structures and buildings used to support these activities.

Detachment Corona's Guided Missile IAA function did not make significant use of these testing structures and buildings, however, so their absence today does not detract from this function's historical integrity. Major buildings used by Detachment Corona's Naval Guided Missile IAA function include all of the Unit 2 tuberculosis ward buildings, the Corpsmen's and WAVES' Quarters of Unit 1, and the Resort Era Pavilion, Chauffeurs' Quarters, and Garage/Laundry buildings. Of these buildings, only the following have been removed:

- The Resort Era Laundry, portion of the Garage/Laundry Building.
- The Unit 1 WAVES' Quarters.
- The Unit 2 Married Officers' Quarters.

While the loss of these buildings is a negative factor in the degree to which Detachment Corona's Guided Missile IAA function retains historical integrity, the overall complex retains a high enough level of integrity to be clearly recognizable to anyone from the period of significance. This factor of integrity and the singular importance of the Guided Missile IAA function, qualifies the property for listing on the National Register of Historic Places as the Detachment Corona Guided Missile IAA Historic District.

HISTORIC DISTRICT BOUNDARIES AND CONTRIBUTORS

The research and evaluation work summarized above results in the establishment of two overlapping historic districts. The first is the Naval Hospital Corona Historic District and the second is the Detachment Corona Guided Missile Independent Assessment Agency Historic District. The maps on the following pages define the boundaries of these districts, while the associated tables list those aspects of the property that contribute to its National Register historical significance.

NAVAL HOSPITAL CORONA HISTORIC DISTRICT MAP

BLDG #s	HOSPITAL ERA CONTRIBUTOR BUILDING NAME	PROPERTY TYPE	BUILT
307-312	Unit 1, Hospital Annex	Health Care	1943
101	Unit 1, Main Administration (Former Hotel Building)	Health Care/Adm	1928
102	Unit 1, Tea House	Health Care	1928
302	Unit 1, Main Power House	Infrastructure	1928
103	Unit 1, Nurses' Building	Residential	1943
104	Unit 1, Nurses' Building Annex	Residential	1944
306	Unit 1, Chapel	Personnel Support	1944
305	Unit 1, Occupational Therapy	Health Care	1942/43
313	Unit 1, Tool House	Personnel Support	1944/45
315	Unit 1, Ship's Service Storage	Personnel Support	1944/45
320-322	Unit 1, Theater/Gymnasium/Ships Store/Laundry Complex	Personnel Support	1945/46
300	Unit 1, Fifth Street Gatehouse	Transportation	1942
301	Unit 1, Corpsmen's Quarters	Residential	1943-44
201	Unit 1, Officers' Club (Former Casino/Pavilion)	Personnel Support	1928
203	Unit 1, Boat House and Docks	Personnel Support	1929
209	Unit 1, (Old) WAVES Quarters & Qtrs " G" (former Chauffeurs Qtrs)	Residential	1929
204	Unit 1, Garage/Laundry	Personnel Support	1930
213	Unit 1, Plumbing Warehouse	Personnel Support	1942
214	Unit 1, Truck Shelter	Transportation	1942
215	Unit 1, Grease Rack	Transportation	1944
208	Unit 1, Fire Station/Electric Shop	Personnel Support	1944
218	Unit 1, Gardner's Shed	Personnel Support	1942
220	Unit 1, Animal House (listed as 217 on some maps)	Health Care	1946
512	Unit 2 Command Center	Administration	1943
511	Unit 2 Recreation Building	Personnel Support	1943
515	Unit 2 Subsistence Building	Personnel Support	1943
513	Unit 2 Power House, Garage and Warehouse	Infrastructure	1943
508, 513, 516, 518	Unit 2, Phase 1 Wards	Health Care	1943
517-523	Unit 2, Phase 2 Wards	Health Care	1944
506-507	Unit 2, Phase 1 Sick Officer' HOSPITAL DISTRICT MAP	Health Care	1943
505	Unit 2, Phase 2 Sick Officers	Health Care	1944
555	Unit 2, Phase 1 Covered Walkw HOSPITAL DISTRICT MAP	Health Care	1943
556	Unit 2, Phase 2 Covered Walkways	Health Care	1944
501-503	Unit 2 Corpsmen's Quarters	Residential	1943
504	Unit 2 Corpsmen's Bag Storage Building	Personnel Support	1945
448, 453, 455, 453, 456, 458	Unit 3, Central Facilities	Administration/ Health Care/ Personnel Support	1944
451	Unit 3, Recreation/Storage Building	Personnel Support	1944
427, 429, 431-439, 441-443, 445	Unit 3, Ward Buildings	Health Care	1944
449	Unit 3, Boiler Plant	Infrastructure	1944
457 and 459	Unit 3, Help's Quarters	Residential	1944
498	Unit 3, Fire Station	Personnel Support	1944
447	Unit 3, Bag Storage	Personnel Support	1944
801-802	Sewage Treatment Plant	Infrastructure	1942
N/A	Lake, Lake Landscaping and Southwest Landscape.	Personnel Support	N/A

NAVAL HOSPITAL CORONA HISTORIC DISTRICT CONTRIBUTING USES

DETACHMENT CORONA GUIDED MISSILE IAA HISTORIC DISTRICT MAP

BLDG #	HOSPITAL FUNCTION	GUIDED MISSILE IAA FUNCTION	YEAR BUILT	DIST CONTRIB?
N/A	Lake/Southwest Landscape	Lake/Southwest Landscape	1928	Yes
201	Officers' Club	Conference Center	1928	Yes
203	Boathouse and Docks	Boathouse and Docks	1929	Yes
204	Garage/Laundry	Stores (Laundry Section Demolished)	1930	Yes
208	Fire Stn & Electric Shop	Unknown	1929	Yes
209	Old WAVES' Quarters	Public Works, Procurement	1929	Yes
213	Plumbing Warehouse	Unknown	1942	No
214	Truck Shelter	Unknown	1942	No
215	Grease Rack	Unknown	1942	No
218	Gardeners Tool Shed	Unknown	1942	No
219	Vehicle Body Paint Shop	Vehicle Body and Paint Shop	1954	No
220	Animal House	Restrooms (Also listed as Bldg 217)	1946	No
300	Main (Fifth Street) Gate	Main (Fifth Street) Gate	1943	Yes
301	Corpsmen's Quarters	Laboratory/Support	1943-4	Yes
501	Corpsmen's Quarters	Laboratory/Support	1943	Yes
502	Corpsmen's Quarters	Laboratory/Support	1943	Yes
503	Corpsmen's Quarters	Laboratory/Support	1943	Yes
504	Bag Storage	Laboratory/Support	1943	Yes
505	Ph 2 TB Officers' Ward	Laboratory/Support	1943	Yes
506	Ph 1 TB Officers' Ward	Laboratory/Support	1943	Yes
507	Ph 1 TB Officers' Ward	Laboratory/Support	1943	Yes
508	Ph 1 TB Ward	Laboratory/Support	1943	Yes
509	Ph 1 TB Ward	Laboratory/Support	1943	Yes
510	Ph 1 TB Ward	Laboratory/Support	1943	Yes
511	Theater & Recreation	Technical Library, Auditorium	1943	Yes
512	Command Office/	Administration	1943	Yes
513	Power House	Laboratory/Support	1943	Yes
514	Ph 1 TB Ward	Laboratory/Support	1943	Yes
515	Subsistence	Photography, Cafeteria	1943	Yes
516	Ph 1 TB Ward	Laboratory/Support	1943	Yes
517	Ph 2 TB Ward	Laboratory/Support	1944	Yes
518	Ph 1 TB Ward	Laboratory/Support	1943	Yes
519	Ph 2 TB Ward	Laboratory/Support	1944	Yes
520	Ph 2 TB Ward	Laboratory/Support	1944	Yes
521	Ph 2 TB Ward	Laboratory/Support	1944	Yes
522	Ph 2 TB Ward	Laboratory/Support	1944	Yes
523	Ph 2 TB Ward	Laboratory/Support	1944	Yes
528	Support Building	Unknown	1954	No
537	Not a Hospital Bldg	Grounds Storage	1957	No
539	Bag Storage	Laboratory/Support	1943	Yes
554	Not a Hospital Bldg	Guard House	1957	Yes
555	Ph 1 Covered Walkway	Ph 1 Covered Walkway	1943	Yes
556	Ph 2 Covered Walkway	Ph 2 Covered Walkway	1944	Yes
626-632	Not a Hospital Bldg	Explosive Labs and Bunkers	c. 1957	Yes
634	Not a Hospital Bldg	Radio Frequency Building	1960	Yes
650	Not a Hospital Bldg	Fire Station	1964	Yes
808	Enlisted Quarters	Unknown	1957	No

DETACHMENT CORONA GUIDED MISSILE IAA HISTORIC DISTRICT CONTRIBUTORS

Norconian Property
Historic Resources Survey & Evaluation
Hospital Era (1941-1957)
Guided Missile RDT&E Era (1951-Present)

Draft Report

October 1, 2015

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NORCONIAN PROPERTY
HISTORIC RESOURCES SURVEY & EVALUATION
NAVAL HOSPITAL CORONA ERA (1941-1957)
DETACHMENT CORONA GUIDED MISSILE RDT&E ERA (1951-1971)
NORCO, CA

DRAFT REPORT
October 1, 2015

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List of Figures

Executive Summary - Naval Hospital Corona Era

The active history of Naval Hospital Corona extends from 1941 - 1957. The U.S. Navy converted Naval Hospital Corona (NHC) from a massive luxury resort originally developed by entrepreneur Rex Clark in 1929 and known as the Norconian Resort Supreme. Clark had previously established the town of Norco in 1923, the village center of which was located northeast of the Norconian. On this land, Clark created a somewhat utopian farm-based village where people were sold two to five-acre lots for the establishment of small farms or ranches. Most of these properties were improved as poultry ranches. Clark supported Norco's land owners with a comprehensive range of services as needed to build and operate a farm or ranch.

After the town of Norco was well established, Clark discovered pockets of hot mineral water near the Santa Ana River, and he commenced the design and development of the luxury Norconian Resort on about 700 acres of this land. Unfortunately, Clark's resort opened literally months before the onset of the Great Depression, and the resort suffered economic challenges throughout the 1930s.

In 1941, the federal government recognized that its entry into World War II would necessitate a need for many thousands of hospital beds. One way in which it sought to satisfy this need was to take control of luxury hotels and resorts throughout the United States for conversion to convalescent hospitals. Most of these properties were leased from their private owners. The Norconian was an exception to this rule, as the Navy purchased the property, with fee title to the land and improvements. Originally, the Navy's intent was to convert the Norconian into a convalescent hospital. Soon after its acquisition, however, the Navy decided to develop the Norconian into a flagship, permanent Naval general hospital. While the property was located in the unincorporated town of Norco, it was designated Naval Hospital Corona.

Rex Clark's Norconian Resort became government property on December 9, 1941, and Captain Harold L. Jensen reported to duty January 2, 1942 to take on the difficult task of converting the luxury resort into a Naval general hospital. NHC was fully functional from 1941 through1949 and then from 1951 through 1957. The Navy expanded the original Norconian resort with new, largely permanent buildings designed to complement the Spanish Colonial Revival design of the original resort buildings and to reflect the California traditions related to this style.

NHC was one aspect of a massive effort to quickly bring hospital beds on line to handle expected casualties from World War II. Prior to World War II, there were only three permanent Naval hospitals to handle casualties from the Pacific Theater. These consisted of Naval Hospital Mare Island and Naval Hospital San Diego in California, and Naval Hospital Bremerton in Washington state.

To quickly add needed bed space, the federal government engaged in a two pronged effort. One involved acquiring the use of resort properties for convalescent hospital purposes. The other involved the construction of numerous temporary hospitals. The Norconian property was the only resort purchased fee-simple by the government. All of the others were leased and returned to their owners after the war.

NHC benefitted greatly from the organizational, knowledge, and medical talents of two teams of doctors from the Mayo Clinic. Arriving in 1942, the final team of doctors left NHC in 1944 for service at the front lines. Because of this pool of talent, NHC quickly became a highly respected Naval hospital.

Ultimately, the the Navy developed the Norconian property into three “units” each organized as an essentially independent hospital. Unit 1 was the central general hospital where the command center was located and where sailors and marines received medical treatment and rehabilitation therapy. Unit 2 was devoted entirely to tuberculosis treatment. Unit 3 was largely devoted to the treatment of rheumatic fever, but also treated patients suffering from other medical conditions, such as polio, syphilis, cord bladder issues, malaria, jungle diseases, and overflow tuberculosis patients from Unit 2. Unit 3 was the only part of the Norconian property developed with temporary buildings not designed in the Spanish Colonial Revival style. Beyond these three Norconian based units was a fourth unit, situated several miles away in Spadra, near the City of Pomona. Consisting largely of temporary buildings, Unit 4 served as a convalescent/rehabilitation hospital for patients initially treated at NHC.

NHC was the designated center for a number of problematic diseases and injuries. It was the West Coast (Pacific Theater) center for the treatment of tuberculosis, polio, and cord bladder issues, and it was the national center for the treatment of rheumatic fever. NHC had priority access to the “miracle” drugs, penicillin and streptomycin. Working with the highly regarded doctors and scientists at Olive View Sanitarium in Monrovia, California, NHC achieved significant advances in the treatment of tuberculosis and rheumatic fever through the use of the newly emerging “wonder drugs”, penicillin and streptomycin.

Rehabilitation was another important aspect of NHC. Improved procedures to evacuate and provide quick medical treatment for World War II’s wounded resulted in the survival of many combatants who, during World War I would have died on the battle field. Corpsmen got injured soldiers off the battlefield to field hospitals that provided emergency care. Once sufficiently stabilized patients were then transported to mainland hospitals via hospital ships and airplanes. These improved procedures resulted in huge demands to care for severely injured combatants, including those with severe injuries that resulted in amputations and paralysis. NHC also provided treatment and rehabilitation services to polio victims.

NHC was ideally suited for patients with physical disabilities. The hot mineral springs that once soothed the Norconian’s wealthy patrons, were pressed into use for therapeutic purposes to help heal combatants and polio victims in need of rehabilitation. Additionally, NHC’s prosthetic technicians developed and produced devices to give mobility and physical dexterity for amputees. NHC’s beautiful grounds, golf course, lake, swimming pools, tennis courts, and large expanses of open space provided an ideal setting for mental and physical healing.

NHC was one of three military hospitals where wheelchair basketball was pioneered and perfected in the mid-1940s. The British were the first to introduce sports for wheelchair bound persons, experimenting with a number of sports, but eventually settling on netball, a distant cousin to basketball. Birmingham Veterans’ Hospital in Van Nuys, California organized the first wheelchair basketball team, with the first documented game played in November of 1946. This game, as with all early games pitted wheelchair bound patients against able bodied persons in wheelchairs. A wheelchair basketball team from Cushing Veterans’ Hospital in Framingham Massachusetts played the second documented wheelchair basketball game against the Boston Celtics in December of 1946. Oral histories from various NHC staff and patients recall wheelchair basketball being played at NHC as early as 1945; however, WHS was not able to locate written documentation of such play. WHS did, however, locate documentation confirming organized team basketball at NHC in early 1947.

Dr. Gerald Gray, an NHC plastic surgeon who specialized in treating the bedsores of paraplegics, saw the Birmingham team practicing during one of his patient visits. Impressed with the improvements to morale and physical health gained by those engaged in the game, he formed the Rolling Devils wheelchair basketball team at NHC. The Rolling Devils gained significant notoriety, winning all but one of its games and being the first wheelchair basketball team to travel by air to distant games. Most significantly, the gymnasium at NHC was the venue of the first wheelchair basketball game between two paraplegic teams. This gym remains essentially unchanged from the day that groundbreaking basketball game was played. Of the three venues where wheelchair basketball was pioneered, only NHC remains intact. Wheelchair basketball has gone on to become a major paraplegic sport, with organizations and teams engaged in the sport all over the world. Wheelchair basketball has also gone on to become a major form of rehabilitation for service men and women suffering from paralysis.

While NHC was built as a permanent Naval hospital intended for use well beyond the end of World War II, politics got in the way and Long Beach was chosen to serve as the area's permanent Naval Hospital. Consequently, NHC was decommissioned on November 1, 1949. It's decommissioning was short-lived, however, as NHC Units 1 and 3 were recommissioned in 1951 when the U.S. entered the Korean War. NHC remained in service after the Korean War, as a general hospital with a service area covering several hundred square miles. Unlike its mission during World War II, NHC's post-war mission included medical care to both military and civilian patients.

Despite concerted efforts to keep NHC open it was permanently closed in 1957. Subsequent to this second decommissioning, however, another effort was engaged in to reopen NHC as a permanent hospital. This time, the push was focused on keepng NHC alive as a veterans' hospital. Unfortunately, this effort was not successful.

Only a portion of NHC was reopened as a hospital in 1951. A large portion of the property, including all of Unit 2 and several adjacent Unit 1 buildings, was pressed into service by the National Bureau of Standards (NBS) in 1951 for weapons related research. The NBS initially attempted to gain access to the entire NHC property, but in the end it was not able to use the main (northerly) part of Unit 1, nor any part of Unit 3. The history and significance of the use of NHC by the NBS and its successors is covered in Part 3 of this document. In 1962, the portion of the property not devoted to laboratories (all of Unit 3 and the majority of Unit 1) was transferred to the California Department of Corrections to serve as a prison for drug addicts.

In the 1950s and 1960s, the Navy sold significant open space and golf course acreage south and east of the core NHC campus. This land was subsequently developed with various governmental and private uses. Nonetheless, the core NHC campus remains essentially as it was during World War II. Today, the property is divided between a weapons RDT&E facility, Norco College, and a state prison.

Qualification for the National Register

NHC qualifies for listing as a Historic District on the National Register of Historic Places, spanning a period of significance from 1941 through 1957. The property type is Naval General Hospitals, and it is significant as a Historic District at the National level under Criteria C and A as follows:

Criterion C:

District Continuity of Architectural Style: There is a distinct continuity of the Spanish Colonial Revival style throughout Units 1 and 2,

Rare Example of a Resort-Based Naval Hospital: NHC is the only remaining, intact, example in the United States of a resort based Naval hospital.

Rare Example of an Intact World War II Built Hospital: NHC is the only remaining, intact example in the Western United States of a Naval general hospital that retains integrity to its World War II form.

Rare Intact Example of World War II Pavilion Site Planning: Units 2 and 3 of NHC are excellent examples of the military pavilion style site planning employed during World War II.

Work of a Master Architect: NHC's designer, Claud Beelman, was a master architect of the twentieth century with at least a dozen buildings on the National Register of Historic Places representing a broad range of architectural styles.

Criterion A:

Establishment by Mayo Clinic Specialists: NHC is unique for having been established by the largest contingent of Mayo Clinic doctors assembled up until that time outside of the Mayo Clinic itself.

Disease Testing and Treatment: NHC was the Pacific Theater center for the treatment of tuberculosis, poliomyelitis, and cord bladder conditions, and the national center for the treatment of rheumatic fever. Significant experimentation was conducted on both humans and animals in the treatment of these diseases, including groundbreaking work in partnership with Olive View Sanitarium and the National Institute of Public Health.

Rehabilitation: NHC was a major center for the rehabilitation of patients suffering from paralysis, amputations, and muscles weakened by polio. Its resort heritage left it with a legacy of spa facilities, beautiful resort grounds, and numerous sports facilities that proved ideal for both physical and mental rehabilitation.

NHC was of singular importance regarding the development and advancement of wheelchair basketball. Of the three military hospitals that pioneered wheelchair basketball only NHC remains intact to its World War II form. Birmingham Hospital in Van Nuys, CA and Cushing Hospital in Framingham, MA are both gone. The NHC Rolling Devils was significant for doing the most to garner national awareness of wheelchair basketball, for being the first to use specially equipped airplanes to transport it to distant games, and for hosting and participating in history's first documented wheelchair basketball game between two paraplegic teams.

Integrity

NHC easily meets the seven aspects of integrity necessary to qualify for listing on the National Register. The seven aspects of integrity consist of Location, Design, Setting, Materials, Workmanship, Feeling, and Association.

Executive Summary - Detachment Corona Research Development, Testing & Evaluation Era

In 1951, the National Bureau of Standards (NBS) relocated its Washington D.C. based guided missile research branch to the former Naval Hospital Corona (NHC.) NHC had been established in 1941 as a Navy general hospital on a former luxury resort property known as the Norconian Resort Supreme. Once established at the former NHC property, the NBS guided missile probram became known as NBS, Corona Laboratories. While located within the community of Norco; both the hospital and weapons Research, Development, Testing & Evaluation (RDT&E) operations identified themselves as Corona facilities, the name of the City immediately to the south of Norco..

Originally, the NBS hoped to secure the entire hospital property, however, the outbreak of the Korean War made it necessary reestablish the majority of the property as a naval hospital. The division of the hospital into three distiinct “units” allowed it to partition its use as needed. The reopened hospital operated from NHC Units 1 and 3, while the NBS took over the NHC Unit 2. About a year after moving into the old Unit 2 buildings, the Corona RDT&E labs were removed from the jurisdiction of the NBS and transferred to the Department of Defense (DoD), under the command of the U.S. Navy, becoming Naval Ordinance Laboratories, Corona (NOLC.) Over the years, the name weapons RDT&E operations at the former naval hospital property changed several times. For the reader’s sake, the generic term “Detachment Corona” is often used in this report to identify the property.

Detachment Corona made significant contributions to the Cold War, playing a prominent role in the development of effective Navy guided missiles. At the peak of its operations toward the end of the 1960s, Detachment Corona was organized into two basic entities:

- The first was its guided missile RDT&E function consisting of the Fuze Department, Missile Systems Department, Advanced Systems Group and the Research Department.

- The Second was its Guided Missile Independent Assessment Agency (IAA) function, which started life as an activity of NBS Corona Laboratories, becoming the Missile Evaluation Department (MED) in 1954, and the Fleet Missile Systems Analysis and Evaluation Group (FMSAEG.) in 1964. Today the facility on this property is known as the Naval Surface Warfare Center Corona (NSWCC).

Guided Missile RDT&E Working Groups: The following is a summary of the working groups that made up the guided missile RDT&E aspect of Detachment Corona:

- **Fuse Department:** Detachment Corona was best known for its work on proximity fuzing. In February of 1954, the Department of Defense (DoD) designated NOLC as the *Technical Director of all Navy fuze work.* NOLC was charged with selecting all contractors for research, development, and engineering, with ultimate approval the responsibility of the Bureau of Ordnance. It was NOLC’s job to provide technical and scientific planning and coordination and to assure that projects were completed on time and within established specifications. NOLC also accomplished significant fuze RDT&E work at Detachment Corona. The successful management of this mission required intensive laboratory and test related work in electronic circuits, microwaves, electromechanics, and component miniaturization. To accomplish this, sophisticated equipment was developed and put into use, including drop towers, massive computers, environmental laboratories, simulation laboratories, telemetering equipment, radar systems, and the like.

- **Missile Systems Department:** This department had overall responsibility for the development of Navy guided missiles. Its Program Management Office was responsible for the technical direction of the Standard ARM missile program The Guidance Division dealt with the analysis, design, development, and flight testing of advanced missile guidance systems. The Instrumentation Division was responsible for the development of telemetry systems, subsystems, and components. The Countermeasures Division had the task of determining the susceptibility of missile guidance systems to enemy countermeasures and developing methods of reducing such susceptibility. Finally, the Dynamics Division was in charge of determining guided missile system design parameters, including airframe, propulsion, trajectory, and flight control system requirements. This division operated the Simulator and Hybrid Computer Facility, which included one of the largest Government-owned analog computers in the Western United States.

- **Advanced Systems Group:** This group was in charge of determining the requirements of future Navy guided missile systems, formulating the parameters of such systems, and assessing the feasibility of these systems. Essentially, this group was responsible for the very important task of staying ahead of the enemy's missile development programs.

- **Research Department:** Originally called the Physical Sciences Department, the Research Department handled a wide variety of scientific and engineering challenges, including those related to materials, components, and guidance systems. Its work focused on guidance-control systems, telemetry, and data recording and processing.

  NOLC's Research Department scientists pioneered numerous technologies that significantly contributed to U.S. efforts to protect its citizens and allies around the world. Technological advancements were made in such fields as telemetry systems, countermeasures, anti-radar guidance systems, computer component development, infrared spectroscopy and detectors, polymer chemistry, radio frequency transmission, and microwave radiometry.

  The Director of the Research Department, the renowned scientist Dr. Curtis Humphries, was responsible for numerous significant advancements. Humphries was recognized internationally for his scientific breakthroughs in atomic spectroscopy. Earlier in his career he determined the correct placement of uranium on the periodic series. He was also the first to measure the sixth series of atomic hydrogen, a breakthrough so important that it was named the Humphreys Series.

  At Detachment Corona, Humphreys' laboratory was responsible for a number of important advancements including the creation of an international system of wavelength standards, the development of revolutionary techniques of radiometry and spectrophotometry, the creation of large artificial crystals, advancements in photoconductivity for infrared detectors, the standardization of detectors for heat-seeking missiles, pioneering work in the use of thin magnetic film for data storage, and important advancements in high speed magnetic domain reversal phenomena.

  An extensive Technical Library housed technical documents that were available to all of Detachment Corona's working groups and all other branches of the military. Within the library, a Technical Information Division provided services for document editing, photography, copying, and Illustration.

A Fabrication Services division also served the needs of all of Detachment Corona's working groups. It was staffed by skilled craftsmen, who created components, parts, and assemblies.

All working groups also had access to Detachment Corona's highly sophisticated computers. Computer services were also offered to military branches outside of Detachment Corona.

The above RDT&E working groups were disestablished at Detachment Corona 1971 and transferred to other locations.

Guided Missile Independent Assessment Agency: Starting out as an integral part of Detachment Corona's RDT&E working groups, the Guided Missile IAA group was physically and organizationally separated from these groups in 1964. When the RDT&E working groups left Detachment Corona in 1971, the missile evaluation group remained, taking over the entire Detachment Corona campus.

When first established as a department, this group was given the name Missile Evaluation Department (MED.) Its job was to provide objective evaluations of the performance of all Navy guided missiles. The necessity of evaluation services was learned during World War II, when torpedoes were plagued with performance problems. In too many cases, these torpedo failures caused of loss of life of our military personnel and the destruction of our ships. MED was the first organized entity charged with the independent evaluation of naval weapons.

While MED's evaluations were highly regarded, the command system within which it worked often altered its reports, to the point that their effectiveness was greatly reduced by the time they reached the DoD. Thanks to the dedicated efforts of Rear Admiral Reich, this problem was solved with the establishment of FMSAEG. Unlike MED, FMSAEG did not have an intermediate reporting system between it and the DoD. FMSAEG became a key component in the guided missile program, saving time, money, and lives in the creation of truly effective weapons.

Government Industry Data Exchange Program (GIDEP) and Failure Rate Data Program (FARADA): By the late 1950s, MED had acquired extensive information on the reliability of electronic and mechanical components. Consequently, MED was given responsibility for providing the contractors involved in the Fleet Ballistic Missile Weapons System, reliability data regarding components being considered for use in the Polaris missile. In 1959, this resulted in the establishment of the Inter-Service Data Exchange Service (IDEP.) IDEP was a cooperative effort of the Army, Navy, and Air Force. IDEP's job was to facilitate the elimination of duplications of components, a huge cost to the nation's defense efforts.

Over time, IDEP grew as more entities made use of its services. Eventually, it became apparent that IDEP needed to be consolidated into one coordinated program. Thus, in 1970, the IDEP offices of the three armed services were consolidated at Detachment Corona as a part of FMSAEG. At this point the program was renamed the Government-Industry Data Exchange Program (GIDEP.)

In the early 1960s, another data exchange program, the Failure Rate Data (FARADA) program was established. Assigned to the Navy, FARADA simplified the problem of determining the reliability of components by making the most current failure rate data available to military and space contractors. Initially, FARADA was simply located in the same building as GIDEP. In 1973, the two programs were merged as one coordinated entity.

In 2007, the GIDEP program was realigned from the Department of the Navy to the Defense Standardization Program.

Qualification for the National Register

Detachment Corona qualifies as a National Register Historic District at the National Level for its history as a Guided Missile IAA. While associated with numerous significant achievements in guided missile design and testing, the RDT&E aspects of Detachment Corona do not count as a factor in the propety's National Register eligibility as nearly all of the testing structures critical to the efforts of these aspects were removed when NOLC was transferred out of the Corona property.

The Guided Missile IAA aspect of Detachment Corona qualifies the property for listing on the National Register of Historic Places as a Historic District on the basis of National Register Criterion C (architecture and physical design) and Criterion A (association with events significant in history.

Criterion C:

Three of the buildings occupied by Detachment Corona, the Resort era Pavilion, Chauffeurs' Quarters, and the Garage/Laundry were designed by Master Architect Dwight Gibbs and are already listed as contributors to the Norconian's Resort Era National Register Historic District.

The vast majority of the other buildings occupied by Detachment Corona were designed by Master Architect Claud Beelman for patients suffering from tuberculosis. Beelman chose the Spanish Colonial Revival style both to coordinate with the architecture of the existing Norconian Resort and to reflect the traditions of California's cultural heritage.

Tying the District together is a landscape consisting of 60-acre manmade lake, surrounding formal landscaping, and a natural area of hills and valleys referred to here as the Southwest Landscape.

The following Criterion C related factors support the eligibility of Detachment Corona for National Register listing as a Historic District:

> **District Continuity of Architectural Style:** Beelman's use of Spanish Colonial Revival architecture is found in all of the major NHC buildings used by the Guided Missile IAA group. The theme is carried out in the use of red clay tile roofing, stucco finished exterior walls, Spanish style cupolas for attic ventilation, and many other design details in the buildings throughout Detachment Corona.
>
> **Rare Intact Example of World War II Pavilion Site Planning:** By the beginning of World War II, pavilion site planning had fallen out of favor. During World War II, this military site planning style returned to favor and was extensively used. Unit 2 is a rare surviving example of military pavilion site planning that retains integrity to its World War II origins.
>
> **Work of a Master Architect:** Claud Beelman, the architect of NHC's Units 1 and 2, was a master architect of the twentieth century with at least a dozen buildings on the National Register of Historic Places. He was a highly versatile architect with National Register listed buildings representing a wide range of architectural styles, including Classical Revival, Renaissance Revival, Beaux Arts, Art Deco, Streamline Moderne, and International Modern. Units 1 and 2 represent the only examples of a large Beelman designed complex using Spanish Colonial Revival architecture.

Criterion A:

Numerous events could be cited as contributing to Detachment Corona's qualification for the National Register, including the accomplishments of its Fuze and Research Departments. Unfortunately, almost all of the testing structures used by these departments are no longer present on the property. This compromises the integrity of the property to its historic period of significance, 1951-1971. One major activity, however, stands out as both singularly important and also retaining a high level of historical integrity. This activity is Detachment Corona's Guided Missile IAA function.

As weapons became more sophisticated, the potential for performance failures rose. The critical importance of the independent evaluation of weapons was a lesson that had to be learned over and over before the establishment of Detachment Corona's missile evaluation function in 1952, its formal organization as the Missile Evaluation Department in 1954, and its perfection as FMSAEG in 1964. The Missile Evaluation IAA function was unduplicated anywhere else in the Navy. It was also born and continues to this day at Detachment Corona.

Perhaps the most dramatic example of need for an IAA occurred during World War II. Early in the war, malfunctioning torpedo fuzes caused significant loss of U.S. military property and life. Torpedo fuzes in use during World War II had not been adequately tested and thus were prone to failure, leading to loss of life and property.

To assure that weapons performed as intended, there needed to be an entity charged with the responsibility of performing unbiased assessments. The establishment of the first IAA occurred in 1952 when the NBS Corona was charged with the unbiased assessment of the Terrier Missile. Thus was created a new function that later became its own department in 1954 with the designation Missile Evaluation Department (MED.)

To accomplish its unique mission, MED created specialized test equipment, telemetry equipment, and new sophisticated computer programs. For its work in this area, MED was recognized as the Navy's central computer facility from 1954-1963. Through the work it did in advancing the analytical capabilities of computers, MED was largely responsible for critical improvements in the quality and performance of Navy missile systems.

Detachment Corona's MED directly participated in missile firing evaluations, becoming a valued component of a ship's crew when tests were conducted. On land, MED addressed production quality, including the evaluation of a manufacturer's ability to consistently produce a reliable product. MED also took responsibility of the quality of weapons "surveillance programs", programs to track and document the "shelf life" of weapons in storage and onboard ships.

By 1964, Detachment Corona's MED had become a significant contributor to the Navy's Fleet Readiness Program. It was the single entity to which the Navy turned for objective evaluations of missile performance and reliability. By that time, its evaluation of ballistic and guided missiles had expanded to include the Talos, Terrier, Tartar, Typhoon, Sidewinder, Sparrow, Bullpup, Shrike, and Polaris missiles. In addition, MED provided the Special Projects Office with analyses of ballistic missile systems.

While NOLC's MED was fully capable of producing competent and unbiased reports, MED lacked the *direct reporting relationship* necessary to assure that its reports would reach the DoD in an unbiased form. In 1964, MED given complete organizational separation from the balance of Detachment Corona. With this change, MED had the needed direct reporting relationship to assure

the unadulterated delivery of its test results. With this new status, MED's name was changed to the Fleet Missile Systems and Evaluation Group, or FMSAEG

From 1964-1971, FMSAEG experienced significant expansion. New responsibilities included testing and evaluating new missile systems (Standard, Sea Sparrow, Shrike, Walleye, Standard ARM, and Poseidon), and assessing the quality and reliability of torpedoes and other underwater weapons systems. Studies and analysis were also done on air-launched missile test equipment for the Sparrow III, Sidewinder, Phoenix, Bullpup, Walleye, Shrike, Standard Arm, and Chaparral missiles.

As a group, FMSAEG's telemetry stations encircled the entire globe. FMSAEG even designed and constructed a *portable* telemetry unit that could be operated by one man on the flight line. By 1968, this telemetry unit was in use at all of FMSAEG's East Coast ranges.

FMSAEG's dedicated staff, cutting edge equipment, and innovative techniques greatly enhanced the analysis of test firings. FMSAEG designed and built equipment and helped assure consistency in the collection, storage, and evaluation of data. Digital recording systems, via FMSAEG's Univac computer, were essential to data consistency documenting the variables of missile systems tests. Previous manual systems were error-prone, time-consuming, and often incomplete. FMSAEG's importance to the success of these naval exercises resulted in its move from outside observer to active participant and valued advisor. FMSAEG proved itself over time to be a bastion of military efficiency and effectiveness. And, as its trust was earned, it was given more responsibilities.

Overall, FMSAEG was a totally unique function in the Navy, a function that was created and operated exclusively at Detachment Corona. FMSAEG's operations as a purely independent entity ended on June 30, 1971 when it became an Annex of the Naval Weapons Station, Seal Beach. Nonetheless, the role of Detachment Corona as the site of the Navy's central Guided Missile IAA function has not changed and remains in effect to this day.

Integrity

As noted earlier, the history of Detachment Corona as a Navy weapons RDT&E facility is clearly significant. Unfortunately, the significance Detachment Corona's RDT&E program is diminished by the removal, starting in 1971, of the vast majority of the testing structures and buildings used to support these activities.

Detachment Corona's Guided Missile IAA function did not make significant use of these testing structures and buildings, however, so their absence today does not detract from this function's historical integrity. Major buildings used by Detachment Corona's Naval Guided Missile IAA function include all of the Unit 2 tuberculosis ward buildings, the Corpsmen's and WAVES' Quarters of Unit 1, and the Resort Era Pavilion, Chauffeurs' Quarters, and Garage/Laundry buildings. Of these buildings, only the following have been removed:

- The Resort Era Laundry, portion of the Garage/Laundry Building.
- The Unit 1 WAVES' Quarters.
- The Unit 2 Married Officers' Quarters.

While the loss of these buildings is a negative factor in the degree to which Detachment Corona's Guided Missile IAA function retains historical integrity, the overall complex retains a high enough level of integrity to be clearly recognizable to anyone from the period of significance. This factor of integrity and the singular importanct of the Guided Missile IAA function, qualifies the property for

listing on the National Register of Historic Places as the Detachment Corona Guided Missile IAA Historic District.

Figures 149 and 150 of this report provide a listing of the contributors to this district and a map showing the district's boundaries.

PART 1
INTRODUCTION
AND CONTEXTUAL BACKGROUND

THE ORGANIZATION OF PART 1

The overall approach taken in the organization of this part of the report is to provide essential background information to allow the reader to understand the property's location, previously completed studies, and the criteria by which the property will be judged to determine its qualification for historic designation.

- **Section 1: Report Background and Parameters**
  This section clarifies the location of the property, Norco's historic preservation program, previously completed cultural resources studies on the property, and the basic overall organization and methodology used in the report**.** It goes on to explain the criteria used to determine a property's qualification for historic designation. Three levels are explained, consisting of the local, state, and federal levels of historic significance. The report only fully examines the property's qualification for the National Register, as its qualification for this federal level of historic designation would automatically make it qualified at the state and local levels. Finally, this section explains the meanings of the various California Historic Resources Status codes used to describe a property's qualification for designation.

- **Section 2: Historical Background - Norco**
  Here the reader will find an overall summary of Norco's history and the role the subject property played in that history.

PART 1, SECTION 1: REPORT BACKGROUND AND PARAMETERS

1. Introduction and Background

a. Property Location

The Norconian Property is located in the City of Norco as illustrated in Figures 1 and 2. Figure 3 defines the survey area addressed in this report. It includes the core Norconian property and three resources located beyond the boundaries of this property.

b. Norco's Historic Preservation Program

The City of Norco's leaders are committed to historic preservation. To translate the goal of preservation into the reality of a preservation program, the City Council launched an action plan in 2008 to create a federally recognized "Certified Local Government" (CLG) historic preservation program. Subsequently, the City adopted the necessary historic preservation ordinances, created a Historic Preservation Commission, and took several other steps to earn CLG status. In 2009, Norco became the State of California's 57th CLG.

c. Survey and Identification of Norco's Historic Resources

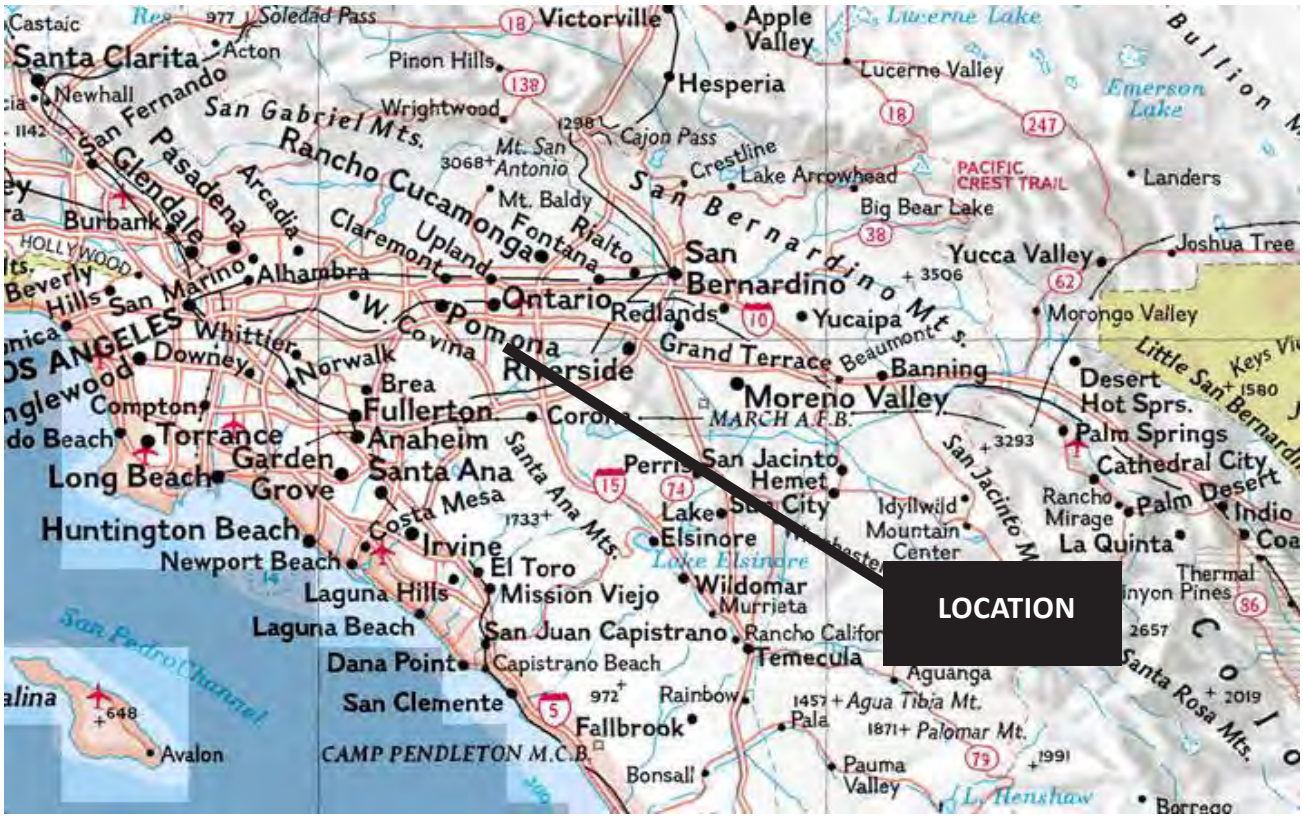


FIGURE 1: LOCATION, REGIONAL LEVEL

Source: USGS

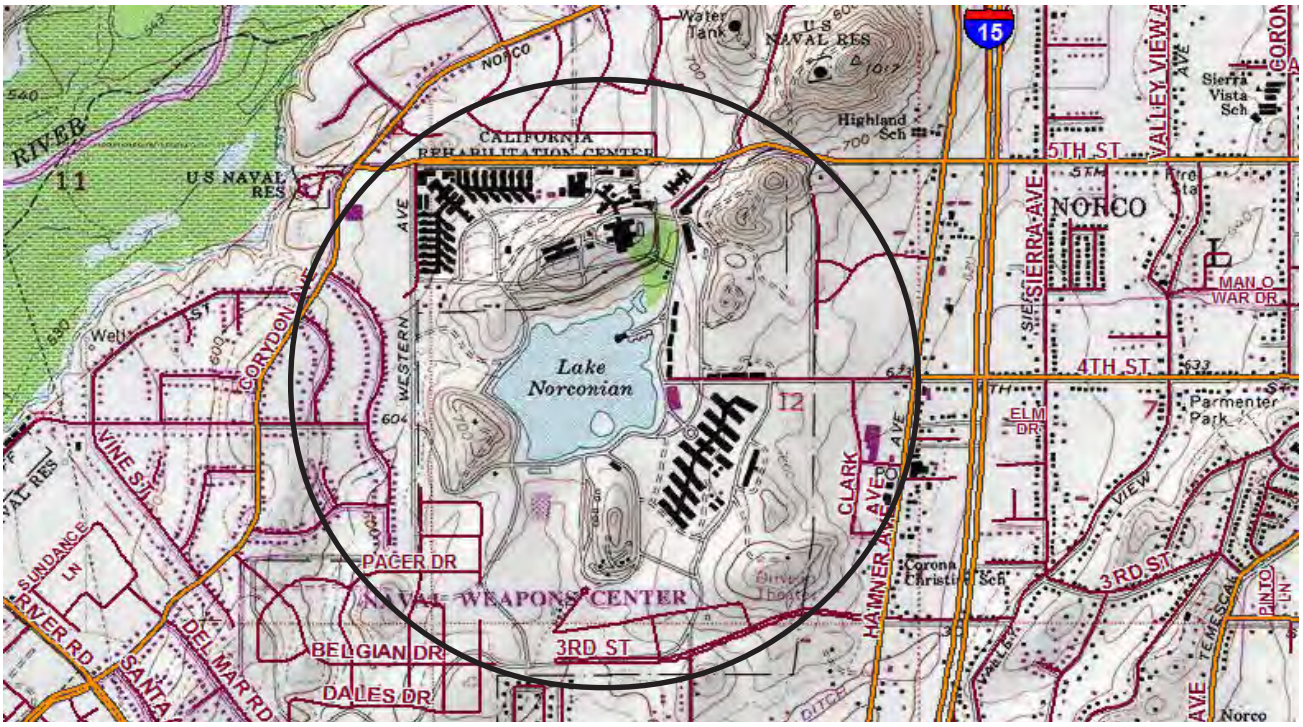


FIGURE 2: LOCATION, CITY LEVEL

Source: USGS

The City's leaders also understood that before Norco could preserve its history, it needed to document that history and identify surviving examples of that history. Toward that end, two major efforts were completed to identify the City's historic context and potential resources of significance. In 2011, the City completed a historic context statement and intensive survey of potential historic resources dating prior to 1946. (WHS and LSA 2011) In 2012, the City completed a historic context statement and general survey of potential historic resources dating between 1946 and 1966. (WHS 2012)

While the Norconian Resort contains some of the most significant historic resources in Norco, the City did not survey the Norconian property in either of the two above referenced projects, because the Navy had already committed to completing a survey and evaluation of the Norconian property's World War II and post World War II eras.

In 2013, the Navy completed a two phase survey of the property. The first phase was completed by ASM Associates in the fall of 2011. (ASM 2011) The second phase was completed by in-house Navy historians in 2013. (U.S. Navy Addendum, November 2013) In its final form, the combined document asserted that no National Register eligible historic resources from the World War II and Post World War II eras exist on the property. The City of Norco took exception to this finding and authorized its Cultural Resources Consultant, Wilkman Historical Services WHS), to prepare a survey and evaluation of the World War II and Post World War II eras of the Norconian property. This report is the product of that authorization.

d. Past Historic Resources Related Reports and Related Correspondence

FIGURE 3: SURVEY AREA

Source: Google.com

The Norconian property has been the subject of several historic resources reports over the years. The following is a summary of these efforts:

- 1980: A report entitled "Intensive Cultural Resources Survey" of the Norco Naval Reservation was completed. (ASM 2011: 7)
- 1984, 1985, and 1987: Three archaeological assessments were completed. (Ibid)
- 1988: ARCHIPLAN et. al. completed a "Master Plan Update, Cultural Resource Assessment Final Report", the purpose of which was to address the property's historic resources and provide management recommendations. (Ibid)
- 1995: In October of 1995, Ogden Environmental and Energy Consultants completed a Navy funded survey of the Norconian property for its resort era (1928-1941). This report asserted that the division of the property into two ownerships caused it to lose all historic integrity. Thus, Ogden concluded nothing on the Norconian property qualified for National Register listing. (Ogden Environmental and Energy Services, October 1995)

- 1998: The City took issue with Ogden finding, and contracted with Mellon & Associates to conduct an independent survey of the property's resort era. The Mellon report identified the presence of a Resprt Era National Register eligible historic district and subsequently nominated this district to the National Register. (Mellon and Associates, 1998)
- 2000: On February 4, 2000, the United States Department of the Interior approved the Lake Norconian Club National Register Historic District, under Criterion C, "...as a fine example of Southern California resort architecture rendered in the regional Spanish Colonial Revival Style." (United States Department of the Interior, National Register of Historic Places Registration Form and Supplementary Listing Record, 2-4-2000)

  Contributing Buildings:
  - Hotel/Club
  - Teahouse
  - Power Plant
  - Laundry/Garage
  - Casino/Pavilion
  - Boathouse
  - Maids'/Chauffeurs' Quarters

  Contributing Site Features:
  - Man-made Lake
  - Historic Landscaping

  Contributing Structures:
  - Footbridge
  - Powerhouse Smokestack
  - Two Gazebos
  - Gasoline Station Island

  Noncontributing Structures
  - Modern Screening Facility for Prison

  Noncontributing Buildings:
  - Modern Guard Towers for Prison

- 2009: The consulting firm of e2M completed a Navy funded research design report as a preliminary step to a survey of the Norconian property's World War II and Post World War II eras. ("Final Summary Report and Research Design for Cultural Resources at the Naval Weapons Station Seal Beach, Detachment Corona") (E2M, November 2009)
- 2010:In September of 2010, the consulting firm of ASM Affiliates completed a Navy funded cultural resources survey and evaluation for the Norconian property's World War II and Post World War II eras. This survey found only the property's Fifth Street Gatehouse to be eligible for National Register Listing. (ASM, 2010)
- 2010: The Lake Norconian Club Foundation (LNCF) issued to the State Office of Historic Preservation (OHP), comments on the ASM report, citing several flaws, omissions, and errors. (Letter, LNCF to SHPO, 11-20-2010)

- 2010: On December 22, 2010, the City of Norco submitted to OHP a 24-page document entitled CITY OF NORCO COMMENTS ON THE DRAFT SURVEY, EVALUATION, AND UPDATE OF NATIONAL REGISTER OF HISTORIC PLACES ELIGIBILITY AT NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CORONA, IN NORCO,RIVERSIDE COUNTY, CALIFORNIA (September 2010 Draft). This document detailed numerous flaws, omissions, and errors in the ASM report. One overarching concern was the study's failure to evaluate the entire historical footprint of Naval operations on the Norconian property. .(Letter and attachment addressed to Tristan Tozer, dated December 22, 2010)
- 2011: On March 23, 2011, the Navy issued a rebuttal to the City's comments and the City responded to this rebuttal on May 9, 2011. (Letter and attachment addressed to Tristan Tozer, dated May 9, 2011) Ultimately, Wayne Donaldson, the State Historic Preservation Officer (SHPO) at that time, agreed that the Navy needed to expand the scope of its survey to include the entire historic footprint of the Navy. The SHPO also directed the Navy to better engage the public in the survey process.
- 2011: ASM released its "Final" survey and evaluation, dated September 2011. It did not, however, include the exapansion of the survey footprint as directed by the SHPO. (ASM 2011)
- 2013: On December 20, 2013, the Navy transmitted to the SHPO (at that point, Carol Rowland Nawi) an addendum intended to address the identified shortcomings of the ASM survey and evaluation. This document was completed in-house, using Navy staff historians. (U.S. Navy Addendum, November 2013)
- 2014: On March 9, 2014, the City of Norco issued a 42-page document detailing the shortcomings in the Navy's Addendum. (Letter and attachment addressed to Carol Roland-Nawi, PhD, dated March 9, 2014)
- On April 9, 2014, the City of Norco submitted an application to the State Office of Historic Preservation for a grant to partially fund the preparation of an independent survey and evaluation of the Norconian property's World War II and Post World War II qualification for listing on the National Register of Historic Places. City felt this was necessary due to the Navy's history of seemingly biased historic resources surveys of the Norconian property and the Navy's categorical rejection of the City's comments on the ASM survey and the Navy prepared Addendum. (City of Norco Application for CLG grant, April 9, 2014)
- 2014: On June 4, 2014, the Norco City Council directed the City's Cultural Resources Consultant, Wilkman Historical Services, to proceed with an independent survey and evaluation of the Norconian Property's World War II and Post World War II eras. This directive was made because the Council felt time was of the essence in completing an independent survey and the City did not want to wait until OHP announced whether the City had received a CLG grant or not. (City Council Joint Meeting with Historic Preservation Commission, June 4, 2014)
- On July 23, 2014,OHP announced its 2014-2015 grant recipients. The City of Norco was not among these recipients. (Email from SHPO, 7-23-2014)
- On August 4, 2014, the City Council directed WHS to continue with the independent survey with the City of Norco to pay for the survey work. (Minutes, August 4, 2014 City Council meeting)

- August 12, 2014: SHPO Carol Rowland Nawi sent a letter to Navy Captain M.H. Hardy detailing her concurrence with the Navy's conclusion that property did not qualify for the National Register in regard to any aspect of its World War II or Post World War II eras. (Letter, Carol Rowland-Nawi to Captain M.H. Hardy, August 12, 2014)

e. Purpose, Contexts, and Organizational Framework

Purposes: The purposes of this document are to:

- Document the World War II and Post World War II eras of the Norconian property.
- Determine the degree to which the resources associated with those eras survive and retain integrity.
- Determine if the Norconian property qualifies for listing on the National Register.

Contexts: Two periods of history, or "contexts," are examined in this report as follows:

- Context One: U.S. Naval Hospital, Corona (NHC) (1941-1957) Context One is documented and evaluated in Part 2 of this report
- Context Two: Weapons Research, Development, Testing and Evaluation (RDT&E) (1951-present) Context Two is documented and evaluated in Part 3 of this report

Organizational Framework: The definitive document in regard to the evaluation of World War II permanent and semi-permanent construction is the May 1997 R. Christopher Goodwin and Associates report entitled *Historic Context for Department of Defense Facilities World War II Permanent Construction*. (Goodwin 1997)

This survey follows the basic format of Goodwin's Chapter 15 in which several case studies are examined with regard to National Register eligibility. The Goodwin format used in this report, consists of the following components:

- Location and Current Status
- Historic Context
- Identification of Buildings
- Evaluation of Property, including consideration of:
  1. Nature of Property
  2. Historic Context Represented
  3. Property Type
  4. Applicable National Register Criteria
  5. Comparison with other similar properties

6. Level of Significance (Local, Regional, National)

7. Retention of Integrity

8. Applicability of Criteria Considerations for properties typically excluded from the National Register

f. Project Methodology

Archival Research:

Primary Sources:

- National Archives, Washington, DC
- Naval Surface Warfare Center, Norco, California
- University of California at Los Angeles Collections, Los Angeles, California
- University of Southern California Collections, Los Angeles, California
- Sea Bee Archives, Port Hueneme, California
- City of Norco Historic Collections, Norco, California
- Kevin Bash Historic Collections, Norco, California

Primary source materials::

- Letters and reports
- Historic time dated aerial photographs
- Historic ground-level photographs
- Property appraisal records
- Construction documents
- Historic medical and professional journals
- Patent records
- Historic dated maps

Secondary sources:

- Oral histories from persons associated or familiar with the historic context period.
- Books, articles, and reports on military history in general and the Norconian property in particular.
- Newspaper accounts.

Where information in a secondary source was contradicted by a primary source, the primary source was given greater weight. A complete list of the sources cited in this report is provided at the end of the document in Part 4.

Field Survey: The majority of the former Norconian property, consists of lands under the control of the U.S. Navy and the California Department of Corrections. For security reasons, these properties are not fully accessible. On the Navy side, restrictions are the result of the sensitive work underway at the property. On the prison side, restrictions are the result of the need to secure the site as an incarceration facility. To help overcome any limitations regarding access to the Norconian, WHS used bird's eye aerial photographs from Bing.Com and photographs incorporated into Naval reports and DPR forms. Limited access was also provided to the property by the U.S. Navy and the California Department of Corrections.

All documentation was guided in part by historical maps and time stamped aerial photographs. Two historic maps were of particular value. For World War II era site details, WHS consulted a series of maps entitled "Plot Plan - U.S. Naval Hospital" c. 1947. Another important map source was a detailed map of Norconian facilities entitled "Master Shore Station Development Plan", June 1, 1956. These maps were secured from the Sea Bee Archives at Port Hueneme.

Study Area: Figures 1 and 2 show the Norconian property at the regional and local levels. Figure 3 shows the study area boundaries. The approximately 390-acre study area includes all of the Norconian property lands that retain reasonable integrity to the World War II and Post World War II contexts.

Peer Review: WHS formed a Peer Review Committee for the purpose of vetting the information presented in the report and for the purpose of assisting in the identification of sources relevant to this report. The panel consisted of the following:

- Thomas Snyder: President, Society for the History of Navy Medicine:
- Dennis Casebier: Retired Department Head/Historian – Fleet Missile System Analysis and Evaluation Group (FMSAEG)
- Loren Meissner: Retired Scientist – Naval Ordinance Laboratory, Corona (NOLC)
- Virginia Austerman: Professional Historic and Prehistoric Archaeologist

2. Criteria for Historic Designation

The ultimate purpose of this document is to determine whether the subject property qualifies for historic listing at the national, state, and local levels. To the extent that the property qualifies for the National Register, it would also qualify for the State Register and the City of Norco's Register. The following is a summary of the criteria used in determining eligibility for historic listing at these levels:

a. National Register of Historic Places

Criteria: According to the Guidelines for Completing National Register Forms (National Register Bulletin 16), National Register listing is intended for historic architecture, archaeology, engineering, or cultural entities expressed in a site, building, structure, district, or object. The National Register is not solely limited to entities with an importance at the national level, but is also applicable to resources at the local and state levels too. To be

eligible for listing in the National Register on the basis of local or state level significance, however, a resource must be of the highest level of significance at the respective level. All resources eligible for listing on the National Register must have integrity of location, design, setting, materials, workmanship, feeling, and association. In this regard, they must meet one or more of the following criteria**:**

A. Associated with events which have made a significant contribution to the broad patterns of our history.

B. Associated with the lives of persons significant in our past.

C. Embodies the distinctive characteristics of a type, period, or method of construction or that represents the work of a master, or that possesses high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction.

D. Has yielded, or may be likely to yield, information important in prehistory or history.

Integrity: A key word in the above description is *integrity*. National Register Bulletin 15 defines integrity as "…the ability of a property to convey its significance." The following are the seven aspects of integrity as used by the federal government:

1. Location**:** The historic location of the property or event.

2. Design**:** The historic form, layout, and style of the property.

3. Setting**:** The physical context.

4. Materials**:** The items that were placed in a specific time period/configuration.

5. Workmanship**:** The craftsmanship of the entity's creators.

6. Feeling**:** The expression of the historic sense of a time period.

7. Association**:** The link between a historic event/person and property.

Not all of the National Register criteria for designation or integrity must be met for an entity to be determined eligible for listing. A property must, however, retain enough integrity to allow it to convey its historic significance.

Criteria Considerations: Ordinarily, cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years are not considered eligible for the National Register. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

a. A religious property deriving primary significance from architectural or artistic distinction or historical importance; or

b. A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or

c. A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his or her productive life; or

d. A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or

e. A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or

f. A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or

g. A property achieving significance within the past 50 years if it is of exceptional importance.

b California Register of Historic Resources

Criteria: The California Register criteria are very similar to the federal criteria and are as follows:

1. Associated with events which have made a significant contribution to the broad patterns of local or regional history of the cultural heritage of California or the United States.

2. Associated with the lives of persons important to local, California, or national history.

3. Embodies the distinctive characteristics of a type, period, or method of construction or that represents the work of a master, or that possesses high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction.

4. Has yielded, or may be likely to yield, information important to the prehistory or history of the local area, California, or the nation.

California resources listed in the National Register of Historic Places are automatically listed in the California Register of Historic Resources.

Integrity: In addition to having significance, resources must have integrity for their period of significance. The period of significance is the date or span of time within which significant events transpired or significant individuals made their important contributions. Integrity is the authenticity of a historical resource's physical identity as evidenced by the survival of characteristics or historic fabric that existed during the resource's period of significance.

Alterations to a resource or changes in its use over time may gain historical, cultural, or architectural significance. Simply, resources must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance.

Age: Unlike the National Register, the California Register does not have an age requirement. The National Register specifies that to qualify for listing, a property must be 50 years old, unless it is exceptionally significant. At the state level, age is addressed in a much more general fashion. In this regard, CEQA Act states that "… in order to understand the historical importance of a resource, sufficient time must have passed to obtain a scholarly perspective…" (CCR 4852 (d) (2).

c. City of Norco Historic Register

Criteria: The City of Norco has one level of individual historic designation and one honorary category that pertains to properties of historical interest that may not qualify for official historic designation: The Landmark designation is the City's only individual historic designation, while the Point of Historical Interest category is an honorary designation primarily for resources of historical interest that do not qualify for Landmark designation. The Point of Historical Interest can also be used in instances where a property qualifies for Landmark status, but the owner prefers that his/her property be placed in the less restrictive Point of Historical Interest category.

> **Landmark:** As defined in Title 20 of the Municipal Code an improvement, object, or natural feature may be designated a Landmark if it is determined eligible, retains integrity, and meets one or more of the following criteria:
>
> A. Exemplifies or reflects special elements of the City's cultural, social, economic, political, aesthetic, engineering, architectural or natural history; or
>
> B. Is identified with persons or events significant in local, state or national history; or
>
> C. Embodies distinctive characteristics of a style, type, period or method of construction, or is a valuable example of the use of indigenous materials or craftsmanship; or
>
> D. Represents the work of a notable builder, designer or architect; or
>
> E. Has a unique location or singular physical characteristics or is a view or vista representing an established and familiar visual feature of a neighborhood community or of the City; or
>
> F. Reflects significant geographical patterns, including those associated with different eras of settlement and growth, particular transportation modes, or distinctive examples of park or community planning; or
>
> G. Has yielded or may be likely to yield, information important in history or prehistory.

Integrity and Age: To qualify for Landmark status, an improvement, object, or natural feature must retain integrity to its period of significance and be at least 50 years of age or older.

Point of Historical Interest: Points of Historical Interest are not "historic resources" for the purposes of the California Environmental Quality Act. Rather, this is an honorary category intended for properties that fall into one or more of the following categories:

A. The resource qualifies for designation as a Landmark; however, the property owner prefers designation as a Point of Historical Interest; or

B. The resource is less than 50 years old, but otherwise qualifies for designation as a Landmark; or

C. The resource otherwise qualifies for designation as a Landmark but does not retain sufficient integrity.

d. California Historic Register Status Codes:

California Historical Resource (CHR) status codes constitute a standardized, shorthand method for identifying the significance level of a resource. Each status code includes a number, followed by a letter or a letter/number combination. The following are the basic numbers used in these status codes:

1. Listed in the National Register or the California Register.
2. Determined eligible for listing in the National Register or California Register.
3. Appears eligible for National Register or California Register listing through survey evaluation.
4. Appears eligible for National Register or California Register listing through other evaluation.
5. Properties recognized as historically significant by local government.
6. Not eligible for listing or designation.
7. Not evaluated or needs reevaluation.

There are several subcategories within each of these categories that give additional details regarding a property's eligibility for listing.

PART 1, SECTION 2: HISTORICAL BACKGROUND - NORCO

The historic context of the Norconian property is that of Southern California. This context includes the histories of the occupancy of these lands by Native Americans, Spain, Mexico, and the United States. On a local level the Norconian property's context is the transition of the area from undeveloped rocky hills and valleys into today's the City of Norco, in which the Norconian is located. The history below is divided into the Norconian property's contextual background, starting with area's Native American history and extending through the occupation of the area by the Spanish, Mexicans, United States, and the development of the town of Norco.

1. Native American Occupation

The Native Americans most often associated with the Norco area include the Luiseño, named for their association with Mission San Luis Rey, and the Gabrieleno, associated with Mission San Gabriel. The Cahuilla and the Serrano are also known to have used the area's resources. All of these groups were similar in their social and linguistic foundations, having cultural associations with the migration of Shoshonean speakers from the Great Basin to the east. Shosonean speakers are believed to have entered this area over 1,000 years ago. Spanish explorers noted the presence of these peoples on the coast of California around 1540–1542 (McKenna 1992: 6–7).

Native Americans occupied the area around Norco in large villages supported by "daughter" or "satellite" locales for exploiting seasonal or localized resources. Groups migrated seasonally in accordance with the availability of resources for sustaining life (Ibid: 9). Native Americans made use of area plants for both food and medicine. Native Americans also hunted deer, rabbits, wood rats, squirrels, quail, and ducks. Tools used included bows and arrows, bedrock mortars, portable mortars, pipes, chisels, metates, manos, and chipped stone tools. Dwellings consisted of thatched structures (wickiups) and semi-subterranean pit-houses. Other structures associated with Native American villages included sweathouses, temples, and accessory structures (Ibid: 10).

There were no known Native American villages in the area now defined as the City of Norco; however, there was a Luiseño village known as "Naq" in what is now the City of Corona just south of Norco (McKenna 1996: 8). While no evidence of permanent settlements have been found in Norco, evidence has been found where resources were processed. Most common in this regard are slicks, petroglyphs, and metates on area boulders where seeds and other plant materials were ground. Scatters of stone tools are also sometimes found. Limited archaeological surveys have been conducted on small parts of the Norconian property for individual projects; however, the overall property has not been surveyed for archaeological resources.

2. Spanish Exploration, Mission/Rancho Periods

Spanish Era: The earliest records of European contact with southern California's Native Americans dates to the mid 1500s. These very early contacts were minor in nature and associated with the earliest Spanish explorations launched from ships off the coast of California. More substantial entry into the area by Europeans occurred in the 1700s when Spanish padres, under the leadership of Junipero Serra, began establishing a network of missions throughout what was then known as Alta California. The first European to enter the region around Norco in this timeframe was explorer Father Francisco Garces. Father Garces' exploration of this area occurred during his travels from Yuma to Mission San Gabriel in 1771. Garces crossed the Mojave Desert and traveled to coastal southern California via the Cajon Pass (Ibid: 11). Garces' visit was followed by a contingent of Spanish soldiers led by Pedro Fages the next year. Fages was sent into Alta California to track down deserters from the Spanish garrison in San Diego (Lech 2004: 3). Juan Bautista de

Anza traversed the area during two expeditions between 1774 and 1776 in an effort to establish an overland route through Alta California. His records indicate the presence of Indian villages on what is now the Riverside bank of the Santa Ana River at Anza Narrows east of Norco. These villages eventually became associated with Mission San Gabriel (Ibid: 4).

Spanish rule over California extended from 1776 to 1821. During this period, Franciscan priests established a system of missions that formed strategic centers from which the Spanish exerted control over the native peoples and lands of California. To support mission operations, ranchos were established, often containing thousands of acres. The lands in today's Norco were not a part of any mission rancho; however, they may have been used for grazing by Mission San Gabriel. Lands to the south, in the vicinity of Corona and beyond, were under the control of Mission San Luis Rey.

The first known non-Native American to settle in the vicinity of Norco was Leandro Serrano. At the behest of Father Peyri of the San Luis Rey Mission, Serrano built a home and laid claim to lands in Temescal Canyon, south of Corona. In 1818, he was given a permit to graze animals on these lands in exchange for protecting the Mission holdings from Indian unrest and ridding the area of bears and mountain lions. Serrano's tanning vats remain in Temescal Canyon and have been designated California Historical Landmark 186 (Ibid: 19–20).

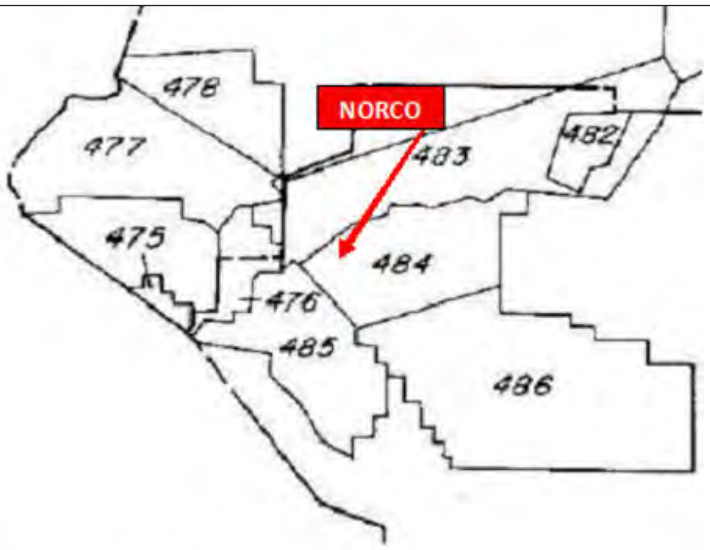
There were no known dwellings or settlements on the lands encompassed by Norco's City limits during the Spanish era.

Mexican Era: Spanish rule of southern California was replaced by Mexican rule in 1821. At that time, the mission lands were largely devoted to grazing and small-scale farming. In 1833, the Secularization Act was passed and the mission lands were divided into ranchos that became the property of non-Native American ranchers. Four ranchos were located in the Norco area, including Jurupa (Rubidoux), Jurupa (Stearns), La Sierra (Sepulveda), and El Sobrante de San Jacinto (Figure 4). The easterly portion of Rancho La Sierra (Sepulveda) was the foundation for today's Norco.

Rancho La Sierra Sepulveda was a Mexican land grant issued to Vicenta Sepulveda on June 15, 1846, by Mexican Governor Pio Pico. This grant was the last in a succession of land grants issued to the Yorba family between 1810 and 1846. (Gunther 1984: 286) The history of this rancho began in 1810 when Jose Antonio Yorba was granted the huge Santiago de Santa Ana land grant, encompassing what is now northern and eastern Orange County. Over time, the Yorba family grazed its herds on pasture lands to the east of the original land grant. To secure these lands, they successfully obtained additional grants, including the Canon de Santa Ana Rancho and the Lomas de Santiago Rancho. Both of these ranchos were very close to the current western boundary of Riverside County.

The family continued to graze its herds further east, eventually extending into the area the Yorba family called La Sierra. (Lech 2004: 46–47). La Sierra is a Spanish name roughly meaning "saw-toothed mountain range" (Gunther 1984: 286) While the Yorba family's use of this land started as early as 1825, they did not apply for a grant to secure the land until it was apparent that Mexico's rule over Alta California would likely fall to the United States. To correct this lapse, in 1845 Bernardo Yorba filed a land grant application with Governor Pio Pico for the La Sierra lands. This angered his sister-in-law Vicenta Sepulveda, widow of Bernardo's brother, who felt a portion of the La Sierra lands should belong to her. Governor Pico settled the dispute by dividing the La Sierra lands between the two, granting the westerly portion to Bernardo Yorba and the easterly lands to Vicenta Sepulveda.

As a result of this division, the westerly lands became known as Rancho La Sierra (Yorba) and the easterly lands took on the name Rancho La Sierra (Sepulveda). (Lech 2004: 46–47) Rancho La Sierra (Yorba) totaled 17,787 acres and Rancho La Sierra (Sepulveda) totaled 17,774 acres. (Beck 1974: 38) Rancho La Sierra (Sepulveda) extended from Riverside's Van Buren Boulevard on the east to the vicinity of Norco's westerly boundary on the west.



MEXICAN RANCHOS IN THE NORCO AREA
475: Canyon de Santa Ana
476: El Rincon
477: Santa Ana del Chino
478: Santa Ana del Chino Addition
482: Jurupa (Rubidoux)
483: Jurupa (Stearns)
484: La Sierra (Sepulveda)
485: La Sierra (Yorba)
486: Sobrante de San Jacinto

FIGURE 4: MEXICAN RANCHOS

Source: Beck & Haase 1974: 37

3. American Annexation

The Mexican-American War ended Mexican rule over California, which became part of the United States in 1848. While ranching generally declined with this change, the discovery of gold, the building of the transcontinental railroad and a number of speculation-friendly government programs spurred increasing growth and interest in California.

Railroads were particularly significant in the growth of Southern California and benefitted greatly from federal land programs. As an encouragement to the extension of new railroad lines, the federal government granted the railroads huge amounts of government land along their tracks. The railroads had a double advantage. With each extension of a railroad line they created the means to bring people west and they became the owners of the land upon which many of these people would settle. Two major railroads, the Southern Pacific and the California Southern (associated with the Santa Fe), are credited with bringing large numbers of people to this area. With each extension of a railroad line, speculators followed, purchasing and then subdividing land from the railroads' inventories. By 1885, California was both connected to the east coast and served by railroads extending north and south throughout the state. (Lech 2004: 221-224)

Government lands were also available for homesteading and many people obtained title to land through the federal homesteading process. Mexican rancho land also became available in abundance due to the decimation of the cattle industry as a result of the drought years of the 1860s. These events, in combination with advances in irrigation, fostered a booming Southern California agricultural industry. (Ibid: 223–224). Norco's development, while significantly later than the boom years of the 1880s, was made possible in large part because of its proximity to the Santa Fe

Railroad, which was extended in 1887 from the Arlington area of Riverside through Corona (then South Riverside) on its way to the City of Orange via Santa Ana Canyon. (Marsh 1998: 39)

All of the lands encompassed by the Norconian property were previously part of Vincenta Sepulveda's Rancho La Sierra (Sepulveda). Written records suggest these lands were only used for grazing purposes and were not developed with any physical improvements during the Mexican rancho era.

In 1876, the Stearns Rancho Company purchased Rancho La Sierra Sepulveda from Vicenta Sepulveda. (Brown and Boyd 1922: 33) Like Sepulveda, the Stearns Rancho Company continued to use these lands, including the future Norconian property, for grazing purposes only.

In 1909, the Stearns Rancho Company sold its former Ranch La Sierra, Sepulveda lands to investors Willits Hole and George Pillsbury. This was significant news in the Southern California real estate market, as it was the last intact rancho to be sold in the Los Angeles area.

Hole held onto the land east of the Norco Hills and created his own agriculturally based community of La Sierra Heights. The Citrus Belt Land Company bought much of the rancho land west of the Norco Hills and created two subdivisions, Orange Heights Tract #1 and Orange Heights Tract #2 covering the land roughly between 1st and 5th Streets in today's Norco. (Figure 5) These tracts were recorded in 1909 and 1910 and consisted of farm lots, most commonly about 10 acres in size. The Orange Heights tracts functioned as a suburb of Corona, having no commercial, industrial, or office uses.

The Citrus Belt Land Company provided irrigation and domestic water to Citrus Belt area homes and farms via its Orange Heights Water Company. Some of the reservoirs and distribution canals of the Orange Heights Water Company were situated on land that was later occupied by the Norconian Resort.

An archaeological investigation (U.S. Navy 2011) of a portion of the Norconian property situated north of Fourth Street and west of Hamner Avenue, revealed remnants of a Citrus Belt farm house, reservoir, and irrigation canal. The residence was relocated and the reservoir was demolished some time after the conversion of the Norconian property to a Naval Hospital. Today, only remnants of foundations and broken concrete remain. As for the canal, a portion of this feature remains intact in a clump of trees situated north of Fourth Street.

4. The Founding of the Town of Norco

Rex Clark began to show an interest in the area in the early 1920s, and by 1923 he had purchased all of the unsold Orange Heights lots long with most of the farming and vacant lands north of the Orange Heights Tracts. He also purchased the Orange Heights Water Company and expanded its system to serve land he proposed to subdivide north of the Orange Heights Tracts. Starting in 1923, he began to record a series of tracts to support his vision of a self-sustaining farming community. (Figure 5) His real estate development company was named the North Corona Land Company, and he used a contraction of the first two words in this name to come up with the name "Norco." (Bash 2013: 47)

Clark was a visionary and his concept for Norco was, in many respects, utopian in nature. He promoted his town as a place where an individual could achieve prosperity through hard work and ingenuity on a small ranch or farm. His town was equipped with almost everything a landowner would need to sustain a farm and family. It had its own general store, pavilion, manufacturing

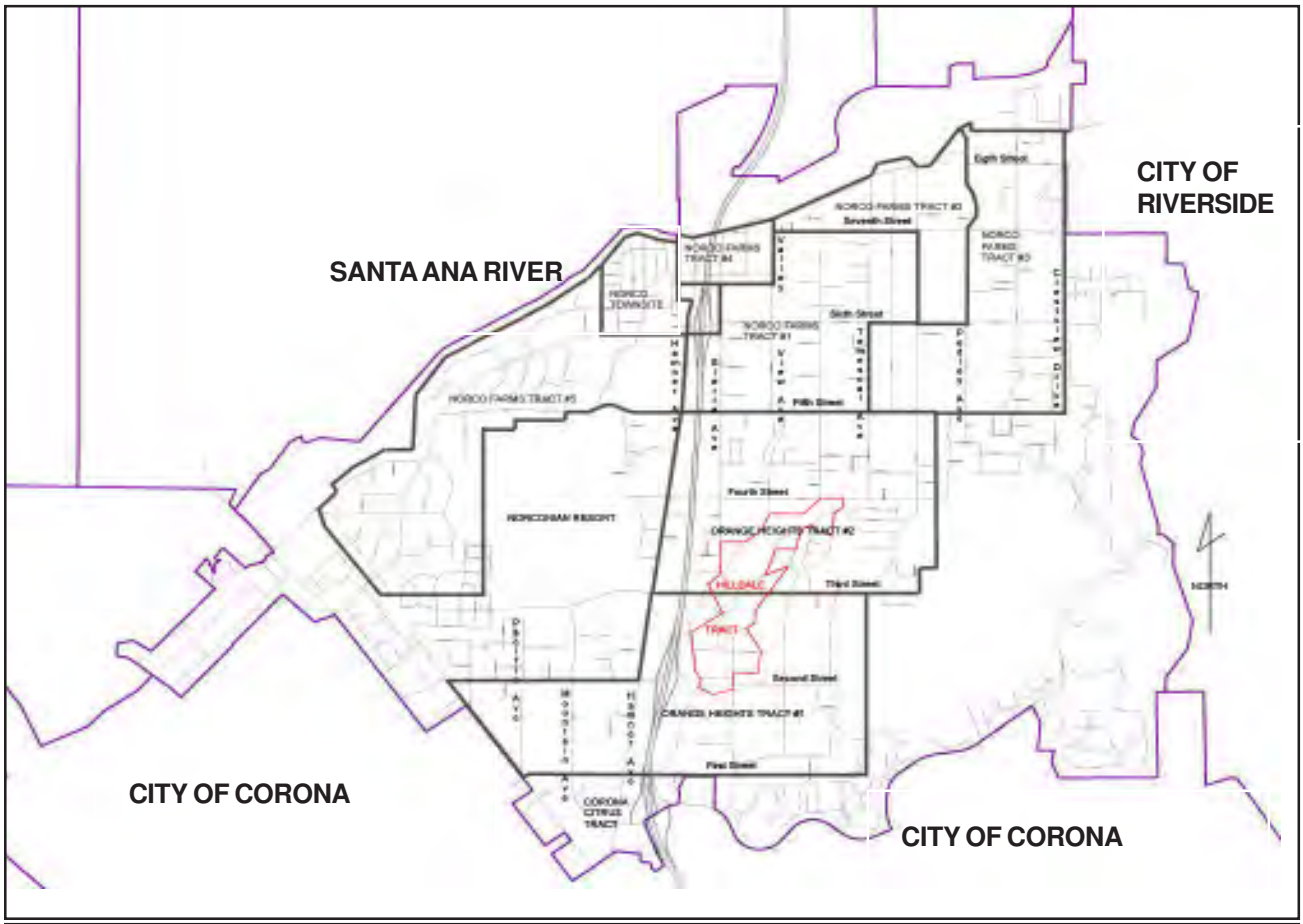


FIGURE 5: ORANGE HEIGHTS AND NORCO SUBDIVISIONS

Source: LSA and WHS 2011

district, and school. His North Corona Land Company had its own lumberyard, concrete block manufacturing operation, and irrigation pipe making machinery. Using these facilities, a landowner could build a house, construct farm buildings, and bring water to his crops. The North Corona Land Company would sell a farmer a tractor and its machine shop would maintain it. At the Norco Garage, a resident could buy a car, purchase fuel, and have any passenger vehicle or light truck serviced. At the town's Pavilion, farmers could meet, display their products, and exchange ideas. The Norco Store sold groceries, feed, clothing, hardware, and other merchandise. One could have a meal at the store's café, borrow books from the volunteer-run library under its roof, hold meetings in its community rooms, and board guests in rooms located on the second floor. Across from the Norco Store were the offices of the North Corona Land Company and the Orange Heights Water Company.

In subdividing the land for Norco, Clark created a Townsite Tract, and five Norco Farms Tracts. He aggressively promoted his town through advertisements in newspapers and by offering free excursions from his Los Angeles headquarters to Norco. He also improved a large number of lots with residences and farm buildings to demonstrate his vision and to provide "turnkey" lots for buyers wanting to get started with no delay. In addition to his Norco Farms tracts,

5. The Development of the Norconian Resort

In his original layout of Norco, Rex Clark reserved an expansive area west of Hamner Avenue and north of Orange Heights Tract #1 to be developed as a large farming operation. While drilling for water on this land, crews tapped into a hot mineral spring. Reporting on the find on February 27, 1925, the *Los Angeles Times* noted that the well had been flowing for three days, with temperatures of 118 degrees Fahrenheit within 26 feet of the surface. The well extended 972 feet down and was one of nine wells within 300 feet of each other. It was the only well producing hot sulfur water. The article noted: "Providing it contains the proper ingredients, its value as irrigation water for the growing of early vegetables is regarded as great" (*Los Angeles Times*, 2-27-1925: A-8).

The water from the hot water well was "sweet" sulfur water, meaning it did not have the odor associated with normal sulfur water. Plans to farm the land did not last very long. At the end of Norco's first rabbit show in 1926, Clark unveiled plans to build a $1.5-million resort (Figure 6) including a 60-acre lake, private pools, baths, lounges, exercise facilities, golf course, and a host of other improvements meant to attract the rich and famous to the town of Norco. Clark felt his resort would ensure Norco's future (Bash and Jouxtel 2007: 20). Reporting on the planned resort, the *Los Angeles Times* called the proposal "A resort devoted to sports, health and rest…" The article noted that the architecture would be Mediterranean in style, with "…towers, balconies, arches, pools and gardens…designed by Los Angeles architect Dwight Gibbs." (*Los Angeles Times*, 8-14-1927)

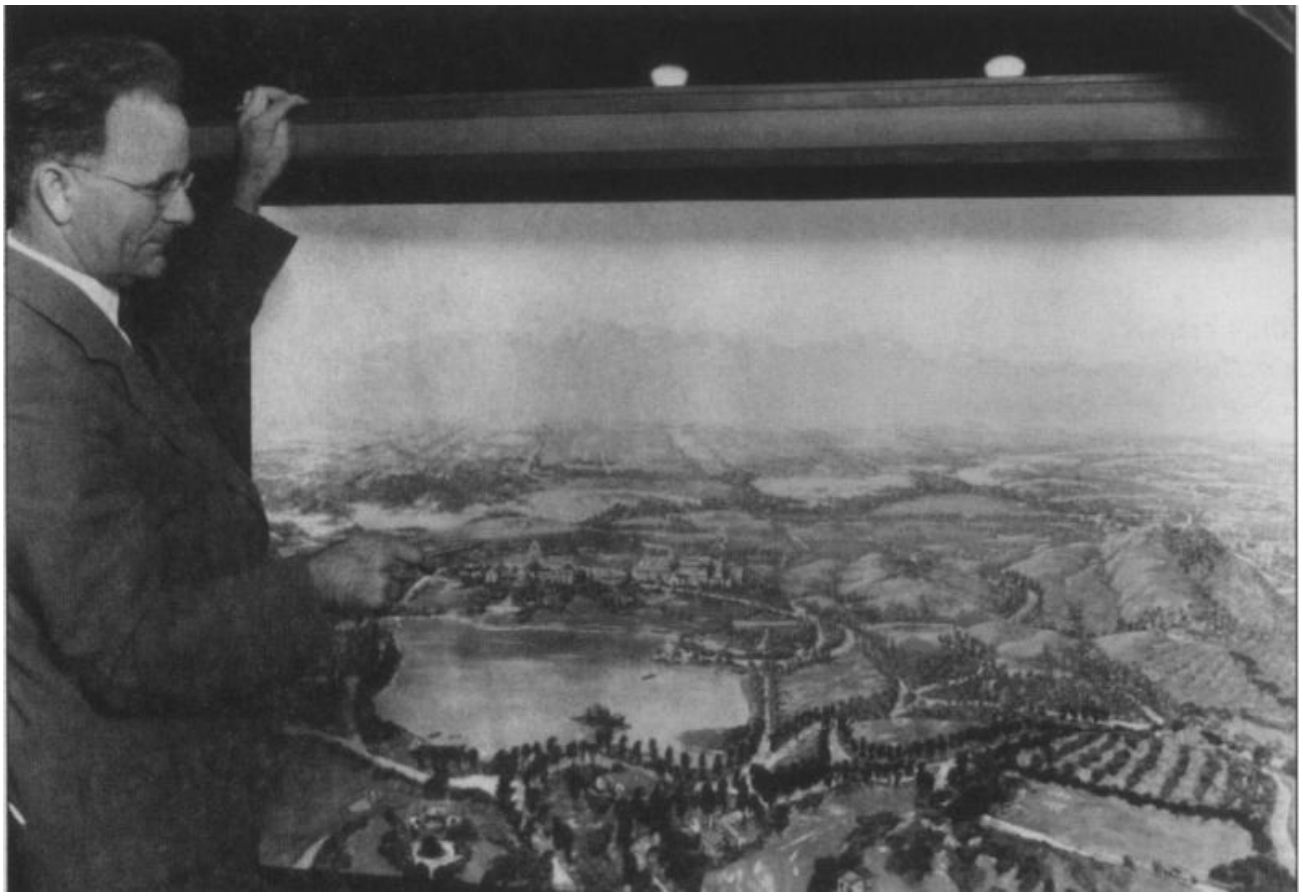


FIGURE 6: REX CLARK AND NORCONIAN RENDERING

Source: Kevin Bash Collection

FIGURE 7: OPEING DAY AT THE NORCONIAN RESORT

Source: Kevin Bash Collection

To convert the dry hills of the Norconian's property to a lush landscaped paradise, Clark purchased and moved Pasadena's Oak Knoll Nursery, plants, buildings and all, to Norco. (*Los Angeles Times*, 1-22-1928: E-4).This nursery, once located at the northwest corner of Hamner Avenue and Fifth Street, was later used by the U.S. Navy to maintain and improve the Naval hospital that was adapted from the resort during World War II.

The resort opened on February 2, 1929, (Figure 7) with nearly 1,000 invited guest in attendance. An article in the *Los Angeles Times* announced the event, noting that it took 15 months to build the facility following years of study by Rex Clark. The article reported that the opening would feature an afternoon sports program, "…including golf exhibitions by well-known players, swimming and diving events under the direction of Fred Cady, and aquatic events on Lake Norconian. Buffet luncheon will be served the guests at the tea house between 12 and 2 o'clock. The swimming pools at night will be illuminated by an intricate system of Neon lights said to resemble liquid moonlight." Each sports facility was designed under the supervision of experts in the field. The golf course, for example was designed by renowned golf course designer John Duncan Dunn. The pools were designed to Olympic standards and were used by athletes in preparation for the 1932 Olympics (*Los Angeles Times*, 1-20-1929: E-5).

Unfortunately, the timing of the resort's construction could not have been worse. Its opening on February 2, 1929, was followed October 29 by "Black Tuesday," the day the stock market crash signaled the beginning of the Great Depression that would last into the 1940s. The combination of

the depressed economy and the impoverished surroundings dealt a death-blow to the resort and it lost money from the beginning. The resort's construction tag, originally estimated at $1.5 million, ballooned to over $4.5 million in the end. Add to that a $250,000 advertising campaign following the resort's completion, and the deficit had to have been staggering (Bash and Jouxtel 2007: 7 and 51) But, while the Norconian may have been dead as a resort, it would soon find new life as a Naval hospital.

PART 2
U.S. NAVAL HOSPITAL CORONA

THE ORGANIZATION OF PART 2

The overall approach taken in the organization of this part of the report is to examine the history of the property, its improvements, and the contribution of the property as a Naval Hospital. Finally, based upon this information, the property is evaluated regarding its qualification for listing on the National Register of Historic Places.

- **Section 1: Historic Context of World War II and the Korean War**
  The use of the property as a Naval Hospital occurred within a larger historic context. This section explores the property's Hosptial Era history in the context of World War II and the Korean War.

- **Section 2: Hospital Era Historic Context & Property Description**
  With an understanding of the war related history in which the property played a role, the reader is now given an overall organization and history of the hospital as an institution.

- **Section 3: Hospital Era Contextual Themes**
  Here the historical "themes" of the property are explained. Themes consist of the basic functions played by the hospital in relation to treatments offered for the sick and wounded and the role played by the hospital in the context of the surrounding civilian community.The following themes are examined in this section:
  - Theme 1: World War II Permanent Construction
  - Theme 2: Disease Treatment
  - Theme 3: Rehabilitation
  - Theme 4: Role in the Local Community
  - Theme 5: Unique Connection to Hollywood

- **Section 4: ID of Hosptial Era Buildings and Structures**
  Here, each major building/structure that played a role in the property's use as a Naval Hospital is described. As the hospital was composed of three 'units" within the property, the description of buildings and structures is divided up in accordance with the units in which they functioned.

- **Section 5: Hosptial Era Property Evaluation**
  Here, the overall property is evaluated for its qualification for listing on the National Register of Historic Places.

PART 2, SECTION 1: HISTORIC CONTEXT OF WORLD WAR II AND THE KOREAN WAR

This part of the report examines the history and historical significance of what is referred to as the "Hospital Era" of the Norconian property, spanning the years from 1941 to 1957. These two periods are tied to two wars in which the United States participated - World War II and the Korean War.

1. World War II

In the period after World War I, Americans were in no mood for another war. President Woodrow Wilson tried to prevent another war through his League of Nations, but the Senate rejected this proposal for fear that rather than preventing conflicts, it would actually make the United States more vulnerable to foreign entanglements. (Goodwin 1997: 29)

Hopes for world peace were dashed; however, as Benito Mussolini made Italy a fascist country in 1922, the Nazis took control of Germany in 1933, and Japan fell under the control of militants who sought to expand Japan's sphere of control into China. Over time, these three entities came to be known as the Axis of Powers. (Ibid)

The Navy and Marine Corps recognized Japan as a serious naval threat, and began a build-up of military readiness in San Diego, Puget Sound, and Pearl Harbor. Of these three areas, Southern California received the greatest attention, with the expansion of existing military installations and the establishment of new bases. Meanwhile, Germany initiated its re-armament program, quickly overpowering its neighboring countries until only Britain stood undefeated. (Ibid)

With an Axis victory appearing very likely, the U.S.A. began to support Great Britain, with the transfer to that country of 50 destroyers in September of 1940, signaling the beginning of what became known as the "lend-lease" policy. Next, the U.S.A. activated its Selective Service system and began the mobilization of the National Guard. Direct military engagement of the Germans began in the summer of 1941, when President Roosevelt ordered the Navy to escort merchant convoys. With the sinking of the destroyer Reuben James in October of 1941, an undeclared war was initiated with Germany. (Ibid)

By 1937, Japan was engaged in a full-scale war with China, entering Indochina in 1941. On December 7, 1941, Japan took the war to U.S. shores when it attacked Pearl Harbor. With this act of aggression, the U.S.A. declared war on Japan. Three days later, Germany and Italy declared war on the United States. To establish an organized effort against these Axis nations, the U.S.A., Great Britain, and Russia joined forces as the Allied Powers. Of the three nations constituting the Allied powers, the U.S.A. provided the greatest amounts of troops and equipment. (Ibid: 30)

The U.S. military was organized into separate War and Navy Departments. The War Department consisted of Army Ground Forces, Army Air Forces, and Army Services Forces. The Navy Department consisted of the Navy, the Marine Corps, and the Coast Guard. Numbered Navy fleets were organized to engage in battle, while land-based Naval operations were organized into headquarters, bureaus, shore bases, and other supporting forces. The Marines was organized around a Fleet Marine Force and related supporting structure. The Coast Guard operated as a part of the Navy. (Ibid)

Most Naval support functions were performed by respective bureaus, including Personnel, Ordinance, Ships, Yards and Docks, Aeronautics, Supplies and Accounts, and Medicine and Surgery. (Ibid)

On the home front, an extensive mobilization of resources was organized, including personnel training, weapons and ammunition production, and the provision of medical support. Known as the "Protective Mobilization Plan", it was accompanied by a tremendous construction program that coincided with the fall of France in June of 1940. Facilities in which to operate these functions needed to be built quickly and in great numbers. Thus, for the most part these facilities consisted of temporary buildings, constructed in accordance with what were known as "700 Series" plans. The Army made the greatest use of this type of construction, primarily for its vast training and deployment efforts. (Ibid)

The Navy was expanded through the acquisition of a tremendous number of ships of various sorts. This greatly expanded fleet of ships was paralleled with a comparable expansion of shore facilities. Hospitals constituted a significant component of these shore facilities. While the Army largely relied on the expansion of existing hospitals, the Navy engaged in the construction of new hospitals, primarily consisting of temporary construction. The Navy also adapted civilian buildings and complexes, such as resorts and hotels, into hospitals. (Mikesell 1995: 7-38) The Norconian Resort was a major example of this approach to hospital expansion.

2. The Korean War

Before World War II, Korea was a part of Japan, however, after the war, it landed in the laps of the Soviets and the United States to determine its future. In August 1945, the decision was made to divide Korea into two halves at the 38th Parallel. The area north of this line came under Soviet control, while the land to the south became the responsibility of the United States. North Korea and South Korea were thus created. By 1950, South Korea was presided over by the anti-communist dictator Syngman Rhee, with the United States reluctantly offering its support of the Rhee government. Meanwhile North Korea became the province of communist dictator Kim Il Sung. Sung was supported by the Soviet Union. (http://www.history.com/topics/korean-war)

The Korean War began on June 25, 1950 when soldiers from North Korea invaded South Korea. As would be expected, North Korea was backed by the Soviet Union, while the United States was the principal ally of South Korea. The Korean War was the first military action related to the Cold War. Many saw it as an act of communist aggression that could instigate the spread of communism world-wide. The Americans saw the communist invasion of South Korea to be a possible precursor to a wider war with Russia and China, with the further possibility that it would lead to World War III.

At first the United States simply tried to push the North Koreans out of South Korea. Before long, however, the objective became one of freeing the North Koreans from communist rule. While this seemed to work at first, the move into North Korea by the United States brought Communist China into the war. This alarmed President Truman, who sought to return the war's initial objective of keeping the North Koreans north of the 38th parallel. General MacArthur, in charge of the American troops, challenged Truman, insisting nothing short of all out victory was acceptable. President Truman subsequently fired General MacArthur.

Truman moved forward with peace talks at Panmunjom. Ultimately the war ended in a stalemate with a two mile swath of land designated as a demilitarized zone between the two countries.

PART 2, SECTION 2: HOSPITAL ERA HISTORIC CONTEXT AND PROPERTY DESCRIPTION

Two historic contexts are defined in this document for the World War II and Post World War II eras, as follows:

- The “Hospital Era” of Naval Hospital Corona (NHC)
- Weapons Research, Development, Testing, and Evaluation (RDT&E) Era

These contexts are addressed separately in two separate parts of this document, with the Hospital Era covered in Part 2 and the Weapons RTD&E Era addressed in Part 3. While the Hospital Era is treated in this document as a single span of time from 1941-1957, it in fact spans two periods. The first was centered around World War II , lasting from 1941-1949. The second was centered on the Korean War, spanning the years from 1951 -1957.

A third context, centered around the use of the northerly portion of the Norconian property as a pioneering rehabilitation prison, originally used to treat heroin addicts (*Corona Daily Independent*, 5-8-1963: A-1) is not addressed in this document.

This part of the survey and evaluation of the Norconian property addresses the Hospital Era.

1. Naval Hospital Location and Current Status:

Named U.S. Naval Hospital, Corona (NHC), the hospital was in fact not situated in the City of Corona, but in the unincorporated area north of Corona known as Norco. Norco was incorporated in 1964, and the property is now entirely located within the City of Norco.

The hospital campus originally encompassed approximately 695-acres (Sanitary Report - Historic Supplement 1946) (Acreage figures tend to vary by source. In general the figure used in this document is 700-acres.) Today, approximately 390-acres of the hospital property remain intact, with portions of the original property transferred for private or governmental development. Most of the transferred lands were previously devoted to golf course and open space uses during the resort and Naval Hospital Eras

Today, the remaining NHC lands are largely divided among three entities as follows:

- Naval Weapons Station, Seal Beach Detachment, Norco: Occupying approximately 247-acres, this part of the site includes the resort’s lake, its Pavilion, Chauffeurs Quarters, and Garage/Laundry building. It also includes what was known as NHC Unit 2, a complex of buildings devoted to the treatment of tuberculosis.
- California Rehabilitation Center: Approximately 102-acres are occupied by the California Rehabilitation Center (CRC), a prison originally focused on the rehabilitation of inmates addicted to heroin. Major buildings within the bounds of the CRC property include such prominent resort era edifices as the Hotel, the Power House, and the Tea House. Buildings added for purely hospital purposes include the hospital wings that extend from the resort’s hotel building, a chapel, a gymnasium/theater/ships store building. This complex of buildings was known as NHC Unit 1. Also on the CRC property are the buildings of NHC Unit 3, a complex built primarily for the treatment of rheumatic fever., but also used for other diseases, including tuberculosis patient overflow from Unit II and polio.

FIGURE 8: CURRENT DIVISION OF SUBJECT PROPERTY

Source: Google.com

- Norco College: This 100-acre community college contains a portion of what was actively used by the weapons station for fuse laboratories and bunkers. This area consists of a hill improved during the resort era as a vantage point over the golf course and used during the Cold War for use related storage and laboratories.

Finally, there are lands situated beyond the functional boundaries of the above uses which are improved with water wells, a reservoir, and an abandoned sewage treatment plant. (Figure 3)

2. Naval Hospital Corona Property Overview

a. Hospital Property Units:

NHC was developed over a seven-year period, beginning in December of 1941 and ending in December of 1947. On January 2, 1942, Captain Harold L. Jensen (MC) USN, reported to the newly established hospital to serve as the Medical Officer in Command. Jensen was born in Denmark in 1889 and came to the United States as a child in the early 1890s. He was a graduate of the University of California and obtained his medical education at Stanford University.

He joined the U.S. Navy c. 1915 and spent a large part of his career in San Diego. Jensen was at Pearl Harbor and witnessed the December 7, 1941 attack by the Japanese. Senior Medical Officer of the hospital ship USS Solace, Jensen directed the medical treatment of many of the Sailors and Marines who were injured in that attack. Figure 9 is a photograph of Jensen receiving a Navy Unit Commendation for Meritorious Service, in honor of his heroic actions during the attack on Pearl Harbor. After his assignment as NHC's Medical Officer in Command about a month after the Pearl Harbor attack, Jensen oversaw the medical treatment of many of the wounded he previously aided aboard the USS Solace.

The Navy selected prominent Los Angeles architect, Claud Beelman to design the hospital campus. Initially, the Navy directed Beelman to merely convert the hotel building into a convalescent hospital with instructions to use caution to preserve the beauty of the building. (Letter, Cather to McIntire, 10/9/1941, Letter, McIntire Navy Department Appropriation Bill, 1/13/1942) Before long, however, the Navy decided that the site was ideal for a flagship permanent general hospital. To make this a reality, an aggressive construction program began that ultimately produced a $15,000,000 hospital complex. (*Corona Daily Independent,* 12-9-1947: 1)

FIGURE 9: CAPTAIN H.L. JENSEN (RIGHT)

Source: Kevin Bash Collection

NHC specialized in a number of diseases and medical conditions, including tuberculosis, rheumatic fever, and poliomyelitis. NHC also had an extensive rehabilitation program to treat wounded combatants suffering from paralysis, amputations, and cord bladder issues. (Fourth Quarter Sanitary Report,1946, Historical Supplement)

NHC consisted of four independent but coordinated hospitals. Three of these units were on the Norconian property (Figure 10), and a fourth unit was situated several miles

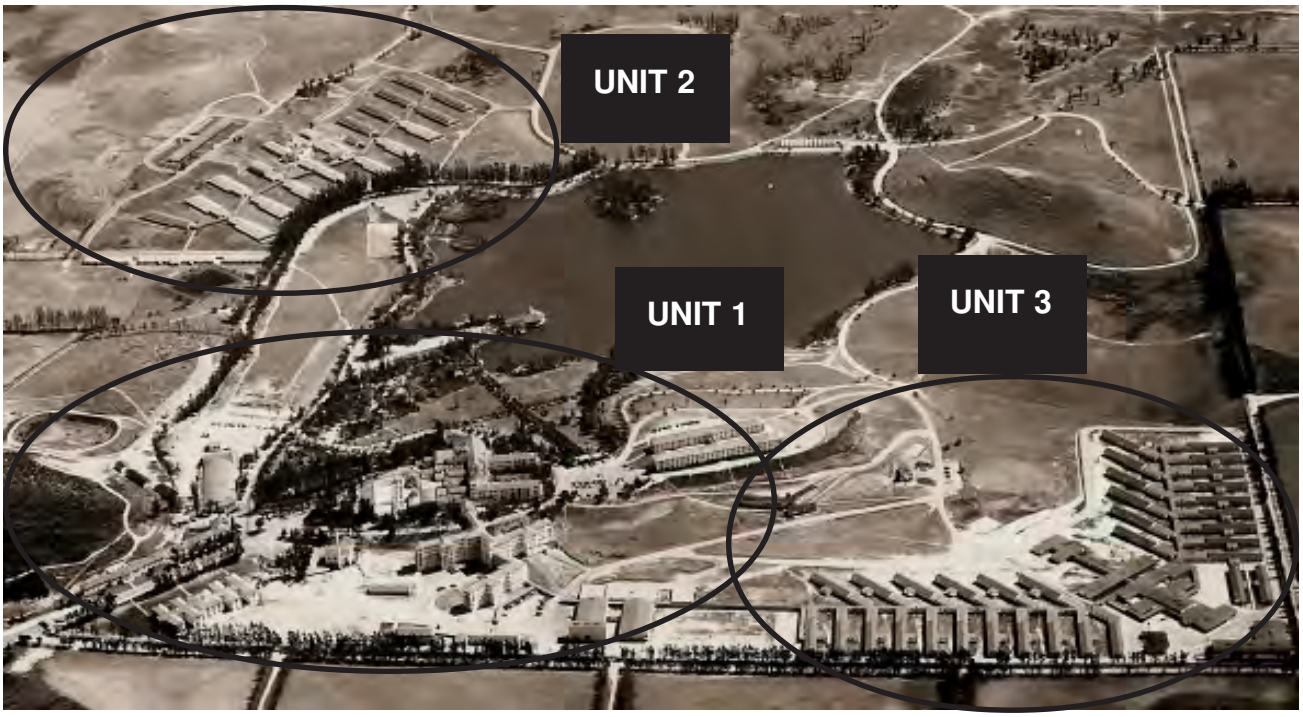


FIGURE 10: NAVAL HOSPITAL CORONA UNITS

Source: Kevin Bash Collection

away in the community of Spadra, near Pomona.

The following is a summary of the functions conducted in each of these units:

Unit 1: This was the nucleus of NHC and the largest of the three Norconian property based units. The heart of Unit 1 was an 800,000 square foot hospital/administrative complex, consisting of the 350,000 square foot reinforced concrete hotel building and a 450,000 square foot reinforced concrete multi-wing addition, known as the Annex.

The part of Unit 1 in the old hotel building contained administrative offices, surgery wards, a morgue, prosthetics facility, a brig, officers' treatment rooms, a pharmacy, a kitchen, dining facilities, hydro-therapy pools, and hospital wards. The Annex housed hospital wards, a commissary, and offices.

Freestanding buildings associated with Unit 1 included a gymnasium/theater complex, with a wing devoted to a bowling alley, ships store, barber shop, and laundry. Also a part of Unit 1 was a chapel, and buildings devoted to occupational therapy, urology, dermatology, syphilogy, x-ray, and physical therapy. Staff housing was an important component of Unit 1, including quarters for Corpsmen, WAVES, and Nurses. An electrical generating plant originally built to serve the hotel was situated east of the hotel building. The hotel's chauffeurs' quarters served various functions over time, including nurses' quarters, WAVES' quarters, and officers' quarters. Also tied to Unit 1 was an electrical shop/fire station, paymaster's office,

FIGURE 11: MAJOR NAVAL HOSPITAL CORONA USES

Source: Kevin Bash Collection

civil readjustment office, rehabilitation administration offices, shore patrol, central laundry, garage, and maintenance buildings. Among these buildings were those originally constructed as temporary contractors' offices, but later converted into hospital related facilities. The resort's Pavilion/Casino housed an Officers' Club.

Other than the gym/theater complex and Occupational Therapy building, all of the major new buildings in Unit 1 were designed by architect Claud Beelman to reflect the Spanish Colonial Revival architecture of the original resort buildings.

Unit 2: This complex was devoted entirely to the treatment of tuberculosis. Because of the communicability of this disease, it was located well away from the balance of the hospital and organized to operate as a separate, completely self-contained, specialized hospital unit. Within its boundaries were buildings devoted to hospital wards, officers' quarters, WAVES' quarters, corpsmen's quarters, nurses' quarters, kitchen facilities, a morgue, a ships store, barber shop, laundry, recreation hall, hydro-therapy facility, maintenance unit, theater, dining hall, and headquarters/ administrative offices.

Like Unit 1, Architect Claude Beelman designed all buildings in Unit 2 to coordinate with the Spanish Colonial Revival architecture of the original Norconian Resort.

Unit 3: Similar to Units 1 and 2, Unit 3 was also a self contained hospital. Primarily designed to treat soldiers afflicted with rheumatic fever, it was also used as a facility to treat, poliomyelitis, lymphatic filariasis, malaria, tropical diseases, venereal diseases, and overflow tuberculosis patients from Unit 2. Within the Unit 3 compound were hospital wards, hydro-therapy facilities, a dental clinic, fire station, helps' quarters, a theater, a dining hall, kitchen, administrative offices, a minor surgery clinic, and a morgue. Unit 3 did not, however, have its own nurses' quarters. Instead, nurses from Unit 3 were housed with nurses from Unit 1.

Unlike Units 1 and 2, Unit 3's architecture was utilitarian, consisting largely of wood frame structures on concrete bifurcated block stilts. Each building was sided with a fireproof modular material consisting of a mixture of cement and asbestos that was known as "cementos." (Letter, Jensen to McIntire, 4-16-1943) Unit 3's building roofs were simple gabled types, sheathed with composition shingles or rolled roofing. It is important to note that, while classified as temporary, Unit 3's buildings were built above the specifications for normal temporary buildings and were expected to last 25 years as opposed to the 10 year lifespan of normal temporary construction. This greater lifespan was largely due to the use of cementos siding, rather than the more typical wood siding. (Ibid) Interestingly,oOver seventy years later, Unit 3's buildings are still in active use today as prison wards, putting their lifespan well beyond even the 25 year prediction.

Common Area: Outside of the three NHC hospital units was a vast amount of land largely devoted to landscaping and recreational uses. This common area included tennis courts, basketball courts, shuffleboard courts, a baseball field, and a nine-hole golf course. A major feature of the common open space was a 60-acre lake and a boat house complete with boats to use for fishing and recreational boating.

These grounds also served another more important purpose. Captain Jensen considered the recreational activities available at NHC to be essential to the rehabilitation process. He felt that golf was particularly beneficial to the healing process. (Letter, Jensen to Sheldon, 9-11-1942) Jensen considered this so important, that he made a special case to justify the purchase of an expensive diesel powered pump for golf course irrigation, despite wartime restrictions on such items. (ibid) Jensen was quite pleased when his position received the support of Acting Chief of the Bureau of Medicine and Surgery, Luther Sheldon. Sheldon stated that, "The primary function of the Naval Hospital, Corona is to rehabilitate our disabled and crippled, wounded and injured personnel as quickly as possible so that they may

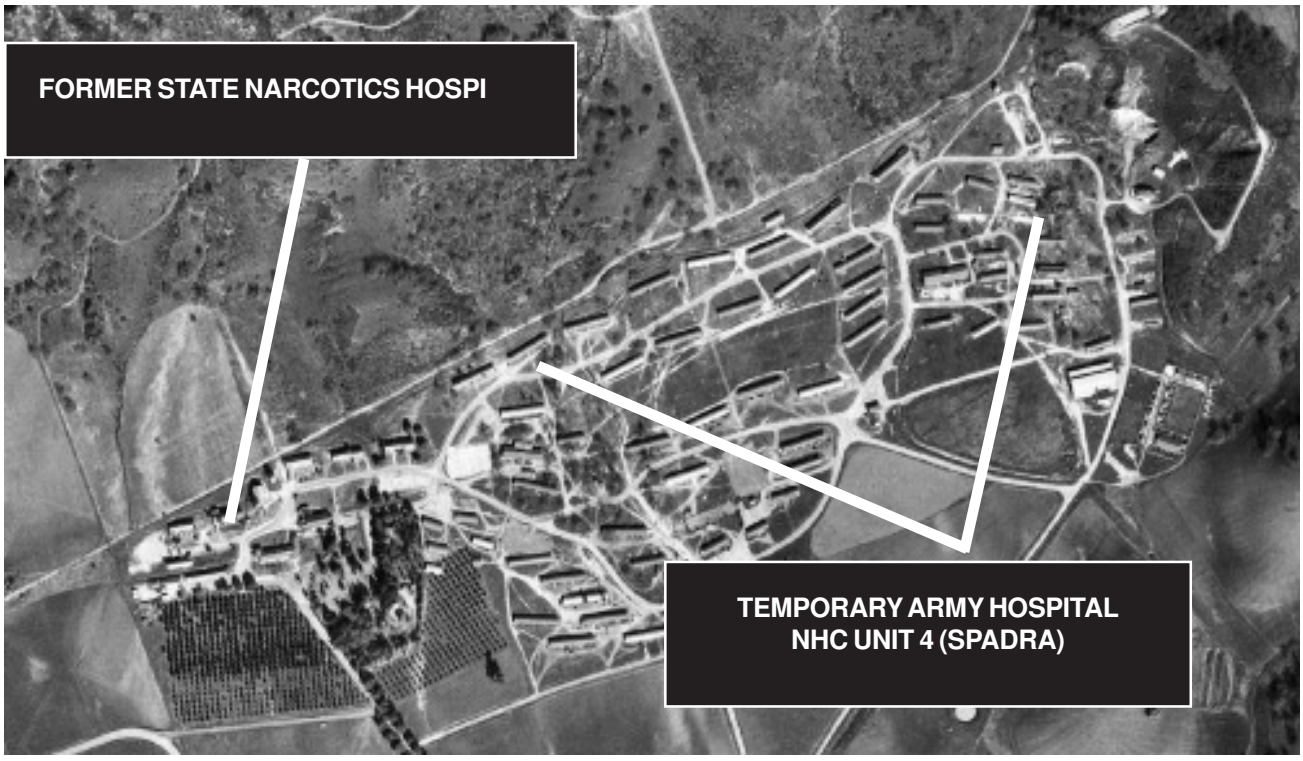


FIGURE 12: NAVAL HOSPITAL CORONA UNIT 4 (SPADRA)

Source: USGS 1946

return to active duty again. The type of exercise offered by golf...is one of the best means for limbering up stiff joints and strengthening weakened limbs." (Letter, Sheldon to Baker, 9-19-1942) Even the landscaped terraces were promoted as "...harbors and coves of peace and tranquility for tired nerves and wounded bodies." (Letter, Berry to McIntire, 5-4-1942)

Other common facilities included hot mineral and clear drinking wells, two open reservoirs, an enclosed reservoir, a water tank, and a sewage treatment plant.

Unit 4: Formerly occupied as an Army general hospital, Unit 4 (Figure 12) was acquired by the Navy on July 1, 1944. Unit 4 was located in an area near Pomona known as Spadra. There had been a state mental institution at that site which was purchased by the Army to serve as a component of a larger general hospital campus. The expansion consisted of a large number of temporary military buildings, situated east of the permanent mental hospital complex. NHC acquired the property from the Army and used it as a convalescent hospital where rheumatic fever, malaria, and tuberculosis patients could build strength through physical labor, including cutting trees and painting buildings. Unit 4 was a key component that helped get sailors and marines back to their regularly assigned military duties. (Sanitary Report, 1941–1945 1) The land on which it was once situated is now occupied by Mt. San Antonio Community College. WHS did not find any remnants of the Army hospital on the present college campus.

b. Hospital Functions:

NHC grew rapidly into a major general Naval hospital. Located in California, it became a primary hospital for sick and wounded from the Pacific Theater. But, it also accommodated patients from other theaters and from all parts of the United States. NHC was of central importance for the treatment of several conditions as noted below:

- Designated West Coast (Pacific Theater) hospital for tuberculosis
- Designated national hospital for rheumatic
- Designated West Coast (Pacific Theater) hospital for poliomyelitis
- Designated West Coast (Pacific Theater) cord bladder hospital.
- Recognized as a leader in treatment and research related to lymphangitis. (Letter, Jensen to Andrus, 8-19-1943)
- Used for numerous controlled studies, including those related to peptic ulcers, gastritis, and psychoneurosis. (*Journal of American Medical Association,* Peptic Ulcer, Gastritis and Psychoneurosis, 7-29-1944, pgs. 890-896)
- Recognized as a leader in the rehabilitation of sick and injured military personnel. Having previously been a luxury resort, NHC boasted several amenities that helped enhance NHC reputation as a major center for rehabilitation. These amenities included hot mineral wells, vast open spaces, a lake, and numerous sports facilities.
- Recognized as a leader in advancing the technology and usefulness of prosthetic devices.

(Fourth Quarterly Sanitary Report, 1946)

More detailed information regarding these functions appears later in Theme 2 covering diseases and Theme 3 covering rehabilitation.

c. NHC's Status in Relation to Other Naval Hospitals:

There were two primary types of stand-alone Naval hospitals in the USA.

- *General hospitals* provided primary treatment for injuries and diseases. Because of the urgent need for hospital beds, the objective of the general hospital was to get patients well enough to allow them to be transferred to a convalescent hospital, active duty, or home.
- *Convalescent hospitals* served as places where patients who had completed primary medical attention at a general hospital could go to recover as fully as possible.

WORLD WAR II NAVAL HOSPITALS – WESTERN UNITED STATES

STATE	LOCATION	HOSPITAL NAME	COMM	DECOMM	INTACT?	WW II HOSPITAL BUILDINGS
CA	Banning	Naval Convalescent Hospital	10-2-1944	12-31-1945	No	Dismantled
	Beaumont	Naval Convalescent Hospital	10-2-1944	10-15-1945	No	Dismantled
	Norco	U.S. Naval Hospital Corona	1941 1951	1949 1956	Yes	Naval Weapons Station & Calif Rehab Center
	Long Beach	U.S. Naval Hospital Long Beach	1942	1994	No	Demolished 1990s
	Mare Island	U.S. Naval Hospital Mare Island	1850	1993	No	Portions of hospital remain
	Oakland	U.S. Naval Hospital Oakland	1942	1996	No	Demolished
	Oceanside	U.S. Naval Hospital Santa Margarita Ranch (Pendleton)	1942	1974	No	Demolished, Replaced
	San Bernardino	Naval Convalescent Hospital Arrowhead Springs	5-23-1944	4-15-1946	No	Temporary bldgs removed
	San Diego	U.S. Naval Hospital San Diego	1919	Present	No	Many WW II Bldgs Demolished
	San Francisco	Naval Receiving Hospital	12-1944	12-1945	No	Demolished
	Shoemaker	U.S. Naval Hospital Shoemaker	10-1-1943	6-30-1946	No	Demolished 1990s
	Treasure Island	U.S. Naval Hospital Treasure Island	4-4-1942	3-1-1947	No	Highly altered
	San Leandro	U.S. Naval Hospital San Leandro	8-15-1944	9-1-1946	No	Engulfed by Oakland Naval Hospital
	Santa Cruz	Naval Convalescent Hospital	3-9-1943	4-1-1946	No	Casa Del Rey Beach Hotel-Demolished
	Yosemite	Naval Convalescent Hospital	6-25-1943	12-15-1945	No	Ahwahnee Hotel-WW II Temporary bldgs removed
CO	Glenwood Springs	Naval Convalescent Hospital	7-5-1943	4-1-1946	No	Colorado Hotel, used with no alterations?
ID	Farragut	U.S. Naval Hospital Farragut	1-15-1943	6-15-1946		Most bldgs removed, now Farragut State Park
	Sun Valley	Naval Convalescent Hospital Sun Valley	7-1-1943	12-1-1945	No	Sun Valley Lodge & Resort – Used with no alterations?
OR	Astoria	U.S. Naval Hospital Astoria	c. 1945	Unknown	No	Now the site of a residential subdivision
	Corvallis	U.S. Naval Hospital Corvallis	WW II	WW II	No	
	Medford	Camp White 8-31-1945 - 1946	c. 1945	c. 1946	No	
WA	Bremerton	U.S. Naval Hospital Puget Sound	c. 1890		No	All but six bldgs demolished, c. 1980
	Seattle	U.S. Naval Hospital Seattle	8-1942	1946?	No	Most bldgs removed over time
	Seattle	Marine Hospital Seattle	1933	1981	Yes	National Register Listed

FIGURE 13: WORLD WAR II NAVAL HOSPITALS IN THE WESTERN UNITED STATES

Source: http://www.ibiblio.org/hyperwar/USN/ref/USN-Act/

There were also dispensaries and clinics attached to Naval bases, but these were not stand-alone facilities. (Mikesell 2000: 7.10.1)

The battles of World War II generated large numbers of patients from four theaters of operations. These theaters consisted of the European Theater, the Mediterranean Theater, the China Burma India Theater, and the Pacific Theater. Previous wars had been largely serviced by hospitals in the eastern United States. World War II's Pacific Theater necessitated the development of significant hospital facilities in the Western United States.

To service the Pacific Theater, an aggressive program was carried out in the western United States to build new hospitals, expand existing hospitals, and adapt existing civilian facilities into hospitals. At the beginning of the war, there were only three general hospitals available for Pacific Theater patients. These consisted of:

- Naval Hospital San Diego, California (1400 beds)
- Naval Hospital Mare Island, California (650 beds)
- Naval Hospital Bremerton, Washington (300 beds).

(Snyder, Of Ships and Surgeons, 2011)

There was also a 312-bed Marine hospital, in Seattle. (http://www.phpda.org/about-the-phpda/history)

To augment the bed count, several hospitals, both general and convalescent, were added. These were built primarily as temporary hospitals intended to be removed after the war. "Instant" hospitals were also created by adapting existing resorts, hotels, and estates into hospitals. As a rule, these latter properties were pressed into service as temporary convalescent hospitals, with expansions to these facilities consisting of typical military temporary construction. After the war they were returned to private ownership. This use of resorts for military hospitals is well documented. For example, in January 1943, the 12th Naval District Medical Officer wrote: "We will undoubtedly need a number of places for convalescents. If possible, I think M & S should get direct appropriations from Congress to take over hotels, call them hospitals, leave the entire management and staff with the exceptions of bell-boys, chambermaids, etc. as is. We'll pay the flat rate per man per day. This will be cheaper and the contracts can be made much more easily and quickly." (National Archives and Records Administration, College Park, MD. ("Archives II, Record Group 52, Records of the Bureau of Medicine and Surgery, Headquarters Records, Correspondence 1842-1945, Entry 15B, File NH70-7 – 7/A1-1, letter Inspector of Medical Activities, Pacific Coast, to assistant chief, Bureau of Medicine and Surgery, RADM Luther Sheldon at the Bureau of Medicine and Surgery, 29 January 1943)

NHC was a unique exception to this rule, as it was expanded into a permanent general hospital, with all but one area of the hospital expanded with permanent construction. (Letter, Jensen to Andrus, 2/3/1943)

The table in Figure 13 provides a list of all World War II hospitals in the Western United States, including hospital type, location, name, commission/decommission dates, and current status. (http://www.ibiblio.org/hyperwar/USN/ref/USN-Act/, Accessed 2015)

3. A Brief History of Naval Hospital Corona:

a. Acquisition of the Naval Hospital Corona Property

His Norconian resort having failed, owner Rex Clark put the property on the market in 1941 for $2 million, an amount that was less than half of its construction cost. In October/ November of 1941 President Roosevelt directed the Navy to purchase the resort, and on December 9, just two days after Pearl Harbor, the Navy took the resort over by executive order.

Clark fought with the Navy over a fair purchase price, with politics playing a significant role in the ultimate outcome. The Navy attempted to devalue the property, claiming it was only worth $725,000. Clark took the Navy to court, seeking his entire asking price of $2,000,000. Some reports say he received that amount, while others reports say the price paid was just $850,000. (Bash/Jouxtel 2011: 29)

The December 16, 1941, issue of the *Los Angeles Times* covered the Navy's purchase of the Norconian property. The *Times* reported that the resort had been closed for the three months previous to its purchase by the Navy. It noted that the purchase included 688-acres of land, including a hot mineral water well, a lake, large garages, swimming pools, electric system, laundry, and other buildings. (*Los Angeles Times*, 12-16-1941: I-4)

(Please note that acreage figures for the resort and its man-made lake tend to vary by source; however, it is fair to say that the property was around 700-acres and that the lake was in the vicinity of 60-acres. These figures are used throughout this report.)

b. Establishment of Naval Hospital Corona

On January 2, 1942, Captain Harold L. Jensen (MC) USN, reported to the newly established hospital to serve as the Medical Officer in Command. Soon thereafter, Jensen initiated a massive construction effort to convert and expand the Norconian Resort into a Naval hospital.

The first project was commenced just 22 days after Jensen's arrival. Assigned to the Guy F. Atkinson-George Pollock Construction Company, the scope of work involved the remodeling of the second and third floors of the main hotel building to serve as the hospital's technical department with X-ray equipment, operating rooms, and the like. (Sanitary Report Historical Supplement, 1945: 1)

An early dispute centered on what name to assign to the new hospital. It was located in the unincorporated town of Norco, so the obvious answer was to have Norco somewhere in its name. And, in fact, on January 6, 1942, it *was* designated US Naval Hospital Norco. But, while the Navy agreed with the logic of including "Norco" in the hospital's name, Norco did not remain a part of the name for long. Neighboring Corona was an established incorporated city with a thriving business district, booming citrus industry, and a transportation hub. More significantly, it also had a full service post office where large quantities of mail could be processed. Norco was an unincorporated village with limited postal services. So, on February 2, 1942, the hospital at the former Norconian resort was renamed "U.S. Naval Hospital, Corona". (Bash/Jouxtel 2011: 29)

In keeping with standard protocol for the use of resort properties, initially the Navy's plan was to make NHC a convalescent hospital. Resorts had the advantage of easy and quick conversion for convalescent hospital purposes. (Navy Appropriation Hearing 1943, Ross

FIGURE 14: NAVAL HOSPITAL CORONA'S HOTEL ENTRANCE DURING WORLD WAR II

Source: Kevin Bash Collection

McIntire statement, 1-13-1942), (Report, "Date of Activation and Early History of US Naval Hospital", Corona California, 1941–1946)

Less than two weeks after assuming command of NHC, Captain Jensen announced that the plan had changed and the Navy would instead expand the resort into a 1,000 bed general hospital. (Letter, Jensen to McIntire, 1-11-1942) By March, an even more aggressive expansion plan was advanced, (Letter, Jensen to Chief, BUMED, 3-12-1942) and by April, the Navy decided that the hospital would include an independent tuberculosis unit. (Letter, Jensen to McIntire, 4-11-1942)

The Navy's expansion program coincided with the decision to make NHC into a permanent general hospital. (Letter, McIntire to Haydock, 3-13-1942) A decision was also made, before the development of any building plans, that NHC would be "The showplace of the west coast" and a "neurosurgical center." (Letter, McIntire to Jensen, 1-18-1942) The massive construction effort to bring this about extended throughout the war and well into peacetime. (Letter, McIntire to Secretary of the Navy, 5-11-1945)

FIGURE 15: NURSES' QUARTERS DURING THE KOREAN WAR

Source: Kevin Bash Collection

Throughout World War II, Jensen fought to avoid temporary construction; even going so far as to turn down projects that specified inferior materials. (Letter, Jensen to Chief of BUMED, 11-23-1942) Jensen insisted on "Class A" construction throughout NHC. (Letter, Jensen to Chief, BUMED, 3-12-1942) When costs finally forced him to accept temporary construction (for Unit 3) he sought only the best materials and lobbied for concrete/asbestos "cementos" exterior siding, rather than the flimsy materials normally used in temporary construction, (Letter, Jensen to McIntire, 4-16-1943) (Letter, Jensen to Chief of BUMED, 4-28-1943)

On February 18, 1942, about eight weeks after the Navy assumed ownership of the property, the first two patients arrived. These inaugural admissions consisted of one officer and one enlisted man. (Letter, Jensen to McIntire, 2-18-1942) Two days later, 24 more patients arrived, transferred from Naval Hospital, Mare Island, California. (Letter, Jensen to McIntire, 2-24-1942) The peak patient load during World War II reached 3,660, (*The Norconian*, 3-3-1952: 1) with a post war record of 4,050 patients reported in late 1946. *(Corona Daily Independent*, 12-19-1946: A-1)

For information about the work accomplished at NHC during and after World War II, see Theme 2, Disease Treatment and Theme 3, Rehabilitation below.

c. Closure of the Hospital:

In early 1945, Jensen wrote that the NHC patient load was dropping, and he confessed that the simultaneous addition of the convalescent beds at Spadra, Banning, and Beaumont might have been unnecessary. With the underutilization of these facilities, Jensen considered the possibility of abandoning them. (Letter, Jensen to Agnew, 4-26-1945) While NHC continued to be seen as a permanent hospital, the end to combat operations greatly reduced patient loads at NHC.

Between 1945 and 1946, the patient load dropped from 4,500 to 2,700. (*Corona Daily Independent*, 2,700 Patients at Naval Hospital; 4,500 a year ago," 3-22-1946) By December 1946, the number of patients at NHC stood at 1,241. (Corona Daily Independent "4,050 Patients at Naval Hospital of Corona Set Record", 12-19-1946) And, during 1947, NHC's patient census decreased to 474. (Sanitary Report, 12 – 31 – 1947)

But construction at NHC continued unabated, lending credence the intended permanence of the hospital. In May of 1945, Surgeon General Ross McIntire petitioned for a major water supply renovation at NHC, calling it "a large permanent Naval Hospital" that will be needed when the large number of temporary hospitals built to service the Pacific Theater are decommissioned. (Letter, McIntire to Secretary of the Navy, 5-11-1945)

Other significant projects were initiated after V-J Day. Among these were expansions and additions to the laundry, a new vehicle shed, a new storage building, and an expansion of the Power House. (Letter, Andrus to BuDocks, 7-25-1945). McIntire did, however, call for a reexamination of the scale of these and other projects, calling for them to be commensurate with a projected postwar patient load of 1,500. (Letter, McIntire to USNH Corona, 7-25-1945)

In March of 1946, the *Corona Daily Independent* reported: "After making an inspection tour of the U.S. Naval Hospital at Corona, Vice Admiral Ross T. McIntire stated the Corona Naval Hospital is in the permanent post-war plan of the Navy. We will continue the fine rehabilitation work that has been done here.'" (Corona Daily Independent, 3-1-1946) Later that month, the paper reported on the first post-war meeting of the San Bernardino, Riverside Inter-County Council of the American Legion Auxiliaries. Speaking to the Legion at a luncheon meeting, Lt. Commander F.H. Wickham, chaplain at the hospital, told those gathered "…that the Corona Naval Hospital was one of the largest on the West Coast and that it definitely will be a permanent institution." (*Corona Daily Independent,* 3-22-1946: 1)

At its peak, the hospital had housed thousands of patients. Local business and veterans' organizations were shocked at NHC's precipitous decline and launched a campaign to urge the military to fill the empty beds at NHC. (*Corona Daily Independent,* 10-21-1947: 1) Joining the boosters were State Senator Nelson S. Dilworth, Corona Chamber of Commerce Secretary Manager Bryant Chandler, and County Veteran's Service Officer James E. Carlson. (*Corona Daily Independent,* 11-26-1947: 1) The local American Legion joined the Chamber of Commerce in urging the transformation of the Naval hospital into a veterans' hospital, adopting a resolution to that effect at its October 19, 1947 meeting. (*Corona Daily Independent,* 10-20-1947: 1)

Despite the $15 million invested in the hospital, however, the facility was considered to have one major drawback. Speaking to a gathering of the Disabled Veterans of America in Las Vegas, General Paul R. Hawley, head of the Medical Department of the Veterans Administration, told the group that the Veterans Administration was interested in acquiring

hospitals only in large centers of population. The news of this speech shook local business groups. Local hospital boosters were urged to contact elected officials, military brass, and Veterans Administration leaders to convince them that the Corona area was sufficiently well connected to metropolitan Southern California to justify maintaining NHC as a permanent veterans' hospital. (*Corona Daily Independent,* 1-28-1948: 1)

Later in 1948, rumors began to circulate that the Corona Naval Hospital would be converted into an Army hospital. A *Corona Daily Independent* reporter asked Captain Robert E. Duncan, Medical Officer in command of NHC, to comment on this rumor. Captain Duncan said he had just returned from a Washington conference of all commanding officers, and told the reporter: "While it had been rumored that the Corona Naval Hospital might be retained as a military hospital – his trip to Washington had gained him nil – as far as having any more definite information." (*Corona Daily Independent,* 6-29-1948: 1) But, within four months, Captain Duncan had a much more positive message to deliver. The *Corona Daily Independent* reported: "Captain Robert E. Duncan…said today that the Corona Naval Hospital is a permanent military establishment and that it will be expanded to operate at nearly full capacity." This announcement came on the heels of an inspection of the hospital by Admiral Leroy Vincent Swanson, "…the Surgeon General of the U.S. Navy and top man of all men connected to the Naval Hospital Service." (*Corona Daily Independent,* 10-27-1948: 1) Exactly two months later, however, doubt was again cast as to the future of the NHC. The Hoover Commission recommended that all chronic NHC patients be moved to existing veterans' hospitals. The paper tried to calm the fears this news would bring to the local community by observing that this was just a recommendation, made purely on the basis of economics. (Ibid)

By the fall of 1949, the drama appeared to be over, with NHC coming out the loser. In September of 1949, Captain Duncan told the *Corona Daily Independent* he had received orders from his commanding officers that NHC must close by November 1, 1949. The patient population at the hospital stood at 330 at that point and it was expected that all of these would be moved to other facilities within weeks. (*Corona Daily Independent,* 9-15-1949: 1) NHC was formally closed on November 1, 1949. (*Norconian*, 3-3-1952: 1)

On October 20, 1949, the last patients left the facility but not without controversy and rumors. Claims were made that the removal of equipment had been stopped by a last minute telegram, which the commanding officer would not confirm (*Los Angeles Times,* 10-21-1949, p 27)

Efforts to Reopen NHC as a Permanent Hospital: Efforts to reestablish NHC as a permanent military hospital continued even after its formal closure. Considering the $15,000,000 that had been invested in NHC to establish it as a flag shop, permanent military hospital, one would have thought its retention would have been unquestioned. After all, while the war was over, there were still veterans to serve. And, the war had swelled the ranks of this population exponentially. But, the obvious answer was not necessarily the favored answer, and the fate of NHC would be bounced around like a ping-pong ball for many years after the end of the war.

The forces against the hospital boosters did not end the agitation to keep the hospital open. The American Legion redoubled its campaign to keep the hospital open. Director Louis Stoneker of the Veterans Administration Rehabilitation Services lamented that the Corona hospital and the McCormack hospital in Pasadena lay idle while thousands of veterans were on the waiting lists of overcrowded veterans' hospitals. Stoneker estimated that 3.600 beds

were needed just for tubercular and neuropsychiatric patients. (*Corona Daily Independent,* 12-12-1949: 1) Stoneker later said he was assured by a congressional committee that Congress would support retaining NHC as a permanent military hospital. (*Corona Daily Independent,* 12-15-1949: 1)

Support from legislators kept hopes alive that NHC would reopen. State Senator Nelson Dilworth assumed a major role in promoting the permanent status of the hospital, spearheading the passage of a resolution in support of the hospital. Congressman Harry Sheppard of San Bernardino joined in the effort, asserting it would cost $40 million to replace NHC with an equivalent hospital somewhere else. (*Corona Daily Independent,* 12-20-1949: 1) Congressman Richard M. Nixon also attached his name to the hospital's supporters, telling the *Corona Daily Independent* that: "…while not too hopeful…he would work for the V.A. or the Navy or some national group needing these fine facilities...." (*Corona Daily Independent,* 5-2-1950: 1) Another idea, promoted by Senator Dilworth, suggested the hospital be converted to a California veterans' home. (*Corona Daily Independent,* 7-28-1950: 1)

In July of 1950, the *Corona Daily Independent* reported there was a slim possibility that hospital might be kept open as a nuclear war treatment center. In the paper's own words: "Due to the strategic location of the Corona U.S. Naval Hospital there appears to be a bare possibility that the Navy may retain the hospital for its own use or that it may be converted for use as a medical center should an atomic bomb be dropped somewhere on the coast." (*Corona Daily Independent,* 7-14-1950: 1)

Despite all the agitation in favor of the hospital, however, the *Corona Daily Independent* delivered bad news in July of 1950 reporting that "Any possible hope that the Corona Naval Hospital will again be used for Armed services is vanishing. Truck after truck of refrigerators, and what appears to be dish washing machines and plumbing for various purposes have been moving down Main Street toward San Diego. Navy trucks and Navy drivers are moving the equipment….Reports are that much equipment is being sent to Tokyo." (*Corona Daily Independent,* 7-26-1950: 1)

d. Reopening of the Hospital for the Korean War

At the eve of the Korean War, two competing interests began to eye NHC. In August of 1950, it was announced NHC might be put to use by the National Bureau of Standards (NBS) as an electronics-testing laboratory *(Los Angeles Times,* 8-23-1950, pB20) and by September an appropriation bill was before the Senate to convert the hospital into a guided missile research laboratory. (*Corona Daily Independent,* 9-14-1950, 1)

Congress, however, felt NHC would be needed to care for military wounded from Korea (*Corona Daily Independent,* 9-20-1950, 1) and in a lopsided 84 to 7 vote appeared to derail permanently the NBS's plans to relocate to Norco. Nonetheless, over the next few months, both the Department of Defense and Veteran's Administration stated there was no interest in reopening the facility for use as a hospital. (ibid)

Subsequently, President Truman asked for $1,632,000 for NBS to modify NHC for a new guided missile laboratory (*Corona Daily Independent,* 11-30-1950, 1) Originally, NBS wanted both Units 2 and 3 for this purpose; however, as negotiations proceeded into February of 1951, only Unit 2 was assigned to the NBS. (*Corona Daily Independent*, 12-18-1950, 1). (For more information on this aspect of NHC's history, see Part 3, Naval Weapons RTD&E.)

Finally, on February 7, 1951 it was announced that the Navy had officially assigned Unit 2 plus 100 acre to NBS. (*Corona Daily Independent,* 2-7-1951, 1) Two weeks later, the Navy announced that Units 1 and 3 would be reopened for the care of 1,000 patients from the Korean War. (*Corona Daily Independent*, 2-19-1951, 1)

The impact in the Corona Norco area was huge as the two facilities prepared to open their doors. Home building skyrocketed, businesses prepared for a new influx of cash, and the Corona Post Office looked forward to a new windfall of postal receipts (*Corona Daily Independent,* 1-31-1951, 1) (*Corona Daily Independent,* 7-19-1950, 1)

On June 1, 1951, as the Korean War heated up, NHC was recommissioned (BUMED Hospital Statistics, 12-14-1970). Initially it was thought this would be solely devoted to the care of Korean War causalities. On opening day, however, NHC was rated as a 1,650 bed institution geared to provide general and clinical services for active and retired personnel and dependents of the Navy, Marines, Army, and Air Force. (*Los Angeles Times*, 6-14-1951, A10). Quite a number of civilian patients were also accommodated in the reopened hospital. NHC's area of coverage included the entire Los Angeles Metropolitan Area and surrounding territory, including Riverside, San Bernardino and Orange Counties. Bases in the 100 square mile area included:

US Naval Shipyard, Long Beach
US Naval Ships in Long Beach Harbor
US Naval Air Station, Los Alamitos
US Marine Corps Air Station, El Toro
US Naval Station Port Heuneme
US Naval Air Station, Point Mugu
US Marine Corps Depot, Barstow
US Air Force Base, March Field
US Air Force Base, Norton, San Bernardino

(Sanitary Report, 1952)

After delays due to labor issues (*Corona Daily Independent*, 10-22-1951, 1), the first 25 patients arrived on November 27, 1951. By late December, the Navy estimated 600 more patients would arrive. (*Corona Daily Independent,* 11-28-1951, 1) By February of 1952, the patient count was expected to reach 1,700. The *Corona Daily Independent* stated that "...the reactivated Corona Naval Hospital will be one of the most up-to-date institutions in its field. It will be equipped and staffed for the best of service in modern quarters with the finest of equipment." (*Corona Daily Independent*, 11-19-1951)

The reopened hospital was put to full use, with facilities for surgery, obstetrics, dental, vision, emergency services, etc. By 1952, most of the mothballed buildings were put back into use, and the recreational facilities were described as "excellent." These included the lake, four tennis courts, a golf course, a gym, bowling alleys, a theatre with nightly movies, an officer's club, etc. (First Quarterly Sanitary Report, U.S. Naval Hospital, Corona California, 3-27-1952. BUMED Archives)

As it did during World War II, the communities of Norco and Corona supported the patients and staff with visits, dances, picnics and a variety of special events. Dances attended by young Corona and Norco ladies held at the NHC gymnasium were popular with the patients.

(*Corona Daily Independent*, 5-12-1953) The Navy returned the community's kindness by opening its grounds to thousands of Boy Scouts, (Corona Daily Independent, 3-28-1955, p.3) (*Corona Daily Independent,* 4-27-1953, 1), allowing their facilities to be used for school plays, (*Corona Daily Independent*, 4-30-1954, 3) and even allowing a portion of its campus to be used as an interim elementary school. (*Corona Daily Independent*, 6-29-1948- 1). Personnel from the NHC became a part of Norco and Corona's communities participating in annual parades (*Corona Daily Independent,* 10-8-1951, 1), donating time for Boy Scout jamborees, etc. (Corona Daily Independent, 7-15-1953, 1)

Hollywood also turned out again: Bob Hope made his second appearance at the hospital (*Corona Daily Independent*, 8-1-1952, 1), and the Three Stooges were regulars because stooge Larry Fine's son was a Corpsman at the hospital (*Los Angeles Times,* 5-20-1955, B10). It was said the Stooges loved to roam the grounds in doctors garb and "attack patients with 'diagnosticosis'." Musical entertainment included Jose Iturbi, the Los Angeles Bureau of Music (*Corona Daily Independent*, 10-28-1953, 1) and local talent, such as the "Circle City Sisters." (Corona was known as the Circle City because of its famed circular Grand Avenue) (*Corona Daily Independent*, 12-16-1953, 4) A TV film was also made at the hospital, *Bullet Lou Kirn*, about a Navy pilot who cured himself from a debilitating paralysis (*Corona Daily Independent*, 3-1-1957, 1)

Following the Korean war, NHC went on to be a teaching hospital, turning out it's first graduating class of interns in 1957. (*Corona Daily Independent,* 6-20-1957: 1) NHC also served as an emergency hospital for area veterans and civilians, treating accident and illness victims on an urgent basis. (*Corona Daily Independent,* 10-12-1955: 1) In the field of medical science, NHC produced several professional papers detailing advancements in treatments developed there, ranging from moles to chest wounds. (*California Medicine,* Chest Injuries Among Korean Casualties, 6-1953, pgs., 496-498) (*Archives of Dermatology,* Treatment of Benign Pigmented Moles, 1954, pgs. 399-410)

NHC was also a very active in the delivery of babies. In 1953 alone it was reported that 2,608 babies were born at NHC. (*Press Telegram*, 12-9-1953, A-20) This jumped to 3,845 in 1956 (Corona Daily Independent, 1-31-1956). In 1954, famed baby doctor Thomas Lebherz delivered 24 babies in one 24-hour period, which so impressed Groucho Marx, he put the physician on as a guest of his television show, *You Bet Your Life.* (*Los Angeles Times*, 1-20-2002, obituary)

The caliber of NHC's physicians continued to be exemplary and as with World War II, many physicians who served at NHC in the 1950s went on to prominent medical careers. For example:

- Thomas Lebherz was a famed professor of obstetrics and gynecology who helped pioneer surgical treatments for women suffering complications after giving birth. He also did important research into the causes of premature births, and detecting congenital problems in the fetus. He went on to be the Chief of gynecology at Naval Hospitals in Bethesda, Oakland, and San Diego before joining the faculty at UCLA. (ibid.)

- Dr. Lay Fox went on to serve as Chief of Medicine at Bethesda, and at President Lyndon Johnson's request was assigned to the White House as a Cardiologist. (Obit, Dr./Captain Lay Fox, 2012)

- Dr. Richard John Kitz, went on to be a renowned researcher/inventor/teacher/anesthesiologist at Harvard, Columbia, and Massachusetts General Hospital. (Richard J. Kitz Papers, 1950-2001)

- Dr. Paul David Mozley went on to true fame as the Founder of Obstetrics Fellowships in the United States amongst numerous other achievements (*American Journal of Clinical Medicine,* Spring 2009, pgs. 6-7)

e. Final Closure ot Naval Hospital Corona

On July 3, 1957 the *Corona Daily Independent* carried the headline, "Fear Corona Naval Hospital May Close" (*Corona Daily Independent,* 7-3-1957, 1). It turned out, there was no "may" about it, NHC was to be closed for good.

Still, there were those who staunchly fought for NHC to stay open. Within days of the announcement that NHC would close, Congressman Dalip Singh Saund, the area's Congressman, was calling for a full report as to why neither the Defense Department nor the Budget Bureau had advised him of the impending closure. Saund expressed concern that 600 patients would be displaced and asked why NHC should close, when there was already a shortage of Naval hospital beds in Southern California. (Corona Daily Independent, 7-12-1957, 1)

Congressman Craig Hosmer confronted Secretary of the Navy Thomas Gates, insisting that NHC's closure would impose "severe hardships" on Naval personnel and dependents in the Greater Los Angeles area, and demanded that Gates make certain that the closing of NHC was in fact "essential." Hosmer accused BUMED planners of a "grandiose plan for a super medical center in San Diego." (*Los Angeles Times*, 7-15-1957, pg. 23) (Press Telegram, 7-12-1957, B-1)

With the closure only six days away, the NHC was still admitting patients with Commanding Officer Captain Coy Abernathy insisting his operation was "going full blast and admitting new patients left and right." He went on to say "it would be practically an impossibility to close the hospital in just six days. Many patients are in critical conditions." Nevertheless, Secretary Gates said "the Navy has not alternative" and "We can't postpone this." (Corona Daily Independent, 7-25-1957: 1)

A reprieve occurred on July 26, 1957, when the White House ordered NHC to remain open following protests from California's delegation to the House of Representatives. Two hospitals costing millions were on the line – NHC and USNH Mare Island (Los Angeles Times, 7-27-1957, pg.4)

In the end, Gates insisted that "The Department of the Navy's proposed closure of Naval Hospitals Corona and Mare Island [were] the only feasible method by which the accumulative financial problem facing the Bureau of Medicine and Surgery could be alleviated and an effective, efficient medical care program be conducted throughout the rest of the Navy." Gates went on to say the move will save $929,000 and the patient load will be distributed to the US Naval Hospitals at Camp Pendleton, San Diego, and USS Haven in Long Beach (*Corona Daily Independent*, 8-6-1957, 1).

After considerable additional wrangling, NHC closed for good on October 15, 1957. *(Riverside Daily Enterprise*, 10-15-1957, B-1)

Senator Dilworth would not give up, however, and he stepped forward recommending NHC be converted to a veterans' hospital. He pointed to the Yountville Home for Veterans in Napa County, California as an example of what Corona could become. (*Corona Daily Independent,* 12-4-1957: 1)

And, once again, U.S. Congressman Saund threw his support behind the retention of NHC for military purposes. In May of 1958, he reported to the *Corona Daily Independent* that he had been successful in "…having the Defense Department Appropriation Subcommittee of the House of Representatives officially consider the re-opening of the United States Naval Hospital and providing funds for its operation." He chided Republican Congressmen for voting along party lines to defeat the motion, saying: "Every Republican member present voted against the motion. Some 90 percent of the Democratic members voted for it." (*Corona Daily Independent,* 5-27-1958: 1)

Just two months later, in July of 1958, F. Gilmore, Rear Admiral and Assistant Chief for Planning and Logistics announced that the portion of the hospital not needed by the Corona Naval Ordinance Laboratory would be declared excess to the planned peacetime requirements of the Navy. (*Corona Daily Independent,* 7-23-1958: 1)

Nonetheless, Saund continued to fight for NHC. In the spring of 1959, he announced that he had been successful in securing an opportunity for the people of the 29th Congressional District to be heard by a Congressional Committee that was to take final action on the closing of the hospital. (*Corona Daily Independent,* 5-1-1959: 1)

But, by October of 1959, it was clear that the U.S. Naval Hospital at Corona would never be used as a hospital again. Congressman Clyde Doyle of Louisiana had been assigned the responsibility of studying NHC and making recommendations for its use. After at tour of the facility by Doyle and other elected and military officials, the answer was clear. The Corona Naval Hospital was just too remote to be retained as a military hospital of any sort. Long Beach would get the nod for new hospital facilities. (*Corona Daily Independent,* 10-28-1959: 1)

PART 2, SECTION 3: HOSPITAL ERA CONTEXTUAL THEMES

The previous section provided an essentially chronological history of NHC. Its purpose was to give the reader an overall sense of the events that determined the essential form and character of NHC and the role it played in relation to the World War II and Post World War II periods. The present section identifies the elements of NHC's history that are particularly noteworthy within its historic context. While, there is inevitable overlap between the previous section and this section, but there is an essential difference too. Where the previous section is a simple recounting of facts and events, this section distills from that information those themes that are particularly important to NHC's World War II and Post World War II hospital periods. Ultimately, these themes will be used to analyze the degree to which NHC qualifies for the National Register of Historic Places.

1. Theme One: World War II Permanent Construction

a. Designation as a General Hospital:

As noted earlier, World War II made the need for hospital beds an urgent matter and the military met this need by building new, largely temporary, hospitals, expanding existing hospitals, and acquiring the use of suitable private properties, such as hotels and resorts. The Norconian and nearby Arrowhead Resort in the San Bernardino area are examples of resorts pressed into service as hospitals. As a rule, resorts and hotels were leased. The Norconian Resort is the only example of a resort/hotel that was purchased by the military.

The role of the general hospital was to bring the patient to a point where all primary medical treatment was completed. The role of the convalescent hospital was to give the wounded and ill a place to recover as fully as possible.

As previously stated, the original thought was to convert the Norconian property into a convalescent hospital. (Historical Supplement, Fourth Quarter Sanitary Report, U.S. Naval Hospital Corona, California 1945: 1) This plan quickly changed, however, and when Captain H.L. Jensen (MC) USN reported to the NHC on January 2, 1942, his instructions were to turn the Norconian property into a permanent Naval hospital. (Ibid)

b. Architect Claud Beelman

With the decision made that NHC would be a permanent hospital that would be kept in service long after World War II, it was important that its architecture be stylistically consistent with the Norconian Resort and that its construction materials be of the highest quality. To assure that both objectives would be met, it was important that the task of designing the new buildings be assigned to a capable architect with a proven record of designing large-scale buildings and complexes. After careful consideration, the Navy hired famed architect Claud Beelman to design the expansion of the resort. Beelman concentrated his efforts on new buildings in Units I and II.

Claud W. Beelman (1884-1963) was born in Bellfontaine, Ohio in 1884. In 1888, young Beelman followed his family to Lima, Ohio, where his father was a partner in a carriage making company. Beelman's first foray into building design occurred when he helped design his family's second home in Lima.

Beelman did not have a formal education in architecture. Recipient of the Harvard Award of the Architectural League of America in 1905, Beelman could have attended Harvard

University. Having only completed grammar school, however, Beelman felt he would not be adequately prepared for a University education, and he declined the opportunity. Fortunately, in the early twentieth century, attaining professional status as an architect did not require a college degree, so Beelman was able to establish himself as a professional architect, despite his lack of a college degree. (Credle, George V. III, Claud Beelman's Corporate Moderne Style 1951-1963, 2012: 6)

With his natural talent for design, Beelman became prolific in the field of architecture at a very early age. As a 16-year-old, he went to work for Toledo architect George F. Mills and by 1911 he had worked in various architectural offices in New Orleans, Detroit, Cleveland, and Indianapolis. Beelman also demonstrated his passion for architecture by serving as president of the architectural clubs in these cities. (Ibid)

In 1912, he became a partner in the firm of Schreiber and Beelman; however, this firm was short-lived, folding in 1916. (Ibid) In 1921, Beelman moved to Los Angeles where he established a partnership with Alexander Curlett. There, he cultivated the Southern California social and business connections that would assure a steady flow of lucrative commissions. His partner, Alexander Curlett had preceded Beelman in making these connections, so Beelman was able to be accepted in high society with relative ease. Both Curlett and Beelman achieved success quickly and both men had homes in Beverly Hills, California. (Ibid)

The Beelman-Curlett partnership lasted until 1930, by which time the firm had designed an impressive range of commercial buildings. The firm was not, however, able to survive much beyond the start of the Great Depression. (Ibid: 8) During the 1930s and 1940s Beelman worked without a partner, cobbling together commissions wherever he could find them. Prospects for work improved with the advent of World War II, however, and among the many commissions he secured, were U.S. Naval Hospital Corona and U.S. Naval Hospital Long Beach. (Ibid:30)

Beelman established himself as one of the country's great architects. And, he was highly versatile. His spanned several eras and was characterized by dramatic changes in style. (http://www.laobserved.com/archive/2013/06/beelman-oxy.php) His work in all areas of style he undertook resulted in exceptional buildings. This is reflected in the many buildings of his design that are listed on the National Register of Historic Places.

Early in his career, Beelman's buildings tended to be formal in appearance, representing such styles as Romanesque, Classical Revival, and Renaissance Revival evident. In the 1930s, he designed several notable Art Deco buildings, and in the 1940s, he followed the trend toward streamline moderne. As architectural styles evolved during the 1950s and 1960s, Beelman designed several buildings in the International or Corporate Modern mode. The following is a list of some of the Beelman designed buildings that are listed on the National Register of Historic Places, with related architectural styles and years of completion noted:

- Pacific Electric Bldg, 610 S. Main St, Los Angeles, CA
  Classical Revival, 1908

- Norwalk Memorial Hospital, 269 W. Main St, Huron, OH
  Classical Revival, 1916

- Cooper Arms, 455 E. Ocean Blvd., Long Beach, CA
  Renaissance Revival, 1923

- South Park Lofts, 816 South Grand Avenue, Los Angeles, CA
  Beaux Arts-Classical Revival, 1924

- Culver Hotel, 9400 Culver Blvd, Culver City, CA
  Beaux Arts-Classical Revival, 1924

- Roosevelt Building, 727 W. Seventh St. Los Angeles, CA
  Renaissance Revival, 1926

- Heinsbergen Decorating Company Bldg, 7415 Beverly Blvd, Los Angeles, CA
  Late Gothic Revival/Romanesque, 1928

- Security Building, 234 N. Central Ave, Phoenix, AZ
  Second Renaissance Revival, 1928

- Board of Trade Building, 111 W. 7th St, Los Angeles, CA
  Beaux Arts-Classical Revival, 1929

- Eastern Columbia Building, 849 S. Broadway, Los Angeles, CA
  Art Deco, 1930

- Garfield Building, 403 W. 8th St, Los Angeles, CA
  Art Deco, 1930

- U.S. Post Office--Hollywood Station, 1615 Wilcox, Los Angeles, CA
  Art Deco, 1937

- Woodbury University, 1027 Wilshire Boulevard, Los Angeles, CA
  Streamline Moderne, 1937

- Superior Oil Company Building, 550 S. Flower St, Los Angeles, CA
  International Modern, 1956

- California Bank Bldg, 600 S. Spring St, Los Angeles, CA
  International Modern, 1961

(https://www.facebook.com/media/set/?set=a.501631306581046.1073741872.170255386385308&type=3: Accessed 2015)

Figure 16 displays examples of Beelman's design versatility. Examples in this figure include Classical Revival, Renaissance Revival, Late Gothic Revival, Art Deco, Streamline Moderne, and International Modern. All of these buildings are listed on the National Register of Historic Places as detailed above.

Based on research conducted by WHS, U.S. Naval Hospital Corona appears to have been Claud Beelman's only major commission designed in the Spanish Colonial Revival tradition. Beelman chose this style in an effort to maintain consistency with the Spanish Colonial

Revival architecture of the Norconian Resort. In keeping with the 1940s trend toward the simplified lines of Modern Architecture, however, Beelman toned down the detailing of these buildings. The use of more restrained design was typical of architect designed military buildings. The thorough study of World War II architecture by R. Christopher Goodwin and Associates (See "Permanence" below.) comments on this practice: "...military designers were aware of popular trends...and incorporated those styles into buildings on military bases. The military interpretation of a style, however, was almost always conservative and restrained." (Goodwin 1997: 7.12.1) This moderated approach to Spanish Colonial Revival architecture allowed the hospital additions to the Norconian Resort to both blend with and be distinctive from the resort buildings.

c. Permanence

Two studies are considered indispensable in regard to the analysis of World War II military architecture. The first is R. Christopher Goodwin and Associates' study of permanent and semi-permanent buildings associated with World War II. (R. Christopher Goodwin and Associates, *Historic Context for Department of Defense Facilities World War II Permanent Construction*, May 1997) The second is a study by JRP Historical Consulting Services, analyzing the history and significance of military buildings from all eras in the State of California. (JRP Historical Consulting Services, *California Historic Military Buildings and Structures Inventory*, March 2000) In this report, the R. Christopher Goodwin report is referred to as the "Goodwin" study and the JRP srudy is referred to as the "Mikesell " study, for the name of its principal author.

Goodwin defines the differences between permanent, semi-permanent, and temporary construction as follows:

- "Permanent construction was intended for use after the war; it typically was built of masonry (brick, tile, or concrete) and metal frame."
- "Semi-permanent construction typically consisted of cinderblock construction, wooden-frame construction clad with synthetic siding, or a mixture of wooden frame and masonry. Semi-permanent construction often resulted from ad hoc compromises between the desire for permanent construction and shortages of time and material."
- "Temporary *construction* typically referred to wood-frame buildings, usually built according to standardized plans, and modular metal buildings. Temporary construction was not intended for use after the war."
- "Theater-of-operations (T.O.) construction was the least durable type of construction; and it typically consisted of wood lath on wall sheathing covered in felt."

Of course, these are generic definitions and not fully applicable to all military buildings. (Historic Context for Department of Defense Facilities World War II Permanent Construction, Chapter II, pg. 30) This is particularly true of the Phase 1, Unit 2 buildings. Although these buildings are of wood frame construction, the use of stucco as an exterior wall finish and red clay tile as a roof sheathing material, reflect the buildings' Spanish Colonial Revival architecture, not any effort to save money on construction costs. The composition shingle roofing used on the Phase 2, Unit 2 buildings and the use of timber for posts and pilasters in lieu of the concrete brick/weeping mortar posts and pilasters of the Phase 1 buildings clearly reflects an effort to save money and could put these buildings in the Semi-Permanent category.

FIGURE 16: EXAMPLES OF BEELMAN'S NATIONAL REGISTER LISTED BUILDINGS
Upper Left: Pacific Electric Bldg. Upper Center: Roosevelt Bldg. Upper Right: Heinsbergen Bldg. Lower Left: Eastern Columbia Bldg. Lower Center: Woodbury University Lower Right: Calif Bank

Goodwin notes that, while 2/3 of World War II Navy construction was permanent, by far the bulk of these permanent buildings were industrial in nature. Goodwin lists the types of industrial facilities likely to be built with permanent construction as follows: "Properties associated with the assembly, production, or repair of war materiel. Examples at shipyards include dry docks, shop buildings, and cranes. Examples at arsenals and ordnance works and plants include manufacturing facilities or assembly lines. Other types of industrial properties including aircraft production or assembly facilities and maintenance and repair shops for routine maintenance of installation equipment." (Historic Context for Department of Defense Facilities World War II Permanent Construction, Chapter II, pg. 33)

While Goodwin asserts that hospitals were likely to be built with permanent construction, this is not true of World War II era military hospitals. WHS' research revealed that the vast majority of Naval hospitals built to service World War II patients were of temporary construction. Existing hospitals, including resorts and hotels converted to convalescent hospitals, were typically expanded with temporary construction. The reason for favoring temporary construction centered in the reality that after the war, the need for hospital space would not be anywhere near the need during wartime. Thus, after the war, the policy was to remove the temporary buildings built for wartime use.

San Diego's Naval hospital is a good example of a twist on this approach. In this case, an increase in capacity in the Naval Hospital was achieved by both adapting existing civilian buildings and by building new temporary construction. During World War II, the hospital expanded through the modification of the former Pan American Exposition buildings in Balboa Park. The park was also renamed Camp Kidd after Rear Admiral Isaac Kidd.

For example, the House of Hospitality and California Building was used as Navy Nurses' quarters, the Fine Arts Gallery and the Natural History Museum were turned into hospital wards, the Lily Pond was used to train swimmers and for rehabilitation, the Red Cross used the Japanese Tea Garden as a Servicemen's Center, and, the House of Pacific Relations became officers' quarters.

In 1946 the Balboa Park buildings were returned to the City of San Diego. (Amero, Richard, "The US Naval Hospital and Balboa Park." (1998), pg. 3.) By the 1990s several Exosition buildings were falling apart due to the flimsy nature of their original construction. As a consequence, many of the Exposition buildings that were adapted for hospital related uses were demolished and replaced with new buildings. (Showley, Roger M.. "Restoring charm: Balboa Park face lift", October 2, 1994, *San Diego Union-Tribune*) The combination of the demolition of Exposition buildings, the removal of World War II temporary buildings, and the addition of new construction greatly compromises the San Diego Naval Hospital's integrity to the World War II era. Only portions of the hospital campus have been found eligible for the National Register.

Hotels and resorts adapted for hospital use were often expanded with buildings of temporary construction. The convalescent hospital at Arrowhead Springs Resort is a good example of accommodating needed bed space beyond the resort's existing civilian buildings, with temporary construction. It is also a good example of the practice of removing temporary buildings before such facilities were returned to their pre-war owners.

Long Beach Naval Hospital (Figure 17) is a rare example of a military hospital built during World War II using permanent construction. But, the permanent part of the hospital was only one aspect. Capacity needed for wartime use consisted of temporary buildings outside of the permanent core. These temporary buildings can be seen in the accompanying figure to the right and left of the permanent building at the center of the image. In the case of Long Beach, not only were the temporary buildings removed soon after World War II, but recently all of the permanent buildings were removed as well to make room for a shopping center.

The convalescent hospitals at Banning and Beaumont (Figure 18) are examples of hospitals that used temporary construction for all or nearly all buildings. In all of the examples noted above, buildings constructed with temporary construction have been entirely or almost entirely removed.

Northern California's Shoemaker Naval Hospital (Figure 19) is another good example of a general hospital consisting of all temporary buildings. Shoemaker Naval Hospital was demolished in the 1990s.

Note the military pavilion layout of the Shoemaker buildings. This site planning practice, which had fallen out of favor prior to World War II, was revived during the war, and was typical of many World War II built complexes. Units 2 and 3 of NHC are rare examples of where the World War II pavilion site plan layout is preserved to this day.

At NHC, the entire Norco hospital campus, with some exceptions, remains as it existed during World War II. This includes both the permanent buildings of Units 1 and 2 as well as the temporary buildings of Unit 3. As noted earlier, Unit 4, is no longer intact; however, this fact is not significant because Unit 4 was not a contiguous element of NHC.

The aerial photographs in Figure 20 show bird's eye views of NHC during World War II and today. One has to look very closely to detect the few World War II buildings that that have been removed and the new buildings that have been added to the property. Essentially, this campus retains a very high level of integrity to its World War II configuration. Research conducted for this document found that of the 24 Naval hospitals in the Western United States, built or expanded to accommodate World War II patients, only NHC and the National Register listed Marine Hospital Seattle retain integrity to their World War II form. All of the others have been substantially altered or demolished. (See Figure 13)

An important point in Mikesell's work is the fundamental difference in historic resources typically associated with the period just before our involvement in World War II, and the period during which the country was directly involved in the war effort. Mikesell notes that in the period between 1848 and 1941, military construction was largely permanent and built to high architectural standards. During World War II, the emphasis was on low-cost, high volume temporary construction. (Mikesell 2000: 7-2) NHC is a rare example of a military hospital built during World War II that was designed to high architectural standards and built largely using permanent construction intended for continued operation after the war.

As noted earlier, Goodwin's definitions of permanent and semi-permanent construction are not fully applicable to NHC. While the main hospital wings of Unit I were constructed of reinforced concrete, the rest of the buildings in Unit I and all of the buildings in Unit II were largely constructed with wood framing, stucco exterior walls, and either clay tile or composition shingle roofing. As documented earlier, all of these buildings were built as permanent buildings of the hospital campus. The buildings in Unit 3 have the appearance, layout, and uniform design typically associated with temporary construction, and are referred to as such in period Navy correspondence. Their construction quality and the durable nature of the siding used, however, place them at a higher level of temporary construction. The World War II constructed buildings at Spadra (Unit 4) were truly temporary and have long since been demolished.

FIGURE 17: NAVAL HOSPITAL LONG BEACH 1945

Source: National Archives

FIGURE 18: TEMPORARY BLDGS OF NAVAL CONVALESCENT HOSPITAL BEAUMONT

FIGURE 19: NAVAL HOSPITAL SHOEMAKER

Source: National Archives

As mentioned previously, the decision to make NHC into a flagship, permanent hospital was made very early in its history. A letter from Surgeon General Ross T. McIntire to Captain Jensen states in no uncertain terms that NHC is to be a improved as a permanent general hospital of the finest order. "You have received several letters regarding your establishment, but I want to write a short personal note telling you just how I feel about the hospital under your command. I want to make it the show place of the West Coast." Later in the letter, McIntire states: "...I want to construct pavilions for the care of at least 240 tuberculosis cases. You may suggest which area of the reservation you think would be the most suitable for this construction. It is also our plan to make this the neurosurgical center for the entire West Coast and I am hoping we can also do a great deal of the plastic surgery that will be necessary in these burn cases there. In addition to his I think we can very well afford to send in the post polio cases...." (Letter from Surgeon General McIntire to Captain Jensen, 1-18-1942)

Another letter to Surgeon General McIntire from District Medical Officer, Captain W.J. Zalesky makes it clear that the hospital is to be permanent. Making reference to Architect

Claud Beelman's plans for the hospital, Captain Zalesky states: "It appears to me that the only practical solution for ward space at that hospital is to start with new permanent additional construction and not try to modify any of the main buildings proper. The main building lends itself admirably to administration, surgery, X-Ray, and other accessory departments....To convert the space in the main building to wards, would be a make-shift proposition....inasmuch as this hospital is to be a permanent Naval hospital, I am of the opinion that we should spend two or more million dollars into this institution in order to obtain five hundred to a thousand ward beds." (Letter from Captain Zalesky to Surgeon General McIntire, 2-17-1942)

FIGURE 20: NAVAL HOSPITAL CORONA, 1947 vs. TODAY

Sources: National Archives and Bing.com

An early thought in regard to the Unit 2 tuberculosis campus was to build using temporary construction. This changed before any construction commenced, however, and permanent construction was funded for this unit. A letter from C.L. Andrus to Captain Jensen documents this matter very clearly: "The proposal to expand the general hospital by 500 [beds] in temporary construction has been abandoned and will not be accomplished." (Letter from C.L. Andrus to Captain Jensen, 1-22-1944)

It is also clear that NHC was intended to remain a permanent Naval hospital after the war. In a March 1946 newspaper article, Vice Admiral Ross T. McIntire stated: "...the Corona Naval

FIGURE 21: UNIT 1 ANNEX SHORTLY AFTER COMPLETION

Source: Kevin Bash Collection

FIGURE 22: NURSES' QUARTERS c 1953

Source: Kevin Bash Collection

hospital is in the permanent post war plan of the Navy. We will continue the fine rehabilitation work that has been done here. Rehabilitation will continue to be part of the Navy's post war plan." (*Corona Daily Independent* 3-1-1946: 1) In a newspaper article published later in 1946, reference is made to NHC as a general hospital with important specialties that are anticipated to remain active well beyond the end of World War II. "In addition to being a general hospital, Corona Naval Hospital is designated as a special center for the care of tuberculosis, infantile paralysis [polio], spinal

FIGURE 23: GYM/THEATER COMPLEX UNDER CONSTRUCTION c. 1945

Source: Kevin Bash Collection

injuries and rheumatic fever." Later the article references the superior assets that made NHC a good candidate for permanent hospital status after the war: "Dr. Pottinger of the Olive View Hospital at Monrovia, recognized as one of the outstanding experts on tuberculosis, has inspected the hospital. With the even temperatures of the Corona area, its usual freeness from fogs and local climatic conditions, there seems to be a hope that the Corona Naval Hospital should be developed as the outstanding of all Naval hospitals for the treatment of tuberculosis." (*Corona Daily Independent* 12-20-1946: 1)

NHC is unique in the context of World War II Naval hospitals. Mikesell notes that, while the late 1930s additions to existing hospitals at Mare Island and San Diego have been found to qualify for the National Register none of the World War II Naval hospitals in California surveyed as of the date of his report had been found to qualify for the National Register. "The reason for this disparity is to be found in the nature of the construction there. The wartime hospitals and hospital additions were temporary in

FIGURE 24: CHAPEL c. 1945

Source: Kevin Bash Collection

FIGURE 25: WAVES' QUARTERS c. 1965

Source: Kevin Bash Collection

FIGURE 26: CORPSMEN'S QUARTERS c. 2011

Source: Kevin Bash Collection

nature....the buildings were undistinguished architecturally...the hospitals were not built to last...." (Mikesell 2000: 7-40) NHC, by contrast, is a rare example of a surviving World War II Naval hospital constructed as a permanent facility. Its substantial Spanish Colonial Revival architecture designed by famed architect Claud Beelman attests to this. Enhancing its rarity even further is the fact that it is the only remaining example of a U.S. Naval hospital that was built as an expansion of a resort and retains integrity to its World War II era. All of the other Naval hospitals founded on resorts and hotels have long since been returned to private ownership with any World War II specific construction removed soon after the war. NHC is the only World War II built hospital in the Western United States that both survives and retains integrity to the World War II era. National Register listed Marine hospital at Seattle, retains integrity to the World War II era, ,but it was built in the 1930s. (See Figure 13)

As noted earlier, while the Unit 1 wards were constructed using reinforced concrete, Unit 2's wards used wood framing clad in an exterior finish of stucco. Unit 2 buildings in the first phase had red clay tile roofs and supporting columns of concrete brick with Spanish styling enhanced through the use of "weeping mortar". Weeping mortar is a method wherein the mortar is allowed to ooze out of the spaces between the bricks. It is a method historically associated with rural Spanish Colonial Revival buildings having a ranch-like character.

As discussed earlier, the original thought in regard to the second phase of Unit 2 was to use temporary construction. But this approach was quickly abandoned at Jensen's insistence. To save time and money, however, the Navy decided to use composition shingles for all roofing and to support the arcades and patios with wood posts rather than concrete brick columns. (Letter, Jensen to Andrus, 5-3-1943) Each phase of Unit 2 was designed to accommodate 250 tuberculosis patients.

In contrast to Units 1 and 2, the 1000-bed Unit 3 was built in temporary construction to quickly address the increasing numbers of war casualties. But, as mentioned earlier, Unit 3

was not temporary in the strictest sense of the word. Referring to this complex, Captain Jensen said in a speech: "You have heard Captain Zalesky speak of the additional expansion program to house 1,000 beds but that will be in so called temporary construction, although we hope to use materials and have design the layout so that this so-called temporary expansion will probably be good for 25 or more years." (Jensen to McIntire, 4-16-1943, National Archives: RG 52 Entry 15B Box 109 File NH47-A-1-1943: Letter 16-22)

Evidence of the intention to keep NHC open as a major Naval hospital can also be seen in the continuation of major construction projects toward the end and after the war. Details on these projects can be found at the end of the next section.

FIGURE 27: WEEPING MORTAR COLUMNS

Source: Kevin Bash Collection

d. Sequence of Construction at Naval Hospital Corona

War time hospital administration came under the purview of the Federal Board of Hospitalization, an independent executive agency established in 1921 to coordinate the hospital programs of the military services, the public health services, Veterans Administration, and Indian Health Service. The goal of this organization was to assure each hospital received needed equipment and improvements, while at the same time avoiding duplication of services and the overbuilding of facilities. Every proposal for new Navy beds went

FIGURE 28: UNIT 2 SUN PORCH EXTERIOR c. 1945

Source: Kevin Bash Collection

FIGURE 29: UNIT 3 BIRD'S EYE VIEW 2-20-1946

Source: Kevin Bash Collection

through this body, and there were inevitable bureaucratic delays in getting beds approved.

With the sudden advent of large numbers of casualties from World War II, the completion of NHC became an urgent priority. This was directly reflected in the recommendation that the hospital move from a 268 to 1,500 bed facility. (Letter, Zalesky (District Medical Officer) to Commandant, Eleventh Naval District, 1-30-1942) The response from Command occurred the same day, "With only 268 beds available at this Hospital, there will be a deficiency of 2,000 beds for Planning Purposes." (Letter, Commandant to Chief of BUMED, 1-30-1942)

This recommendation occurred only five days after January 25, 1942 when Guy F. Atkinson-George Pollock Construction Company commenced alterations to the hotel building to make it suitable for hospital use. The first task was to complete alterations to the second and third floors of the hotel building to serve as the technical part of the hospital, including x-ray, ENT, operating rooms, etc. (Sanitary Report, 1941 – 1945 1)

Unit 1: As early as January 11, 1942, Captain Jensen was pushing to expand NHC's bed capacity and to add staff quarters, laboratory facilities, etc. (Letter, Jensen to McIntire, 1-11-1942 1) and by February 17, 1942 District Medical Officer Captain Zalesky concurred with architect Claud Beelman's recommendation that the "only practical solution for ward space at that hospital is to start with new permanent additional construction and not try to modify

FIGURE 30: UNIT 3 PATIENTS OUTSIDE THE COMMAND CENTER BUILDING c. 1945

Source: Kevin Bash Collection

any of the main building proper."(Letter, Zalasky to McIntire, 2-17-1942) By March, Beelman was submitting plans for a 2,235 bed Annex to the hotel, as well as a Corpsmen's Quarters building, and two Nurses' Quarters buildings. (one for surgical nurses and the other for ward nurses) Also on his drafting board was an expansion of the Power House and plans for the addition of three officers' residences. (Letter, Beelman to Jensen, 3/3/1942)

Less than four months later, the Atkinson-Pollock Construction Company commenced work on the permanent "Annex" wings attached to the hotel building. The firm also began work on the Nurses' and Corpsmen's Quarters. (Sanitary Report, 1941 – 1945 1) Per Captain Jensen's request, these buildings were "Class A Construction" and not "Class D." (Letter, Jensen to Chief of BUMED, 11/23/1942) Class A construction was something upon which Jensen consistently insisted. In a March 10, 1942 letter, Jensen reasserted his insistence on Class A construction. "I would most heartily recommend that if any expansion is to take place it should be Class A permanent construction. (Letter Jensen to Sheldon, 3-10-1942)

Even flooring was not exempt from Jensen's efforts for quality. In writing about the newly converted Red Cross building, he stated he could cover the floor with "cheap paper flooring"

or, “in view of the permanency of the hospital, he could lay more expensive asphalt tile which would be “best for the long pull.” (Letter, Jensen to Butler, 5-25-1944)

Jensen was also keen to expand his hospital in several other ways. For example, he proposed utilizing some of NHC’s land to build a Naval home for convalescents that would relieve the West Coast Naval hospitals of a large number of chronics who are usurping active hospital beds.” (Letter, Jensen to Sheldon, 3-10-1942) While this idea was put on hold as the war progressed, the Navy Surgeon General had ideas of his own – a pavilion style hospital for 240 tuberculosis cases. (Letter, McIntire to Jensen, 1/18/1942) This idea was implemented and took the form of NHC’s Unit 2.

Later Unit 1 construction included St. Luke’s Chapel (completed on 12-24-1944), Corpsmen’s Quarters (built in stages, first phase completed on 9-15-1942, final stage occupied on 1-29-1944), Nurses’ Quarters (built in phases, first phase occupied on 9-15-1942, final phase occupied 1-29-1944), WAVES’ Quarters (completed in July of 1945) , and a complex that included a gymnasium, theater, ships store, laundry, barber shop, bowling alley, etc. (final stage completed in April of 1946) Several other minor buildings were also a part of Unit 1. These are discussed later in the architectural descriptions section later.

Unit 1 also included several existing Norconian Resort buildings that were simply adapted for Naval Hospital use. Besides the Hotel building, these included the Tea House, Power House, Pavilion, Boat House, Chauffeurs’ Quarters, and the huge Garage/Laundry building.

Unit 2: As the Unit 1 work was being performed, the Atkinson-Pollock Construction Company initiated work on the Unit 2 (tuberculosis) wards. (Sanitary Report, 1941 – 1945) Facilities for staff were housed in freestanding buildings, while wards for tuberculosis treatment were laid out in a military pavilion fashion with wards oriented and spread far enough apart to allow maximum exposure to the sun. To give patients abundant sunlight, each hospital room was connected to a glass faced porch. To give Unit 2 a residential feel, Beelman chose the one-story Spanish Ranch variant of Spanish Colonial Revival architecture.

A Sanitary report issued at the time these buildings were under construction referred to them as “...Spanish style buildings of permanent construction with red tile roofing.” (Ibid) Another distinctive feature of these first phase buildings was the use of concrete block columns to support the covered walkways and glassed in porches. To express an element of rustic, ranch-like charm, the mortar between the bricks was allowed to ooze out, a detail known as “weeping mortar.” (Figure 27)

Two different dates are noted in period correspondence as to the time when work on Unit 2 commenced. One source has Unit 2’s work commencing on July 1, 1942 (Sanitary Report, 1941 – 1945) while another records September 1942 as Unit 2’s start date. (Sanitary Report Supplement, Report Date of Activation and Early History of US Naval Hospital, Corona California, 1941 – 1946) Unit 2 received its first patients on July 13, 1943. (Sanitary Report, 1941 – 1945)

On May 8, 1944, Phase 2, a 250-bed expansion of Unit 2 was commenced, and opened for patients approximately six months later, on January 1, 1945. (Ibid) As noted earlier, in contrast to the first phase of Unit 2, the second phase had less architectural detailing. Specifically, the Phase 2 buildings had composition shingle rather than clay tile roofing and

the supporting posts of the covered walkways and glassed in porches consisted of unadorned square wooden posts.

As previously stated, Jensen fought to have permanent construction wherever possible. He stated to Captain Carl Andrus of BUMED regarding the Unit 2 expansion, “The Project Manager for the Simpson Company is of the opinion that he can erect the new buildings, conforming to the present architecture over there, as cheaply as he can put up the so-called temporary construction, with the exception of tile roofs. Obviously, tile costs more than paper.” (Letter, Jensen to Andrus, 5-3-1943)

Unit 3: The Navy contracted the William Simpson Construction Company to build Unit 3, commencing construction on April 12, 1943. Unit 3 was primarily intended as a facility for rheumatic fever patients. Unlike Unit 2 , the Unit 3 buildings were of temporary construction. Unit 3 was laid out in classic military pavilion fashion, (Figure 29) with all wards and common buildings connected by an enclosed covered walkway. Unit 3 received its first patients on January 1, 1944. (Sanitary Report, 1941 – 1945).\

Unit 4 and Other Convalescent Facilities: Jensen consistently wrote of the need for convalescent/rehabilitation facilities, especially for recovering rheumatic fever patients. He was aware of three large Army hospitals located relatively nearby that had been vacated and stood unused. These Army hospitals were located at Spadra, (Figure 12) near Pomona, and Banning and Beaumont, (Figure 18) situated mid-way between Riverside and Palm Springs.

The Army used as the foundation for its hospital at Spadra, the closed State of Callifornia Pacific Grove Narcotics Hospital. The Army kept the permanent buildings of this complex intact, but greatly expanded the capacity that facility with temporary buildings. Banning and Beaumont were unused Army hospitals consisting entirely of temporary construction. In May of 1944, McIntire decided to implement Jensen’s recommendations for convalescent facilities and he instructed the District Medical Officer to examine the Army hospitals at Spadra, Banning, and Beaumont. (Letter, McIntire to District Medical Officer, 5-6-1944).

By June 15, 1944, Jensen was charged with setting up Banning, Beaumont, and Spadra as Navy convalescent hospitals. Spadra became Unit 4 and was the only one of the three convalescent facilities over which Jensen had direct operational command. Nonetheless, he was directed to secure and set up all three facilities. (Letter, Jensen to Sheldon, 6-15-1944)

Homer Shockey was among thirty Navy Hospital Corpsmen transferred from USNH Corona to Beaumont to render the facility operational. Eventually Shockey worked at both Banning and Beaumont. In his “Remembering Naval Hospitals in Beaumont & Banning” he recalled the flimsy construction of the buildings at these facilities.(*Record Gazette,* Remembering Naval Hospitals in Beaumont & Banning, Homer Shockey, 5-27-2004) Banning eventually cared for nearly 3,000 patients (*Of Ships and Surgeons*, The U.S. “Phantom “ WWII Hospitals in California, Part II, Dr. Thomas Snyder, 2011) while Beaumont cared for roughly 400 patients. (*Record Gazette,* “Remembering Naval Hospitals in Beaumont & Banning”, Homer Shockey, 5-27-2004) Spadra’s temporary buildings were also of flimsy construction, designed for only short term use.

Arrowhead Springs was another convalescent hospital to which recovering patients could be sent. Arrowhead Springs was located in the foothills of the San Bernardino Mountains and consisted of the Arrowhead Springs resort, the capacity of which was expanded with

temporary construction. On May 23, 1944, USNH Corona sent 500 ambulatory patients to U.S. Naval Hospital Arrowhead Springs and eventually that facility cared for 5,800 service personnel (*Of Ships and Surgeons*, The U.S. "Phantom " WWII Hospitals in California, Part II, Dr. Thomas Snyder, 2011).

NHC patients typically began their treatment at Unit 1, 2 or 3. Then as they gained health, they were sent to Spadra, Banning, Beaumont or Arrowhead Springs to build strength and recover as completely as possible. From there, they were either sent home, to a veterans' hospital, or back to their military unit to resume duty.

Continuation of Construction Near and Beyond the War's End: A considerable number of construction projects were begun near World War II's end or after the conclusion of World War II.

In May of 1945, Navy Surgeon General Ross McIntire wrote of NHC, "This is a large permanent naval hospital and will be retained by the Navy after the war." He went on to state, it is "strongly recommended" that the water system to the hospital be improved. (Letter, McIntire to Secretary of the Navy, 5-11-1945) The wells needed to supply adequate water for postwar hospital use were completed in early 1946. (Photo, Sea Bee Archives, Wells along Bluff Street, 2-28-1946) This water project was deemed "imperative" to the operation of the hospital (Letter, Ravenscroft (Eleventh Naval District) to Secretary of the Navy, 5-16-1945).

St. Luke Chapel's first service was Christmas 1944 (Sanitary Report, 1941 – 1945 1), however, its dedication did not occur until the fall of 1945 (*Corona Daily Independent*, 9-26-1945, pg. 3). The Recreation Complex (Theatre, Gymnasium, Ships Store, etc.), entered into a contract on 4-16-1945 for construction, just four months prior to VJ Day, (Sanitary Report, 1941 – 1945 1) and the building was completed in stages. The theater opened on December 21, 1945 with a show featuring Red Skelton and it was announced that the gym and bowling alley would go on line in the next several weeks. (*Corona Beacon*, 1-25-1946, pg.1). The basketball facilities were ready for play by April of 1946, and the rules for their use were publicized in the NHC newsletter. (*Corona Beacon*, 4-1-1946, pg. 7) The bowling alley was opened the same month (*Corona Beacon*, 4-26-1946, pg.7). The WAVES' Quarters were contracted on September 28, 1944 (Sanitary Report, 1941 – 1945 1) and were dedicated July 17, 1945 a month prior to VJ Day (*Daily Press*, 7-18-1945, pg. 4). The Unit 3 fire station was completed just three months prior to VJ Day (Sanitary Report, 1941 – 1945 1). All this construction late in the war serves as more evidence of the Navy's intent to keep NHC in operation as a permanent hospital after the war.

Even after VJ Day, several projects to serve NHC as a permanent postwar facility were contracted and completed: These included a bake shop addition, a boiler room addition, laundry building improvements, a Power Plant addition, and a morgue. (Sanitary Report, 12 – 31 – 1947) Additionally, in 1947 the Navy gave approval to have the golf course rehabilitated for a second time, with work beginning in May of 1947 and opened for use in December of the same year. Extensive alterations were also made to the Unit 1 galley in 1948. (Sanitary Report, 12 – 31 – 1948)

2. Theme Two: Disease Treatment

A combination of factors came together to assure the prominence of NHC as a central facility for the treatment of diseases and injuries. First, It enjoyed the clear vision of Captain Jensen, a leader with strong and a solid personal relationship with Navy Surgeon General Ross McIntire. Second, it

benefitted greatly from having been set up by some of the finest specialists in the world from private practice, particularly the Mayo Clinic doctors. Third, its abundance of undeveloped land for expansion gave NHC more than enough room to implement an extensive medical campus. And, finally it was blessed with a large cadre of specialists, capable of dealing effectively with a myriad of medical and health issues. Consequently, NHC ended up being designated a Navy Center for the treatment of four specific maladies to strike Sailors and Marines (tuberculosis, rheumatic fever, poliomyelitis, and cord bladder issues). And, it handled all of these conditions while still serving as a general hospital with surgical wards, dental clinics, vision clinics, and treatment facilities for such Pacific Theater illnesses as lymphangitis, malaria, venereal disease, and other jungle diseases.

a. NHC's Physicians and Nurses

To help assure NHC's future as a flagship permanent Naval hospital, its organization, staff training, and facilities enjoyed the benefit of two teams of Mayo Clinic doctors, Mayo Unit 1 and Mayo Unit 2. The Mayo Clinic was and is a renowned teaching college where visiting doctors learn innovative approaches to medical practice and surgery. (http://www.mayo.edu/mshs/about/mshs-history, Accessed 2015)

Mayo Unit 1 consisted mostly of doctors who were already in the Naval Medical Reserve at the time of Pearl Harbor in December of 1941. Before being assigned to NHC, this group was given orders to compile data relating to war time medical and surgical matters and to tour the country, giving seminars to doctors and other medical staff. As it did during World War I, the Mayo Clinic initiated training courses for officers assigned by the Surgeon Generals of the Army, Navy, Public Health Service, and the Veterans Administration. The training courses were designed to review and discuss those phases of medicine and surgical procedures that were directly applicable to field conditions in war. (Historic Profiles of Mayo, WWII and Mayo, Clark W. Nelson, B.S., Mayo Clinic Historic Unit, 1992)

While the Mayo doctors were intended from the beginning to be assigned to NHC, a letter from Surgeon General McIntire to Captain Jensen suggests it was Jensen's idea to send them on tour until NHC was ready to receive them. McIntire wrote: "The Mayo Clinic Unit has created a fine impression at various places they have visited and your idea of getting them underway was a fine one, for it will help bridge over this gap, and in addition, do the medical corps a great deal of good." (Letter, McIntire to Jensen, 3-9-1942)

The "gap" referred to a lack of trained medical staff at various Navy and Army Hospitals. Mayo Clinic doctor Donald Balfour conducted an extensive tour of Naval Hospitals to specifically analyze the quality of the Navy's physicians. (Ibid) Balfour subsequently held a three-month training course for over 1500 medical officers to prepare them for wartime service. (*Annals of Surgery*, "Contributions of the Mayo Clinic in World Wars i and II," Oliver H. Beahrs, MD. 1995)

The "gap' also referred to the overall lack of physicians serving in the military at the war's beginning. To bridge this gap, reserve and National Guard physicians were the first to be called in after Pearl Harbor. Next, direct commissions were offered to distinguished private citizen doctors. (U.S. Army Medical Department, Office of Medical History, Chapter VI: Procurement, 1941-45,: Medical, Dental, and Veterinary Corps, 2015)

After their nation-wide tour, the Mayo doctors settled in for their assignment at NHC. (Annals of Surgery, "Contributions of the Mayo Clinic in World Wars i and II," Oliver H. Beahrs, MD. 1995) According to Mayo Clinic physician Mark Conventry, the Mayo Unit 1 team, led by Dr.

Albert Snell, was assigned to NHC to begin the process of building it into a first rate Naval Hospital in preparation for the arrival of thousands of patients.

FIGURE 31: SURGEON GENERAL, DR, ROSS T. MCINTIRE

Source: National Archives

Mayo Unit 1 consisted of the following specialists, most of whom had been Mayo Clinic Department heads with stellar reputations.

Dr. Albert C. Snell – Gastroenterology (Mayo Department Head)
Dr. Harry B. Macey – Orthopedics (Mayo Department Head)
Dr. Harry M. Weber – X Ray (Mayo Department Head, Roent-Genology)
Dr. Edward N. Cook – Urology (Mayo Doctor)
Dr. Bill Williams – Ears, Nose and Throat (Mayo Doctor)
Dr. Winchell M.C. Craig – Neurosurgery (Mayo Department Head)
Dr. Archie H. Baggenstoss – Pathology (Mayo Department Head)
Dr. Howard K. Gray – General Surgery (Mayo Department Head)
Dr. Gershom Thompson - Urology (Mayo Doctor)

(Mayo Clinic Physicians Who Served in WWII at *U.S. Naval Hospital Corona*, Mayo Clinic, Rochester, MN, 1943)

The Mayo Unit 1 doctors included those who had organized the 71st General Hospital in Rochester, Minnesota in 1940 for wartime preparedness. This experience gave them critical skills needed to initiatethe establishment of NHC as a first rate hospital. (*Annals of Surgery*, "Contributions of the Mayo Clinic in World Wars i and II," Oliver H. Beahrs, MD. 1995)

The Mayo doctors at NHC were augmented by other outstanding medical and surgical specialists from throughout the country, including several from Stanford University. (*Riverside Daily Enterprise*, 3-24-1947)

In June of 1942, Mayo Unit 2 arrived. Like Unit 1, Unit 2 was formed right after Pearl Harbor, however, it was not made functional until 1942. The Mayo Unit 2 doctors had their commissions by March of 1942 and they were called to active duty in June of 1942. When the Mayo Unit 2 doctors arrived at NHC, there were only 18 patients. Mayo Unit One was very short-lived, existing for only about six months. Mayo Unit Two stayed at NHC until March of 1944, by which time there were about 2,000 patients. (Coventry 1970: 3)

The Unit 2 doctors continued the work of the Unit 1 doctors in the organization of the hospital, the training of staff, and the establishment of protocols for patient treatment and rehabilitation. They also treated many of the hospital's patients. (Snyder, speech delivered

at former Naval Hospital Corona, December 7, 2011) After Unit 2 arrived, Unit 1 was deactivated as a unit and its members moved on to a variety of assignments.

In 1943, the overall Mayo Clinic team was estimated to have constituted the largest assemblage of medical specialists outside of the Mayo Clinic. (*Riverside Daily Enterprise*, 3-24-1947) *(Los Angeles Times,* 2-21-1943: A-14) Like the first unit before them, Mayo Unit 2 was comprised of some of the finest specialists in the nation. As with the Mayo Unit 1 doctors, the Unit 2 doctors included several department heads::

Dr. Waltman Walters – Surgery (Mayo Department Head)
Dr. Charles Watkins– Hematology (Mayo)
Dr. Richard Cragg – Pathologist (Mayo)
Dr. John D. Camp – Radiology (Mayo Department Head)
Dr. Donald H. Pattison – Urology (Mayo)
Dr. Theodore Hughes – Ears, Nose, Throat (Mayo)
Dr. Laurentius O. Underdahl – Medicine (Mayo)
Dr. Hugh R. Butt – Gastroenterology – (Mayo Department Head)
Dr. Mark B. Coventry – Orthopedics – (Mayo Department Head)
(Mayo Clinic Physicians Who Served in WWII at *U.S. Naval Hospital Corona*, Mayo Clinic, Rochester, MN, 1943) .

In November of 1943, a memorandum from Captain W.J.C. Agnew announced the intention to reassign the Mayo Unit 2 doctors to front line duty in mobile hospitals. These doctors were in favor of being released, as they felt their mission of transforming the Norconian luxury resort into a flagship Naval hospital had been achieved. The memo called for these Mayo Clinic doctors to be transferred to mobile hospitals in Pacific Theater and for doctors already assigned to mobile units to be transferred to NHC to replace them. (Memo - Agnew to Sutton, 11-20-1943) Orders affecting this transfer were issued in March of 1944. (Coventry 1970: 3)

Jensen was anxious to keep Mayo Unit 2 at NHC, as he considered them the nucleus of his hospital and the key men around which he had built his staff. (Letter, Jensen to Sheldon, 11-15-1943) But, the Navy felt differently, and reassigned several of Jensen's most prized doctors. (Letter, Agnew to Sutton, 11/20/1943) (Letter, Sutton to Jensen, 11-22-1943) While the departure of Mayo Unit 2's doctors was a blow to NHC, by the time of their departure, they had established a state-of-the-art hospital for the treatment of war related illnesses and injuries. (Snyder, speech delivered at former Naval Hospital Corona, December 7, 2011)

Many of the Mayo physicians who established NHC made significant contributions to medicine, both while stationed at NHC and subsequent to departing NHC. For example:

Dr. Hugh R. Butt – Became renowned for his studies involving Vitamin K and patients with jaundice;

Dr. Mark B. Coventry – Was famed for his work in orthopedics and dedicated himself to chronicling the history of the Mayo doctors at NHC. (Article, Sailing the Uncharted Seas: 46 Years of Orthopedics, 1-1985)

Dr. Waltman Walters– Went on to serve on Admiral Halsey's staff and was later Chief of Surgery at the Naval Hospital in Philadelphia (Annuals of Surgery, "Contributions of the Mayo Clinic in World Wars i and II," Oliver H. Beahrs, MD. 1995) Eventually, Dr. Walters returned

FIGURE 32: CAPTAIN JENSEN WITH THE MAYO UNIT 2 DOCTORS c. 1942

Source: Mayo Clinic Archives

to the Mayo Clinic to become a key abdominal surgeon and editor of the *Archives of Surgery*. (*Riverside Daily Enterprise*, 3-24-1947) *(Los Angeles Times,* 2-21-1943: A-14)

Drs John D. Camp, Hugh R. Butt and Richard W. Cragg – Constituted a team of NHC Mayo doctors that did important work in Lympahngitis (United States naval medical bulletin. v.42 1944 Jan- Jun. Lymphangitis of Suspected Filarial Origin, 1944)

Dr. Harry Macey – Along with Mayo Clinic physician **Dr. Mark B. Coventry,** developed the use of the hanging cast for fractures due to gunshots (US Naval Medical Bulletin, 45:33, 1945) He later authored articles about World War II medical units. (Article, Coventry, Mark, "Mayo Naval Medical Units of WWII, 1970 Mayo Clinic) (Article, Sailing the Uncharted Seas: 46 Years of Orthopaedics, 1-1985)

Dr. Winchell M. Craig – Established the first neurosurgical center for Navy and Marine wounded at NHC. He went on to the US National Naval Medical Center, Bethesda, Maryland where he served as Chief of its Neurosurgical Division and later as its Chief of Surgery. At the time of enlistment Craig was considered to be the leading neurosurgeon in the United States and was practicing at the Mayo Clinic. He went on to become a consultant to the

Surgeon General (Obituary, Winchell Craig, 1960) (*The History of the Medical Department of the United States Navy in World War II,* Vo. I, 1958, pg. 253)

A number of Mayo Clinic nurses were also assigned to NHC to assist the Mayo physicians. One example is Miss Marie Pound who, because she was familiar with the Mayo system, was assigned to assist Dr. W. Craig as a surgical nurse (*Waterloo Sunday Courier*, 4-19-1942, 1). Pat Cohill received her nursing degree at the Mayo Clinic and spent most of her Naval career at NHC as an operating room nurse. (*Times Herald – Record*, 11-24-2005)

Despite the departure of the Mayo doctors, the NHC medical staff that remained at the hospital for the long-term were of a high calaber, and NHC was the center of significant medical research, testing, and treatment activities during and after World War II.

According to a Naval quarterly report: "There have been a total of 24,907 patients admitted to this hospital [NHC} between the time of commissioning [12-9-1941] and 25 November 1945. Since that time a total of 26,325 surgical operations have been performed." (Fourth Quarter Sanitary Report 1945: 13) Later in the report, the quality of the program was addressed: "Professional standards have been maintained at a high level, and an excellent pattern has been established to guide the staffs of the future. This is a distinct advantage because the pattern that was established originally is not easily nor readily changed." (Ibid: 14)

Below is a list and summary of the significant long-term medical professionals who contributed to the success of NHC.

Dr. William H. Leake - Head of the rheumatic fever unit. (*Torrance –Herald* "Navy Doctors Conquer Heart Ails from Rheumatic Fever", 10-19-1944:5)

Dr. Edward W. Lowman – The head of the Physical Therapy Department who saw the role of his department as an extension of those who performed primary medical care to patients. "We take over where surgeons leave off," (The Era Bradford, 7-19-1944) Lowman developed the Navy's comprehensive physical therapy program and conducted an important 1,000 patient physical therapy study. (US Naval Medical Bulletin, Edward W. Lowman, Vol. 43, October 1943) Lowman was a Mayo Clinic physician but was not among the Clinic doctors that made up Units 1 and 2. (*Corona Daily Independent,* 1-10-1946)

Dr. George C. Griffith – The clinical Head of Rheumatic Fever Unit, who was previously at Philadelphia Naval Hospital where he conducted several studies of rheumatic fever. (Biography, George Griffith, 1988) (*The History of the Medical Department of the United States Navy in World War II,* Vo. I, 1958) He was subsequently sent to NHC to set up NHC's national rheumatic fever unit. Griffith reportedly achieved a high level of success in advancing the treatment of rheumatic fever at NHC. (Navy Doctors Conquer Heart Ails From Rheumatic Fever, Torrance Herald, 10-19-1944) Among Griffith's important achievements at NHC was a study of 6,000 rheumatic fever patients. (*California and Western Medicine,* 1946, Vol. 64, No. 6, pgs. 340 – 346) Previous studies appear to have utilized a range of 50 to 300 patients. Another article "Sudden Death in Rheumatic Fever," referred to 7,165 rheumatic fever patients observed at NHC over an 18 month period. (*Annals of Internal Medicine*, 1946, pgs 283-286) A medical journal article entitled "The Treatment of Rheumatic Fever by Roentgen Ray Irradiation" detailed a study of 201 patients under Griffith's leadership. (Annals of Internal Medicine,1946, pgs. 1039 – 1042) Griffith wrote of another study at NHC with 229 patients "Treatment of Rheumatic State by X-Ray Irradiation of the Heart and of the Sympathetic Gangliia (BUMED News Letter, 10-26-1945, pg 10 – 11).

Dr. Gerald H Gray – A plastic surgeon who is credited with establishing the Rolling Devils wheelchair basketball team at NHC. (Oakland Tribune, "Gallant Story of Rolling Devils Basketball Team Told by Oakland Doctor, 5-20-1947, A1)

Dr. Harold L. Jensen - Received a commendation for his heroic role as Medical Officer of the hospital ship Solace during the attack on Pearl Harbor. Served as the Commander of NHC throughout World War II.

Letters written by Jensen to Navy Surgeon General McIntire reflected the close relationship they shared. Letters to his superior often included references from and to their respective wives, "Winnie joins me in sending our kindest personal regards to you and Polly" (Letter, Jensen to McIntire, 1-11-1942 1) In the same letter, Jensen makes a reference to his days with McIntire at San Diego, reminding McIntire that he was known at that hospital as "Jensenheimer" for his ability to handle tough tasks. He promised McIntire that as head of NHC, he would live up to the standard he set at San Diego. (Letter, Sheldon to Jensen, 3-3-1942)

Jensen was a prolific letter writer given the hundreds of letters written to McIntire and a large cadre of local and national command staff. These letters at one point prompted Captain L. Sheldon to comment, "Your several letters have created much interest in the Bureau and you will, no doubt, be flooded with letters from the various divisions commenting upon the several points raised by you." (ibid)

McIntire placed a high level of trust in Jensen, assigning him to envoys looking for new hospital locations in Death Valley, Las Vegas, and Barstow. (Letter, Jensen to Sheldon, 1/21/1944 1), During a Los Angeles envoy, he examined the Biltmore, Huntington, Vista del Arroyo, and Ambassador Hotels. (Letter, Jensen to Andrus, 2/3/1943 1) McIntire also directed Jensen to supervise the construction of the Long Beach Naval Hospital. (Letter, McIntire to Jensen, 1-18-1942)

Dr. (Sister) Elizabeth Kenny – Famed for her innovative polio treatment, Kenny's methods had been dismissed by established medical authorities until recognized by the Mayo Clinic. (*Minnpost* 11-27-2012) (*Corona Daily Independent,* 3-21-1944, 1)

Dr. Enoch Brian – Brian was the only Mayo team doctor that Jensen was successful in retaining at NHC. Brian was responsible for significant advancements in the use of Penicillin in the treatment of tuberculosis. In 1944 NHC made national news with the announcement that Penicillin was effective against Tuberculosis related empyema. (*Los Angeles Times,* 7-3-1944, pg. 7*)(New York Times,* 7-3-1944). This was a groundbreaking event that led to many other studies of the use of penicillin as a means to to combat empyema as opposed to dangerous surgery. (Ibid)

Brian and his team of doctors also comprised the "Streptomycin Study Unit at NHC. (*Journal of the American Medical Association*, 8-20-1949, pgs. 1274 – 1275) This study uncovered both positive and negative effects from the use of streptomycin. The other key physicians who comprised the unit were Norma Furtos, and Morton Gibbons.

Dr. Morton R. Gibbons – Gibbons was instrumental in the treatment of tuberculosis at NHC and was a key physician during the three-year period from July 1943 to May 1946 when some 2,838 patients had been treated at NHC. (*American College of Chest Physicians*,

Nov/Dec. 1947, pgs. 673 – 682). This set the stage for NHC to become the Navy's West Coast (Pacific Theater) Tuberculosis Treatment Center (Sanitary Report, 1941 – 1945).

Dr. Norma C. Furtos – Fuertos worked with Olive View Sanitarium to advance tuberculosis treatment. She also participated in a May 1946 study of tuberculosis, organized as a cooperative effort by the Veteran's Administration, Army, and Navy. Originally nine hospitals participated in this study, but the number was increased to twenty-three in December of 1946. NHC was an original member of the study and the only Naval hospital among the participants. (Journal of the American Medical Association, 10-23-1948, pgs. 584-593)

By 1948, three studies at NHC had been completed, including those involving laboratory animals housed at NHC. Furtos with Olive View Sanitarium presented "Transmission of Streptomycin – Resistant Tubercle Bacilli in Man" to the Sixth Streptomycin Conference at Minnesota in October of 1948 (Sanitary Report, 12 – 31 – 1948). In the group's paper, the study participants were referred to as the "Streptomycin Study Unit, United States Naval Hospital, Corona, California" and the "Western Trudeau Streptomycin Laboratory, Olive View Sanitarium. (*Journal of the American Medical Association*, 8-20-1949, pgs. 1274 – 1275)

Nurse Ruth Houghton – After serving at NHC, Houghton went on to become a Captain in the US Navy and Chief Nurse at both San Diego and Bethesda before assuming the role of Director of the Navy Nurse Corps (Wikipedia, Ruth Agatha Houghton)

Nurse Nellie Jane DeWitt – DeWitt became the sixth and final Superintendent of the Navy Nurse Corps and became its first Director (Wikipedia, Nellie Jane DeWitt). However, she was also USNH Corona's first Head nurse (*Corona Daily Independent*, 9-9-1942, p. 3)

Nurse Anna Danyo – Danyo served aboard hospital ships for one and half years and survived the attack on Pearl Harbor aboard the *USS Solace. S*he later worked as a flight nurse before settling at NHC. (*Los Angeles Times*, 10-29-1943, pg. A-5) She later wrote several articles on nursing duties and her experiences as a hospital ship member of the nursing corps (*American Journal of Nursing, 10-1941)*(*American Journal of Nursing*, 9-1945, pg 727)(*American Journal of Nursing*, 2-1951, Vol. 51, No. 2).

Marietta (Chong) Eng – Eng was one of the first Chinese-Americans to serve as a WAVE/ occupational therapist (Women in Military Service for American Memorial).

b. Tuberculosis:

As documented earlier, Unit 2 was solely devoted to tuberculosis treatment, research, and testing. It was also a self-contained hospital within the overall NHC campus. (Fourth Quarter Sanitary Report 1945: 5-6) Unit II also had its own recreation building, including a theater.

Tuberculosis had been a serious problem during World War I, and the military established procedures to prevent it from becoming a serious problem during World War II. Preventative procedures were adopted to keep infected persons from entering the military, with x-ray constituting a key component. Unfortunately, the need to induct as many people as quickly as possible resulted in lapses in the application of these procedures, particularly in regard to the use of x-rays. As a result, tuberculosis became a serious health issue during World War II. (Long and Lew, *American Journal of Public Health*, May 1945: 469)

As the West Coast (Pacific Theater) center for the treatment of tuberculosis, NHC received tuberculosis patients from numerous hospitals, hospital ships, and other transitional facilities. While its purpose was to treat patients from West Coast locations, in fact Unit 2 received many patients from elsewhere in the country. As a consequence of the huge demand for tuberculosis treatment, serious overcrowding was being realized in Unit 2 by 1945. (Letter from Captain Jensen to Admiral McIntire, 7-9-1945) (Letter from Captain Jensen to Admiral McIntire, 7-9-1945)

In a 1945 letter from Captain Jensen to Admiral McIntire, the problem of overcrowding was extensively discussed. The letter noted that, while Unit 2 was designed to accommodate 500 patients, it in fact had 623 patients. Even beyond these patients, 175 tuberculosis patients were being housed in Unit 3, the rheumatic fever unit. In turn, rheumatic fever patients were forced to be transferred to Unit IV, located near Pomona, at Spadra. While some of the patients at NHC were eligible for transfer to veterans' hospitals, the process to accomplish this was exceedingly slow. These delays forced NHC to keep 134 patients deemed ready for transfer. Further complicating this was the refusal by some officers and enlisted men to be transferred to any veterans' hospital, an option they were allowed to exercise under military regulations. (Ibid)

Captain Jensen's letter also noted that the San Francisco Debarkation Area was receiving some 100 tuberculosis patients per month, all of whom local command wanted to send to NHC. Additionally, various Bay Area hospitals wanted to transfer tuberculosis patients to NHC. And, NHC's reach went well beyond the West Coast. Fitzsimons General Hospital in Colorado wanted to transfer tuberculosis patients to NHC. Even patients from the Great Lakes were being considered for transfer to NHC. Captain Jensen's letter mentioned up to 1,000 patients could come from the Great Lakes area. At one point, consideration was given to converting all of Unit 3 for tuberculosis patients. To accommodate this, rheumatic fever patients would have had to be transferred elsewhere, with facilities in Mississippi considered as a potential recipient. Consideration was also given to converting the convalescent hospitals at Spadra, Beaumont, and Banning to tuberculosis hospitals, but the woeful lack of infrastructure and the flimsy construction of the temporary buildings at these locations quickly eliminated this idea from serious consideration. (Ibid)

One seemingly feasible alternative was a proposal to acquire and convert an entire facility in Sampson, New York into a tuberculosis hospital. (Ibid) Ultimately, the reduction in patient demand that accompanied the end of World War II took care of the problem. Clearly, though, while NHC was designated the West Coast center for tuberculosis treatment, it was in actuality used as a nationwide center for tuberculosis treatment.

As an important center for tuberculosis treatment and experimentation, NHC was given access to scarce supplies of the relatively unproven antibiotic drug, penicillin. NHC was also a recipient of another experimental drug, streptomycin.

By studying the history of penicillin one can understand its scarcity during World War II. The discovery of penicillin is generally attributed to Nobel laureate Scottish scientist Alexander Fleming. Flemming placed the date of his discovery as September 28, 1928. Despite the significance of Fleming's discovery, his poor communications skills resulted in his inability to convince a competent chemist to work with him refine the antibiotic for practical use. (http://www.pbs.org/newshour/rundown/the-real-story-behind-the-worlds-first-antibiotic/)

FIGURE 33: UNIT 2 SUN PORCH INTERIOR c. 1945

Source: Kevin Bash Collec

The first practical medical use of penicillin was accomplished in the early 1940s at Radcliffe Infirmary in Oxford England. In 1942 the drug was used to save the life of a dying patient at the infirmary. The patient involved was expected to die in a matter of days. Through the application of penicillin, the patient's life was saved. Needless to say, this dramatic outcome brought considerable attention to penicillin. (Ibid)

In the United States, penicillin was given practical use in the treatment of survivors of the November 1942 Cocoanut Grove fire in Boston. Penicillin was crucial in combating staphylococcus infections related to skin grafts. This success led the U.S. Government to support the production and distribution of penicillin to the military. (Stuart B. Levy, The Antibiotic Paradox: How the Misuse of Antibiotics Destroys Their Curative Powers, Da Capo Press, 2002: pp. 5–7.) The demand for penicillin during World War II was so tremendous that the job of keeping up with demand proved seriously daunting. It was not until June of 1945 that a method for producing penicillin in large quantities was developed. (http://www.pbs.org/newshour/rundown/the-real-story-behind-the-worlds-first-antibiotic/)

As noted earlier, NHC was given priority in securing penicillin for experimental use. While during peace time, experiments using new drugs tended to happen in laboratories, during World War II, there were simply too many patients in a short amount of time to await laboratory testing. As a consequence, military hospitals often did the testing that would otherwise have been done in laboratories or they did the testing in cooperation with

laboratories. Dr. Esmond R. Long of the Office of Medical History (U.S. Army) stated it this way: “The very nature of warfare between 1939 and 1945 forced the medical world to rush forward the pace of advances in medicine. Advances in the treatment of infection had occurred pre-war, but with the turmoil of war, research pioneers pushed forward to find solutions to very pressing problems.” (http://history.amedd.army.mil/booksdocs/wwii/PM4/CH14.Tuberculosis.htm)

In 1944, a major breakthrough was achieved at NHC in the use of penicillin to combat dangerous complications of tuberculosis. It was not unusual for the lungs of tuberculosis patients to be invaded by streptococcus and staphylococcus germs resulting in massive infections. The standard procedure had been to cut a hole into the lungs and allow the pus to drain off, sometimes for as long as six months. (*New York Times,* 7-3-1944) Patients already weakened by tuberculosis often died of this infection complication rather than the disease itself.

Navy doctors at NHC experimented with penicillin, administering the drug in lieu of performing surgery. The experiment was a success. Using penicillin, infections were checked leaving only a clear fluid that could be drained off by simply inserting a needle into the pleural envelope. NHC doctors proclaimed that “it worked like magic, eliminating a major hurdle in the treatment of tuberculosis. (Ibid) Newspapers all over the United States covered NHC’s significant medical advancement.

The Navy made special reference to the success of the penicillin experiments in one of its quarterly publications: “Use of penicillin in the treatment of tuberculosis empyema was tried as soon as penicillin became available for this type of experiment. The first tests, [conducted at NHC] were so remarkably successful that all subsequent cases of this type have been treated with penicillin and the results indicate clearly that its use is justified.” (Historical Supplement to the Fourth Quarter Sanitary Report 1945: 13)

Streptomycin testing was also a significant component of Unit 2’s work. In this arena, NHC worked with the tuberculosis treatment pioneer institution Olive View Sanitarium in Monrovia, California. Olive View Sanitarium was one of only three institutions in the United States to receive streptomycin for tuberculosis experimental treatment and research. The other two were the University of Michigan and Cornell University. Olive View was granted $25,000 from the National Institute of Health to use for continuing research “...on the value of streptomycin, a new and rare drug.” (*Los Angeles Times,* 3-26-1947: A-1)

NHC, with its large patient base, began a partnership with Olive View Sanitarium in 1946 to test the effectiveness of streptomycin on tuberculosis. A 1946 article in the *Corona Daily Independent* reported that “Dr. [Francis] Pottenger of the Olive View Hospital at Monrovia, recognized as one of the outstanding experts on tuberculosis, has inspected this [NHC] hospital. With the even temperature of the Corona area, its unusual freeness from fogs and local climatic conditions, there seems to be the hope that the Corona Naval Hospital should be developed as the outstanding of all Naval hospitals for the treatment of tuberculosis in patients.” (*Corona Daily Independent*, 12-20-1946: 1)

NHC was the site of significant research regarding the effectiveness of streptomycin on tuberculosis. Working in cooperation with Dr. Edwin A. Doane of Olive View Sanitarium, Lieutenant Commander Dr. Norma C. Furtos of NHC was responsible for conducting tests on tuberculosis patients to see what effect streptomycin would have in the treatment of that disease. Dr. Furtos examined over 385 patients for the presence of possible resistance to

streptomycin. As a result of these tests, she learned that there are streptomycin resistant strains of tuberculosis and that these forms of tuberculosis are easily transmitted from person to person.

The NHC testing resulted in the conclusion that, not only was streptomycin generally ineffective in treating tuberculosis, but that its use could actually accelerate the spread of the disease by transmitting resistant tubercle bacilli from patient to patient. (Furtos and Doane*, Journal of the American Medical Association,* 8-20-1949: 1274-1275) The data obtained from this study allowed streptomycin to be understood as having limited value in the treatment of tuberculosis. Knowing this, allowed researchers to look in other areas to find effective tuberculosis treatment drugs and techniques.

c. Rheumatic Fever

NHC was the site of significant testing and advancements in the treatment of rheumatic fever. Surgeon General Ross McIntire stated in *The History of the Medical Department of the United States Navy in World War II,* "In recognition of the important role played by rheumatic fever in the development of heart diseases, the Navy set up a special hospital at Corona, California, for its study and control. Beginning in 1943, a well-organized program was developed...." (*The History of the Medical Department of the United States Navy in World War II,* Vo. I, 1958, pg. 292)

The treatment of rheumatic fever was assigned to NHC's Unit 3. In January of 1943, NHC received a draft of 225 rheumatic fever patients. The ultimate capacity of Unit 3 was over 1700 patients, however, so there was considerable room for growth. (Historical Supplement to the Fourth Quarter Sanitary Report 1945: 5) Subsequently, on February 15, 1944, the Bureau of Medicine and Surgery designated NHC as the Navy's national center for the treatment of rheumatic fever. (Ibid: 8)

Unit 3 was created as a 41 building complex, 30 of which were ward buildings. Unit 3 was a semi-independent hospital, with its own administration building, galley, and mess hall. Also within Unit 3 were facilities for surgery, a library, an x-ray department, dental department, pharmacy, laboratory, and helps' quarters. (*California and Western Medicine,* February 1944: 73-74) Missing from the facilities were quarters for the nurses and corpsmen. These staff members were housed with the staff of Unit 1. Unit 3 was capable of handling 1,723 enlisted men. No facilities were designated for officers only. (Historical Supplement to the Fourth Quarter Sanitary Report 1945: 6)

Rheumatic fever is caused by a deficiency of the immune system that is associated with a streptococcus infection (commonly referred to as strep throat). In many cases, patients experience pain in their joints before the sore throat associated with the disease is evident. The most severe form of rheumatic fever is rheumatic heart disease which can cause permanent damage the heart valves. In fighting the infection, the immune system not only attacks the harmful bacteria but also attacks healthy tissue. It is an inflammatory disease that attacks the connective tissues in the body. (http://www.lifescript.com/health/a-z/conditions_a-z/conditions/r/rheumatic_fever.aspx)

In a study of rheumatic fever, Dr. Robert W. Quinn stated that "During World War II, rheumatic fever was one of the major causes of lost man days due to sickness in the Navy and Marine Corps....The number of cases of rheumatic fever in the Navy rose from 148 in 1940 to 7,668 in 1944. The rate per thousand persons increased during the same period

from .073 to 2.29." According to this study, two Naval hospitals were designated to treat rheumatic fever, U.S. Naval Hospital, Dublin, Georgia and NHC. (Quinn, *Archives of Internal Medicine,* December1947: 709)

The rheumatic fever Unit at NHC was one of the Navy's leading centers for the treatment of this disease. The unit was headed by Dr. George C. Griffith, "...recognized as a world authority on rheumatic hearts." Dr. Griffith studied 11,000 rheumatic fever cases through the Rheumatic Heart unit at NHC. (*Corona Daily Independent,* 2-15-1945: 1)

After the war, Dr. Griffith created the Mary Louise Griffith Rheumatic Heart Clinic at San Antonio Community Hospital in Upland, CA. In 1951, Dr. Griffith stated that "Rheumatic fever, together with tuberculosis and syphilis, constitute the remaining big three of infectious problems in American communities." (*Corona Daily Independent,* 1-22-1951: 1)

Significant rheumatic fever research was conducted at Unit 3 by a small group of medical officers, carefully chosen because of their interest, experience, and training in cardiology. Many came from prestigious institutions such as the University of Southern California, Stanford, Cornell, the University of Pennsylvania, and others. These doctors created a comprehensive program of medical care, education, occupational therapy and rehabilitation. (Historical Supplement to the Fourth Quarter Sanitary Report 1945: 6 and 8)

The Unit 3 doctors conducted an intensive research program addressing all phases of rheumatic fever, including early diagnosis, treatment, evaluation of different drugs, the correlation of electrocardiographic changes, skin manifestations, the proper period of convalescence, etc. The importance of this work was nicely summarized in a Navy Sanitary Report: "The findings made by this staff have proven of inestimable value and some of the results have been disseminated throughout the medical world by various articles and treatises published in medical journals, magazines and periodicals." (Ibid:8)

Experiments conducted by the Unit 3 doctors revealed that "...sulfonamides and penicillin, while tending to prevent rheumatic fever before it develops...do not evidence any beneficial effect upon the rheumatic fever itself....Sodium salicylatge given in conjunction with sodium bicarbonate appears to be the most efficacious drug in alleviating symptoms." (Ibid: 9)

As of April 1, 1944, Unit 3's bed capacity was completely filled necessitating an increase in ward bed capacity from 66 to 82 beds. This was accomplished by placing beds closer together. The average daily census in Unit 3 stood at 2,000 until July of 1944. For the years 1944 and 1945, approximately 10,000 rheumatic fever patients were treated and proper dispositions made. Toward the end of 1945, the rheumatic fever census declined and the space thus opened up was made available for an overflow of tuberculosis patients from Unit 2. (Ibid)

NHC was able to achieve a 95% cure rate. This high success rate was due to the "...outstanding heart specialists...." who were stationed at NHC. (*Corona Daily Independent,* 11-10-1948: 22) Only 14 deaths were recorded among the rheumatic fever patients treated in Unit 3. (Historical Supplement to the Fourth Quarter Sanitary Report 1945: 6 and 8)

Throughout 1947, NHC was engaged in reducing the scope of the hospital commensurate with the reduction of military forces following the end of the war. Beds became rapidly available because the limited duty status had been discontinued. Patients who were sufficiently recovered were typically dispositioned out of the military (Sanitary Report, 1941

– 1945) The number of rheumatic fever patients dropped significantly with a patient count of only 26 by the end of the year. Consequently, Unit 3 was deactivated in 1947, with only the deep freeze kept in operation. The recreation building and some of the wards were used for storage. (Fourth Quarter Sanitary Report 1947: 2)

FIGURE 34: RHEUMATIC FEVER PATIENTS IN A UNIT 3 WARD c. 1945

Source: Kevin Bash Collection

d. Poliomyelitis

On February 15, 1944, NHC was designated the West Coast (Pacific Theater) center for the treatment of poliomyelitis. (Historical Supplement to the Fourth Quarter Sanitary Report 1945: 3)

In contrast with rheumatic fever treatment, which was phased out by the end of 1947, poliomyelitis remained a significant aspect of NHC's operations. Poliomyelitis had reached epidemic proportions in the United States, necessitating the use of NHC for civilians stricken by this disease. Headed by former member of President Roosevelt's personal and family physician team (FDR American Heritage Center, Ross T. McIntire, 2015), Dr. Robert E. Duncan, established NHC as a first rate poliomyelitis hospital. According to the *Los Angeles Times,* NHC and Los Angeles General Hospital were among the best equipped hospitals in the world to treat poliomyelitis. In contrast to a national patient death rate of 11%, NHC and Los Angeles General Hospital had only a 4.01% death rate. (*Corona Daily Independent,* 2-24-1949: 20)

During the devastating polio epidemic of the late 1940's, in one of the U.S. Navy's prouder moments, they opened the doors of USNH Corona to treat at no charge, non-military children afflicted with the dread disease to ease the overcrowding experienced in facilities in the greater Los Angeles area (*Los Angeles Times*, Luxurious Resort Now Polio Hospital, 9-6-1948, B2)

The surge in poliomyelitis cases during the late 1940s taxed Los Angeles General Hospital well beyond its limits. On August 5, 1948, the Los Angeles hospital had 29 patients in iron lungs with a reserve of only three machines available for other patients in need. Los Angeles General Hospital's poliomyelitis patient load stood at 266 at this time. (*Los Angeles Times,*

8-6-1948: 11) In 1948, NHC and Los Angeles General Hospital worked out an agreement to transfer some of its patients to NHC. During the summer of 1948, 96 polio patients were transferred to from Los Angeles General Hospital to NHC. These patients were added to the population of 261 poliomyelitis patients already at NHC. (*Los Angeles Times,* 8-3-1948: 20)

Patients sent from Los Angeles General Hospital to NHC included men, women, and a large number of children. A *Los Angeles Times* article on this matter noted "Patients who are expected to require a long period of secondary hospitalization are being sent [TO nhcthere....Corona's facilities, developed during the war for paraplegic patients will be put to full use in treating the polio victims." (*Los Angeles Times,* 12-30-1948: 7) By the end of 1948, NHC's poliomyelitis population included 46 civilian patients from Los Angeles County. (*Los Angeles Times,* 12-30-1948: 7)

Post war, NHC was so highly regarded that Franklin Roosevelt's grandson Curtis was sent for treatment in the polio facility headed by former Roosevelt physician Dr. Robert Duncan. Duncan was known to the Roosevelts because he had once treated the boy for measles (*Los Angeles Times*, FDR Physician to Treat Grandson 'Buzzy' for Polio, 8-27-1948, A1) (*The Norconian*, 3-3-1952: 1).

e. Other Diseases

In 1943, Jensen lobbied to have the opportunity have a research center for malaria and filariasis. He also expressed his belief that NHC was more suited to research on a truly scientific basis than the "...acute hospitals in the immediate coastal areas...," as their turnover was very rapid and NHC could hold patients longer to gather results. (Letter, Jensen to Andrus, 8-19-
1943)

Research conducted at NHC led four of its physicians to early breakthroughs in the identification and treatments of Lymphangitis. (United States Naval Medical Bulletin. v.42 1944 Jan-Jun. Lymphangitis of Suspected Filarial Origin, 1944) and other illnesses. Because of the pressing demands of the war, papers reporting on the results of significant tests were often not published until after the war.

FIGURE 35: CHILD RECEIVES POLIO TREATMENT IN A HUBBARD TANK c. 1948

Source: Kevin Bash Collection

Lymphatic filariasis was the second most common parasitic disease world-wide, after malaria, and there were numerous outbreaks in military deployments during World War II. (*Military Medicine*, 2005, 170, 7:585) A special commission from NHC was appointed to investigate this disease, and a

test study was performed on 46 Marines who had arrived from the South Pacific. Because of the rarity of filariasis in “white men” and the previous rarity of the disease overall, a careful study, likely the first in the history of the Navy, was directed by the Navy. While the report was preliminary, the results were said to be promising (United States naval medical bulletin. v.42 1944 Jan - Jun. Lymphangitis of Suspected Filarial Origin, 1944)

FIGURE 36: HOPALONG CASSIDY VISITS A CHILD IN AN IRON LUNG c. 1948

Source: Kevin Bash Collection

Captain Jensen also told of a controlled study by NHC physicians on peptic ulcers, gastritis, and psychoneurosis. The study examined disease treatment and looked into how to effectively diagnose symptoms (*Journal of American Medical Association,* Peptic Ulcer, Gastritis and Psychoneurosis, 7-29-1944, opgs. 890-896

NHC’s status as a medical center grew considerably over time. In this regard, the hospital received regular attention in newspapers both locally (where the hospital was daily news) and across the country via numerous articles. (*Riverside Daily Press*, “Craft Work Helps Veterans Recover at Navy Hospital,” 8-7-1944) (*Corona Daily Independent,* “Local Naval Hospital Is Given Worldwide Publicity by U.P.” 6-17-1942, A-1) (*Wisconsin State Journal*, “Navy Hospital Converted from Club Restores Life to Atrophied Muscles of Sailors, Marines, 7-30-1944, P-11) (*Los Angeles Times,* Corona Naval Hospital Gets Diamond-Graph, 6-11-1943, A13) (*Los Angeles Times*, Heroes Man Ship That Never Sails, 5-1-1942, A-1)

3. Theme Three Rehabilitation

This section addresses rehabilitation in relation to war injuries. As documented earlier, NHC’s rehabilitation program was also used for polio patients.

World War II’s systems for evacuating wounded soldiers off the battlefield and into hospitals resulted in numerous military personnel surviving wounds that would, in previous wars, have resulted in death. Medics rendered immediate treatment of the wounded where they fell, and helped

to evacuate them to field hospitals. From there patients were loaded onto hospital ships and airplanes for transportation to fully equipped military general hospitals in the USA. The Navy recognized early-on that the morale of those fighting on the front was greatly improved if they were confident that the military was dedicated to their care and that continuing care would be given after the war. This morale factor not only helped soldiers withstand the rigors of the war's many battles, it also helped to bring the fighting to a quicker end. (*Annals of the American Academy of Political and Social Science,* May 1945: 66) It also meant, more than ever, that military hospitals needed to be fully equipped to handle the rehabilitation needs of those suffering from paralysis, amputations, or other devistating wounds.

To address the need for more robust rehabilitation services, in April of 1944, the Bureau of Medicine and Surgery created a new branch devoted entirely to rehabilitation, and ordered each Naval hospital in the USA to appoint one officer to serve as the hospital's rehabilitation officer. (*Corona Daily Independent*, 9-28-1945: 1)

This approach was first tried in Britain, where the British Air Force made a practice of giving graded exercises matched to the abilities of wheelchair-bound warriors in their World War II hospitals. The result was less time in bed and faster recovery. This approach was adopted by U.S. military branches, including the Navy. (Ibid)

The basic principles of the Navy Medical Department's concept of rehabilitation were:

- Give the best care and treatment that medical science and skill could afford.
- Expedite recovery so patients could return to duty with a minimum loss of time.
- For those whose disability prevented return to active duty, emphasize treatment on skills and needed in civilian life.
- Concentrate recovery efforts to achieve the highest possible level of post-hospital activity.
- Apply these principles to all patients, not just select patients with severe disabilities.

(*Annals of the American Academy of Political and Social Science,* May1945: 67)

a. NHC's Rehabilitation Program

NHC was a major rehabilitation center for the Navy. In fact, in 1944, Dr. Edward Lowman who supervised the program of rehabilitation at NHC wrote "the book" on how to bring patients back to health through systematic rehabilitation tailored to the needs of the individual. (*US Naval Medical Bulletin*, Planned Convalescence, Edward Lowman, 10 - 1944).The physical rehabilitation program at NHC was the second largest at any hospital operated by the Navy, the largest being the program at U.S. Naval Hospital San Diego. Six commissioned officers and 40 chiefs oversaw NHC's rehabilitation program. (*Corona Daily Independent*, 9-28-1945: 1) The essential difference today, between NHC and Navil Hospital San Diego is the fact that NHC retains a higher level of overall integrity to its World War II configuration, whereas Naval Hospital San Diego has been substantially altered over the years.

A major effort at NHC was devoted to physical fitness. The main objective was, to prevent the inevitable muscular atrophy associated with inactivity. Exercise would typically start while the patient was still confined to bed. Incrementally, exercises would be increased to the point where the patient was ready for post-hospital activity. This would include vocational education, preparation for college, or the completion of high school. Prior to release, all patients were informed of their rights and benefits provided by law and

assistance was provided in making related claims. (*Annals of the American Academy of Political and Social Science,* May 1945: 67)

As noted earlier, NHC was the designated West Coast Center for the treatment of poliomyelitis. Thus, NHC received very large numbers patients requiring rehabilitation services. As an example of the magnitude of the NHC program, at the beginning of 1946, six to seven thousand patients were treated at NHC's Department of Physical Medicine and Rehabilitation. (Fourth Quarterly Sanitary Report, NHC 1946: 5)

To secure staff for NHC's exercise centered approach, the Navy rounded up men with physical education backgrounds from schools and colleges, sending them to Sampson, New York, for intensive training. (*Annals of the American Academy of Political and Social Science,* May 1945: 66) At NHC, the rehabilitation program was born in the rheumatic fever wards of Unit 3 and then expanded to the orthopedic and surgery wards of Unit 1. Only the tuberculosis patients in Unit 2 were precluded from this program of vigorous physical exercise. (*Corona Daily Independent*, 9-28-1945: 1) A report on this program noted that "... of the 30,000 Navy and Marine Corps wounded up to June 30, 1944, only 433 had to be invalided out of the service." (*Annals of the American Academy of Political and Social Science,* May 1945: 66)

Incorporated into the rehabilitation facility were devices for corrective exercise. Among the offerings was a chair set up for developing thigh muscles, finger wheels to relieve stiffness, shoulder wheels, bicycles, and rowing machines. Several exercise machines were also available for recovering patients. (Ibid) Many rehabilitation tasks were also performed in the hospital wards, including heat, massage, muscle re-education, general physical therapy, and instruction in walking. (Fourth Quarterly Sanitary Report, NHC 1946: 4)

The Department of Physical Medicine and Rehabilitation was also charged with fitting braces. The braces were made by a private contractor in Los Angeles that did fittings and delivered completed braces to NHC every two to three weeks. (Ibid)

The Department of Physical Medicine and Rehabilitation also offered Occupational Therapy through a separate department by that name. The Occupational Therapy Department was staffed by three Wave officers, four enlisted personnel, and three full-time instructors. Augmenting the staff of this department were workers from the Arts for National Defense, some of whom were paid and others of whom were volunteers. Volunteer Arts and Skills workers also assisted this department, under the auspices of the Red Cross. (Ibid: 5)

b. Rehabilitative Value of NHC's Resort Amenities

As noted earlier, the Navy assumed control over several posh resorts, hotels, and estates. Bed space was needed, and these sorts of private facilities were well suited to serving as instant convalescent hospitals. The book *The History of Medical Department of the United States Navy in World War II*, documents use of civilian health resorts. Those equipped with extensive facilities for hydrotherapy were used as special rehabilitation treatment centers. (*The History of Medical Department of the United States Navy in World War II, 1958* pg. 359)

NHC was in a class of its own, however, even when compared to other luxury properties. Its vast landscaped grounds, huge man-made lake, and extensive sports and spa-related amenities were beyond anything offered at other resort properties adapted for Naval hospital

FIGURE 37: SURGEONS WORK ON AN INJURED SEAMAN c. 1945

use. NHC's hot springs were particularly well suited for the rehabilitation of severely injured and ill military personnel, especially those with injuries of the spinal cord, tuberculosis, polio, and rheumatic fever. Because the water was "sweet" sulfur water, it did not have the odor associated with regular sulfur water.

In a 1942 *Los Angeles Times* article entitled "Heroes Man Ship that Never Sails", writer Timothy Turner expounded on the healing nature of NHC: "The club, built in 1929 is a palace, with spacious parlors, a vast dining hall and many hotel rooms...suitable for remodeling into a hospital." Noting that the hospital included the traditional tools of rehabilitation like pool tables, occupational therapy apparatus, mechanical toys, wire puzzles, typewriters, rug rooms, and carpentry and machine shops, he emphasized that the resort environment offered much more. "The club setup includes 700 acres of grounds that can be planted to truck and flower gardens...a golf course, a 52 acre lake and two outdoor and two indoor swimming pools....[and] a famed sulfur spring." These characteristics offered considerable benefit to physical rehabilitation, but even more important, Turner noted, was the effect of the grounds on psychological rehabilitation. "Never has there been such a pleasant hospital, and the physicians are noting a good psychological effect on the patients as a result of it. A colorful building surrounded by the beauties of nature is making

for recovery much more than the usual neutral hospital background, and this discovery may lead to a new concept of treatment." (LA Times, 5-1-1942: A-1)

But, the resort offered more than just ambiance. Many of its spa facilities were directly adaptable for rehabilitation purposes. Quoting from a period *Los Angeles Times* article: "Here in a splendorous setting reminiscent of the luxury of ancient Roman baths in the days of the Caesars, treatment is administered. The rooms have tiled floors, high arched ceilings and house the most modern therapeutic equipment obtainable." (*Los Angeles Times,* 7-30-1944: 11)

FIGURE 38: FITTING A PROSTHETIC DEVICE

Source: Kevin Bash Collection

Working with the department's director, Lt. Commander Edward W. Lowman (MC) USN, were 30 Pharmacist's Mates, half Waves and half Navy men. Each patient was seen by appointment, making wait times nil or very short. Treatments lasting about 45 minutes would be selected from hot sulfur baths, mineral swimming pools, whirlpools Hubbard tanks, steam and heat cabinets, numerous heat bakers and hot salt glow slabs.. (Ibid: 4)

The *Los Angeles Times* in 1943 spoke of the value of hot springs and their use by the U.S. Military as one of "Natures Remedies" (*Los Angeles Times,* 1-8-1943, pg. 16). Lt. Commander Lowman stated his staff "takes up where the surgeons leave off" and pointed to the success of using the former Norconian spa facility, equipped with the most modern therapeutic equipment available to get men's bodies back to mobility and flexibility. (*Corona Daily Independent*, 5-29-1944) (California and Western Medicine, Volume 60, No. 6, pg. 334)

Eleanor Roosevelt stated after her visit in 1943, "There is an indoor swimming pool and individual baths where the patients can have the benefit of hot sulphur water (My Day, Eleanor Roosevelt, 4-28-1943). Given her husband's polio affliction she would have had first-hand knowledge of the value of these facilities.

Hydrotherapy per Lowman should be part of a department that includes “electrotherapy, light therapy, mechanotherapy, fever therapy, and a gymnasium for corrective exercise. (US Naval Medical Bulletin, Edward W. Lowman, Vol. 43, October 1943). NHC was in a unique position in that it had existing spas, swimming pools, recreation areas and eventually a full service gym. Captain Jensen stated “We are using the hydrotherapeutic facilities here for the post polios and the scar cases with very good results (Letter, Jensen to McIntire, 4-11-1942 1).

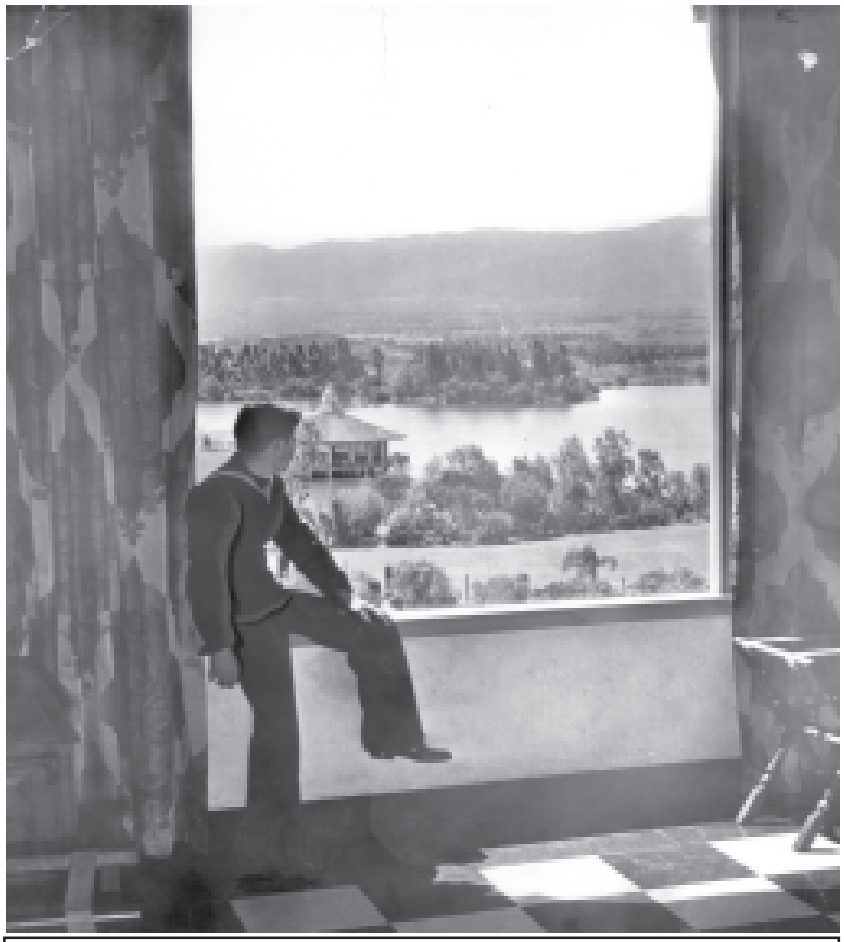


FIGURE 39: SAILOR ENJOYS A VIEW TOWARD THE BEAUTIFUL NORCONIAN GROUNDS c. 1944

Source: Kevin Bash Collection

c. Cord Bladder Service

On October 6, 1945, the Bureau of Medicine and Surgery designated NHC as the West Coast center for the treatment of cord bladder issues. (Historical Supplement to the Fourth Quarter Sanitary Report 1945: 6) Cord bladder issues consist of complications from spinal injuries that disrupt the ability of a person to have normal bladder function. Typically this involved men who had suffered gunshot or shrapnel wounds to the spinal cord or an injury of the spinal cord. The first group of cord bladder cases to arrive at NHC consisted of 59 patients from the U.S. Naval Hospital Santa Margarita Ranch in Oceanside. By the end of 1945, 62 cord bladder patients were under treatment at NHC. (Ibid)

NHC was chosen as the West Coast center for the treatment of this disorder because it had the best overall physical therapy program. Patients with this disorder required an unusual amount of lifting and turning to avoid pressure sores, frequent changing of dressings, specialized bladder and bowel care, and for those with arm paralysis, feeding, shaving, brushing teeth, etc.

NHC had a specially trained group of corpsmen and nurses assigned to the wards containing cord bladder patients. The availability of enhanced spa facilities, including the hot or cold water, sulfur or otherwise, proved ideal for treating these patients. Treatments given

FIGURE 40: PATIENTS ENJOY THE HOTEL'S OUTDOOR POOL c. 1944

Source: LA Times-1-3-1944

included Hubbard tank therapy, ultraviolet exposure, heat and massage of the paralyzed muscles, and ambulation training for those gaining reuse of their muscles. To avoid deformities and contractures, these treatments had to be administered regularly by staff highly skilled in these areas.

Surgery was another important component in the cord bladder program. NHC's surgical facilities and highly skilled doctors allowed damaged areas to be surgically repaired to relieve nerve pressure. Orthopedic surgeons assigned to NHC were a valuable part of the medical team assigned to the Physical Therapy unit. (Ibid 6)

As of the end of 1945, operations on the neck and bladder of patients allowed satisfactory bladder function to be restored in 28 cases. Other patients were set to receive this type of operation as soon as their condition allowed for it.

Infections of the urinary tract were eliminated through the use of penicillin, streptomycin, and sulfa drugs. As noted earlier in the discussion of tuberculosis, NHC was one of only a small number of hospitals given access

FIGURE 41: SAILOR SHOWS OFF CATCH NEAR LAKE NORCONIAN BOATHOUSE c. 1944

Source: Kevin Bash Collection

to penicillin and streptomycin, the demand for which was much greater than the supply. In fact, streptomycin was only available under the provisions of a special project for the treatment of these cases toward the end of 1945. The results of testing related to this special study proved very encouraging. Special attention in the use of streptomycin focused on determining an effective dosage and administration schedule. (Sanitary Report, 1941 – 1945 1).

Another important aspect of the treatment of NHC's cord bladder patients involved vocational training and scholastic guidance. In many cases, it proved possible to bring patients to a point of recovery and reeducation where they could live at home and be self-supportive. (Ibid)

Because of the quality of treatment given to cord bladder patients, morale tended to be quite high given the circumstances. The expertise of the staff allowed most patients to be out of bed several hours a day, with many patients becoming well enough to walk with the aid of crutches and braces. Fully 80% of the patients treated at NHC gained sufficient mobility and skill sets to allow them to live at home with a high level of independence. (Ibid: 7)

The work conducted at NHC was significant, resulting in the publication of several medical articles on the subject. (Ibid) For example, NHC established the necessity of segregating such patients from others not suffering the results of the condition. An article in the *S.A. Medical Journal* made reference to the cord bladder service at NHC, pointing out that in

FIGURE 42: FIRST LADY ELEANOR ROOSEVELT VISITS A PATIENT, 4-23-1943

Source: Kevin Bash Collection

FIGURE 43: AMBULATORY TRAINING IN THE HOTEL BUILDING c. 1945

Source: Kevin Bash Collection

this unit, all paraplegic bladder cases are treated together and the psychological as well as the technical aspects are handled in a coordinated fashion. “Thirty-three sailors and marines of the Cord Bladder Service at Corona have been awarded the Urological Gold Star. This is placed with fitting ceremony on their bedside charts. These fortunate 33 not only empty their bladders, but the urine they pass is sterile on culture - the ultimate goal of every paraplegic” (*S.A. Medical Journal*, 1-15-1949: 48)

d. Occupational and Vocational Therapy

Per Lowman, hobby activities, workshops, etc were key to recovery. (*US Naval Medical Bulletin*, Edward W. Lowman, Vol. 43, October 1943) The building contractors who were responsible for expanding the resort into a three-unit hospital, left their temporary offices behind, some of which were used for occupational and vocational therapy.

NHC had a rehabilitation shop where ceramics, weaving, woodworking, and plastics could be enjoyed. (*Corona Daily Independent*, 4-5-1946). One problem was finding instructors to teach the patients how to perform the work. Needed were people who could teach linoleum, block printing, leather tooling, painting, cartooning, weaving, and much more (*Corona Daily Independent*, 1-5-1945, pg 2)

e. Golf

One of the physical activities found to particularly benefit the recovery of patients was golf. Fortunately for the patients at NHC, a golf course was already in place, built as an attraction of the Norconian Resort. Unfortunately, however, the golf course was in poor condition when the Navy bought the property, having been neglected for several years.

A 1942 memo from the Chief of the Bureau of Medicine and Surgery to the Bureau of Yards and Docks nicely summarized the rehabilitation value of golf. The memo requested a Caterpillar diesel engine to pump water for the irrigation of the Norconian golf course. Concerned that the request would be seen as frivolous, the memo explained that “...the importance of this ...[golf course]...becomes apparent when it is realized that the primary function of the Naval Hospital, Corona, is the rehabilitate our disabled, crippled, wounded, and injured personnel as quickly as possible so that they may return to active duty again.” The memo goes on to observe that “The type of exercise offered by golf, affording as it does motion of the arms, body and legs in easily controlled degrees of activity together with the added incentive of a competitive sport, is one of the best means for limbering up stiff joints and strengthening weakened limbs.” (Memo, 9-19-1942, Chief of the Bureau of Medicine and Surgery to the Bureau of Yards and Docks.) Only a small portion of the golf course used for this purpose remains today. Most of the land it once occupied is now developed with residences and the Norco College Campus.

f. Wheelchair Basketball

Many sources of information are available on the history of wheelchair basketball. These include books, newspaper articles, and internet web sites. Unfortunately, these sources are often at odds with each other in terms of dates, participants, and significant events. WHS found that the most accurate information came from media that was published at the time the events took place. This rigorous approach to research has resulted in information that is more reliable and accurate than that found in the many histories of wheelchair basketball

FIGURE 44: OCCUPATIONAL AND VOCATIONAL TRAINING c. 1945

Source: Kevin Bash Collection

commonly available today. In fact, some authors and internet sites have corrected their content based on the research conducted by WHS.

The precursor to sports for the disabled can be traced to the U.S.A. and Great Britain. The British newspaper, *The Thames Star* references a "Cripples Olympiad" held in the USA in 1911. While, no mention of wheelchairs could be found in the article, it did refer to many participants with a variety of disabilities. *(The Thames Star,* Volume XLVII, Issue 14652, 10-17-1913: 5)

Featured in the article was a man named Skipper Francis, well-known as an accomplished athlete, despite having a withered leg. While not a paraplegic, Francis's achievements as a disabled individual were quite impressive. At the Cripples Olympiad, he won the running and wrestling competitions. At home in England, he participated in team sports with able bodied athletes and made impressive achievements in such individual sports as swimming, cycling, and running. His high mark of achievement came when he swam England's Bristol Channel from Penarth to Newport in 1913. Despite freezing temperatures and his physical disabilities, he set a new record of 4 hours 32 minutes. (Ibid)

As early as 1923, wheelchair bound patients and able bodied staff in the United Kingdom participated in gymkhanas and bowls at the Royal Star and Garter Home in Richmond, Surrey. (http://www.mandevillelegacy.org.uk/, Accessed 2014) These games did not, however, constitute organized team sports. Wheelchair athletics were unknown until World War II.

FIGURE 45: NAVAL HOSPITAL CORONA'S GOLF COURSE - RIGHT AND LOWER RIGHT (NHC's AIRSTIP CAN BE SEEN IN UPPER RIGHT.) c 1945

Source: Kevin Bash Collection

In Great Britain and in the United States, many of the combatants who were rescued from battlefields had devastating injuries, including those necessitating amputations and resulting in paralysis. In 1943, Dr. Ludwig Guttmann established a Spinal Injuries Unit at the Ministry of Pensions Hospital at Stoke Mandeville in Ayulesbury, Buckinghamshire. Here wheelchairs were used informally in hybrid forms of polo and hockey, played in hospital wards between wheelchair-bound patients and able-bodied physiotherapists in wheelchairs. (Ibid)

Armand Thiboutot, author of the most complete history of wheelchair basketball published to date (*Wheelchairs Can Jump!*) provides a detailed analysis of the history of Wheelchair Basketball. In his book, he documents that Dr. Guttmann was responsible for the replacement of wheelchair polo with wheelchair netball. Guttmann was a pioneer in wheelchair athletics and was the creator of the International Stoke Mandeville Games, an international sporting event for persons with severe disabilities, sanctioned by the International Stoke Mandeville Wheelchair Sports Federation. (Labanowich and Thiboutot 2011: 3-4)

Thiboutot takes great pains in his book, however, to dispel the notion that wheelchair basketball was invented in England. He emphasizes that in England, they played wheelchair "netball", a distant cousin to wheelchair basketball. While netball and basketball share the use of a hoop through which a ball must pass to score points; that is about all the two sports have in common. In wheelchair netball there is no dribbling and no backboard. The rules are also entirely different. While wheelchair netball is still played, it was largely replaced with wheelchair basketball in the mid-1950s. Thibotout notes in his book: "The myth that wheelchair basketball originated in England continued to circulate for years, even as late as 2011. A growing number of wheelchair basketball aficionados and administrators now recognize that wheelchair basketball was originally developed by WW II veterans in the United States in 1945-1946." (Ibid: 4)

Thiboutot later writes that: "The myth associated with the origins of wheelchair basketball at Stoke Mandeville has been repeated...on the Web sites of the International Paralympic

Committee.... When this historical error was called to the attention of the progressive organizers of the 2006 Gold Cup...necessary corrections were made on the 2006 Gold Cup website. Likewise...the IPC [International Paraplygic Committee] website now reads: 'Wheelchair Basketball was originally developed by World War II veterans in the U.S. in 1945/1946.' The IWBF [International Wheelchair Basketball Federation] website notes that wheelchair basketball was played at Corona Naval Station (sic) and at Framingham, Massachusetts as early as 1945 (Ibid: 25) Thiboutot documents in his book that Birmingham hospital in Van Nuys, California should also be listed with these pioneers." (Ibid: 9)

The incorporation of wheelchair athletic activities into the military's rehabilitation programs came to the USA in April of 1944 via the United Kingdom. Recognizing the success of the United Kingdom's programs, the Bureau of Medicine and Surgery created a U.S. military branch devoted entirely to rehabilitation, and ordered each Naval hospital in the USA to appoint one officer to serve as the hospital's rehabilitation officer. (*Corona Daily Independent*, 9-28-1945: 1)

The earliest record found by WHS of wheelchair athletic activities at NHC appeared in a 1945 newspaper article in the *Riverside Daily Press.* This article describes the use of athletic equipment to aid in the physical and mental recovery of wheelchair-bound seamen and marines. Referring to the participants as the Navy's "wheelchair athletes", the article documents that "Every day...the wheelchair teams of the U.S. Navy Hospital are getting a little more speed on the ball, they're tossing the medicine ball a little higher and the pace of impromptu 'polo' games is getting faster, according to an official navy report." The article observes that "...these ailing members of the Navy and Marine Corps are getting a whale of a lot of fun out of their treatments and convalescence, at the same time hastening the time when the crippling effects of injury or disease have been conquered." Later the article goes on to say "Exercises for the wheelchair contingent have become a major part of the Navy's physical rehabilitation program." Describing the specific activities engaged in by the patients, the article says: "A typical morning schedule finds a group of four or five tossing a medicine ball around the circle, while others toss a baseball to and fro with all the pep of a talkative infield....polo games are apt to spring up at any time with the players chasing the ball in their chairs and whacking at it with a cane or crutch." (*Riverside Daily Press,* 5-22-1945)

While wheelchair basketball is not mentioned among the sporting activities engaged in by the NHC "wheelchair athletes" of 1945, NHC patients and staff noted in later writings and oral histories that they witnessed wheelchair basketball being played as early as 1945. While, WHS has not found period written documentation to support the accuracy of these recollections, more than one individual has testified to the existence of wheelchair basketball activities at NHC in 1945.

Charles Roth, a patient at NHC in 1945 stated in an oral history:

> "I remember hearing about the paraplegics playing basketball and that must have been about October or November of 1945....I knew there was a group playing basketball in wheelchairs but I don't know of any one from the polio ward that got into that . . . . I wondered about it at the time because the polio patient's muscles were so tender to even touch that we didn't get into things that ended up hurting more . . . . I had heard at the time that the paraplegics had also lost feeling and also that because

> of the trouble with possible urinary infection there were rumors that they probably wouldn't live more than 10 or 12 years . . . this is only hearsay but it was what I had heard at the time . . .and many got an attitude of resentment and bitterness because of it . . ." (Oral History, Charles Roth, 2014)

Rita Kyle, who was one of Roth's nurses during 1945 recalled:

> "Everything possible was given to the wheelchair boys - baseballs, bats, basketballs, footballs - most of them played sports in school and once they got to rolling around, they just killed each other. Get four or five together and playing basketball; one minute they were playing and laughing and the next minute they were punching each other and rolling around on the ground. I don't know if there were teams, but they certainly kept score. At first the docs were worried; then one of the plastic surgeons called them all into an operating room and showed them the damage being done. It came down to, infection and dying and pain or letting them kill each other playing ball. They played ball." (Oral History, Rita Kyle, 2014)

On the east coast, Dick Foley, a veteran who was paralyzed in action in Europe stated in an oral history that he first played wheelchair basketball as early as the winter of 1945 at Cushing General Hospital in Framingham, Massachusetts. (Labanowich and Thiboutot 2011: 7)

Written documentation places the beginnings of wheelchair basketball in late 1946. These sources document three locations as the pioneers in wheelchair basketball played as a team sport. Thiboutot lists these pioneers as follows:

- Birmingham Veterans' Hospital in Van Nuys, California
- Cushing Veterans' Hospital in Framingham, Massachusetts
- U.S. Naval Hospital Corona, Norco, California

(Ibid: 9)

Thiboutot documents that the earliest documented wheelchair basketball game occurred on November 25, 1946 at Birmingham Hospital. (Ibid) Written documentation of this game appeared in the hospital's newsletter, the *Birmingham Reporter,* in which a headline in the November 29, 1946 issue read: "'Plegics Win Wheelchair Game, 16 to 6". The game was played between wheelchair-bound patients and able bodied medical staff from the hospital. The wheelchair bound patients went by the name "Birmingham Five", while the able bodied opponents were referred to as the "Birmingham Medics". The able bodied Medics played the game from wheelchairs, subject to the same rules as the wheelchair-bound athletes. (*Birmingham Reporter,* 11-29-1946: 1)

The idea of wheelchair basketball at Birmingham Hospital appears to have started with Sergeant Stanley Den Adel. Adel was sent to Birmingham Hospital in 1945 after becoming paralyzed due to a spinal injury suffered while fighting with the 11th Armored Division in Europe. Adel recounted that he got the idea of playing wheelchair basketball in November of 1946 while watching a regular game with some of his wheelchair-bound friends. Between halves, he and his friends started experimenting with one of the basketballs. After a while, the future wheelchair athletes tried a few shots at the basket, experiencing success very early on. Bob Rynearson, Assistant Athletic Director at the hospital quickly saw the potential

of basketball as a form of wheelchair therapy, and organized a team from the paralyzed soldiers at the hospital. Adel became the team's captain. (*Oakpark Oakleaves,* 2-26-1948)

The second documented instance of wheelchair basketball occurred at Cushing Veterans Hospital in Framingham, MA on December 6, 1946. In this game, Cushing's wheelchair athletes played the professional Boston Celtics, winning the game18 to 2. As with the Birmingham game, both basketball teams (able bodied and paraplegic) played from wheelchairs, and in accordance with rules created for the wheelchair form of the game. Documented in the *Framingham News,* this match occurred at the Boston Garden arena. (*Framingham News,* 12-6-1946: 9)

There were key differences in the rules between West Coast and East Coast wheelchair basketball teams. The West Coast rules provided for a very aggressive form of the sport, while the East Coast rules called for less contact and more liberal standards. Eventually, the West Coast rules were adopted as the national standard, and these rules form the foundation of today's wheelchair basketball rules. Birmingham Hospital's Bob Rynearson is credited with devising the West Coast rules. (*Oak Park Oakleaves*, 2-26-1948)

NHC was the third hospital documented to have taken up organized wheelchair basketball. Historical records document that the founder of wheelchair basketball at NHC was Dr. Gerald Gray. Dr. Gray was a plastic surgeon who moved to Corona in July of 1946. (*Oakland Tribune*, 7-3-1946:5) He had been assigned to NHC to heal the bedsores paraplegics suffered as a result of being relegated to bed for hours on end. While stationed at NHC, Dr. Gray traveled to many of the region's military hospitals to heal bedsores.(Ibid)

In early 1947, while visiting Birmingham Hospital, Dr. Gray observed wheelchair-bound patients playing basketball. And, he learned from the staff there that the game had proven very beneficial to these patients, both physically and mentally. Physically, the exercise helped build strength, coordination, and stamina. But, even more important were the game's mental health benefits. Specifically, it gave wheelchair-bound patients a sense of purpose and self-respect. Their success in the endeavor of wheelchair basketball gave them the knowledge that they could accomplish a physical activity that demanded speed, strength, and coordination. (Kinzer**,** *WW II: A Navy Nurse Remembers,* Cypress Publications, 2007: 52-53)

Before participating in wheelchair basketball, many wheelchair-bound patients were bed-ridden and dependent on staff for all of their needs. These circumstances caused the patients to suffer from debilitating depression and a sense of hopelessness. Success in wheelchair basketball proved greatly beneficial in lifting the spirits of the paraplegic patients and in giving them a sense of confidence that they could make something of themselves in civilian life.(*Oak Park Oakleaves*, 2-26-1948)

After witnessing wheelchair bound patients playing basketball at Birmingham Hospital, Dr. Gray returned to NHC to form what became known as the "Rolling Devils", a precise and competitive wheelchair basketball team. (Ibid) One source asserts that the team was founded in February of 1947 (Labanowich and Thiboutot 2011: 9) while another suggests the founding date was March 15, 1947. (Devils-Bittner program, 5-26-1947: 2) WHS believes the March date is likely the most accurate, as it is taken from a period publication, the program for a game between the Rolling Devils and Oakland's Bittner professional basketball team in May of 1947.

On March 18, 1947, three days after the Rolling Devils team was formed, the Birmingham team came to the NHC gymnasium to play the Devils. This was the first documented game of wheelchair basketball played between two teams composed entirely of wheelchair-bound players. While the Devils were defeated, 20 to 6, they were not discouraged. Rather, the defeat spurred them on to train harder and practice relentlessly. As stated in a Devils wheelchair basketball program, "It seems as if each and every member of the Devils decided in some part of the game that the opponents could be beaten and they hoped to do it. In that they were new to the rules and the game, an intensive practice began and each afternoon much time was devoted to the principles of this game." (Ibid)

FIGURE 46: DR. GERALD GRAY, FOUNDER OF THE ROLLING DEVILS c. 1947

Source: Bittners-Devils Program, May 1957

As noted above, wheelchair basketball was transformational for the handicapped military personnel who practiced it. These benefits are nicely summarized in a book (*World War II: A Navy Nurse Remembers*) by Elizabeth Kinzer O'Farrel in which she recounts her experiences as a World War II nurse at NHC. Referring to wheelchair basketball at NHC, she wrote:

> "The paraplegic wards were literally abuzz with excitement. Even the quadriplegics were enthusiastic and were talking about how they could find a way to get to the game. Suddenly, we were seeing our patients beginning to feel like men, not like cripples waiting around to be sent to a veterans hospital for the rest of their lives, or worse home to become an object of pity and a burden to their families. Life was not quite the same on the paraplegic wards after the game. In subtle ways patients seemed more confident, as though they had somehow proved to themselves if not yet to anyone else that they could succeed at something, and that just maybe, if they really tried they might be able to make some kind of a life for themselves after their discharge from the hospital." (O'Farrell 2007: 52-53)

Following their defeat at the historic Birmingham vs. Devils game, the Rolling Devils went on to play some 26 games, winning all of these contests. (Paraplegia News, 10-1948: 8) Eventually, the Rolling Devils took to the air, flying in a specially equipped airplane to

Northern California, where they played St. Mary's College, the University of California at Berkeley, and finally the professional Oakland Bittners basketball team. (Devils-Bittner program, 5-26-1947: 2) This was the first documented instance of a paraplygic basketball team traveling by air to a distant game.

In Oakland, the Devils defeated the Bittners, 38 to 16. Leading the scoring on the Devils team was Johnny Winterholler, a former Wyoming University All-American basketball player. Louie "The Tank" Largey was said to steal the show with amazing defensive tactics. (*Oakland Tribune,* 5-27-1947: 15) Proceeds from the sale of tickets for the game were donated to the Paralyzed Veterans' Association of Corona, founded on March 25, 1947 by Dr. Gerald Gray. (Devils-Bittner program, 5-26-1947: 8)

The Northern California tour was sponsored by the *Oakland Tribune* newspaper, thus garnering the team considerable publicity. The *Oakland Tribune* articles were picked up by wire services with the result that news of the Rolling Devils was spread to dozens of newspapers across the United States. The publicity from the Northern California tour helped catapult wheelchair basketball and the Rolling Devils team into the public's attention and undoubtedly spurred the adoption of the game in many distant cities. This nationwide coverage continued until the Devils disbanded. (*Los Angeles Times*, Veteran's Wheelchair Team Will Hang Up Basketball Togs , 6-15-1947: A8)

Research suggests that the Birmingham team was the first to tour, but all of their touring was accomplished using ground transportation. The earliest out of town Birmingham game found by WHS occurred on February 9, 1947, when Birmingham played an exhibition half-time game with the women's Red Heads basketball team at the Long Beach Municipal Auditorium. (Long Beach Independent, 2-9-1947: 30) The earliest away Rolling Devils game found by WHS occurred on April 1, 1947 in Pomona, California. (Devils-Bittner program, 5-26-1947: 8) The Rolling Devils, however, was the first wheelchair basketball team to fly to a distant city via a specially equipped airplane. This set the stage for nation-wide travel by the Flying Wheels, the name given to the Birmingham wheelchair basketball team shortly before they were transferred to Long Beach Naval Hospital.

While, the Rolling Devils' impact on wheelchair basketball was significant, the team itself was relatively short lived. Created in March of 1947, by June of that year news was circulating that the team would disband. The June 15, 1947 *Los Angeles Times* carried a wire story which it headlined "Veteran's Wheelchair Team Will Hang Up Basketball Togs" (*Los Angeles Times,* 6-15-1947: A-8) Dozens of other newspapers across the country also carried this article.

At first glance it may seem surprising that a successful and pioneering basketball team like the Devils would disband so soon after it was formed. But the answer resides in two factors, the type of hospital to which the Devils team was attached and the period in history relative to World War II. Unlike Cushing and Birmingham, which were *veterans'* hospitals, the Devils were attached to a *general* military hospital. The significance in this lies in the fact that general hospitals existed for the purpose of administering urgent medical attention to its patients. Once an NHC patient had reached a point where he no longer needed this type of care, one of three things would happen:

- He would be sent back to his military unit.
- He would be transferred to a veterans' or a convalescent hospital.
- He would be sent home.

In 1947, the war had been over for some time and paraplegic patients and others with lower extremity issues were not being generated in battle. Consequently, while the populations of paraplegic patients were an ongoing phenomenon at veterans' hospitals, at general hospitals the trend was just the reverse. The fact that the Rolling Devils could not remain at NHC indefinitely, coupled with the sharp reduction in paraplegic cases meant that wheelchair basketball could not be perpetuated at NHC. This in no way, however, diminishes the significance and impact on wheelchair basketball that resulted from the Rolling Devils team.

FIGURE 47: THE ROLLING DEVILS LINE-UP c. 1947

Source: Bittners-Devils Program, May 1947

About a month after news of the Rolling Devils dismantling, news surfaced that suggested the team might go on to play at least one more game. The July 3 and 4, 1947 issue of the *Corona Daily Independent* carried a story that reported: "The Rolling Devils, Crack U.S. Naval Hospital wheelchair basketball team has been invited to play a top national

FIGURE 48 JOHNNY WINTERHOLLER c. 1946

Source: Kevin Bash Collection

professional basketball team in Chicago at the College Allstar World Championship tournament November 27, sponsored by the Chicago Herald-American." The paper went on to observe that sports editor Larry Birlaffi of the *Wyoming Daily Eagle* had pronounced the Devils the number one sports sensation of 1947. (*Corona Daily Independent,* 7-3 & 4-1947: 1) Unfortunately, the decision to disband the team had already been made and the Devils did not play this game.

In 1949, the Birmingham team took on the name "Flying Wheels" and launched a nation-wide tour, adopting the air travel methods developed by the Devils. Among the key players on the Flying Wheels were former Devils team members "Pistol Pete" Simon, Jerry Fensmeyer, and Neil Harris. The Flying Wheels team was later transferred to Long Beach Naval hospital. (Labanowich and Thiboutot 2011: 12)

Soon after wheelchair basketball had been given life at Birmingham, Cushing,

FIGURE 49: GROUP PHOTO SHOWING THE ROLLING DEVILS WITH THE UNIVERSITY OF CALIFORNIA at BERKELEY BASKETBALL TEAM c. May 1947

Source: Kevin Bash Collection

FIGURE 50: ROLLING DEVILS RELAXING ON THE NHC COURT c. May 1947

Source: Kevin Bash Collection

and NHC, the Paralyzed Veterans of America took on the mission of promoting the sport throughout the United States. By 1948 six veterans' hospital teams had been formed, including teams in Chicago, Memphis, Richmond, and New York. In Kansas City, Missouri, mixed teams composed of both veteran and non-veterans were formed. (Ibid: 12)

The Gym/Theater complex, the site of the first documented basketball game between two paraplygic teams and the only remaining gym of the three pioneers of wheelchair basketball, remains intact essentially the same today as it was in 1946. (Figure 51)

Essentially unknown when pioneered at NHC, wheelchair basketball today is one of the major disabled sports worldwide. Governing the sport is the International Wheelchair Basketball Federation (IWBF) This entity is recognized by the International Paralympics Committee (IPC) as the worldwide authority in wheelchair basketball. (http://www.iwbf.org/)

Some 82 National organizations promote and organize wheelchair basketball throughout the world . And, the number of wheelchair basketball teams and organizing bodies increases every year. It is believed that over 100,000 athletes play wheelchair basketball, from local clubs to national teams. (Ibid)

As an international game, wheelchair basketball is included in the Paralympics Games. Two years after every Paralymics Games, a Wheelchair Basketball World Championship is organized. Countries participating in these games include Canada, Australia, the United States, Great Britain, the Netherlands, and Japan. Wheelchair basketball also remains an important part of military rehabilitation programs for wounded warriors. (Ibid)

4. Theme Four: Role in the Local Community:

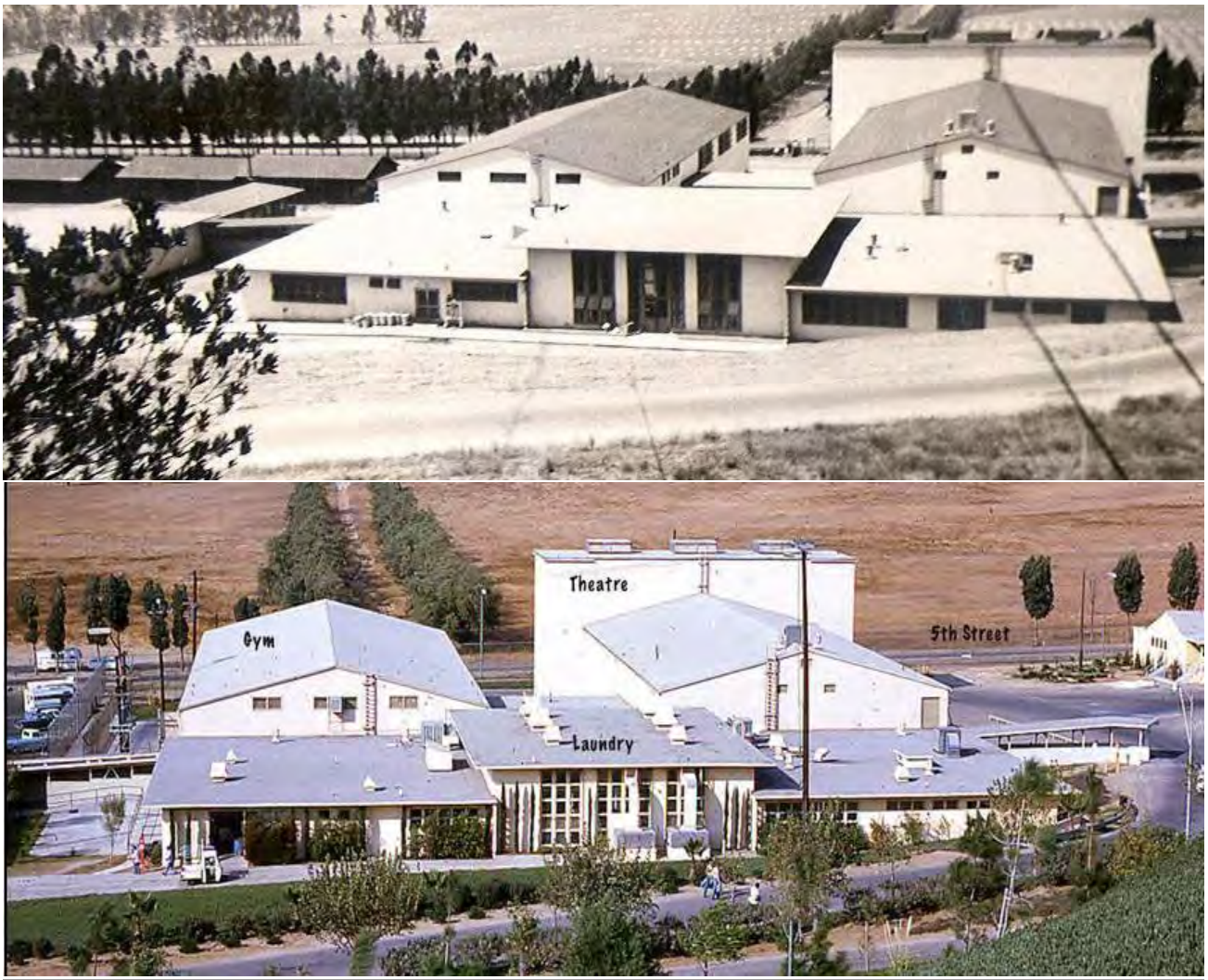


FIGURE 51: ABOVE: GYM-THEATER COMPLEX NEARING COMPLETION c. 1946 BELOW: CONTEMPORARY PHOTO OF GYM-THEATER COMPLEX

Source: Kevin Bash Collection

NHC was a major component in the Norco-Corona area's economic, social, and governmental service arenas. The *Corona Daily Independent* put it this way: "The U.S. Naval Hospital of Corona means much for the entire vicinity, Corona, Norco, Home Gardens and other areas." The article went on to discuss the many ways the hospital had benefitted the area:

- The area's fire protection services enjoyed a unique partnership with the Navy, whereby the Navy stood ready to respond to any community fire or medical emergency when needed.
- The NHC golf course was made available for public play.
- Other NHC recreational facilities were also shared with the community, including baseball, softball, bowling, billiards, and dancing.
- Of particular value were the entertainment aspects of the hospital which brought major bands and celebrities to the area.

- Employment was greatly boosted, either directly or indirectly, via NHC's presence in the area.
- Local businesses significantly benefitted by the demands for goods and services generated NHC.
- USO and other military service organizations established a strong presence in the area, providing local employment and drawing customers for local businesses.
- NHC brought prestige to the area as a major center of some of the nation's best doctors, medical scientists, and specialists.
  (*Corona Daily Independent,* 12-23-1946: 1)

The local business community had an especially close relationship with NHC. The *Corona Daily Independent* reported that "Corona business interests consider the establishment of the US Naval hospital in the Corona area the most important single development helping the growth of Corona of anything that has taken place in the city's history. (*Corona Daily Independent*, 3-11-1946: 1)

This fact is also amply demonstrated in the concerted and diligent effort made by local organizations in the Norco-Corona area to keep NHC open as a general or veterans' hospital. See Part 2, Section 2, for a detailed accounting of the many efforts made to keep NHC intact.

Among the more significant connections between NHC and the Corona/Norco communities was the large number of volunteers that assisted in the care of NHC's patients. The Gray Ladies was a Red Cross contingent devoted to non-medical care of NHC patients. They did everything from playing cards with patients to, to transporting them to and from the hospital, to talking to them about their joys, concerns, and personal interests.

Further research is underway regarding this theme to more fully develop its role in NHC's history.

5. Theme Five: Unique Connection to Hollywood

The Norconian's proximity to Hollywood and the established connections between Hollywood and the Norconian Resort resulted in a unique bond between Hollywood and NHC that went beyond that of any other Naval hospital. The use of the term "Hollywood" is a reference to the entertainment industry. Other prominent people were also associated with NHC and these individuals are also addressed in this section.

Over time, there were many illustrious patients at NHC, including:

- Film actor Louis Hayward recovered from battle fatigue at NHC after filming the Academy Award winning *The Marines at Tarawa.* (*Los Angeles Times*, Ida Lupino to 'Go Sweet' for Change, 2-13-1944, C1) considered so gruesome that President Roosevelt had to okay it's release. (*The War*, Documentary, 2007)
- Baseball Hall of Famer Bill Veeck. (*Kokomo Tribune*, Brewer's President Given Discharge, 8-18-1945)
- Corydon Wassell, the Navy physician who saved the lives of twelve wounded by evading capture by the Japanese, portrayed by Gary Cooper in the film *The Story of Dr. Wassell.* (*Los Angeles Times*, Wounded in Hospital Quiet During Navy Day, 10-28-1943, A)
- Franklin Roosevelt's wife Eleanor visited NHC and was quoted as saying: "It is indeed an admirable place for the Navy to take care of its men." (*Corona Daily Independent*, Wife of Chief Executive Has Lunch at Noon, 4-26-1943, A-1).

FIGURE 52: RED CROSS "GRAY LADIES" VOLUNTEERS FROM THE LOCAL COMMUNITY POSE WITH CAPTAIN JENSEN AND WIFE c. 1943

Source: Kevin Bash Collection

- Helen Keller visited in April of 1946 (*Corona Beacon*, 4-26-1946) and, according former WAVE Vickie Dean, inspired those who had lost their sight, suffered paraplegia, and other afflictions. (Oral History, Vickie Dean, 2009)
- Joe DiMaggio in 1943 delivered a scoreboard for the ball filed donated by the *Los Angeles Times* (*Los Angeles Times,* 6-11-1943, Corona Naval Hospital Gets Diamond-Graph, A13), and
- Famed English Nurse Sister Elizabeth Kenny visited to demonstrate her views on treating Infantile Paralysis. (*Corona Daily Independent*, Sister Kenny Addresses Staff at Navy Hospital, 3-21-1944, A1)

NHC enjoyed a unique connection to Hollywood and Olympians. Prior to its conversion to a Naval hospital, the Norconian Resort drew the biggest stars of the day and was used as a location for several films. Clark Gable, Norma Shearer, Buster Keaton, Bob Hope, Spencer Tracy, and numerous other stars visited and played at the hot springs resort. And, the best Olympic divers and swimmers competed and trained regularly at the Norconian pools. (*The Norconian Resort,* Bash and Jouxtel, 2007)

As might be expected, upon becoming a Naval hospital, those same stars and athletes returned to entertain and visit with the wounded and sick Sailors and Marines. Esther Williams, before Hollywood stardom, was a young Olympic swimming hopeful who trained and performed at the old Norconian, (*Corona Daily Independent*, Noted Divers to Entertain at Norconian, 7-11-1939, 1) and later returned to give exhibitions and swimming lessons to patients. (Oral Interview, Esther Williams, 2009) (Letter, Francis to Lastfogel, 12-9-1943) Sammy Lee, the famed Olympic diver also utilized the Norconian pools prior to the war, (*Corona Daily Independent*, Noted Divers to Entertain

FIGURE 53: LEFT: GRAY LADY PLAYS CARDS WITH PATIENTS, RIGHT: PATIENTS WITH RED CROSS VEHICLE c. 1945

Source: Kevin Bash Collection

at Norconian, 7-11-1939, 1) and later returned to NHC to stage diving exhibitions for the patients. (Oral History, Sammy Lee, 2008 – 2010)

Hollywood stars entertained at Navy and Army camps, hospitals and battlefields all over the world through the USO, Hollywood Victory Committee, and other groups. While NHC enjoyed this same type of entertainment, its association with Hollywood went beyond performances alone.

NHC was a springboard in 1942 for a unique organization dedicated to serving the Coast Guard and Navy. The Naval Aid Auxiliary (NAA) was founded by the wives of some of the most powerful men in Hollywood. It was chartered under the supervision of the Eleventh Naval District and registered with the President's War Relief Control Board as the first volunteer women's naval welfare organization founded and chartered to serve the Navy and Coast Guard. (*Naval Aid Auxiliary Souvenir Booklet,* 1944)

The NAA "...was organized to promote the welfare of and to furnish financial and other assistance and relief to enlisted men and other personnel of the United States Navy and Coast Guard and their families and dependents." (Ibid) The direct connection of the NAA's leaders to members of the Hollywood elite, led to direct access to, and participation by, the biggest names in Hollywood,

A unique unit of the NAA was the "Hospital Service," which was begun by film star Kay Francis at NHC in 1942. While the Hospital Service would eventually grow to encompass Navy, Army and VA Hospitals across the nation, the genesis of this organization was established at NHC. (Ibid)

Unlike the USO and Victory Committee touring companies, this was not the typical wartime entertainment unit, but one devoted to visiting and speaking with individual patients weekly, sometimes staying with them while they died of their injuries. (Letter, Francis to Lastfogel, 12-9-1943) Francis served as the "morale officer" for NHC and every week personally visited hundreds of

patients at the hospital with some of her Hollywood friends, including Cary Grant, Francis Langford, and James Cagney. (ibid) Key to these visits were not only the movie stars, who inspired multiple stories written by former patients (*A Kiss for your Mother: A Tribute to Claudette Colbert*, Mathews, Carl, 2009), but, also the Hollywood Starlets who were enormously popular with the patients (*Los Angeles Times*, Kay Francis to Tour Military Hospitals, 9-27-1942, D4).

After being born at NHC, the NAA program spread to the newly opened Long Beach Naval Hospital in 1943. The stars and starlets who participated in NAA activities operated with two units running simultaneously between Long Beach and NHC. In 1944 after having been born at NHC and spreading to Naval Hospital Long Beach, the NAA program was expanded throughout the nation (Los Angeles Times, 7-21-1944, A5).

However, there was a significant difference – because of its proximity to Hollywood, only NHC and later to a lesser extent, Naval Hospital Long Beach, enjoyed regular weekly visits by the top movie stars of the day. While the program took off in other more distant military hospitals, these military facilities were generally entertained by lesser celebrities. NHC, on the other hand, received regular visits by the likes of such great stars as Randolph Scott and James Cagney. (Letter, Francis to Lastfogel, 12-9-1943).

The film *Voyage to Recovery,* in which Kay Francis made an appearance, detailed the Navy's efforts to treat and rehabilitate wounded and sick Marines and

FIGURE 54: INJURED SAILORS ENJOY A SHOW AT THE NHC THEATER c. 1945

Source: Kevin Bash Collection

FIGURE 55: TONY ROMANO, FRANCIS IANGFORD, ADOPH MENJOU KEN CARPENTER COMFORT AN INJURED SAILOR AT NHC c. 1942

Source: Kevin Bash Collection

FIGURE 56: NAA BOOKLETOCHURE c. 1944

***Source: Naval Aid Auxiliary Souvenir Booklet,* 1944**

FIGURE 57: DEANNA DURBIN c. 1942

Source: Kevin Bash Collection

Sailors. *Voyage to Recovery"* was filmed at NHC, which by many accounts was the most beautiful hospital in the chain. This film was shown throughout the Naval Hospital chain, then released to the general public (*Corona Independent,* "Rehabilitation at Naval Hospital Is Topic for Rotary," 4-5-1946, A1). Captain Jensen claimed the hospital was chosen as the site for the film because of "its excellent progress in the restoration of naval personnel to good health (*Corona Daily Independent*, 3-26-1945: 1).,

FIGURE 58: KAY FRANCIS, NAA UNIFORM c. 1942
Source: Kevin Bash

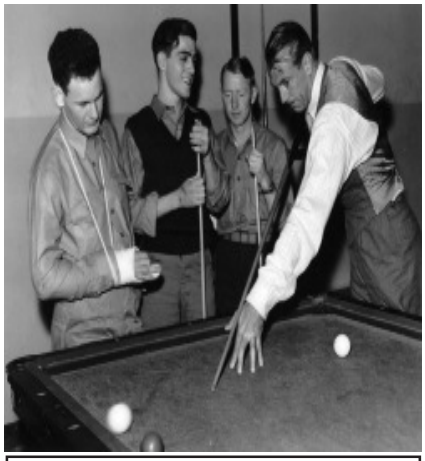


FIGURE 59: GARY COOPER c. 1942

Source: Kevin Bash Collection

PART 2, SECTION 4: IDENTIFICATION OF HOSPITAL ERA BUILDINGS AND STRUCTURES

Per National Register Bulletin 15, a property must retain integrity to its period of significance to qualify for National Register listing. (National Register Bulletin 15 1997: 44) In this regard, NHC enjoys a unique advantage over other Naval hospitals in the Western United States.

In California, there were only two permanent Naval hospitals at the beginning of World War II. These were Naval Hospital San Diego and Naval Hospital Mare Island.

Naval Hospital San Diego enjoys a significant World War II history, but it differs greatly from NHC. First, it was not built as a World War Ii hospital. During World War I it opened as a tent hospital in San Diego's Balboa Park. Its first permanent campus opening occurred in 1925. (http://www.sandiegohistory.org/amero/notes-1925.htm) While a beautiful and significant hospital, it lacks integrity to its World War II form. In this regard, some of the significant former Pan American Exposition buildings it adapted to hospital usage for World War II have been demolished and replaced with new buildings. Further, its dedicated hospital campus has been altered and expanded to meet current medical needs. Consequently, Naval Hospital San Diego no longer retains integrity to its World War II form.

Mare Island is another example of a significant California Naval hospital with issues pertaining to its World War II integrity. The now decommissioned, but historically significant Naval facility differs significantly from NHC. Its campus consisted of a number of Naval uses, of which the hospital was only one. Besides the hospital, base facilities at Mare Island during World War II included an ammunition depot, paint and rubber testing laboratories, and schools for firefighters, opticians, and anti-submarine attack. Its hospital was first established in 1869, and therefore, unlike NHC was not built for World War II. (Kern, James & Vallejo and Naval Historical Museum Images of America: Vallejo. Arcadia Publishing, 2004) (http://discovermareisland.com/history/)

Elsewhere in the Western United States, there were two other general hospitals in place before the beginning of World War. These were Naval Hospital Puget Sound and Marine Hospital Seattle. Of these two, only Marine Hospital Seattle remains intact, and its1933 built Art Deco building is listed on the National Register of Historic Places. The balance of the Naval hospitals in the Western United States were built during World War II, specifically for the purpose of serving World War II patients. All or a majority of the buildings on all of these hospital campuses were of temporary construction.

NHC is distinctive for a number of factors, including those related to its role as a central medical facility during World War II. But, regardless of the significance of its history as a medical institution, NHC has the following distinctions not shared by any extant World War II Naval hospital in the Western United States

- Only NHC and the National Register listed Marine Hospital Seattle retain integrity to their World War II form. All of the others have been substantially altered or demolished. And, the Marine Hospital is actually in a different category, as it was built prior to World War II, not during the war as was the case with NHC.

- It is also the only remaining resort-based World War II Naval hospital that remains intact from that period. Other than NHC, all of the resort-based Naval hospitals were returned to their prewar owners, with any temporary construction removed as part of the restoration of the grounds. he two aerial photographs of the property in Figure 20, clearly support the fact that it retains amazing integrity to its World War II form. The

aerial taken in the 1940s and that taken recently are nearly identical. One has to look very closely to discern the absence of a few buildings and the addition of several utility buildings.

The following is a list of the more substantial buildings and structures at NHC that remain intact from the Hospital Era. Photographs and architectural descriptions of these buildings appear in the section that follows this list. Note that the list does not include all of the property's buildings/ structures, especially the smaller and more utilitarian examples..It also does not include buildings and structures that are no longer extant. For two overall views of the NHC campus, see Figures 3, 10, and 11.

Unit 1

Norconian Hotel Building (101)

Norconian Tea House (102)

Norconian Power House (302)

Hospital Annex (307-312)

Nurse's Quarters (103-104)

Chauffeurs' Quarters (209)

Norconian Pavilion (201)

Boathouse (203):

Occupational Therapy (305)

Chapel (306)

Corpsman's Quarters (301)

Norconian Garage and Laundry (204)

Theater (320)

Gymnasium (321)

Ships Service/Laundry (322)

Ships Service Storage (318)

Gate House (300)

Electric Shop (208)

Plumbing Warehouse (213)

Truck Shelter (214)

Animal House (220)

Sewage Treatment Plant (801)

Unit 2

Headquarters Building (512)

Theater/Recreational Building (511):

Kitchen/Mess (515)

Power House (513)

Corpsman's Quarters (501, 502, 503)

Bag Storage (515)

Sick Officers' Quarters (505, 506, 507)

Bag Storage (539)

Tuberculosis Wards, Phase I (508-510, 514, 515, 518):

Tuberculosis Wards, Phase II (517, 519-523)

Unit 3

Administration(448)

Kitchen/Mess (453)

Disbursing (427)

Treatment (458 and 456)

Recreation/Storage (451)

Boiler Plant (449)

Help's Quarters (457and 459)

Bag Storage (447)

Fire House (498)

Hospital Wards (429, 431-439, 441-443, 445-446, 461-469, 471-473, 475-477)

The following architectural descriptions address the buildings and structures as listed above.

1. Unit 1 Architectural Descriptions

a. Unit 1 Site Plan

Unit 1 was widely distributed within the Norconian property, with many buildings adapted for hospital use from original resort buildings. Unit 1 was centered on the Norconian Hotel building and was both the general hospital and command center for the overall hospital campus. It also provided hospital-wide support and utility buildings. Support building examples include NHC gym, chapel, laundry, theater, corpsmen's quarters, and WAVES' quarters. Utility buildings include NHC's sewage treatment plant, vehicle repair facilities, and building maintenance facilities.

b. Unit 1 Main Administration (Hotel Building) (Bldg. 101, 1928)

Designed by architect Dwight Gibbs and originally built as a luxury hotel, this building was used during World War II for overall hospital administration, hydrotherapy treatment, surgery, x-ray, physical therapy, and a variety of social events. When NHC closed in 1957, the hotel sat vacant until 1962, when that portion of the property not already in use for weapons RDT&E was reopened as a state prison for criminals with drug addiction problems. Known as the California Rehabilitation Center (CRC), the old hotel building was pressed into service as the administrative arm of the prison. Unfortunately, in 2002, it was once again abandoned due to seismic safety concerns.

The massive hotel building contains some 204,000 square feet and ranges up to six levels in height. It is irregular in plan, and its walls and foundation are made of reinforced concrete. All exterior walls have a stucco finish, and all roof areas visible from below are sheathed in red clay tile. Other, less visible roofs are finished with composition roofing. Several roof styles are used throughout the building, with gabled roofs predominating. Elsewhere are hipped roof towers, shed roofs, vaulted roofs, and flat roofs. The main entrance to the building is situated at the top of a prominent hill that overlooks a major part of the property. The three lowest levels of the building step down the grade of the hill upon which the building is built. The three upper-most levels are situated at the top of the hill. This upper level of the building takes on a "U" shape formed by a central wing with two perpendicular wings that enclose the landscaped entry to the building. The main entry provides access to the hotel's main lobby and its guest rooms. The levels below this upper level are occupied by public rooms, such as the dining hall, ballroom, and spas. At the lowest level are two interconnected outdoor

pools, one an Olympic sized pool and the other a smaller pool that services the high dive. By stepping the building down the slope of the hill, many of the hotel's rooms are exposed toward the property's Southwest Landscape, which consists of vast open spaces that include landscaped grounds, three prominent hills, a man-made lake, and an area once devoted to a golf course.

The building's architecture is Spanish Colonial Revival, designed with sculptural volumes that create many smaller masses to break up the monumental size of the structure. Focal areas are highlighted through the use of cast Churrigueresque ornamentation. The building also features such classic Spanish Colonial Revival design elements as arches, wrought iron, wood sash windows, French doors, and ornamental glazed ceramic tile.

The Hotel Building retains excellent integrity to both its Resort and Hospital Eras; however, since it was vacated in 2002, the State of California has allowed the building to fall into disrepair.

The hotel building was fully documented by Knox Mellon and Associates in 1998, and was placed on the National Register of Historic Places as a contributor to the Lake Norconian Club Historic District in 2000. (National Register Listing Documentation and Approval 2-4-2000)

c. Unit 1 Hospital Annex (Bldgs. 307-312, 1943)

Designed by master architect Claud Beelman, the Annex is attached to the east side of the Hotel building, by an enclosed bridge that extends over a service road. Beelman designed this wing in the Spanish Colonial Revival style to complement the architecture of the Dwight Gibbs designed Hotel building.

The Annex has three wings and as many as six floors open to view from the outside, corresponding with the terrain upon which each wing is built. The building's construction is that of steel reinforced concrete with a stucco exterior finish. While less ornate than the hotel building, the Annex employs a number of design features to express the Spanish Colonial style. These include hipped clay tile roofs, cast ornamentation, clay tile capped cupolas, an exterior stucco finish, and cast horizontal belt courses to break up the vertical mass of the building. The ends of each wing are highlighted with more ornate windows that assume a tall horizontal form. The portion of the building closest to the hotel employs additional Spanish Colonial Revival detailing, including arched recesses and a gracefully designed arched bridge that extends over a service road. At the peaks of the building's red clay tile roofs are cupola roof ventilation elements that are repeated on the majority of NHC's significant Claud Beelman designed buildings.

The Annex retains a high level of architectural integrity to its World War II appearance and would qualify as a contributor to a Hospital Era Historic District..

d. Unit 1 Tea House (Bldg. 102, 1927)

The Tea House was the first improvement of the Norconian Resort to be completed. It is situated west of the hotel, nestled into the side of the same hill that supports the hotel building. The uppermost element of the Tea House is a terrace situated at the same level as the hotel entrance. This terrace serves as the roof of the Tea Room building below and a vantage point toward the property's expansive Southwest Landscape.

To the south of the terrace, one story down, is a patio area which provides access to the the enclosed Tea House building. Linking the upper terrace to the lower patio is a pair of concrete stairways. The south edges of the patio and the terrace are secured by ballustraded concrete walls. The facade of the Tea House is segmented by pilasters, with arched openings situated between each pair of pilasters. These openings originally provided access to the Tea House via French doors, however, today the openings are infilled with wood and glass panels.

This Tea House was fully documented by Knox Mellon and Associates in 1998 and was placed on the National Register of Historic Places as a contributor to the Lake Norconian Club Historic District in 2000. (National Register Nomination 2000) The Tea House retains integrity to both the Resort and Hospital Eras, and thus would be a contributor to a Hospital Era Historic District.

e. Unit 1 Power Plant and Smoke Stack (Bldg. 302, 1928)

Situated northeast of the hotel building, is the Resort Era Power Plant/Smoke Stack complex. This building has an essentially rectangular floor plan, is one to two stories high, has stucco finished reinforced concrete walls, red clay tile roofing, and a reinforced concrete foundation. Visible for a considerable distance is the buildings smoke stack, which takes on the form of a Greek fluted column. Less ornate than the hotel building, the Power Plant's National Register documentation describes the building's architecture as "Spanish Eclectic." The building has two distinct elements, both with gabled roofs. One gabled element extends north and south, while the other gabled element, attached to the west side of the building, extends east and west. Windows and doors are functional in nature, with a variety of types present. Small shed additions have been made to the building over time, but its essential integrity remains intact.

The Power Plant and Smoke Stack were fully documented by Knox Mellon and Associates in 1998 and placed on the National Register of Historic Places as a contributor to the Lake Norconian Club Historic District in 2000. (National Register Listing Documentation and Approval 2-4-2000) The Power House and Smoke Stack retain integrity to both the Resort and Hospital Eras, and thus would be constitute contributors to a Hospital Era Historic District.

f. Unit 1 Nurses' Quarters Complex (Bldgs 103, 1943 and 104, 1944)

Designed by NHC architect Claud Beelman, the World War II era Spanish Colonial Revival style Nurses' Quarters Complex is situated west of the hotel building at the top of the hill upon which the hotel building is located. The complex consists of two interconnected buildings, both having the same general architectural character. The building to the north is referred to as the Nurses' Quarters and the smaller building to the south is referred to as the Nurses' Quarters Annex.

Both buildings are rectangular in floor plan, three stories in height and situated on reinforced concrete foundations. Both buildings have stucco exterior walls and red clay tile roofs. The roofs, while primarily of the hipped type, have gabled elements situated perpendicular to the main east-west orientations of the roofs. Prominent entries consist of gabled porticos at the east ends of both buildings, with another such entry at the west end of the Annex. Also centered on the south elevation of the Annex is a prominent entry that stands proud of the

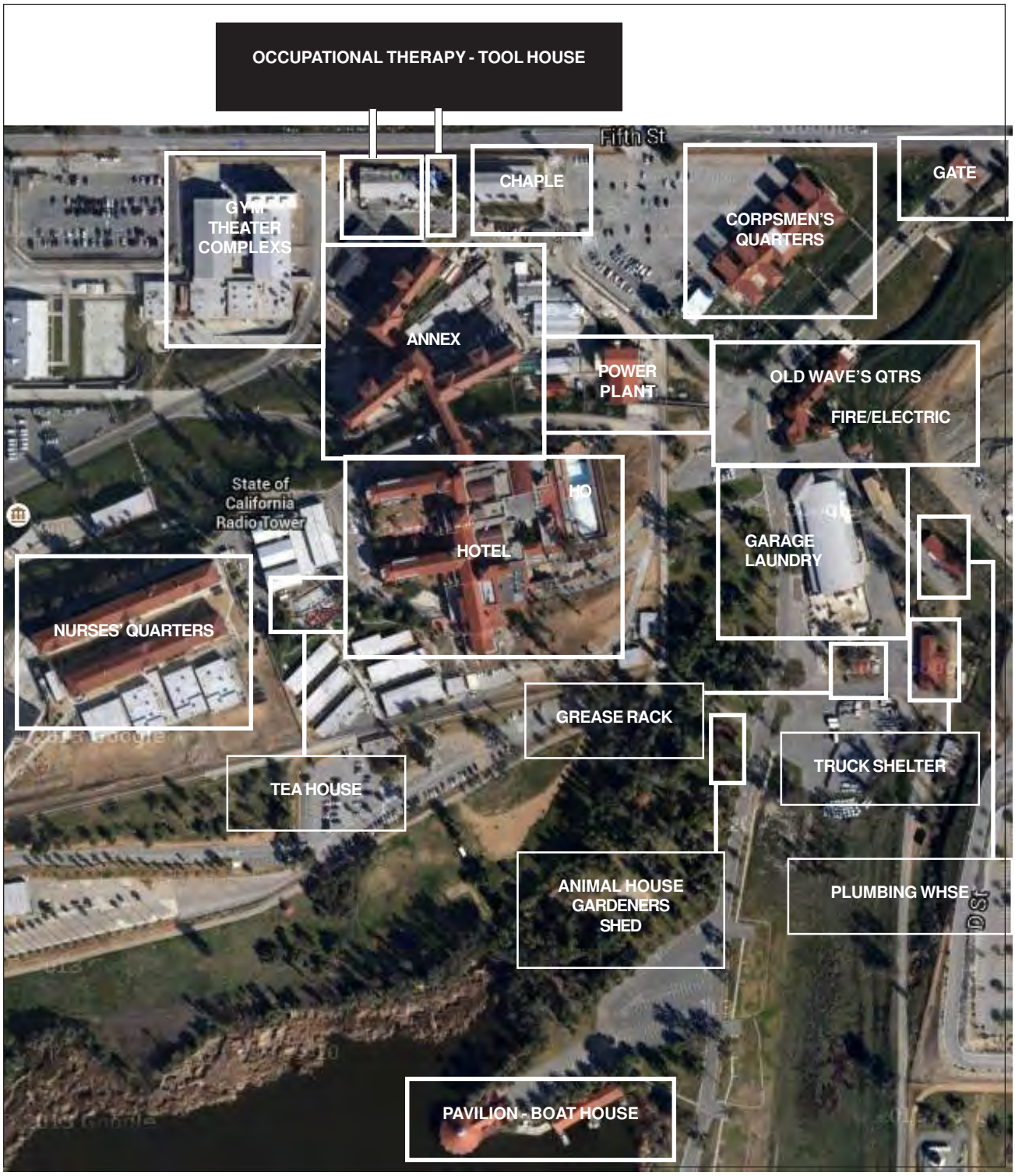


FIGURE 60: UNIT 1 SITE LAYOUT

Source: Google.com

main building wall. Dominating this entry are arched openings, three on the south face and one each on the east and west faces. All windows are rectangular in shape, with a vertical

FIGURE 61: UNIT 1 HOTEL (Bldg 101)

Source: Bing.com

orientation. A bridge that spans the space between the two buildings provides a connection at the center-point of each building. Gabled cupolas provide ventilation to each of the buildings.

The Nurses' Complex retains a high level of architectural integrity to its World War II appearance and would qualify as a contributor to a Hospital Era Historic District.

g. Unit 1 Chapel (Bldg. 306, 1944)

The Chapel is another of the property's Claud Beelman designed Spanish Colonial Revival themed buildings. Situated north of the hotel building, the chapel has a reinforced concrete foundation, stucco finished walls, and red composition shingle gabled roofs. The overall height of the building is that of a two-story building; however, most of the interior is dominated by a Sanctuary that consists of a single volume from floor to ceiling. Entry to the building is via a gabled portico that extends from the west end of the south elevation. The entry has a Classical Revival influenced surround, consisting of pilasters bridged at the top by an entablature that provides a space for the copy "ST. LUKE'S CHAPEL". Offering visual relief to the mass of the building is a shed roof that divides the vertical mass of the building into two planes. This roof extends across the balance of the south elevation east of the entry and continues around to the entire east elevation and a portion of the north elevation. In the upper reaches of the sanctuary are vertically oriented rectangular stained glass

FIGURE 62: UNIT 1 HOSPITAL ANNEX (Bldgs. 307-312)

Source: Bing.com

windows, each having a unique design in honor of the various religions, institutions, and organizations that contributed to the United States' commitment to World War II. While engineered and intended to have a red Spanish clay tile roof, the Chapel was fitted with a composition shingle roof as a cost saving measure.

The Chapel retains a high level of architectural integrity to its World War II appearance and would qualify as a contributor to a Hospital Era Historic District.

h. Unit 1 Occupational Therapy and Tool House Buildings (Bldgs. 305, 1942/43 and 313, 1944/45)

The Occupational Therapy and Tool House Buildings are World War II buildings of utilitarian design. The Tool House is a simple wood framed gabled building with exterior walls finished with stucco and a composition shingle gabled roof. The Occupational Therapy building is of similar design and materials. The Tool House building is essentially unaltered, while the Occupational Therapy building has been altered by the addition of shed additions to the rear (north) elevation and a deep shed canopy addition along the entire width of the south elevation.

Overall these buildings are reasonably true to their World War II appearance, with most alterations easily reversible and none of the alterations significant enough to detract from the

FIGURE 63: UNIT 1 TEA HOUSE (Bldg 102)

Sources: Bing.com and Kevin Bash Collection

essential architectural integrity of the buildings. Both would qualify as contributors to a Hospital Era Historic District.

i. Unit 1 Ship's Service Storage, Theater/Gymnasium/Laundry Ship's Store Complex (Bldgs. 315 and 320-322, 1945/46)

This complex consists of four elements that were built in late 1945-1946, over a year after the end of World War II. The four elements consist of a separate ships store storage building (Bldg. 315, Not in Photo) and three interconnected elements consisting of, a theater (Bldg. 320), a gymnasium (Bldg. 321), and a ships store/laundry complex (Bldg. 322). The storage building (Building 318) is a simple flat roofed building with a rectangular floor plan and a complete lack of architectural detailing. Windows are of the clerestory type and entry to the building is via simple man-doors. The theater and gymnasium buildings (321 and 322) are of utilitarian design with simple stucco walls and gabled roofs. The north end of the theater accommodates a tall stage fly area. Building 322, the ships store/laundry complex reflects the Modern architectural trends of the day. Its flat roof is divided into three elements. The central element is taller than the two elements that flank it. This central element has tall, floor to ceiling windows and glass doors which serve as the complex's main entry point.

Originally, this entire complex was linked to Unit 3 and the Unit 1 Annex via covered walkways that provided wheelchair access for patients situated in these facilities While

FIGURE 64: UNIT 1 POWER HOUSE (Bldg. 302)

Source: Kevin Bash Collection

these walkways are largely intact today, they are no longer continuous, as a segment that connected the gym to Unit 3, is no longer extant. Buildings 320 and 321 are interconnected via a fully enclosed passageway between the two buildings.

Overall this complex retains a high level of architectural integrity to its World War II era appearance and would qualify as a contributor to a Hospital Era Historic District..

j. Unit 1 Fifth Street Gatehouse (Bldg. 300, 1942)

While a relatively minor building among the Spanish Colonial Revival World War II era buildings at NHC, architect Claud Beelman gave this entryway a higher than normal level of architectural detail than would otherwise be afforded such a utilitarian building. As documented earlier, NHC was planned to be a flagship Naval hospital to be in use long after World War II. This gatehouse was designed by Beelman to establish a positive first impression announcing the importance of NHC and an introduction to the Spanish Colonial Revival architectural theme used throughout most of the NHC property. The Spanish Colonial Revival architectural theme is clearly reflected in the building's horizontal massing, low relief concrete ornamentation, red clay tile roof, the use of quoins in the supporting columns, the employment of stucco for the building's walls, and the distinctive details of the building's over hanging eaves with decorative rafters.. More than just a gateway, the

FIGURE 65: UNIT 1 NURSES' QUARTERS (Bldg. 103-104)

Source: Bing.com

gatehouse includes an enclosed personnel space with Spanish Colonial detailing evident throughout.

The Fifth Street Gatehouse retains excellent integrity to its original World War II architecture, with alterations limited to changes in window and door types. Accordingly, it would qualify as a contributor to a Hospital Era Historic District..

k. Unit 1 Corpsmen's Quarters (Bldg. 301, 1943/44)

The Corpsmen's Quarters is one of the major Claud Beelman designed buildings on the NHC property. The overall building is three-stories high, however, from the front (south elevation) only two stories are visible. The mass of the exposed three-story walls, as seen from the north side of the building are broken by a belt course trim element. All exterior walls are finished with stucco. All roofs are hipped in style, sheathed with red clay tile. All eaves have exposed decorative rafters. The majority of the windows are double hung wood sash types, most with a vertical rectangular orientation and four over four multi-paned glass. The

FIGURE 66: UNIT 1 CHAPEL (Bldg. 306)

Source: Kevin Bash Collection

building's five residential wings are tied together down the center with a hipped roofed corridor. The main entries to the building are centered on north and south faces of the middle wing. Each of these openings has a Classical Revival influenced surround, consisting of pilasters bridged at the top by an entablature. As is typical of most of the Claud Beelman designed buildings, distinctive gabled cupolas are use for attic ventilation.

The Corpsmen's Quarters retains excellent integrity to its World War II design, with the most noticeable alterations consisting of air conditioning ducting attached to the building for the purpose of cooling the massive computers that occupied the building during its use for the Weapons RDT&E era. Accordingly this building would qualify as a contributor to a Hospital Era Historic District..

FIGURE 67: UNIT 1 OCCUPATIONAL THERAPY and TOOL HOUSE (Bldgs. 305 and 313)

Source: Bing.com

l. Unit 1 Pavilion/Casino/Officers' Club (Bldg. 201, 1928)

Located on the east shore of Lake Norconian, south of and below the hotel building, the Pavilion building has been known by different names over the years. As an element of the hotel, it was referred to as the Pavilion or the Casino. During the World War II it was termed the Officers' Club, offering dining, entertainment, and drinking opportunities for the many officers assigned to NHC. Entry to the building is via a one-story wing accessible from a large paved parking lot. This wing leads to the signature element of the building, an octaganal pavilion that hovers over the lake and provides panoramic views of the lake via a deck that wraps around the lake frontage of the building. Designed by resort architect Dwight Gibbs, this building is a highly detailed and remarkable example of Spanish Colonial Design. Distinctive features include the octoganal shape of the ballroom, the prominent flag pole topped cupola at the top of the ballroom's peak, red clay tile roofing, carved rafter ends, floor to ceiling windows/doors adjacent to the deck, and stucco exterior walls elsewhere. Alterations to the building include some small shed additions, the replacement of the doors and windows, and the addition of a bar space to the south side of the entry corridor.

This building was fully documented by Knox Mellon and Associates in 1998 and was placed on the National Register of Historic Places as a contributor to the Lake Norconian Club Historic District in 2000. (National Register Nomination 2000)

Despite the alterations described above, the core components of this building retain excellent integrity to both the Resort and Hospital Eras. None of the alterations are fundamental to the building, and all could be reversed. Accordingly this building would qualify as a contributor to a Hospital Era Historic District..

m. Unit 1 Boathouse (Bldg. 203, 1929)

Situated southeast of the Pavilion, the Boathouse is another of the Dwight Gibbs designed structure that served the Norconian Resort as an access point for recreational boating on

FIGURE 68: UNIT 1 SHIP'S SERVICE STORAGE (Bldg 315) GYM, THEATER, SHIP'S STORE, LAUNDRY (Bldgs. 321-323)

Source: Kevin Bash Collection

the lake, the same purpose it served during the Hospital Era. The building is of Spanish Colonial Revival design, with a rectangular floor plan, gabled red clay tile roof, and stucco finish. Essentially a deep overhang to provide shelter for boats and access to the lake via a series of three perpendicular docks, this building is remarkable for the exposed structure of its roof and Spanish Colonial Revival detailing, most notably expressed in the exposed structural elements of the roof and in the bell tower like features at the east and west ends of the building.

The Boathouse was fully documented by Knox Mellon and Associates in 1998 and was placed on the National Register of Historic Places as a contributor to the Lake Norconian Club Historic District in 2000. (National Register Nomination 2000)

While altered in regard to its replacement red clay tile roof, the Boathouse retains excellent integrity to both the Resort and Hospital Eras. Accordingly it would qualify as a contributor to a Hospital Era Historic District.

n. Unit 1 Chauffeurs'/Maids' Quarters (Old Wing of WAVES Quarters) (Bldg. 209, 1929)

This Spanish Colonial Revival style buiding was designed by resort architect Dwight Gibbs to house maids and chauffeurs. While utilitarian in function, the level of detailing on the building suggests a much more prominent role for resort guests. During World War II it served a number of functions, including interim uses as officers' quarters and WAVES quarters. Roughly U shaped in its floor plan, the building features a red clay tile hipped and gabled roof, stucco exterior walls, and a variety of window styles including rectangular, arched, and square. Wrought iron grille work asssociated with some windows suggests the presence of balconies, but lack the depth to serve as such. The main entry to this building is a three-story tower with a clay tile sheathed pyramidal roof. Other than a small one-story wing at the south end of the building and the building's three-story tower entry, also at the

FIGURE 69: UNIT 1 FIFTH STREET GATEHOUSE (Bldg. 300)

Source: ASM 2011

south end of the building, the Chauffeurs' quarters is a two-story building. Attic ventilation is achieved via Claud Beelman's signature cupola features that extend from the roof.

This building was fully documented by Knox Mellon and Associates in 1998 and was placed on the National Register of Historic Places as a contributor to the Lake Norconian Club Historic District in 2000. (National Register Nomination 2000)

Other than minor alterations to windows and doors, this building retains excellent architectural integrity to both its Resort and Hospital Eras. Accordingly it would qualify as a contributor to a Hospital Era Historic District..

o. Unit 1 Garage/Laundry/Gasoline Pump Island (Bldg 204, 1930)

Another example of a utilitarian resort era building given a much higher level of architectural detail than would be expected in relation to its function, the Garage/Laundry Building is situated south of the Chauffeur's Quarters. An eclectic building featuring both Spanish Colonia Revival and Italianate details, this building has a character unlike other resort era buildings. With a rectangular floor plan and concrete slab foundation, the central portion of the Garage/Laundry building extends to the height of a two-story building, however, its interior is all a single volume.

The true two story portion of the building is situated at the main entry at northwest corner of the building. This hipped roof element houses offices on its upper floor and an entry foyer and offices on its lower floor. This main entry area is the most decorative aspect of the

FIGURE 70: UNIT 1: CORPSMEN'S QUARTERS (Bldg. 301)

Source: Kevin Bash Collection

building, dominated by huge arched openings that house windows and doors and substantial quoin detailed pilasters. The roof overhang of this part of the building features Italianate brackets that help give the building a formal, European appearance. An important feature of this building is the Lake Norconian Club cast shield situated at the northwest face of the entry portion of the building. The east and west frontages have shed roofs at the one-story level below which are windows and doors that are suggestive of row-houses, with each "unit" separarated by quoin detailed pilasters. Between the shed roofs and barrel garage roof are clerestory windows that enhance the two story appearance of the building. Breaking the continuity of the shed roofs is a small hipped roof element at the northeast corner of the building. All roofing is composition shingles and rolled roofing.

Immediately outside of the main entry to the building is an ornate gasoline pump island, characterized by a hipped red clay tile roof, exposed decorative structural members, and oversized fluted columns.

Unfortunately, the distinctive Laundry portion of his building, shown in the lower right corner of the photo montage, was demolished in 2000 by the Navy in accordance with a bureaucratic policy calling for the demolition of building space equal or larger than that of any new building.

This building was fully documented by Knox Mellon and Associates in 1998, and was placed on the National Register of Historic Places as a contributor to the Lake Norconian Club Historic District in 2000. (National Register Nomination 2000)

Other than the loss of the Laundry element, this building retains excellent integrity to both its Resort and Hospital Eras. Accordingly it would qualify as a contributor to a Hospital Era Historic District..

FIGURE 71: UNIT 1 PAVILION AND BOAT HOUSE (BLDGS. 201 and 203)

Source: Kevin Bash Collection

p. Unit 1 Plumbing Warehouse (Bldg. 213, 1942), Truck Shelter (Bldg. 214, 1942), and Grease Rack (Bldg. 215, 1944)

The Plumbing Warehouse and Truck Shelter are utilitarian buildings with concrete slab foundations, wood siding and composition shingle roofing. The Plumbing Warehouse has a simple gabled roof and rectangular floor plan, while the Truck Shelter has a cross gable and shed roof at its south elevation, giving it a shallow L shape. Large garage doors enclose the interior of the Plumbing Warehouse, while the Truck Shelter's openings are unenclosed, other than the presence of chain link fencing across each opening. The Grease Rack has a rectangular floor plan and is situated on a raised concrete block foundation. It's walls are stucco finished and its gabled roof is clad in composition shingles. A roll-up garage door at the building's east elevation leads to a vehicle servicing space with sunken work area. The aluminum slider windows are replacements to the originals.

These buildings retain good integrity to their World War II origins, with obvious alterations limited to the windows and doors of the Grease Rack Building. These are minor, utilitarian buildings and would not be priority contributors to a Hospital Era Historic District.

q. Unit 1 Fire Station/Electric Shop (Bldg. 208, 1944)

The Fire Station/Electric Shop building is among the Claud Beelman designed buildings that carry out the Spanish Colonial Revival architectural theme of NHC. The rectangular shaped floor plan of this building accommodates a concrete slab foundation, stucco clad walls, and hipped red clay tile roof. Hinged wood garage doors provide vehicular access to the building from its north elevation. Windows are of the double hung wood sash type and appear

FIGURE 72: UNIT 1 CHAUFFEURS' QUARTERS/WAVES' QUARTERS (Bldg. 209)

Source: Bing.com

original to the building. Like the Garage/Laundry Building the roof overhand features Italianate style brackets. Each corner of the building is enhanced with a pilaster column.

This building retains good integrity to its World War II era, and accordingly would qualify as a contributor to a Hospital Era Historic District..

r. Unit 1 Animal House (Bldg 220, 1946)

This is a simple stucco clad building situated on a rectangular reinforced concrete foundation. Walls are stucco clad and the ends of the gabled composition shingle roof are sheathed in lapped wood siding. Various windows and doors appear to be later replacements or additions. Now used as a restroom, this building once housed the animals used for laboratory experiments. Maps show it as both Building 220 and 217.

This building retains enough integrity to its original form to qualify as contributors. Its original use to house animals for laboratory testing is significant, as medical testing was a key activity at NHC and one that played a significant role in advancements in medicine. Accordingly it would qualify as a contributor to a Hospital Era Historic District..

s. Unit 1 Gardener's Tool Shed (Bldg. 218, 1942)

FIGURE 73: UNIT 1 GARAGE (Top and Upper Left) LAUNDRY (Lower Right- Demolished) (Bldg. 204)

Source: Bing.com and Kevin Bash Collection

The Gardner's Tool Shed (Bldg. 218) has a rectangular floor plan and is supported on a reinforced concrete foundation. Walls are stucco clad and the ends of the gabled composition shingle roof are sheathed in lapped wood siding. Various windows and doors appear to be later replacements or additions.

Constructed in 1942, this building is among the oldest that survive from the World War II era. It also retains enough integrity to its World War II era to qualify as a contributor to the Hospital Era Historic District.

2. Unit 2 Architectural Descriptions

a. Unit 2 Site Plan and Architectural Theme

The overall Unit 2 campus consists of two distinct elements. Spanning the length of the property in a north-south direction is a complex of buildings laid out in classic military pavilion fashion and interconnected by a central spine of covered walkways. In the center of

this complex are buildings that serve the entire Unit 2 campus, including buildings devoted to administration, recreation, and subsistence. As originally designed, housing for staff was situated to the north and east of the central campus. The northerly complex of housing is still extant; however, the easterly complex of housing was demolished by the Navy in the mid-2000s and replaced with a laboratory building.

Unit 2 was an important component in the Spanish Colonial Revival theme of NHC, taking this architectural theme beyond the central hospital campus, into a separate area southeast of the central campus. Unless otherwise noted, all buildings are single story, with generally rectangular floor plans, and concrete slab foundations. Roofs are predominantly gabled and sheathed in red clay Spanish tiles. The predominant wall material is stucco. All buildings also are equipped with gabled cupolas that serve to ventilate attic spaces, a design element repeated throughout the Claud Beelman designed buildings on the NHC property.

b. Unit 2 Command Center (Bldg. 512, 1943)

The Unit 2 Command Center is centrally located among Unit 2's tuberculosis ward buildings and within a sub-campus of support buildings. As a focal point building, it has more design detail than most of Unit 2's other buildings. It's entry is via a porte cochere, served from a circular driveway. Centered on the circular driveway is a flag pole with a distinctive ship-like design. A view into the porte cochere is afforded through an arched opening in which a mission-like bell is hung.

The Command Center building retains remarkable integrity, with alterations limited to the replacement of some of its double hung wood sash windows and all of its exterior doors. The Command Center would qualify as a key contributor to a Hospital Era Historic District.

c. Unit 2 Theater/Recreation Building (Bldg. 511, 1943)

The Recreation Building is situated southeast of the Command Center. While predominantly rectangular in floor plan, the west side of the building has a prominant projection with four distinct design elements. At the center of the projection are two pedimented gabled elements that step down from the building's main roof. To each side of the larger gabled projection are lower elements with hipped roofs. This important character defining feature of this building remains remarkably intact to its World War II origins, including a beautiful multi-pane arched window centered on the above described projection. Original windows are double hung wood sash types, some of which have been replaced with metal framed windows. The entry/exit doors, situated at the north and south ends of the building, are modern storefront replacements. Like the Command Center, the Theater/Recreation Building is a signature aspect of Unit 2.

Remarkably, this important building retains very good integrity to its World War II origins. The photo of this building in Figure 80 was taken in 1957, yet the building is largely unchanged today. The Recreation Building would qualify as a key contributor to a Hospital Era Historic District.

d. Unit 2 Subsistence Building (Bldg. 515, 1943)

The Subsistence Building originally housed Unit 2's cooking facilities and dining hall. Predominantly rectangular in floor plan, it includes a substantial side gable that extends easterly from the north end of the building. This projection terminates in a patio area,

FIGURE 74: UNIT 1 PLUMBING WAREHOUSE (Bldg. 213), TRUCK SHELTER (Bldg. 214), GREASE RACK (Bldg. 215)

Source: ASM 2011

FIGURE 75: UNIT 1 FIRE STATION/ELECTRIC SHOP (Bldg. 208)

Source: ASM 2011

enclosed by concrete block walls. Another smaller side gable that is situated to the south of the larger projection provides an entryway into the building. While a one-story building throughout, a portion of the southerly end of the building is higher than the balance of the building. The ventilation cupolas on this building range in size and configuration as needed to ventilate cooking equipment. Weeping mortar brick pilasters evenly spaced along portions of the building pick up a theme of this type of architectural feature used throughout the first phase of Unit 2.

Other than alterations to windows and doors, this building retains good integrity to its World War II origins. The Subsistence Building would qualify as a key contributor to a Hospital Era Historic District.

e. Unit 2 Power House (Bldg. 513, 1943)

FIGURE 76: GARDNER SHED (Bldg. 218)

Source: ASM 2011

FIGURE 77: ANIMAL HOUSE (Bldg. 220)

Source: ASM 2011

Also referred to as the Boiler House, Building 513 was built to supply power to Unit 2 and to provide warehouse and vehicle storage space. Clearly distinguishing this building from the other buildings in the Unit 2 complex is a taller cross gable element and distinctively designed smokestack at the north end of the building. The smokestack is square at its base extending upward as a cylindrical form. The top is highlighted by a fluted band that serves as a visual crown to this feature.

While there have been alterations to the windows and doors of this building, it retains good integrity in regard to its predominant form, scale, massing and materials. Accordingly, the Power House building and its smoke stack would be contributors to a Hospital Era Historic District

f. Unit 2 Tuberculosis Wards (Phase 1 Bldgs. 508-513,516,518, 1943 and Unit 2 and Phase 2 Bldgs. 517-523, 1945)

Unit 2's tuberculosis wards were built in two phases. The first phase wards were essentially the same as the Phase 2 buildings; however, Phase 2 lacked some of the more expensive and labor intensive finish materials of the Phase 1 buildings. Nonetheless, both Phase 1 and Phase 2 buildings carry out the Spanish Colonial Revival architecture of the Claud Beelman designed hospital campus. The primary differences between the Phase 1 and Phase 2 buildings is the use, on Phase 1 buildings, of red clay tile roofing and weeping mortar concrete brick columns to support walkways and porch shed roofs. The Phase 2 buildings used composition shingles for roofing and wood posts as supports for these elements.The Phase 2 buildings, also had a greater separation between the porch roofs and the main building roofs, and the use of clerestory windows on some of the buildings.

In keeping with an intent to provide a residential-like living environment for housing of tuberculosis patients, all of the Unit 2 wards were designed in the ranch-style variant of

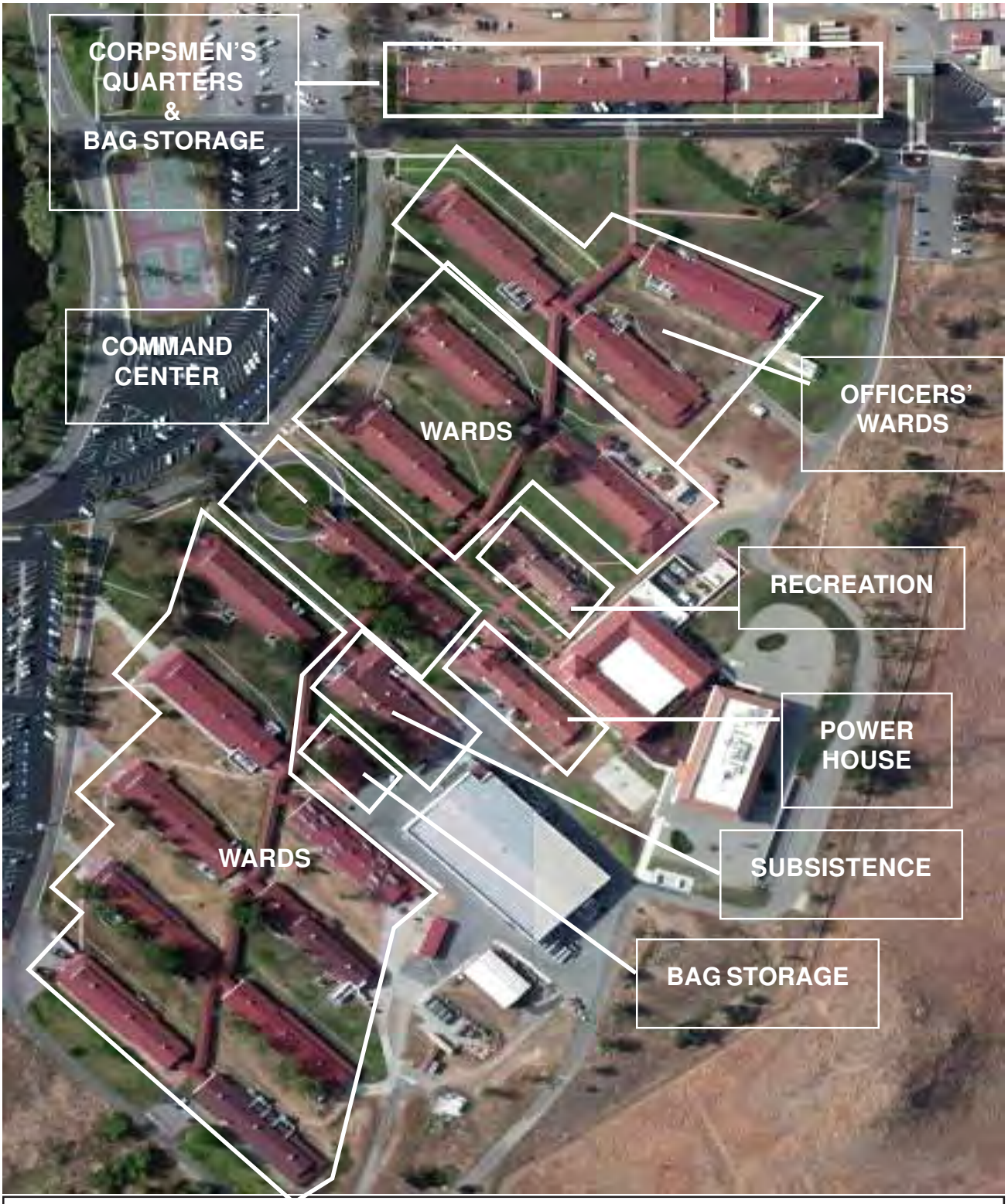


FIGURE 78: UNIT 2 SITE LAYOUT
Source: Bing.com

Spanish Colonial Revival architecture. The residential feel was effectively achieved by limiting all buildings to a one story height and by the use of low pitched gabled roofs flanked

FIGURE 79: UNIT 2 COMMAND CENTER (Bldg. 512)

Source: ASM 2011

by shed roofed extensions. These extensions were used to create sun rooms with glass walls on the exterior sides to allowed a maximum of sunlight to enter each hospital room.

When the Unit 2 wards were converted to laboratories in the early 1950s the glass walls of the porches were replaced with light-weight stucco finished walls, penetrated by ribbons of windows toward the top. While it would have been preferable, for the sake of Hospital Era architectural integrity, to retain the porch glass walls, the change to predominantly solid walls does not significantly reduce the overall architectural integrity of the Unit 2 buildings. This is the case because every other significant architectural element associated with these buildings remains unaltered, including scale, massing, roof and wall materials, and the weeping mortar block columns or wood posts between the former sun porches. Other minor alterations include the replacement of original doors and windows with modern windows and doors.

Overall, the Phase 1 and 2 ward buildings retain good integrity to their World War II appearance and all of them would be contributors to a Hospital Era Historic District

g. Unit 2 Sick Officers' Wards (Phase 1, Bldgs. 506-507, 1943 and Phase 2, Bldg. 505, 1944)

Situated at the far northerly end of the tuberculosis ward complex are three ward buildings designated "SOQ" on a World War II era site plan of NHC. (Plot Plan U.S. Naval Hospital c. 1947) Research by WHS suggests this acronym stands for Sick Officers' Quarters. For architectural description purposes, the reader is referred to the descriptions of the Phase 1 Wards for Buildings 506 and 507. For Building 505, see the description for the Phase 2

FIGURE 80: UNIT 2 RECREATION BUILDING (Bldg. 511)

Source: Kevin Bash Collection

Wards. One detail that doesn't follow the design pattern for Phase 1 buildings is the roof of Building 506. At some point in the past, the clay tile roof of this building was replaced with composition shingles.

The analysis of integrity found in regard to the other ward buildings also applies to these buildings. Accordingly, the Sick Officers Quarters qualify as contributors to a Hospital Era Historic District.

h. Unit 2 Covered Walkways (Phase 1, Bldg. 555, 1943 and Phase 2, Bldg. 556, 1945)

Two building numbers are assigned to the covered walkways that link the wards and central facility buildings. Walkways that were built in association with Phase 1 (Building 555) employ red clay tile roofs and supporting columns of weeping mortar concrete bricks. Walkways associated with Phase 2 buildings have composition shingle roofs and supporting posts of wood. These walkways are designated Building 556.

Both types of covered walkways retain excellent integrity to their original designs, and both would qualify as contributors to a Hospital Era Historic District.

i. Unit 2 Corpsmen's Quarters (Bldgs. 501-503, 1943 and 504, 1945)

Across Fourth Street to the north of the tuberculosis wards are three interconnected buildings (501-503) used for housing corpsmen and a fourth building used for corpsmen's bag storage. These buildings strongly reflect the Spanish Colonial Revival design theme established by architect Claud Beelman for the overall hospital. In keeping with the residential look employed in Unit 2, the Corpmen's Quarters buildings all have low pitched gabled roofs sheathed in red clay tiles flanked by shed roof covered walkways. Other design details are essentially the same as those described for the Phase 1 wards. Behind the living quarters buildings is a simple composition shingle gabled roof building (504) devoted to storing the personal effects of the corpsmen.

FIGURE 81 UNIT 2 SUBSISTENCE (Bldg. 515)

Source: ASM 2011

While the windows and doors of these buildings have been changed into modern types, the overall sense of scale, massing, materials, and building style remains intact. Accordingly, the Corpsmen's Quarters and Bag Storage building qualify as contributors to a Hospital Era Historic District.

3. Unit 3 Architectural Descriptions

a. Unit 3 Site Plan and Architectural Theme

Unit 3 is the only NHC complex built entirely with temporary construction. Most of Unit 3's buildings are situated on concrete pier foundations and are not designed with any sort of architectural style in mind. All buildings have gabled or flat composition shingle/rolled roofing. Most of the buildings also have exterior walls are sheathed with "cementos" panels. The layout of the buildings is a textbook example of military pavilion design, with wards situated parallel to each other and linked to each other and to the central facilities building above via a system of fully enclosed corridors. These corridors formerly extended easterly to the gym/theater,/ships store complex; however, at some point in the past, the segment of corridor nearest the gym was removed.

While, Unit 3 lacks the architecture to qualify it as a Criterion C Historic District contributor, it is strongly linked to the rest of NHC based on Criterion A and therefore its buildings qualify as contributors to a Hospital Era Historic District.

b. Unit 3 Central Facilities Building (Bldgs. 448, 453, 455, 456,458, 1944)

WHS has designated this building "Central Facilities" as it is designed and centrally located to serve the needs of all aspects of Unit 3. It is, in fact, a complex of five interconnected

buildings that appear as one building from above. Beginning at the front (southeasterly) end of the building and working back, the following elements compose this building complex:

- 448: Originally devoted to administrative offices. As built, there were two wings in this area. Today, the most southeasterly wing is no longer extant.
- 456 and 458: Two adjacent wings, both devoted to patient treatment,
- 455: A segment at the southwesterly end of the subsistence wing, built to serve as Unit 3's brig.
- 453: A large wing, designated the Subsistence wing, devoted to cooking and dining.

FIGURE 82: UNIT 2 POWER HOUSE (Bldg. 513)

Source: Bing.com

Unlike most of the other buildings in Unit 3, this complex has an irregular floor plan, concrete foundation, and a variety of roof types, including gabled, shed, and flat.

Other than the missing wing of Building 448, this complex retains excellent integrity to its World War II design and would qualify as a district contributor under Criterion A.

c. Unit 3 Recreation/Storage Building (Bldg. 451, 1944)

The Unit 3 Recreation/Storage Building has an L shaped floor plan, situated on a reinforced concrete foundation, with composition roofing, and a stucco finish on all exterior walls. This building began life as the recreational building for Unit 3; however, as Unit 3 was phased out after World War II, it was used for storage. It is situated in the far northwesterly corner of Unit 3, and it is characterized by two distinct components,

- The first is a gabled wing that runs in an east-west direction. Breaking the vertical mass of this wing are shed elements that extend from its north and south walls. The uppermost roof of this component is ventilated by three raised cupolas. This wing is largely the height of a two-story building; however, WHS was not able to determine if its interior is divided into two floors or is one tall volume. Situated at the east end to the building is a single story gabled addition with the same details as the above wing.

FIGURE 83: UNIT 2 TB WARDS - PHASE 1 (Bldgs. Bldgs: 508-513,516, and 518)

Source: ASM 2011

FIGURE 84: UNIT 2 TB WARDS - PHASE 2 (Bldgs. Bldgs: 517-523)

Source: ASM 2011

- Extending southerly from the south wing is a single story gabled addition with a single cupola attic vent and an irregular floor plan.

Overall the Recreation/Storage building appears to retain good integrity to its World War II form and would qualify as a district contributor.

d. Unit 3 Wards (Bldgs. 427, 429, 431-439, 441-443 and 445, 1944)

Two banks of hospital ward buildings extend out from the Central Facilities building, laid out in classic military pavilion style. The most northerly bank runs in an east-west direction, while the southerly wind runs in a north-south direction. Each ward building is characterized by a generally rectangular floor plan cementos panel walls, gabled composition roofs, and regularly spaced windows with a vertically oriented rectangular shape. Each building has a

FIGURE 85: UNIT 2 SICK OFFICERS' WARDS (Bldgs. 505-507)

Source: Bing.com

small shed-roof extension midway along one side, where restroom facilities are located. The ward buildings are distinctive for their uniformity and consistency of design. All windows are presently covered with a dense metal mesh, making it impossible from the outside to determine types. All of the windows appear to be their original size and shape, however. Linking all wards together is an enclosed gabled walkway. Some of the wards are designated for specialized services.

The ward buildings are exceptional for their architectural integrity to their World War II design and would qualify as district contributors under Criterion A.

e. Unit 3 Helps' Quarters (Bldgs. 457 and 459, 1944)

The Unit 3 Helps' Quarters buildings consist of two parallel gabled, generally rectangular buildings in the northwesterly area of Unit 3. Architectural components and finishes are generally the same the ward buildings. Also, like the ward buildings, each Helps' Quarters building has a rectangular flat roof restroom extension.

The Helps' Quarters buildings retain excellent integrity to their World War II design and would qualify as district contributors under Criterion A.

f. Unit 3 Boiler Plant Building (Bldg. 449, 1944)

The Boiler Plant building is situated north of the Central Facilities building and east of the Recreation Building. It has an irregular floor plan consisting of three elements. The main building is a rectangular floor plan gabled building with vehicle entry doors on the east and west elevations. Attached to this main building are two appendages, both with flat roofs. The appendage at the southeast corner is a rectangular building with a minimal area of attachment to the main building. The appendage at the northeast corner is also a

FIGURE 86: UNIT 2 WALKWAYS, PHASE 1 LEFT, PHASE 2 RIGHT (Bldgs. 555-556)

Source: ASM 2011

FIGURE 87: UNIT 2 CORPSMEN'S QUARTERS (Bldgs. 501-504)

Source: ASM 2011

rectangular floor plan building, the entire west side of which is attached to the main building's east wall.

This building retains good integrity to its World War II design, and would qualify as district contributers under Criterion A.

g. Unit 3 Bag Storage Building (Bldg. 447, 1944)

The Unit 3 Bag Storage building is situated at the west end of the northerly ward wing. It has a shallow V shaped floor plan and in general has the same details as the ward buildings, other than the absence of a restroom extension.

FIGURE 88: UNIT 3 SITE LAYOUT

Source: Google.com

The Bag Storage building retains excellent integrity to its World War II appearance and would qualify as district contributors under Criterion A.

h. Unit 3 Fire Station (Bldg. 498, 1944)

The Unit 3 Fire Station is a wood framed building, with a generally rectangular floor plan situated on a concrete foundation. All walls are finished with stucco, and all roofing is either

FIGURE 89: UNIT 3 ADMINISTRATION (Bldg. 448) SUBSISTENCE (Bldg. 453), BRIG (Bldg. 455) TREATMENT (Bldgs. 458 and 456)

Source: Bing.com

composition shingle or composition rolled. World War II maps list this building as 498. Its current number is 316.

Overall, the building consists of three basic components. The central part of the building is the original hipped roof, two story fire station. Its first floor devoted to fire truck bays and offices and its second floor is likely devoted to dormitories. The upper floor has vertically oriented rectangular windows spaced evenly above the truck bays. The truck bays are characterized by typical garage door-type openings with metal roll up doors. A small one story, flat roof fire truck bay is attached to the south end of this central component. , has a flat roof sheathed with composition rolled roofing. A small shed roof element tends from the west end of this building component, providing additional weather protection to the truck bay opening.

Attached to the north end of the two story fire station component is an addition, itself consisting of four components. The main component is attached to the north wall of the fire station and is characterized by an irregularly shaped flat roof sheathed with composition rolled roofing. Three other components are attached to the north end of this addition. Each of these is equipped with a flat roof, sheathed with composition rolled roofing. The purpose of this building element is unknown at this time. Clearly, however, it was built long after the hospital era..

Other than the above noted addition, the Fire Station retains integrity to its World War II appearance, and would qualify as a district contributor under Criterion A..

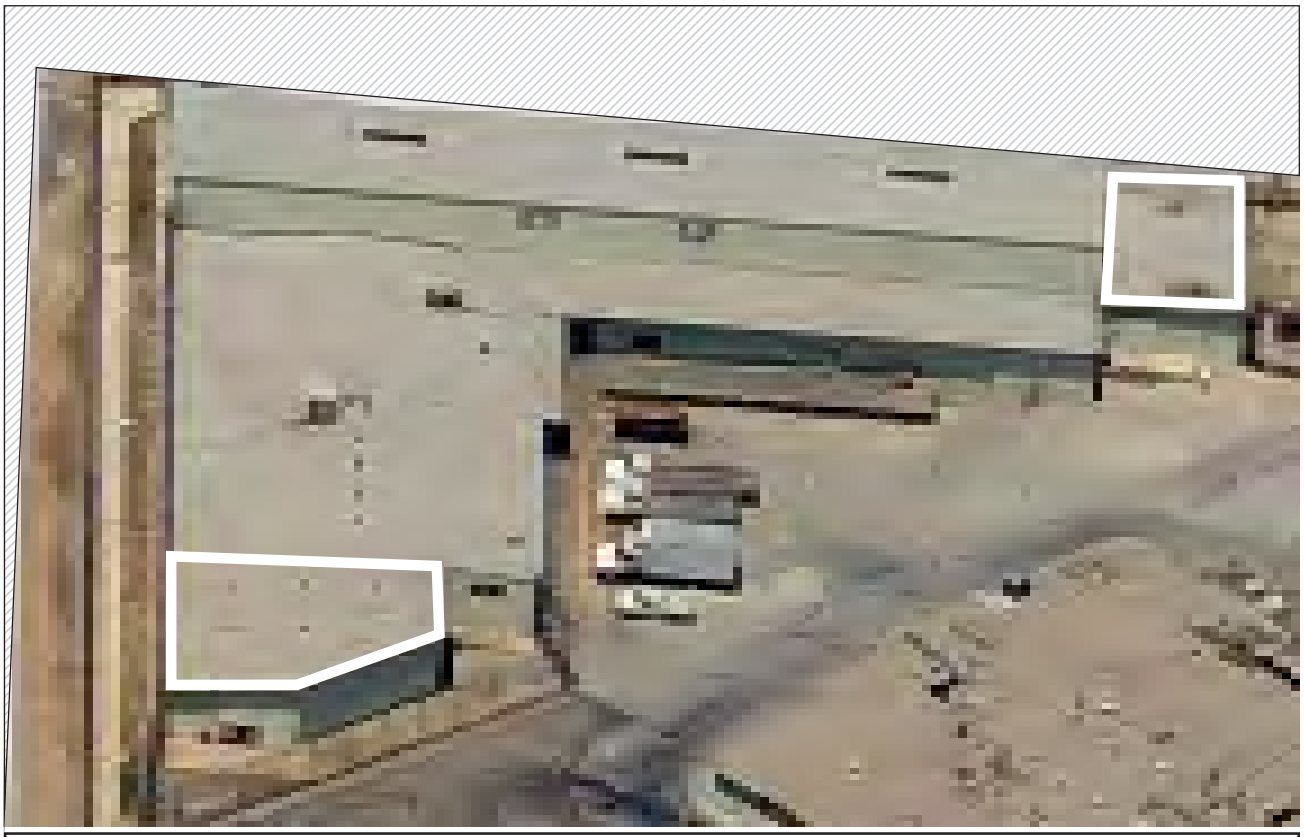


FIGURE 90: UNIT 3 RECREATION/STORAGE (Bldg. 451) (Post WW II Additions Highlighted)

Source: Bing.com

4. Common Facilities

The preceding sections address resources, primarily buildings, associated with each of the three Norconian property based hospital units. Beyond the above resources are facilities that clearly served the entire Norconian property. WHS has termed these resources “Common Facilities”. Water wells typify this type of facility. The following subsections address what WHS has defined as “Common Facilities.” Note that, while the Navy designation “building” is used to identify most of these facilities, it is understood that some of them are more properly identified as “structures” or “features” per the Secretary of Interior’s standards.

a. Sewage Treatment Plant and Fertilizer Structure (Bldgs. 801 and 802, 1943)

The Sewage Treatment Plant is situated northwest of the NHC campus adjacent to the Santa Ana River. The site is occupied by an equipment control building, six round concrete treatment tanks, and a concrete structure originally used to compost waste for use as fertilizer. The equipment control building has a rectangular floor plan and it is situated on a concrete slab foundation. Despite its remote location, well outside of the NHC campus, the control building was designed by architect Claud Beelman to have a distinct Spanish Colonial Revival design. This is reflected in the building’s red clay tile roof and stucco

FIGURE 91: UNIT 3 TYPICAL HOSPITAL WARDS (Bldgs. 429, 431-439, 441-443, 445-446, 461-469, 471-473, 475-477)

Source: Bing.com

finished walls. Where one might expect utilitarian windows and doors, this building's windows are double hung wood sash types and access is via wood and glass French doors. The Spanish Colonial Revival design of this utility building reflects the Navy's intention for NHC to be a permanent Naval hospital.

Despite its deteriorated and vandalized state, this complex retains remarkable integrity to its World War II origins. However, because of its remote location this complex is not listed as a district contributor.

b. Water Wells, (Bldgs. 701-705, 1928)

The Navy acquired, along with the other Norconian improvements, the water wells that served the resort. The wells included 4 fresh water wells and one, hot sulfur water well.

FIGURE 92: UNIT 3 HELPS QUARTERS (Bldgs. 457 and 459)

Source: Bing.com

Amazingly, after 87 years, the wells are still in place, although not all are in working order and none are producing potable water. At least one well is being used to supply “reclaimed water” for landscape irrigation. It is also interesting that the wells remained in federal ownership until the spring of 2015, when they were turned over to the City of Norco.

Because of the remote location of these wells and the lack of distinctive architectural features, these wells are not listed as district contributors.

c. Covered reservoir (Bldg 20, 1942)

Situated on a hillside northeast of the hospital campus is a covered reservoir built by the Navy in 1942. This reservoir remains today, supplying water to the Navy and State

FIGURE 93: UNIT 3 BOILER PLANT (Bldg. 449)

Source: Bing.com

Department of Corrections. The reservoir is a concrete cylindrical structure almost entirely located below ground on the slope of the hill. Its roof follows the cylindrical shape of the reservoir with a very shallow hipped slope. In the center of the roof is a raised cupola like element with ventilation louvers built into its shallow walls. Both roof elements are sheathed with composition rolled roofing

The reservoir is in excellent condition and retains very good integrity to its World War II appearance. While it is remotely located, it is clearly visible from the NHC campus and WHS believes it should be among the contributors to a Hospital Era Historic District.

d. Lake, Lake Landscaping, and Southwest Landscape

Landscaping was an important design component of the Norconian Resort. Rex Clark's architect, Dwight Gibbs, placed the hotel building on a hillside with prominent rooms overlooking the land below. The hotel dining hall, ballroom, and key rooms had a view overlooking a landscape of natural and man-made beauty, situated in the southwesterly portion of the property. The Tea House was cited precisely to have a view of this landscape. The basic elements of the Southwest Landscape are as follows:

- **Lake:** The 60 acre man-made lake was a carefully sited on the property. to provide a sense of coolness that helped counter the dry hillsides beyond. The lake also served as a source of recreational boating and fishing, both for the guests of the Norconian Resort and later for the patients and staff of NHC. The lake is currently listed as a contributor to the Norconian Hotel Era National Register Historic District and it would also be a contributor to a Hospital Era District.

- **Lake Landscaping:** The entire perimeter of the lake is lushly landscaped with trees, shrubs, turf, and water features. Also incorporated into the

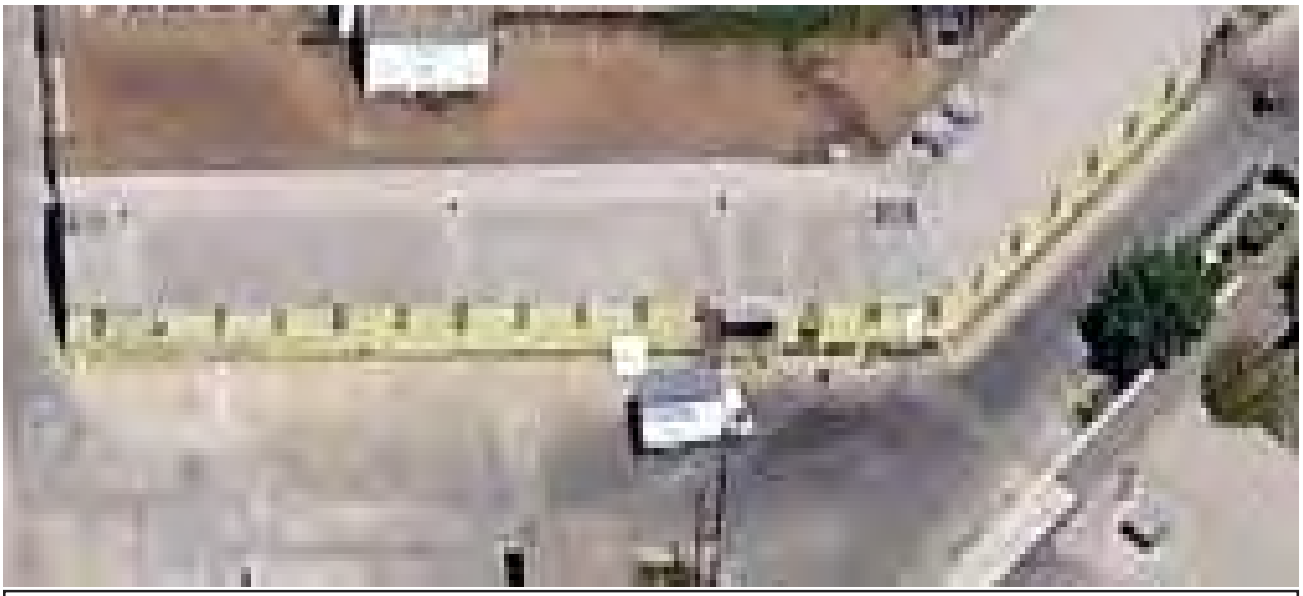


FIGURE 94: UNIT 3 BAG STORAGE (Bldg. 447)

Source: Bing.com

landscape are a variety of structures, including gazebos, foot bridges, stone lined decomposed granite paths, Japanese lanterns, and the like. The landscape has a park-like area at its east end and a more natural landscaped perimeter around the balance of the lake. The lake has two man-made dams and a small island. All of these elements are contributors to the existing National Register Historic District and they would also qualify as contributors to a Hospital Era District.

- **Natural Hills:** Clark and Gibbs used the natural terrain to give the lake a sense of enclosure. Three hills form the foundation of the lake backdrop, named by the navy Hill A, Hill B, Hill C as shown in Figure 99. Of these three hills, Hills A and B are the most prominent and the most significant. The south side of Hill A was altered during the Cold War to incorporate two explosives bunkers nestled into the hillside and laboratory buildings at the base.

Hill A was used during the Resort Era as a viewing toward lake, the hotel building and Tea House, and golf course. Rock lined paths improved during the Resort Era remain intact on the on the hill. Figure 100 is a Resort Era photo taken from Hill A toward the Pavilion.

Hill B was also altered during the Cold War era to incorporate a military building at the top along with an access road extending up the hill from the south. This building can be seen in the top photograph of Figure 99. Like Hill A, Hill B offered a view of Norconian grounds and buildings.

Hill C is a less prominent hill that provides additional definition for the northwest perimeter of the lake.

FIGURE 95: UNIT 3 FIRE STATION (Bldg. 498)

Source: Bing.com

- **Golf Course:** The golf course, located generally south of the lake and Hills A and B, was another important landscape component of the overall spatial organization of the Norconian site design. Most of the golf course has been replaced with residences, Norco College, and a portion of Unit 2's ward complex. (See Figure 101) While Hill B and C are largely within the Navy's property, most of Hill A is within the boundaries of Norco College. All of this can be seen in Figure 100.

Southwest Landscape: All of the above elements constitute what is referred to here as the "Southwest Landscape." When the property was analyzed to determine the components of the Resort Era National Register Historic District, the extent of what was referred to as "Landscaping" was not clearly delineated. Subsequent to its designation, the Navy defined this landscaping as the perimeter of the lake and the entire park area at the lake's north end. To the south and west of this area, the large swath of land consisting of hills and their surroundings were not analyzed for possible listing as a cultural landscape component of the Norconian Resort National Register District. To fill this gap, WHS took a close look at this part of the property in an effort to determine its importance to the overall property as a component of the spatial design of the property.

The Southwest Landscape consists of the lake, the lake's landscaping, and Hills A, B, and C along with the land between and around them. The accompanying figure shows the proposed boundary of the Southwest Landscape which, of course, extends southerly and westerly of the National Register listed lake and its related landscaping.

FIGURE 96: SEWAGE TREATMENT PLANT (Bldgs. 801 and 802)

Source: Wilkman Historical Services

Taking a broader look at the property, it is abundantly clear that Clark and Gibbs included the lake, its perimeter landscaping, the three hills, and the golf course as important spatial components of the overall site's design. These elements provided a natural backdrop to the lake, vantage points from which to view the property, and opportunities for relaxation and recreation. Rex Clark and his architect, Dwight Gibbs, specifically sited the hotel building, Tea House, and Pavilion to have panoramic views of a spectacular swath of natural beauty found in the Southwest Landscape.

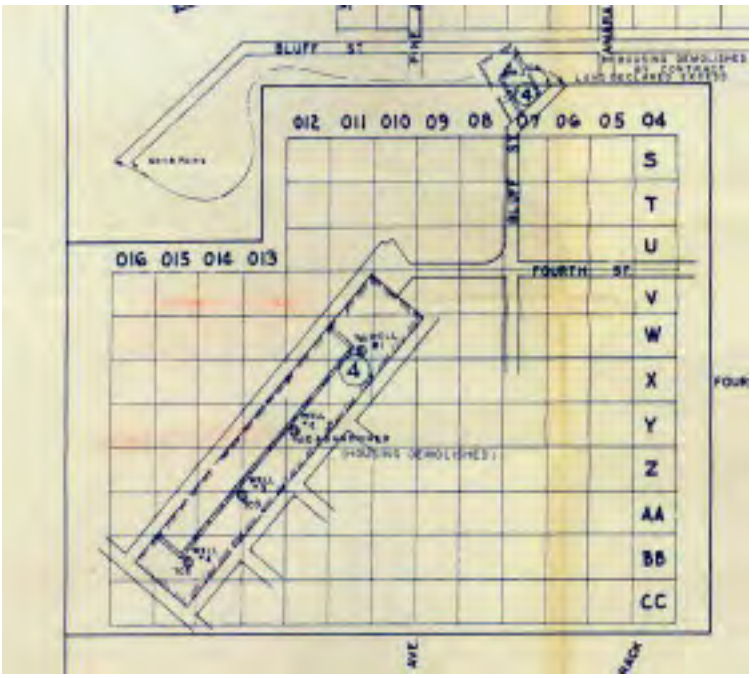


FIGURE 97: WATER WELLS (Bldgs. 701-705)

Source: Department of the Navy, Bureau of Yards and

While the majority of the golf course has long since been consumed by development, the hills, the lake, lake landscaping, and one tee area south of the lake remain intact. Additionally, the space between Hills A and B are sufficiently open to give the sense of open space once offered by the overall golf course. This space is largely intact, with the exception of a building foundation situated midway in this swath of land.

FIGURE 98: COVERED RESERVOIR (Bldg. 20)

Source: Kevin Bash Collection

A landscape component that is no longer obvious today consists of the trees that once lined the roadways in the Southwest Landscape. Gibbs and Clark used these trees as a way to define the many roadways that extend through the southwest landscape. While many of these trees are no longer extant, enough remain to give a sense of the corridors they once defined.

The southwest landscape is important to both the Hospital Era and the Resort Era of the Norconian property. While its nomination to the National Register could be advanced as an amendment to the Resort Era listing, it is also a logical component of the Hospital Era and therefore qualifies as a contributor to a Hospital Era Historic District.

FIGURE 99: TOP: SOUTHWEST LANDSCAPE CURRENT BOTTOM: SOUTHWEST LANDSCAPE c. 1945

Sources: Top: Bing.com Bottom: Kevin Bash Collection

PART 2, SECTION 5: HOSPITAL ERA PROPERTY EVALUATION

1. Background

In evaluating the historic significance of the Norconian's Hospital Era, WHS used the model established by Goodwin in its examination of case studies. (Goodwin 1997: Chapter 15) Goodwin's analysis addresses each case study property at two levels. At level one, Goodwin gives summary data about the installation. Sections within this part of the evaluation consist of: *Location and Current Status*, *Summary History and Historic Context*, and the *Identification of Buildings*, organized by the various categories of use. With this basic data established, Goodwin goes on to address the *significance* of the property, consisting of consideration of the following: *Nature of the Property, Historic Context Represented, Property Type, Applicable National Register Criteria, Comparison to Similar Properties, Significance Level, and Integrity.*

a. Location and Current Status

The NHC property was initially developed c. 1929 as a luxury resort. When the Navy purchased the property in 1941 for use as a Naval hospital, it contained approximately 700 acres. Over time, the property's size has been reduced to its present approximately 390 acres, as large swaths of open space and land devoted to a golf course have been sold for private development. The remaining intact property consists of the core of Naval Hospital Corona, including all essential elements contributing to its contextual history. A portion of the hospital was used as a Cold War weapons lab beginning in the 1950s. This history and its significance is addressed in Part 3.

At the present time, the property is divided into three major ownerships. The Navy owns approximately 247 acres at which a government-owned, contractor operated (GOCO) weapons Research, Development, Testing & Evaluation (RTD&E) facility is located, known today as the Naval Surface Warfare Center, Corona. Another approximately 102 acres is owned by the State of California, and used as a prison, known as the California Rehabilitation Center (CRC). Finally approximately 100 acres is owned by Norco College, a local community college. Only a small part of the college campus, a prominent hill retains integrity to the Naval Hospital Era.

b. Summary History and Historic Context

Naval Hospital Corona (NHC) was converted from a massive luxury resort originally developed by entrepreneur Rex Clark in 1929 and known as the Norconian Resort Supreme. Clark had previously established the town of Norco in 1923, the village center of which was located northeast of the Norconian. On this land, Clark created a somewhat utopian farm-based village where people were sold two to five-acre lots for the establishment of small farms or ranches. Most of these properties were improved as poultry ranches. Clark supported Norco's land owners with a comprehensive range of services as needed to build and operate a farm or ranch.

After the town of Norco was well established, Clark discovered pockets of hot mineral water near the Santa Ana River, and he commenced the design and development of the luxury Norconian Resort on about 700 acres of this land. Unfortunately, Clark's resort opened literally months before the onset ot the Great Depression, and the resort suffered economic challenges throughout the 1930s.

In 1941, the federal government recognized that its entry into World War II would necessitate a need for many thousands of hospital beds. One way in which it sought to satisfy this need was to take control of luxury hotels and resorts throughout the United States for conversion to convalescent hospitals. Most of these properties were leased from their private owners. The Norconian was an exception to this rule, as the Navy purchased the property, with fee title to the land and improvements. Originally, the Navy's intent was to convert the Norconian into a convalescent hospital. Soon after its acquisition, however, the Navy decided to develop the Norconian into a flagship, permanent Naval general hospital. While the property was located in the unincorporated town of Norco, it was designated Naval Hospital Corona.

Rex Clark's Norconian Resort became government property on December 9, 1941, and Captain Harold L. Jensen reported to duty January 2, 1942 to take on the difficult task of converting the luxury resort into a Naval general hospital. NHC was fully functional from 1941 through1949 and then from 1951 through 1957. The Navy expanded the original Norconian resort with new, largely permanent buildings designed to complement the Spanish Colonial Revival design of the original resort buildings and to reflect the California traditions related to this style.

NHC was one aspect of a massive effort to quickly bring hospital beds on line to handle expected casualties from World War II. Prior to World War II, there were only three permanent Naval hospitals to handle casualties from the Pacific Theater. These consisted of Naval Hospital Mare Island and Naval Hospital San Diego in California, and Naval Hospital Bremerton in Washington state.

To quickly add needed bed space, the federal government engaged in a two pronged effort. One involved acquiring the use of resort properties for convalescent hospital purposes. The other involved the construction of numerous temporary hospitals. The Norconian property was the only resort purchased fee-simple by the government. All of the others were leased and returned to their owners after the war.

NHC benefitted greatly from the organizational, knowledge, and medical talents of two teams of doctors from the Mayo Clinic. Arriving in 1942, the final team of doctors left NHC in 1944 for service at the front lines. Because of this pool of talent, NHC quickly became a highly respected Naval hospital.

Ultimately, the the Navy developed the Norconian property into three "units" each organized as an essentially independent hospital. Unit 1 was the central general hospital where the command center was located and where sailors and marines received medical treatment and rehabilitation therapy. Unit 2 was devoted entirely to tuberculosis treatment. Unit 3 was largely devoted to the treatment of rheumatic fever, but also treated patients suffering from other medical conditions, such as polio, syphilis, cord bladder issues, malaria, jungle diseases, and overflow tuberculosis patients from Unit 2. Unit 3 was the only part of the Norconian property developed with temporary buildings not designed in the Spanish Colonial Revival style. Beyond these three Norconian based units was a fourth unit, situated several miles away in Spadra, near the City of Pomona. Consisting largely of temporary buildings, Unit 4 served as a convalescent/rehabilitation hospital for patients initially treated at NHC.

NHC was the designated center for a number of problematic diseases and injuries. It was the West Coast (Pacific Theater) center for the treatment of tuberculosis, polio, and cord bladder issues, and it was the national center for the treatment of rheumatic fever. NHC had priority access to the "miracle" drugs, penicillin and streptomycin. Working with the highly

FIGURE 100: LAKE AND SOUTHWEST LANDSCAPE BOUNDARY (green line) WITH FORMER GOLF LINKS SHOWN

Source: ASM 2011

regarded doctors and scientists at Olive View Sanitarium in Monrovia, California, NHC achieved significant advances in the treatment of tuberculosis and rheumatic fever through the use of the newly emerging “wonder drugs”, penicillin and streptomycin.

Rehabilitation was another important aspect of NHC. Improved procedures to evacuate and provide quick medical treatment for World War II’s wounded resulted in the survival of many combatants who, during World War I would have died on the battle field. Corpsmen got injured soldiers off the battlefield to field hospitals that provided emergency care. Once sufficiently stabilized patients were then transported to mainland hospitals via hospital ships and airplanes. These improved procedures resulted in huge demands to care for severely injured combatants, including those with severe injuries that resulted in amputations and paralysis. NHC also provided treatment and rehabilitation services to polio victims.

NHC was ideally suited for patients with physical disabilities. The hot mineral springs that once soothed the Norconian's wealthy patrons, were pressed into use for therapeutic purposes to help heal combatants and polio victims in need of rehabilitation. Additionally, NHC's prosthetic technicians developed and produced devices to give mobility and physical dexterity for amputees. NHC's beautiful grounds, golf course, lake, swimming pools, tennis courts, and large expanses of open space provided an ideal setting for mental and physical healing.

NHC was one of three military hospitals where wheelchair basketball was pioneered and perfected in the mid-1940s. The British were the first to introduce sports for wheelchair bound persons, experimenting with a number of sports, but eventually settling on netball, a distant cousin to basketball. Birmingham Veterans' Hospital in Van Nuys, California organized the first wheelchair basketball team, with the first documented game played in November of 1946. This game, as with all early games pitted wheelchair bound patients against able bodied persons in wheelchairs. A wheelchair basketball team from Cushing Veterans' Hospital in Framingham Massachusetts played the second documented wheelchair basketball game against the Boston Celtics in December of 1946. Oral histories from various NHC staff and patients recall wheelchair basketball being played at NHC as early as 1945; however, WHS was not able to locate written documentation of such play. WHS did, however, locate documentation confirming organized team basketball at NHC in early 1947.

Dr. Gerald Gray, an NHC plastic surgeon who specialized in treating the bedsores of paraplegics, saw the Birmingham team practicing during one of his patient visits. Impressed with the improvements to morale and physical health gained by those engaged in the game, he formed the Rolling Devils wheelchair basketball team at NHC. The Rolling Devils gained significant notoriety, winning all but one of its games and being the first wheelchair basketball team to travel by air to distant games. Most significantly, the gymnasium at NHC was the venue of the first wheelchair basketball game between two paraplegic teams. This gym remains essentially unchanged from the day that groundbreaking basketball game was played. Of the three venues where wheelchair basketball was pioneered, only NHC remains intact. Wheelchair basketball has gone on to become a major paraplegic sport, with organizations and teams engaged in the sport all over the world. Wheelchair basketball has also gone on to become a major form of rehabilitation for service men and women suffering from paralysis.

While NHC was built as a permanent Naval hospital intended for use well beyond the end of World War II, politics got in the way and Long Beach was chosen to serve as the area's permanent Naval Hospital. Consequently, NHC was decommissioned on November 1, 1949. It's decommissioning was short-lived, however, as NHC Units 1 and 3 were recommissioned in 1951 when the U.S. entered the Korean War. NHC remained in service after the Korean War, as a general hospital with a service area covering several hundred square miles. Unlike its mission during World War II, NHC's post-war mission included medical care to both military and civilian patients.

However, despite concerted efforts to keep NHC open it was permanently closed in 1957. Subsequent to this second decommissioning, however, another effort was engaged in to retain NHC asa permanent hospital. This time, the push was focused on keeping NHC alive as a veterans' hospital. Unfortunately, this effort was not successful.

Only a portion of NHC was reopened as a hospital in 1951. A large portion of the property, including all of Unit 2 and several adjacent Unit 1 buildings, was pressed into service by the National Bureau of Standards (NBS) in 1951 for weapons related research. The NBS initially attempted to gain access to the entire NHC property, but in the end it was not able to use the main (northerly) part of Unit 1, nor any part of Unit 3. The history and significance of the use of NHC by the NBS and its successors is covered in Part 3 of this document. In 1962, the portion of the property not devoted to laboratories (all of Unit 3 and the majority of Unit 1) was transferred to the California Department of Corrections to serve as a prison for drug addicts.

In the 1950s and 1960s, the Navy sold significant open space and golf course acreage south and east of the core NHC campus. This land was subsequently developed with various governmental and private uses. Nonetheless, the core NHC campus remains essentially as it was during World War II. Today, the property is divided between a weapons RDT&E facility, Norco College, and a state prison.

c. Identification of Property Types:

The existing Norconian property retains a high level of integrity to its World War II era. Of the 141 buildings and structures in use during or shortly after World War II, only 32 are no longer extant. Most of the buildings/structures that are no longer extant were relatively small and unsubstantial. The more significant buildings that are no longer present consist of the *NHC Resort Era Laundry, the Unit 1 WAVES.' Quarters, and the Unit 2 Married Officers' Quarters*. The Navy demolished all of these buildings in recent years under a policy stipulating that for any new building constructed, one existing building of similar size had to be demolished. The Navy indicates that this policy is no longer in effect.

The Property types represented among the extant buildings and structures include those associated with administration, health care, personnel support, infrastructure, residential, storage, and transportation uses. Figure 101 lists all of the historically significant buildings at NHC, identifying a number of factors, including the property types represented.

2. Evaluation of Norconian Property for the Hospital Era

a. Nature of Property

Date Established as a Naval Hospital: The Navy assumed ownership of NHC on December 9, 1941, Captain H.L. Jensen reported to duty on January 2, 1942 to take command of the conversion of the Norconian Resort into a Naval hospital..

Function during World War II and Korean War: During World War II and beyond, up to late 1949, the entire property served as a permanent Naval general hospital. In the period, from 1951 to 1957, all except Unit 2 and the southerly part of Unit 1 operated as a permanent Naval general hospital. During the late 1940s and in the hospital's period during the 1950s, NHC also treated civilians. During the polio epidemic of the late 1940s, civilian polio patients, including numerous children, were treated at NHC. The part of the property that did not operate as a hospital in the 1950s was pressed into service as a weapons RDT&E facility.

Category of Property: NHC qualifies as a Historic District, composed of buildings, structures, and landscape elements.

b. Historic Context Represented

Period of Significance: 1941-1957

Theme: World War II and Korean War Naval hospitals in the United States.

c. Property Type and Significance in Illustrating the Historic Context:

The property type is Naval General Hospitals. NHC is significant in illustrating the historic context of World War II and Korean War hospitals because it was one of the few permanent Naval hospitals built during World War II and it was the only resort property converted to a general, rather than convalescent, Naval hospital. Having been organized and trained by two teams of Mayo Clinic doctors, NHC was recognized as among the best Naval hospitals in the United States.

In the Pacific Theater, it was the designated Naval hospital for the treatment of tuberculosis, polio, and cord bladder issues. Its rheumatic fever treatment program earned NHC the status of being the national Naval center for that disease. Working with famed Oliveview Sanitarium and the National Institute for Public Health, significant advances were made at NHC in the treatment of tuberculosis and rheumatic fever with the little understood "wonder drugs", penicillin and streptomycin.

NHC's physical therapy program earned it the reputation of being among the best Naval hospitals for the treatment of paralysis. Most importantly, in this regard, is the fact that NHC was one of three military hospitals where wheelchair basketball was pioneered and developed. It was also the venue of the first documented wheelchair basketball game between two paraplegic teams. Of the three hospitals documented to have pioneered wheelchair basketball, only NHC remains in existence. Further, NHC retains excellent integrity to its World War II configuration, including the gym where the first all paraplegic wheelchair basketball game was played. NHC is also the last remaining Naval hospital in the Western United States with overall integrity to World War II and the last remaining resort-based Naval hospital in the entire United States with integrity to its World War II form.

d: Applicable National Register Criteria

The National Register defines a historic district as follows: *"A district possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development."* (National Register Bulletin 15: 5) NHC is eligible for listing on the National Register of Historic Places as a Historic District on the basis of both Criterion C (architecture and physical design) and Criterion A (historical events) as follows:

(Contributors to the NHC Hospital Era National Register Historic District are listed in the table in Figure 102)

Criterion C:

Master architect Claud Beelman designed NHC in the Spanish Colonial Revival style both to coordinate with the architecture of the existing Norconian Resort and to reflect the traditions of California culture and architecture. The roots of Spanish Colonial Revival architecture in the United States extend back to the 18th century, originating from the Spanish colonization

of the Americas. In this regard, California is considered to be the major center of the U.S. expression of the Spanish Colonial Revival style. This style was particularly popular in coastal cities, but it also found favor well inland. The popularization of the style in California is generally attributed to the 1915 Panama-California Exposition in San Diego. The City of Santa Barbara is considered a Mecca of this architectural style, having mandated the use of Spanish Colonial and Mission Revival architecture for the reconstruction of the city after the 1925 Santa Barbara earthquake. While, the Spanish Colonial Revival movement enjoyed its greatest popularity between 1915 and 1931, it has remained a favored architectural style in California throughout the 20th century and into the 21st century.

District Continuity of Architectural Style: Beelman's use of Spanish Colonial Revival architecture is found in all of the major NHC buildings in Units 1 and 2 . Beelman even designed the remotely located sewage treatment plant in the Spanish Colonial tradition. The theme is carried out in the use of red clay tile roofs, stucco finished exterior walls, Spanish style cupolas for attic ventilation, and many design details in the buildings throughout Units 1 and 2. Beelman used variants of Spanish Colonial Revival architecture, depending upon the scale of the buildings involved. The multi-story Annex, Nurses' Quarters, and Corpsmen's. Quarters buildings use detailing appropriate to the institutional scale of these buildings. Buildings at a more pedestrian scale, such as the Unit 1 Chapel, and the buildings of Unit 2 are designed in a Spanish ranch, or village like variant of Spanish Colonial Revival architecture. Contributing to the residential scale of these latter buildings is their low-profile single story height, and the use of shallow pitched roofs, shed roofed porches, covered walkways, and residential scale windows and doors.

Rare Example of a Resort-Based Naval Hospital: NHC is the only remaining, intact, example in the United States of a resort based Naval hospital. All of the other resort based Naval hospitals were returned to their owners after World War II, with any improvements or temporary construction installed for hospital purposes removed as part of a policy of returning these properties to the owners intact.

Rare Example of an Intact World War II Built Hospital: NHC is the only remaining, intact example in the Western United States of a Naval general hospital built during World War II to handle World War II related injuries and illnesses. The vast majority of World War II built Naval hospitals in the Western United States consisted entirely or largely of temporary construction that was removed after the war. All of the existing Naval hospitals that were in service in the United States during World War II have been altered significantly from their World War II configurations.

Rare Intact Example of World War II Pavilion Site Planning: Units 2 and 3 of NHC are excellent examples of the military pavilion style site. By the beginning of World War II, pavilion site planning had fallen out of favor. During World War II, this site planning style returned to favor and was extensively used. NHC's Units 2 and 3 are rare examples of extant World War II pavilion military site planning that retain integrity to their World War II origins.

Work of a Master Architect: Claud Beelman, the architect of NHC's Units 1 and 2, was a master architect of the twentieth century with at least a dozen buildings on the National Register of Historic Places. He was a highly versatile architect with National Register listed buildings representing a wide range of architectural styles, including Classical Revival, Renaissance Revival, Beaux Arts, Art Deco, Streamline Moderne, and International Modern.

NHC is the only example of a large Beelman designed complex using Spanish Colonial Revival architecture.

Criterion A:

There are numerous "event-based" factors that contribute to NHC's eligibility for National Register Historic District listing. The following are some of the more prominent event-based factors upon which eligibility for National Register District status can be based:

Establishment by Mayo Clinic Specialists: NHC is unique for having been established by the largest contingent of Mayo Clinic doctors assembled outside of the Mayo Clinic itself. The Mayo Clinic sent two Mayo "units" to NHC. After lecturing and consulting at medical facilities all over the United States to ready doctors for the rigors of war related injuries and illnesses, the Mayo Unit 1 doctors reported to NHC in early 1942 to begin the task of organizing NHC, training its staff, and establishing protocols for patient treatment and rehabilitation. The Mayo doctors also treated many of NHC's patients. The Unit 1 doctors were replaced by Mayo Unit 2 in June of 1942. This second contingent remained at NHC through 1943, at which point they departed to serve as front line physicians in the Pacific Theater.

Disease Testing and Treatment: NHC was the Navy's Pacific Theater center for the treatment of tuberculosis, poliomyelitis, and cord bladder conditions. It was the national center for the treatment of rheumatic fever. These factors alone place NHC in a unique class among the various Naval hospitals that served the Pacific Theater and beyond. When added to NHC's status as the only Naval Hospital in the Western United States that retains integrity to its World War II era, and the only intact remaining example in the entire United States of a resort converted to a Naval hospital, these event-based factors take on even greater importance. Among the many event-based factors that contribute to NHC's Hospital Era qualification for listing on the National Register of Historic Places as a Historic District are the following:

Unit 2 was devoted to, and specifically designed for tuberculosis treatment. Units 1 and 3 provided treatment services for rheumatic fever, poliomyelitis, cord bladder issues, malaria, and jungle diseases. Thousands of patients were treated for tuberculosis and rheumatic fever and significant experimentation was conducted in association with the treatment of these diseases. NHC worked with renowned Olive View Sanitarium in Monrovia and the National Institute for Public Health to conduct tests using scarce supplies of the largely untested drugs penicillin and streptomycin. Numerous experiments were carried out using these drugs on both humans and laboratory animals kept at NHC.

Of the tests and experiments involving these drugs, two in particular stand out as groundbreaking. One is the discovery of the effectiveness of penicillin in the treatment of tuberculosis-related empyema. Another is the discovery of the dangers of using streptomycin to treat tuberculosis. In this latter case, NHC discovered that, while streptomycin was effective in some cases, it allowed drug resistant strains of tuberculosis to remain after treatment and to be passed from patient to patient. This discovery was presented at the 1948 Streptomycin Conference and published in major medical journals.

A significant finding In the area of rheumatic fever, testing was that, while sulphonamides and penicillin were helpful in preventing rheumatic fever, they were of limited value in treating

this disease once established. During the years 1944 and 1945, over 10,000 rheumatic fever patients were treated at NHC, 95% of whom were cured of the disease.

Rehabilitation: NHC was a major center for the rehabilitation of patients suffering from paralysis, amputations, and muscles weakened by polio. Its spa facilities and hot sweet sulfur water wells contributed to greatly to the effectiveness of treating patients with these afflictions. The beauty of the resort's grounds and the abundance of resort built facilities for golf, boating, fishing, tennis, and others made NHC an ideal locale for both physical and mental rehabilitation.

NHC was of singular importance regarding the development and advancement of wheelchair basketball. NHC was one of three military hospitals that pioneered wheelchair basketball. Birmingham Hospital in Van Nuys, California is credited with the first documented basketball game in November of 1946, followed shortly thereafter, in December of 1946, by the pioneer wheelchair basketball team at Cushing Hospital in Framingham Massachusetts. NHC was the third military hospital documented to have formed a wheelchair basketball team. Of the three pioneering wheelchair basketball teams, the Rolling Devils garnered the greatest amount of national publicity, thus making it the most important agent for the growth of the sport throughout the United States. Further, the Rolling Devils was the first wheelchair basketball team to use specially equipped airplanes to transport it to distant games. And, most importantly, the NHC gymnasium was the venue of history's first documented wheelchair basketball game between two paraplegic teams. Adding to the significance of these elements is the fact that NHC, as a whole, retains a high level of integrity to its World War II form. And, more importantly, the NHC gymnasium where the Rolling Devils was established and the venue where the first wheelchair basketball game between two paraplegic teams, remains intact and essentially unchanged from its World War II form.

e. Comparison to Similar Properties

Properties comparable to NHC include resorts that were converted to Naval hospitals and Naval hospitals specifically built to serve the medical needs of World War II. To a lesser extent, NHC is comparable to Naval hospitals already in existence prior to World War II.

Resort-Based Naval Hospitals: WHS has identified 11 resort properties that the Navy converted to World War II Naval hospitals. Of these, NHC is the only one that remains with integrity to its World War II form. All of the other resorts converted to Naval hospitals were returned to their owners after the war, with all war-specific improvements removed so as to return these properties to their pre-war condition.

World War II Built Naval Hospitals: NHC is the only Naval hospital built in the Western United States during World War II that remains intact. Most of the other World War II built hospitals consisted of temporary buildings that were removed after the war. Naval Hospital Long Beach is a rare exception to this rule, consisting of both permanent and temporary construction built during World War II. Naval Hospital Long Beach is no longer extant, however, having been demolished and replaced with other uses subsequent to World War II.

Pre-World War II Built Naval Hospitals: Naval hospitals built prior to World War II, but pressed into service and expanded for World War II consist of Naval Hospital San Diego, California Naval Hospital Mare Island, California, and Naval Hospital Bremerton, Washington.

Naval Hospital San Diego contains numerous buildings that predate World War II and are accordingly built to a different standard than was typical of World War II construction. Further, NHSD no longer retains overall integrity to its World War II form. The Pan American Exposition buildings it adapted for hospital use for World War II were vacated after the war and several of these have since been demolished and replaced. The balance of the overall hospital campus that remains has seen alterations, additions, and expansions that have diminished the hospital's integrity to its World War II form.

Naval Hospital Mare Island differs from NHC in that it was only a part of a much larger Naval base that included numerous other uses. Additionally, many of Mare Island's hospital buildings predate World War II and are accordingly built to a different standard than was typical of World War II construction. Overall, Mare Island's hospital campus no longer retains overall integrity to its World War II form.

Like Naval Hospitals San Diego and Mare Island, Naval Hospital Bremerton, Washington was built prior to World War II, using construction typical of pre-war standards. Further, Naval Hospital Bremerton has been significantly altered since World War II and no longer retains overall integrity to its World War II form.

Marine Hospital Puget Sound is not directly comparable to NHC, because it was built prior to World War II, using standards and the Art Deco style typical of its construction period. Nonetheless, Marine Hospital Puget Sound retains excellent integrity to its World War II form, and is listed on the National Register of Historic Places for both its architectural quality and its integrity.

f. Significance Level

NHC appears to be qualified for listing on the National Register of Historic Places as a Historic District at the National Level, CHR Status Code 3D.

g. Integrity

National Register Bulletin 15 (*How to Apply the National Register Criteria for Evaluation*) defines integrity as "...the ability of a property to convey its significance." Additionally, Bulletin 15 lists seven aspects of integrity and notes that to be eligible for National Register listing, "...a property will always posses several, and usually most, of the aspects." The seven aspects of integrity consist of *Location, Design, Setting, Materials, Workmanship, Feeling, and Association.* All of these aspects, as applicable to NHC, are addressed below:

Location: Bulletin 15 defines *Location* as "...the place where the historic property was constructed or the place where the historic event took place." NHC retains excellent integrity of location, as its location remains largely as it was during the Hospital Era. The only difference is the fact that it is smaller in overall size. Specifically, about three-hundred of its original acres have been transferred to other public and private entities for development with new uses. These surplused lands consist of undeveloped open spaces and land devoted to golf course usage, so the effect on the integrity of the resource is minimal.

Design: Bulletin 15 defines *Design* as "...the combination of elements that create the form, plan, space, structure, and style of a property." NHC retains excellent integrity to its World War II design, with all World War II buildings retaining their original form, plan, space,

structure, and style. For the most part, alterations made subsequent to World War II consist of minor additions, and the replacement of windows and doors within their original openings.

Setting: Bulletin15 defines *Setting* as "...the physical environment of a historic property." The NHC campus is largely unaltered since World War II. Other than golf course and open space lands that were sold for private and governmental development, changes in setting consist largely of new buildings. Most of the new buildings are located on the California Rehabilitation part of the campus (consisting of Unit 3 and the north portion of Unit 1), with the vast majority of these consisting of modular and temporary construction. New permanent construction is largely located on the Naval Weapons Station side of the property (consisting of Unit 2 and the south portion of Unit 1) and most noticeably consists of new lab buildings. Two of these buildings (Buildings 544 and 547) are Spanish Colonial Revival in design and only one of which (Building 575) is a non-descript utilitarian design. The balance of the new buildings on the Naval Weapons Station side of the property are small utility buildings that have little or no impact on the overall character of the property.

Materials: "Bulletin 15 defines *Materials* as "...the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property." All NHC buildings retain their historic materials, with exceptions largely limited to replacements of windows and doors within original historic openings. The most visible of these replacements consist of the Unit 2 ward buildings, the porches of which have been altered to replace the exterior glass walls with stucco finished walls penetrated by much smaller windows. Other minor changes in materials may be found in some of the roof vent cupolas which no longer retain their tile roofs and one of the Unit 2 Phase 1 ward buildings the tile roofing of which has been replaced with composition shingles.

Workmanship: Bulletin 15 defines *Workmanship* as "...the physical evidence of the crafts of a particular culture of people during any given period in history or prehistory" (Ibid) Other than replacement windows and doors, the workmanship of NHC remains essentially unchanged from its World War II appearance.

Feeling: Bulletin 15 defines *Feeling* as "...a property's expression of the aesthetic or historic sense of a particular period of time." Anyone who was associated with NHC during the hospital era would immediately recognize the hospital campus as that known during historic times. The buildings, setting, and site planning are largely intact.

Association: Bulletin 15 defines *Association* as " the direct link between an important historic event or person and a historic property. A property retains association if it is the place where the event or activity occurred and is sufficiently intact to convey that relationship to an observer." The important events associated with NHC took place in a hospital campus composed of three distinct units. NHC today looks essentially the same as it did during the Hospital Era.. Even the temporary buildings of Unit 3 remain largely unchanged in materials, design, workmanship, setting, and site planning.

h. Southwest Landscape

As established earlier, the southwest landscape (Figure 100) is important to both the Hospital Era and the Resort Era of the Norconian property. Of all the landscape and site design components of the Norconian property, the Southwest Landscape is among the most important. Just as it did for resort guests, the Southwest Landscape provided a sense of

calm, reflection, and renewal for both patients and staff assigned to NHC. In researching this document, WHS located numerous newspaper articles, books, oral histories, and internet sites that refer to the positive benefit NHC's landscaped grounds had on the morale and sense of well-being on NHC's patients and staff. The Southwest Landscape was also an important component of the rehabilitation process. For example, it is well documented in this report that the golf course provided cardiovascular exercise and also helped patients with issues regarding range of motion, muscle stiffness, and hand-eye coordination. Boating on the lake provided physical rehabilitation and recreational benefits similar to those found in golf.

The only significant changes to the Southwest Landscape are the loss of much of the golf course to various types of development. and the addition of a building and access road on Hill B. As viewed from the hotel building; however, Hills A, B, and C, along with the land between and around them still give the sense of edge to the lake and the feeling of a bucolic landscape as intended in the original site planning for the Norconian property. In this regard, the Southwest Landscape retains sufficient integrity to represent its role in the Norconian property's original site design. Without the hills and open spaces between, the resort would lack definition in regard to southerly views from the hotel. The space between Hills A and B remain sufficiently intact to retain the sense of open space once offered by the former golf course beyond. Hills A and B themselves continue to visitors to enjoy views to the many aesthetic features characteristic of the core of the NHC campus.

i. District Contributors and Noncontributors

The table in Figure 101 lists the contributors to the NHC National Register Historic District. Because of the multitude of the smaller buildings and structures, no effort was made to identify every one of them. Suffice it to say, if the building is not on the list of contributors to the Hospital Era Historic District, it can be categorized as a noncontributor to the Hospital Era Historic District.

The district contributors include both Resort Era buildings and buildings constructed specifically for hospital purposes. While the Resort Era buildings are already National Register listed for their association with the Norconian Resort, these buildings were adapted to serve important roles in NHC's mission. Thus their significance as contributors a National Register Hospital Era district is fundamental.

Further, some resources that were used for hospital purposes, were also used for weapons RDT&E. Accordingly, these hospital buildings need to be evaluated for significance to the Weapons RDT&E Era. *This point is important, as some of the buildings that are noncontributors to the Hospital Era, may nonetheless be contributors to the Weapons RTD&E Era.* The survey and evaluation of these resources is addressed in Part 3.

j Other Potentially Significant Factors Needing Further Research:

Research is on-going regarding several other facets of NHC's history that may be likely candidates for Criterion A related significance. Below are some of these facets:

- **Art in Defense:** There is considerable evidence that the use of Arts and Crafts as occupational and physical therapy tools took a huge pioneering step forward at NHC during World War II and prompted a groundbreaking therapy

movement that spread across the nation. (*Los Angeles Times*, Art in Defense Aides Here Lead Nation, Fox, Christy, 9-101944: C-1)

Due to improved surgical techniques and new medications introduced during the World War II, more soldiers and sailors survived the battlefield, thus forcing the rehabilitation and occupational therapy movement to align with the needs of surviving patients. (*American Journal of Occupational Therapy*, The Use of Crafts in Occupational Therapy for the Physically Disabled, Bissell, Julie Crites, Mailloux, Zoe, pp. 369-374, Vol. 35, No., 6, 6-1981)

Occupational therapy, much taken for granted today, was a relatively new concept prior to WWII. Beginning as "a moral treatment" prior to WWI with the credo, "Respect for human individuality and a fundamental perception of the individual's need to engage in creative activity in relation of his fellow man," therapy was essentially limited to those who were mentally ill. WW I forced the philosophy to be extended to the physically disabled. (Ibid)

The 1920's brought "Reconstruction Aides," who developed craft programs for veterans to "reactivate minds" and "limbs" to get them on the road to vocational training (ibid.) During this period, therapists endeavored to establish their field as a profession and occupational therapy as a fundamental and unique service to develop not only physical improvement but psychological and social improvement as well. (Ibid)

The Great Depression devastated the Occupational Therapy movement as budget cuts forced such treatment away from arts and crafts and focused once again on improving physical health only. (ibid)

Artist and writer Marion Churchill Raulston reintroduced arts and crafts as a key component of occupational/vocational therapy via specially trained volunteers who were actually trained prior to World War II. The opening of the *US Naval Hospital Corona* provided the testing ground for such therapy. (*Los Angeles Times*, Art in Defense Aides Here Lead Nation, Fox, Christy, 9-101944: C-1)

There is significant, though early, evidence that the NHC Therapy Unit complex eventually overseen by the Red Cross, Navy WAVES, Corpsmen, and civilian volunteers, may have been one of the first in the nation, with references to equipping the facility as early as August of 1942 and indicating the facility was already in use (*Los Angeles Times*, Bereft Father Provides Tools for Navy's Wounded Men, 8-8-1943: A-2) predating or perhaps coinciding with the earliest known Army program at Walter Reed General Hospital. (Website: U.S. Army Medical Department: Office of Medical History, Dietitians, Physical Therapists, and Occupational Therapists, Chapter V, pp. 151-163, 2015). http://history.amedd.army.mil/booksdocs/wwii/medtrain/ch5.htm (Accessed 2015)

Contextually, available evidence indicates that Vocational and Occupational therapy (utilizing arts and crafts) overall was not truly recognized by the military because therapists had no military status (though there were a few therapists at the beginning of the war, they could not achieve rank), and the

single program outside Corona to be found in 1942 (Walter Reed General Hospital), was said to be poorly run without oversight of the Army surgeon general. However, in October of 1943, well after Corona had established a Vocational Therapy Department, with the introduction of Army Occupational Therapy indoctrination courses, Vocational Therapy began to take hold. (Website: U.S. Army Medical Department: Office of Medical History, Dietitians, Physical Therapists, and Occupational Therapists, Chapter V, pp. 151-163, 2015). http://history.amedd.army.mil/booksdocs/wwii/medtrain/ch5.htm (Accessed 2015)

A more thorough examination of this topic needs to be conducted; however, early research indicates this therapy movement, if found to have been developed at NHC, was groundbreaking and changed the course of vocational and occupational therapy to the present day.

- **Naval Aid Auxiliary (NAA):** The NAA was a unique World War II wartime service organized by the wives of some of the most powerful directors, producers and studio heads in Hollywood (Program: Messerschmitt Display Program, Naval Aid Auxiliary, 1943). Begun by Mrs. Ernst Lubitsch and Mrs. Mervyn LeRoy (wives of two of the most prominent directors in Hollywood) as "Bundles for Britain", the program served as a means to support those fighting the Battle of Britain (*Berkeley Daily Gazette*, Hedda Hopper's Hollywood: Hat's Off, pp. E-2, 1-19-1942) The organization soon became "Bundles for Bluejackets" after Pearl Harbor (*St. Petersburg Times*, 'Bundles for Bluejackets' New Title of Aid Group, pp. 12, 1-10-1941), to support American Sailors and their families docking at San Pedro. Soon thereafter, this program became known as the "Naval Aid Auxiliary" with a home office in Hollywood.

  The NAA, chartered under the direct supervision of the Eleventh Naval District, was the first woman's naval welfare organization in the history of the Navy to be founded and chartered to serve the Navy (Navy Program: Messerschmitt Display Program, Naval Aid Auxiliary, 1943).

  Little research has been done on war time women's support organizations (Naval Aid Auxiliary, Women's Ambulance and Defense Corps of America, Civil Air Patrol, etc.); each of which, in many cases had very different missions, wore quite elaborate civilian, pseudo military uniforms, and are frequently and incorrectly lumped with the more famous USO. (U.S. Navy: *NAVFAC Southwest ADDENDUM Survey, Evaluation, and Update of National Register of Historic Places Eligibility at Naval Weapons Station Seal Beach, Detachment Norco, Riverside County, California,"* 3-23-2011)
  The NAA was not an entertainment organization (though they did sponsor a few selected entertainment events: concerts, plays, sporting events and displays of enemy weaponry). Its primary mission was offering support to those fighting the war by providing canteen services, promoting war bond sales, rolling battle dressings, providing childcare for the wives of Sailors, operating recreation rooms, providing new and used clothing to the families of those overseas, organizing nursery schools, etc. (Program: Messerschmitt Display Program, Naval Aid Auxiliary, 1943).

BLDG #s	HOSPITAL ERA CONTRIBUTOR BUILDING NAME	PROPERTY TYPE	BUILT
307-312	Unit 1, Hospital Annex	Health Care	1943
101	Unit 1, Main Administration (Former Hotel Building)	Health Care/Adm	1928
102	Unit 1, Tea House	Health Care	1928
302	Unit 1, Main Power House	Infrastructure	1928
103	Unit 1, Nurses' Building	Residential	1943
104	Unit 1, Nurses' Building Annex	Residential	1944
306	Unit 1, Chapel	Personnel Support	1944
305	Unit 1, Occupational Therapy	Health Care	1942/43
313	Unit 1, Tool House	Personnel Support	1944/45
315	Unit 1, Ship's Service Storage	Personnel Support	1944/45
320-322	Unit 1, Theater/Gymnasium/Ships Store/Laundry Complex	Personnel Support	1945/46
300	Unit 1, Fifth Street Gatehouse	Transportation	1942
301	Unit 1, Corpsmen's Quarters	Residential	1943-44
201	Unit 1, Officers' Club (Former Casino/Pavilion)	Personnel Support	1928
203	Unit 1,Boat House and Docks	Personnel Support	1929
209	Unit 1, (Old) WAVES Quarters & Qtrs " G" (former Chauffeurs Qtrs)	Residential	1929
204	Unit 1, Garage/Laundry	Personnel Support	1930
213	Unit 1, Plumbing Warehouse	Personnel Support	1942
214	Unit 1, Truck Shelter	Transportation	1942
215	Unit 1, Grease Rack	Transportation	1944
208	Unit 1, Fire Station/Electric Shop	Personnel Support	1944
218	Unit 1, Gardner's Shed	Personnel Support	1942
220	Unit 1, Animal House (listed as 217 on some maps)	Health Care	1946
512	Unit 2 Command Center	Administration	1943
511	Unit 2 Recreation Building	Personnel Support	1943
515	Unit 2 Subsistence Building	Personnel Support	1943
513	Unit 2 Power House, Garage and Warehouse	Infrastructure	1943
508, 513, 516, 518	Unit 2, Phase 1 Wards	Health Care	1943
517-523	Unit 2, Phase 2 Wards	Health Care	1944
506-507	Unit 2, Phase 1 Sick Officer's Wards	Health Care	1943
505	Unit 2, Phase 2 Sick Officers' Wards	Health Care	1944
555	Unit 2, Phase 1 Covered Walkways	Health Care	1943
556	Unit 2, Phase 2 Covered Walkways	Health Care	1944
501-503	Unit 2 Corpsmen's Quarters	Residential	1943
504	Unit 2 Corpsmen's Bag Storage Building	Personnel Support	1945
448, 453, 455, 453, 456, 458	Unit 3, Central Facilities	Administration/ Health Care/ Personnel Support	1944
451	Unit 3, Recreation/Storage Building	Personnel Support	1944
427, 429, 431-439, 441-443, 445	Unit 3, Ward Buildings	Health Care	1944
449	Unit 3, Boiler Plant	Infrastructure	1944
457 and 459	Unit 3, Help's Quarters	Residential	1944
498	Unit 3, Fire Station	Personnel Support	1944
447	Unit 3, Bag Storage	Personnel Support	1944
801-802	Sewage Treatment Plant	Infrastructure	1942
N/A	Lake, Lake Landscaping and Southwest Landscape.	Personnel Support	N/A

FIGURE 101: HOSPITAL ERA CONTRIBUTING USES

Source: WHS

However, as pertains to *US Naval Hospital Corona*, the NAA served as a pioneering effort that became the national "hospital service" movement.

Headed by Hollywood star and "morale officer" Kay Francis, the NAA sent the biggest names in show business (James Cagney, Gary Cooper, etc.) and

FIGURE102: NAVAL HOSPITAL CORONA HISTORIC DISTRICT

Source: Google.com

starlets to Norco to actually visit with patients (Kay Francis: 1943, Francis to Lastfogel, 12-9-1943 Kear, Lynn. (Author: "Kay Francis: A Passionate Life and Career," McFarland Publishing, Jefferson, North Carolina, 1-11-2006) This "hospital service" became a national movement spread by Francis herself. *(Los Angeles Times*, Kay Francis to Tour Military Hospitals, 9-27-1942, D4)

Only Corona (and later US Naval Hospital Long Beach to a lesser extent) had such a prominent Hollywood connection. This was due to the proximity of Los Angeles, where stars would visit patients at both NHC at NHC's special box at the Hollywood Canteen. The NAA also organized various social functions, including those at the Beverly Hills Playhouse, Grauman's Chinese Theatre, Ciro's Night Club, etc..

The NAA began to phase out in 1946 as need for its services waned. During this time, shore stations closed, the Hollywood Canteen disbanded, and the numbers of volunteers began to dwindle. It appears that the NAA gave way to the Navy Relief Society, but, this needs further research.

More research needs to be done over all, but, thus far documentation supports the idea that *US Naval Hospital Corona* had a unique connection to Hollywood.

- **Hollywood Connection:** Beyond the NAA, NHC's proximity to Hollywood and the history of the Norconian Resort as a playground for the "rich and famous", made it a familiar destination for the entertainers of Hollywood. NHC had a direct connection with the Hollywood Canteen, including a special seating area for NHC patients and special transportation services to transport patients to and from the Canteen. Taken in context with the overall Hollywood effort to entertain and boost the morale of U.S. military personnel, it appears NHC enjoyed a more substantial connection to Hollywood than did other military installations.

- **Local Significance:** NHC and the local communities of Norco and Corona enjoyed a very close relationship. Numerous community volunteers served at NHC (Gray Ladies, USO, Coronettes, etc.), Businesses reached out to NHC in support of its mission to heal sick and wounded military personnel, and several industries were revitalized by the hospital as a customer of eggs, produce and poultry meats, etc. Sailors and Marines, patients at the hospital, their families, staff, literally thousands of people flooded into the Corona-Norco Communities injecting commerce never before seen in the area. Those who barely survived the Great Depression also welcomed employment. NHC's facilities were freely shared for community events and activities. NHC even made space in its hospital available to serve as a temporary elementary school while the school district looked for a replacement for its seismically unsafe original elementary school. Community concerts were held in the theater, and dances in the former ballroom and hospital gymnasium. There is also some evidence that Navy opposition to racial discrimination may have started with an incident involving NHC and Corona businesses. So far, the only clear evidence of this possibility has come from oral histories. Research is on-going to determine the validity of this assertion.

  The hospital was important to community health: for example, opening its doors to children during the great polio epidemic, and George Griffith the famed heart specialist continued his relationship with local physician Bernice Todd, the schools physician, after his service at USHC to work with local children suffering from Rheumatic fever. There are numerous references by public officials that the Navy had the greatest impact on Corona - Norco than any other source in the community's history.

  To this day, Norco honors the Pearl Harbor connection and has placed a significant monument to honor both the hospital and Cold War laboratories. Research indicates that the hospital was of monumental importance socially, financially, population and housing wise.

Continuing research in these areas and more hold promise for further cementing the national significance of NHC).

PART 3:
DETACHMENT CORONA WEAPONS RESEARCH DEVELOPMENT, TESTING & EVALUATION (RDT&E)

THE ORGANIZATION OF PART 3

The overall approach taken in the organization of this part of the report on Detachment Corona's Weapons Research, Development, Testing & Evaluation (RDT&E) work is to explore the Cold War and the role played by Detachment Corona from the general to the specific. It is organized as follows:

- **Section 1: Historic Context of the Cold War**
  This section examines the overall context of the Cold War. It explores the factors that brought about the Cold War and how it impacted U.S. national defense. It also delves into the role played in the Cold War by the Navy's missile programs.

- **Section 2: Historic Context of Detachment Corona**
  This section of the report focuses on the history of the subject property in relation to the Cold War. To accomplish this, it provides an overall history of the property as a facility that specialized in RDT&E of Navy missiles.

- **Section 3: Historical Themes of Detachment Corona**
  Here the report explores the history of the three main activities conducted at the subject property during the period between 1951 and 1971. Otherwise known as "themes," these activities consist of the following.
    - Theme 1: Fuse, Science, and Engineering RDT&E
    - Theme 2: Independent Missile Evaluation
    - Theme 3: The GIDEP and FARADA systems.

- **Section 4: Identification of Detachment Corona Buildings and Structures**
  This section of the report takes a detailed look at the various buildings and structures associated with the subject property in relation to the implementation of its mission.

- **Section 5: Analysis of Detachment Corona for National Register Listing**
  This section takes a look at the degree to which the property may qualify for listing on the National Register of Historic Places.

Part 3, SECTION 1, HISTORIC CONTEXT OF THE COLD WAR

1. Introduction

The purpose of this Overview of the Cold War is to provide a context for the main subject of this report, the documentation and evaluation of weapons RDT&E at the former Naval Hospital Corona (NHC.) NHC was a World War II built naval general hospital. It was built between 1941 and 1947 through the conversion and expansion of a former luxury resort known as the Norconian. While located within a community known as Norco, all activities at this property have historically used the designation “Corona”, the name of a larger and older community located south of Norco. For the sake of consistency, this report also uses the term “Corona” when describing the property, despite its location in the City of Norco.

Detachment Corona has a history as a key component of weapons RDT&E in Southern California. Through the efforts of this facility, some of this country’s most sophisticated weapons were brought into practical use and independently tested for effectiveness.

Unfortunately, the classified nature of many of the projects undertaken at Detachment Corona somewhat limits the degree to which the technologies undertaken there can be researched. For example, scientist Dr. Frederick Alpers is known to have accomplished significant work at Detachment Corona; however the public record is not complete enough to substantiate that. However, there is enough information available in the public record to determine the historical significance of the property in relation to the National Register of Historic Places. This document addresses the work accomplished at Detachment Corona between 1951 and the present day. The period of significance, however, spans 1951-1971. The period of significance is the portion of the property’s history that is subject to evaluation for historical significance.

2. The Cold War - 1946-1989

World War II was the impetus toward significant technological advancements in weapons design. In many respects victory hinged on who could create the most advanced weapons first. The development by the United States of the Atomic bomb as a fully functional instrument of war was a significant factor in the success of the allied forces in winning World War II. This invention also, however, initiated a technology race that dominated the years afterward. The arms race with the Soviet Union and subsequently with smaller countries accelerated the pace of development and added a level of urgency to weapons advancement that was not as prevalent before World War II. (http://www.historytoday.com/john-swift/soviet-american-arms-race, Accessed 2015)

While the Soviet Union was an ally with the United States and England during World War II, the relationship was always tenuous. Once the common goal of defeating Germany, had been accomplished, the level of distrust between the US and the Soviet Union grew rapidly. Fear of losing the arms race encouraged the expenditure of significant amounts of money to support the technological advancements deemed necessary for safeguarding our homeland and the free world overall. (Ibid)

During the post-war era, the U.S. aligned itself with Europe, thus creating a strong partnership to counter Joseph Stalin’s Soviet Union. President Harry Truman proclaimed the U.S. to be a proponent of the free world in the struggles against external forces, particularly those controlled by communist governments. President Truman’s “Truman Doctrine” of March 1947 and the subsequent “Marshall Plan” of June 1947 instituted an investment of some $13 billion in Europe that

led to an extraordinarily rapid and permanent reconstruction of democratic Western Europe. (https://history.state.gov/departmenthistory/short-history/truman, Accessed 2015)

While the successful use of atomic weapons during World War II caused the U.S. to become the superior power right after the war, it did not take long for the Soviet Union to catch up. Evidence of the speed with which the Soviet Union was progressing in the arms race occurred in 1949, when it conducted a successful test of an atomic bomb. With this development, the U.S. came face-to-face with the reality that it was vulnerable to mass destruction. (Lonnquest and Winkler 1996) The threat posed by the Soviet Union was magnified by its ability to raise a combined army with China. (Mikesell 2000, *California Historic Military Buildings and Structures Inventory: Volume II*: 8-7)

Shortly after the Soviet's successful test, President Truman responded by directing the Atomic Energy Commission to develop a hydrogen bomb. He also created a task force to review U.S. National Security policies. The result was the National Security Council (NSC)-68 report, released on April 14, 1950, which issued a warning that the U.S. needed to greatly expand its weapons RDT&E program if it was to avoid falling behind the Soviets. The NSC report estimated that the Soviets could have the ability to attack the U.S. with long-range bombers and atomic weapons by 1954. (Ibid)

The NSC-68 report was taken very seriously and led to an increase of the Department of Defense (DoD) Fiscal Year 1952 budget by an astounding 300 percent. The urgency of investing in an aggressive weapons development program was further accelerated in June 1950, when communist North Korean attacked South Korea, leading to the Korean War (1950-1953.) RDT&E efforts led to the successful testing of a hydrogen bomb in 1952. And, as with the atomic bomb, the Soviet Union was not far behind, developing and testing its hydrogen bomb in 1955. The pace of the arms race led President Truman to favor strategic weapons development over the assemblage of massive armies. (Ibid: 6-7)

Extending Truman's approach to defense spending, President Eisenhower adopted the "New Look" defense policy. Basically the New Look policy decreased defense spending by reducing the funding of conventional forces and emphasizing the ability to retaliate against with atomic bombs. The Soviet Union's 1957 announcement that it had developed an intercontinental ballistic missile served to place even greater emphasis on weapons technology development. The Soviet's successful launch of Sputnik later that year added fuel to the fire and greatly increased U.S. concerns about what appeared to be a significant missile gap between the U.S. and the Soviets. (http://millercenter.org/president/eisenhower/essays/biography/5. Accessed 2015)

In 1961, President Kennedy advanced a new concept dubbed "Flexible Response." This policy called for the technological advancement of both conventional and nuclear weapons to counter potential aggressors. This allowed the deployment of sophisticated weapons of various sizes and capabilities, in scale with the nature of the conflict. (http://www.nuclearfiles.org/menu/key-issues/nuclear-weapons/history/cold-war/strategy/strategy-flexible-response.htm, Accessed 2015)

In the late 1950s into the 1960s, the Space Race gained considerable traction, with increased efforts to produce launch vehicles. Radar also took on an important role in technological development. These efforts paid off as the U.S. countered Russia's Sputnik with the launch on January 31, 1958 of Explorer I. To further expand and accelerate U.S. efforts to achieve superiority in the Space Race, the National Aeronautic and Space Administration was created in that same year. Related to this was the advancement of intelligence gathering capability through radio wave technologies. To make this possible, larger antenna arrays were developed. The Navy's ANIFRD-

10 Wullenweber, spanned the gap between high frequency direction finders and satellites. (http://history.nasa.gov/sputnik/, Accessed 2015)

Relations with the Soviet Union worsened through the early to mid-1960s as evidenced by several incidents:

- **Gary Powers:** In 1960, a U.S. spy plane piloted by Gary Powers was shot down over the Soviet Union. This event put a chill on U.S.-Soviet relations and set back talks between Khrushchev and Eisenhower. For many Americans, who were unaware of such U.S. conducted spying operations it was also a time of disillusionment. (Powers, Francis Gary; Curt Gentry, *Operation Overflight,* Hodder & Stoughton Ltd, 1971)

- **Bay of Pigs:** The following year, another event occurred that proved to be an even greater embarrassment to the U.S. The CIA believed it could overpower Castro's Cuba with an army of 1,400 American trained Cubans who had fled their homes when Castro took over. Known as the Bay of Pigs incident, the invasion failed miserably when the anti-Castro troops were outnumbered by Castro's army and forced to surrender within 24-hours of the invasion. (http://www.history.com/topics/cold-war/bay-of-pigs-invasion, Accessed 2015)

- **Cuban Missile Crisis:** In October of 1962 the U.S. and Soviet Union clashed over Russia's installation of nuclear-armed Soviet missiles in Cuba. In a TV address on October 22, 1962, President Kennedy let the American public know that the U.S. had enacted a naval blockade to force the removal of the weapons. Termed the Cuban Missile Crisis, it ended peacefully when Khrushchev agreed to remove the missiles if the U.S. would promise not to invade Cuba again. Many Americans feared we were about to enter World War III. (http://www.history.com/topics/cold-war/cuban-missile-crisis, Accessed 2015)

- **Vietnam War:** In August of 1964, the North Vietnamese were reported to have attacked the U.S. destroyer *Maddox.* This led President Johnson to request Congress' authorization of "…all necessary measures to repel any armed attack against the forces of the United States and to prevent further aggression." Known as the Gulf of Tonkin Resolution, many consider this event to have been the "beginning" of the Vietnam War. (http://www.history.com/topics/vietnam-war/gulf-of-tonkin-resolution, Accessed 2015) Both the USSR and the People's Republic of China also lent moral, logistic and military support to North Vietnam. (http://alphahistory.com/vietnam/chinese-and-soviet-involvement/#sthash.JTPTPt8s.dpuf, Accessed 2015)

Somehow, however, 1972 marked the beginning of a period called "détente", a French word meaning *release from tension*. This period had its definitive beginning when in May of 1972 President Richard M. Nixon visited Leonid Brezhnev, the Secretary-General of the Soviet Communist party. The meeting took place in Moscow and marked the first time a U.S. President had visited that Russian city. The increase in trade and a reduction of the threat of nuclear war that followed was to the benefit of both countries. Nixon's trip to China a few months earlier magnified the Soviets' interest in détente; given Russia's fear that China and the U.S. could join forces against it. Nixon and Brezhnev ultimately signed seven agreements covering arms control and the prevention of accidental military clashes. All of these agreements were recommended by the Strategic Arms Limitation Talks (*SALT*) discussed below. (http://www.history.com/topics/cold-war/detente, Accessed 2015)

The SALT agreements were an attempt to reduce the amassing of nuclear weapons in both the U.S.A. and the USSR. Conducted in Helsinki, Finland, and spanning over two and a half years, the talks led the USSR and the U.S.A. to agree to nuclear arms reductions. Two treaties were ultimately signed. While a legacy of President Johnson, it was President Nixon who ultimately signed the interim SALT agreement with Soviet General Secretary Leonid Brezhnev on May 26, 1972, in Moscow. This marked the first time during the Cold War that the U.S.A. and the Soviet Union had agreed to limit the number of nuclear missiles in their arsenals. (https://history.state.gov/milestones/1969-1976/salt, Accessed 2015)

In the 1980s, President Regan increased spending and initiated a new program, the Strategic Defense Initiative (SDI) or "Star Wars." First initiated in March of 1983, Star Wars was a program aimed at developing a sophisticated anti-ballistic missile system in order to prevent missile attacks from the Soviet Union and other countries. As a consequence of this, tensions between the U.S. and the Soviets once again grew. (www.coldwar.org/articles/80s/SDI-StarWars.asp*, Accessed 2015)*

Fortunately, the election of Soviet leader Mikhail Gorbachev in 1985 facilitated a cooling down of these tensions. This trend was greatly enhanced when Gorbachev initiated a policy of "perestroika" (economic restructuring) and "glasnost" (openness), which began a period of profound changes in Russia's economic practices, internal affairs, and international relations. In just five years, Gorbachev's bold program led to the downfall of communist governments throughout Eastern Europe. When the Berlin Wall fell in 1989, many believed the Cold War was over. Unintentionally, Gorbachev's policies had also set the stage for the 1991 collapse of the Soviet Union and its division into 15 individual republics. He resigned as General Secretary of the Communist Party of the Soviet Union on December 25, 1991. (http://www.history.com/topics/cold-war/perestroika-and-glasnost, Accessed 2015)

3. Cold War Naval Weapons Systems

Technological advancements developed during World War II included atomic weapons, jet aircraft, solid-state and miniaturized electronics, radar, proximity fuzes, rockets, and long-range missiles. The post World War II period greatly accelerated the pace of weapons technology development. To avoid falling behind our country's enemies, the federal government saw a need to harness a broad spectrum of talents, including those found in the military, private industry, and universities. The Army, Navy, and Air Force assumed important roles in the development and deployment of advanced weaponry. The Navy was particularly important in the RDT&E of guided missiles. (John C. Lonnquest and David F. Winkler, *To Defend and Deter: The Legacy of the United States Cold War Missile Program*, 1996: 2-5, 13, 17, 20, 66)

A significant amount of Detachment Corona's work centered on the development of effective guided missile fuzes. As Technical Director of Missile Fuze Development, Detachment Corona contributed significantly to the success of the following guided missiles:

Surface to Air:

- Talos
- Terrier
- Tartar
- Standard Extended Range Missiles
- Stand Medium Range Missiles
- Aegis

Air to Air:

- Sparrow
- Sidewinder
- Phoenix

Surface to Surface:

- Polaris
- Poseidon
- Trident
- Tomahawk

Air to Surface:

- Bullpup
- Walleye

Anti-Radar:

- Shrike
- Standard Anti-Radiation Missiles (Norman Friedman, *U.S. Naval Weapons: Every Gun, Missile, Mine, and Torpedo Used by the U.S. Navy from 1883 to the Present Day,* Naval Institute Press, Annapolis, 1984: 13)

The years immediately following World War II were ones of demobilization and cost savings. While funding for RDT&E continued, many World War II installations and facilities that served wartime functions were closed or experienced changing missions and declines in staffing. The Korean War, however, brought about a renewed effort in the development of effective weapons; and the Navy responded with major advancements in this area. (Goodwin, Christopher and Associates, *Navy Cold War Guided Missile Context: Resources Associated with the Navy's Guided Missile Program, 1946-1989,* 1995: 38)

While World War II brought with it significant advancements in weapons, critical gaps needed to be bridged in the Korean War era. Topping the list of technological gaps was the need for guided missiles that could be used against aircraft and surface targets. The Korean War justified accelerating the development of air-to-air and air- to-surface missiles. Advancements included larger and more sophisticated ships and jet planes equipped with air-to-air and air-to-surface missiles, and improved air defense weapons. (Ibid) Fuzes and guidance systems were particularly important aspects of effect guided missile. Detachment Corona was heavily involved in both of these aspects.

The year 1956 saw the introduction of the air-to-air Sidewinder missile. Surface-to-air missiles consisted of the "3 Ts," Talos, Terrier, and Tartar. Unfortunately, while these weapons provided the Navy with a modern air defense system, they were plagued by reliability and performance issues. By 1954, the Navy had developed the first nuclear powered ship, Nautilus, and by 1960, it had engineered the first submarine-launched ballistic missile, Polaris. These assumed an essential role in the U.S. nuclear arsenal as part of the effort to bridge the perceived "missile gap" and the Soviet naval expansion that grew after the Cuban Missile Crisis. (Ibid)

During the Vietnam War era, between 1963 and 1972, funds were redirected to ship construction and repair, leaving RDT&E with significantly reduced support. Nonetheless, radar and computer advancements in the 1960s and 1970s greatly improved weapons systems, particularly in regard to guidance systems. (Norman Friedman, *U.S. Naval Weapons: Every Gun, Missile, Mine, and*

Torpedo Used by the U.S. Navy from 1883 to the Present Day, Naval Institute Press, Annapolis, 1984:13)

Between 1965 and 1968, the naval Fleet provided an air campaign against North Vietnam, and between 1969 and 1971, it conducted limited bombing. It was during these efforts that some air-to-air missiles were found to be unreliable in close combat. Between 1970 and 1974, a Fleet reduction and President Carter's emphasis on air and land forces proved detrimental to the Navy. Nonetheless, by the end of the decade, international problems in Iran and Afghanistan led the DoD to fund both the expansion and modernization of the naval Fleet. (Goodwin, Christopher and Associates, *Navy Cold War Guided Missile Context: Resources Associated with the Navy's Guided Missile Program, 1946-1989,* 1995: 8-9)

President Regan increased defense spending, helping to provide the means to realize qualitative improvements to the weapons systems that had been developed during the 1960s and 1970s, Among these were the Aegis system, cruise missiles (Harpoon and Tomahawk), and Trident. All of this was done to increase the effectiveness of the U.S. in world domination. (Ibid)

During the 1980s, the military advanced cumulative technologies, especially missiles. Among these, the Trident and Tomahawk are recognized as significant strategic surface-to-surface missiles. Improvements to the Sparrow evolved into the Eagle and ultimately the Phoenix, the Navy's most advanced air-to-air missile, delivered exclusively via F-14 fighter jets. Other jets still used the Sparrow into the 1980s. (Ibid)

California was particularly active in weapons manufacturing during the 1980s, garnering 22% of government contracts. With the conclusion of the Cold War in 1989, came the need to reduce the size and extent of the military. To carry this out, the Base Realignment and Closure program (BRAC) was created. This resulted in the closure of several California installations. Installations that survived the BRAC process, often adapted via mission redirections and staff reductions. (Mikesell, *California Historic Military Buildings and Structures Inventory: Volume II*: 8-15)

The four aspects of weapons development, Research, Development, Testing, and Evaluation, did not typically occur at a single location. Some facilities were focused on Research and Development, while others specialized in Testing and Evaluation. At Detachment Corona, all four aspects took place.

California and New Mexico boasted some of the most important RDT&E facilities including the following examples:

- Naval Ordnance Test Center, China Lake, CA: Originally developed in 1946, China Lake was of the two earliest RDT&E facilities, China Lake was unique for the comprehensiveness of its operations. Many of the very early missile advancements happened at China Lake. Located in the desert, this naval facility was the Navy's main land-based testing operation.

- Point Mugu, CA: The second of the earliest RDT&E facilities, Point Magu was created in 1947. Point Mugu was primarily a T&E station, serving as the Navy's principal sea range using San Clemente Island as an important part of its operations. Much of Point Mugu's work was carried out in concert with China Lake.

- Naval Ordnance Laboratory, Corona, CA: Starting out as a branch of the National Bureau of Standards (NBS), the Corona laboratories provided critical RDT&E on the

missile components and systems, particularly fuzes and guidance systems, necessary for the development of effective guided missiles. Corona also provided a one-of-a-kind service in the form of independent missile evaluation.

- Edwards AFB, CA: This was the Air Force's most significant T&E facility.

- Naval Ordnance Missile Test Facility, at the Army's White Sands Proving Ground, NM: This New Mexico facility was significant for its early air-launched weapons testing. (Goodwin, Christopher and Associates, *Navy Cold War Guided Missile Context: Resources Associated with the Navy's Guided Missile Program*, *1946-1989,* 1995:178-202)

All of California's facilities concentrated on conventional weapons, including air-to-air and surface-to-air guided missiles. China Lake had a unique relationship with the California Institute of Technology (Caltech), working directly for the Navy during and shortly after World War II. Tests too large for China Lake were conducted at the Salton Sea. (Ibid)

Test facilities played an important role in the overall RDT&E effort. Testing facilities conducted evaluations of the preliminary test data incorporated into missile design (Developmental Testing), verification of missile performance in relation to design expectations (Technical Evaluation), and the all-important final testing before being put into use as an operational weapon (Operational Testing.) (Ibid: 177)

Field tests were the primary means for testing missiles in the late 1940s and early 1950s. Soon, however, cost considerations dictated a greater use of laboratory testing prior to field tests. Laboratory testing was conducted using such equipment as wind tunnels, environmental chambers, drop towers, and computer simulation laboratories. Increasingly, these laboratory facilities provided critical development support for the Navy's work in perfecting guided missiles. The Detachment Corona labs were heavily involved in such testing. (Ibid: 197)

Typically, a missile did not receive any field testing until it proved itself in the laboratory. More than ever, therefore, the laboratory became a key component in the missile development process. Drop towers and wind tunnels were some of the earliest laboratory test facilities. Later, environmental facilities were introduced to evaluate missile performance in challenging environmental conditions, such as extreme vibration, major temperature fluctuations, and humidity extremes. Test tracks, including subsonic and supersonic tracks, were another important type of testing facility. (Ibid: 177)

In the 1950s and 1960s, advancements in computer design played an increasingly important role in the enhancement of weaponry sophistication. In this arena Corona "…pioneered the use of large-scale digital computers in processing data." (Barnes, P.A., "Naval Warfare Assessment Division, Naval Ordnance Center's Premier Testing and Research Facility", *Program Manager*, July-August 1997: 75) Specially equipped buildings were needed to accommodate these early massive computers and keep them within operational temperature ranges. At Corona, the former Naval Hospital Corpsmen's Quarters were adapted for this use. Digital computers made it possible for the complex recordation and analysis tasks that would have been much more labor intensive and expensive before their advent. Once a weapon had proved itself in the laboratory, field tests were conducted at remote land-based facilities such as China Lake and ocean based facilities such as Point Mugu. (Ibid) Corona was also a key location where tests were carried out. At Corona, tests were conducted in laboratories, environmental chambers, via computer simulations, and via a number of outdoor test facilities.

The 1950s and 1960s were in many respects a golden age of missile development. (Mikesell, *California Historic Military Buildings and Structures Inventory, Volume II*: 8-6) In executing its responsibility for keeping the nation safe from air attack, the Air Force was responsible for Intercontinental Ballistic Missile systems and Intermediate Range Ballistic Missile systems. But, there was inevitable overlap between the missions of various military branches. The Navy, for example produced the Submarine Launched Ballistic Missile, Polaris. (Goodwin, Christopher and Associates, *Navy Cold War Guided Missile Context: Resources Associated with the Navy's Guided Missile Program, 1946-1989,* 1995:178-202, 19-21, 25, 36-37, 58, 69)

As noted earlier, California was an important center for RDT&E, and from 1946 to 1965, and received the greatest amount of defense funding of all the other states. These funds were used to support installations, RDT&E facilities, and manufacturing operations. The aircraft industry was well established in California creating a knowledge pool for manufacturing missiles via companies such as Hughes Aircraft and Convair. Los Angeles, San Diego, Orange, and Santa Clara counties were the home for almost 60% of the jobs in ordnance, aircraft, parts, and electrical machinery. (James L. Clayon, "The Impact of the Cold War on the Economics of California and Utah, 1946-1965 *Pacific Historical Review*, Volume 36, Number 4, November 1967: 453-461)

As noted above, after the early 1950s, weapons field testing could only be undertaken after successful laboratory testing. Typical laboratory functions included the following:

- Drop Towers for fuze tests.
- Wind Tunnels.
- Environmental facilities that tested and analyzed atmospheric and climatic stresses.
- Static test facilities.
- Captive test facilities.
- Underwater launch tests.
- Computer simulation tests.
- Anechoic chambers and hardware-in-the-loop facilities that evaluated missiles and subsystems before live tests. (Goodwin, Christopher and Associates, *Navy Cold War Guided Missile Context: Resources Associated with the Navy's Guided Missile Program, 1946-1989,* 1995:: 178-202)

Detachment Corona was a major center for laboratory testing and had most of the above types of test facilities on its Norco property. Other types of support facilities were located in other areas.

- Guided Missile Training: Pomona and Point Mugu, California; Jacksonville, Florida; and Dam Neck, Virginia. (These were later consolidated into the Jacksonville and Dam Neck locations.)
- Trident Missile Program: Washington and Georgia.
- Logistical and Operational Support: Earle, New Jersey, Charleston, South Carolina, Yorktown, Virginia, Yorktown, Virginia, and Seal Beach and Concord, California. (ASM 2011: 61)

FIGURE 103: DETACHMENT CORONA SURVEY AREA (White Boundary)

Source: Google.com

Part 3, SECTION 2: HISTORIC CONTEXT OF DETACHMENT CORONA

1. Detachment Corona Location and Current Status

Detachment Corona is located in the City of Norco and is currently the home for an important guided missile evaluation program, known today as the Naval Surface Warfare Center, Corona (NSWCC.) Laboratory functions at Detachment Corona are conducted primarily in the former tuberculosis wards (Unit 2) of Naval Hospital Corona and more recently constructed buildings within the Unit 2 complex. Detachment Corona also makes use of several former Norconian Resort features and buildings, including prominent hills, open spaces, a 60-acre man-made lake, and the former resort's Garage, Pavilion, and Chauffeurs' Quarters. Detachment Corona is also the location of a data exchange center housing performance and failure information on missile components. This latter activity is conducted in a privately owned building on Hamner Avenue opposite Fourth Street from Detachment Corona. Figures 1 and 2 at the beginning of this report, illustrate the location of Detachment Corona at a regional and local level. Figure 103 defines the survey area within the former naval hospital property.

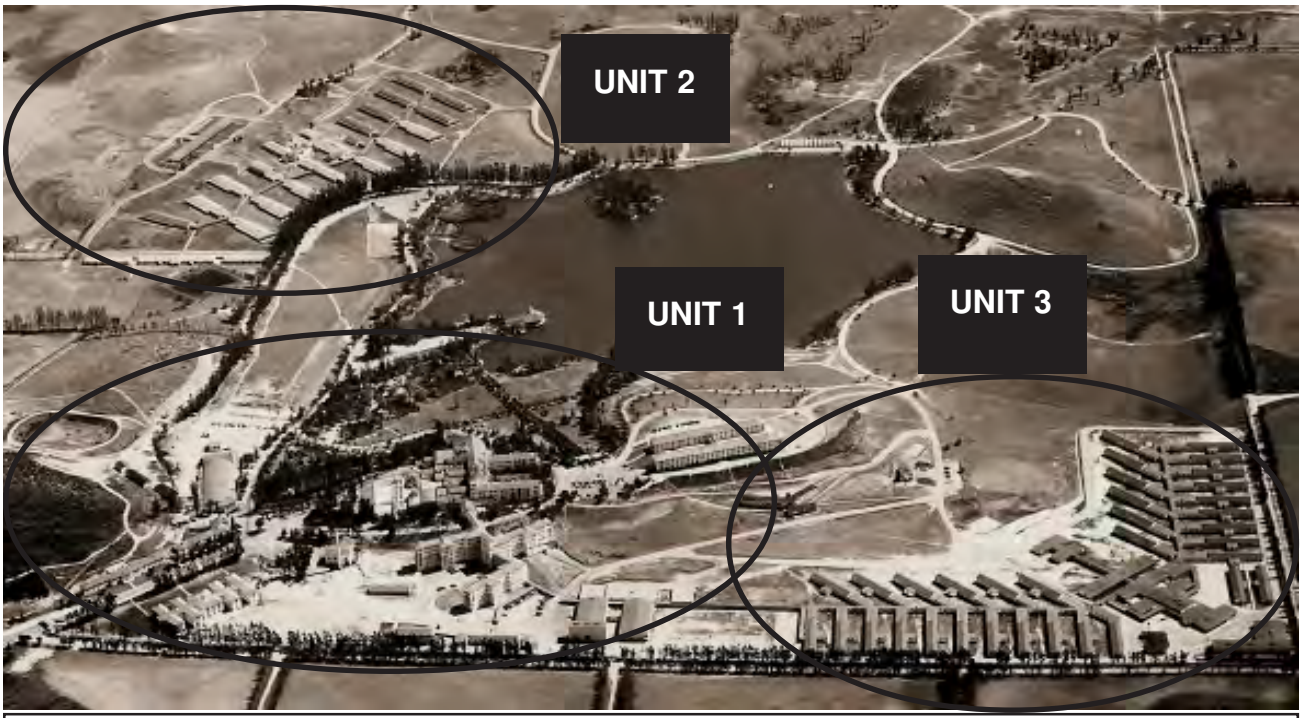


FIGURE 104: NAVAL HOSPITAL CORONA UNITS

Source: Kevin Bash Collection

2. Detachment Corona Property Overview

Detachment Corona consists of a segment of what was formerly a 700-acre naval hospital, adapted from a luxury resort known as the Norconian Resort Supreme. Naval Hospital Corona was divided into three "units" within the former resort property. (Figure 104) Unit 1 was the main general hospital, Unit 2 was a tuberculosis hospital, and Unit 3 was a hospital largely devoted to the treatment of rheumatic fever, poliomyelitis, paralysis issues, and other afflictions. Unit 3's buildings were essentially standard World War II military structures. Units 1 and 2 consisted of a mixture of resort buildings adapted for hospital use, and buildings built expressly for hospital purposes. The resort buildings had been designed by master architect Dwight Gibbs, while the hospital buildings of Units 1 and 2 were designed by master architect Claud Beelman. Naval Hospital Corona was built between 1941 and 1947. All of the resort and permanent hospital buildings were designed in the Spanish Colonial Revival style. NHC closed in 1949 and then reopened between 1951 and 1957. Detachment Corona moved into the former tuberculosis wards of Unit 2 in 1951, later expanding into portions of Unit 1's campus.

Detachment Corona started life as a National Bureau of Standards guided missile R&D laboratory complex, expanding to a DoD associated guided missile RDT&E facility named Naval Ordinance Laboratory Corona (NOLC). By 1955, NOLC's footprint had grown from 95 to 108 acres. Two years after that, it acquired an additional 219 acres. This latter land was located in the southwestern portion of the property, previously used as a golf course. Here, in 1958, NOLC implemented its first major laboratory construction project. (*Los Angeles Times,* "Corona Naval Laboratory Expansion Due," 5-1-1958: B-12)

Detachment Corona can best be understood as a complex of five components (Figure 105) as follows:

- The Unit 2 complex of buildings built between 1942 and 1945.
- The 800 Series of buildings built in 1957.
- The 60-acre man-made lake, completed as part of the resort's landscape in 1929.
- An area of hills and open spaces referred to as the Southwest Landscape that were a part of the resort's open space lands.
- A portion of the Unit 1 complex, consisting of the resort's Pavilion, Chauffeurs' Quarters and Garage, and the hospital's Corpsmen's' Quarters, WAVES' Quarters, and Main (Fifth Street) Gatehouse.

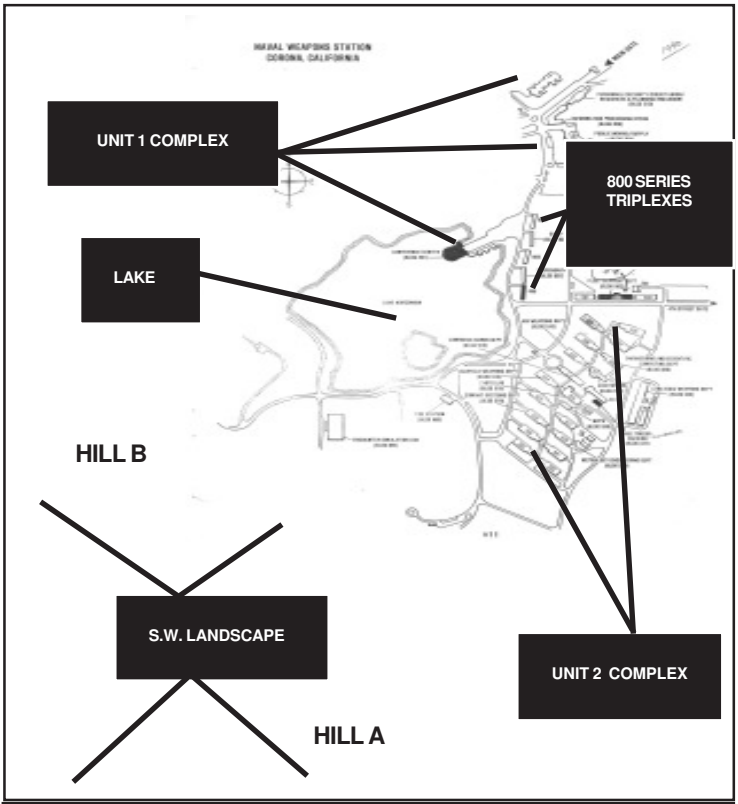


FIGURE 105: DETACHMENT CORONA COMPONENTS

Source: U.S. Navy

3. A Brief History of the Corona Labs

The laboratories and test facilities at Corona were and continue to be a critical center of advanced guided missile work. This section provides an overview history of the Corona Laboratories between 1951 and 1971, the period of significance of this report.

a. Corona's Association with the National Bureau of Standards

Corona's role in guided missile RDT&E began in June of 1951, as a branch of the National Bureau of Standards (NBS.) In that year, the NBS spun off its guided missile RDT&E function, moving it from Washington D.C. to the former Naval Hospital, Corona property located in Norco, California. The NBS team of scientists and engineers had already proven to be a highly effective working group in Washington D.C., but needed a complex with more room and security. Their relocation to the former Naval Hospital Corona instantly put the Corona/Norco area on the map as a major center of national defense work. (http://www.nist.gov/nvl/nist-nbs_history.cfm, Accessed 2015)

The historical roots of the NBS, now known as the National Institute of Standards and Technology (NIST,) extend back to at least 1781. In this year, the Articles of Confederation

gave Congress the exclusive right and power to establish standards for alloy and value of coin. But it was not until 1838 that a set of uniform standards was actually established. From 1830 until 1901, the role of overseeing weights and measures was carried out by the Treasury Department's Office of Standard Weights and Measures. This changed in 1901, when the NBS was founded for the purpose of taking over this function and, additionally, to serve as the nation's official scientific laboratory. (Ibid)

FIGURE 106: BAT MISSILE UNDER PB4Y PATROL BOMBER

Source: U.S. Navy

The first task assigned to the NBS was the standardization of scientific research apparatus. Over the years, however, the NBS assumed responsibility for a wide variety of projects in the fields of physics, chemistry, mathematics, and engineering. During World War I, the NBS engaged in a number of war related projects. (Ibid)

Prior to the outbreak of World War II, the federal government established the National Research Defense Committee, with the mission of developing new and more sophisticated weapons. Division 5 of the Committee was given the responsibility for guided weapons, including radio controlled bombs and pilotless aircraft. This aspect of the NBS's work was well established by 1940. Soon, the Navy became interested in the work of Division 5, and established a naval detachment to help boost the manpower and resources devoted to its guided weapons endeavors. (NAVSEA, *A Tribute to 60 Years of Service to the Navy*, 2000, Corona, CA: 5)

In its Washington D.C. location, the NBS made significant contributions to the effectiveness of the technology that helped make it possible to achieve victory in World War II. The NBS was particularly instrumental in the development and perfection of guided weapons. The following is a summary of the NBS's groundbreaking achievements in this arena:

- Created, in conjunction with the Applied Physics Laboratory, the first successful radio proximity fuze for explosive missiles in 1941.

- Developed the first radio direction finder.

- Helped develop and perfect the Bat, (Figure 106) the first guided U.S. missile successfully used in combat. The Bat is credited with sinking several enemy ships during World War II. (Goodwin, Christopher and Associates, *Navy Cold War Guided Missile Context: Resources Associated with the Navy's Guided Missile Program, 1946-1989,* 1995: 245-261)

FIGURE 107: NOLC BIRDS EYE VIEW c. 1955

Source: U.S. Navy

The BAT body was used well into the 1960s as a test bed for fuzes, miniaturization, and infrared guidance systems.

By 1950, the NBS consisted of some 15 divisions as follows:

- Electricity
- Optics and Metrology
- Heat and Power
- Atomic and Radiation Physics
- Chemistry
- Mechanics
- Organic and Fibrous Materials
- Metallurgy
- Mineral Products
- Building Technology
- Applied Mathematics
- Electronics
- Ordnance Development
- Radio Propagation
- Missile Development (http://www.nist.gov/nvl/nist-nbs_history.cfm, Accessed 2015)

Work on electronic ordnance for guided missiles and radiation physics was one area in which some of the greatest growth had occurred. For this and security reasons, the

decision was made to split this aspect of the NBS off and move it out of its Washington D.C. laboratories. (NAVSEA, *A Tribute to 60 Years of Service to the Navy*, 2000, Corona, CA: 5)

The search for a new home eventually led the NBS to the shuttered Naval Hospital Corona property. The hospital property was considered ideal as it was in close proximity to the centers of military RDT&E facilities such as China Lake, Point Mugu, and the aircraft manufacturers of Southern California. It was also ideal because of the ready availability of a large number of buildings ideally suited for conversion to laboratories, and expansive open spaces where outdoor testing could be conducted. Thus, in 1951, the NBS transferred its Missile Development Division from Washington, D.C. to the former Naval Hospital, Corona, in Norco, California. (*Los Angeles Times,* "Corona Hospital to be Used for Guided Missile Research," 1-30-1951: A-1)

FIGURE 108: UNIT 2 PORCHES
Above: c. 1945 Below: c. 2010

Source: Kevin Bash Collection

The part of NBS that moved to Naval Hospital, Corona was given the name "National Bureau of Standards, Corona Laboratory" (NBS Corona.) Making the move from Washington DC, were some 250 NBS personnel. Suddenly, the Corona/Norco area was awash with physicists, aerodynamicists, electronic scientists, electronic engineers, electromechanical engineers, and engineering draftsmen. The *Corona Daily Independent* estimated that by 1955, some 80% of the Corona labs employees lived in the Riverside-Arlington-Corona areas, with the remainder commuting from locations within 50 miles of the labs. (*Corona Daily Independent*, 10-4-1955: 5)

Dr. Robert D. Huntoon assumed the position of NBS Corona's first Director. Huntoon's resume included a stint as the Chief of the Atomic and Radiation Physics Division at NBS in Washington, D.C. during World War II. Following the war, he was made the chief of the NBS Electronics Department. In that capacity, he directed fundamental research on electrical circuits, control devices, and other electronic ordnance components. (*Los Angeles Times*, "Missile Study Set at Closed Hospital", June 1, 1951: A1)

The relocated technical and support staff moved into 22 buildings that had served as Naval Hospital Corona's "Unit 2." (Figure 107) Originally used as tuberculosis wards, the buildings required very little modification to serve as laboratory and support services facilities. The most noticeable change was the replacement of largely glass exterior frontages of the tuberculosis wards with solid walls penetrated with much smaller windows. (Figure 108) This change did not significantly disrupt the architectural character of the buildings, as all

other architectural elements, such as weeping mortar columns and tile roofs, remained unchanged. All remodeling necessary to establish Unit 2 as a RDT&E facility was accomplished by Zoss Construction Company of Los Angeles, at a cost of $700,000. (*Los Angeles Times*, "Missile Study Set at Closed Hospital," 6-1-1951: A-1)

Originally, the NBS had hoped to occupy the entire Naval Hospital Corona complex, but its interest in the facility coincided with the start of the Korean War, at which point the need for hospital beds kept the NBS out of all but one of the three hospital units. Accordingly, the NBS was granted ownership and use of Unit 2. Units 1 and 3 remained devoted to hospital uses. (*Los Angeles Times*, "Missile Study Set at Closed Hospital," June 1, 1951: A-1)

Working primarily with the Department of Defense (DoD), the newly reassigned NBS personnel concentrated on missile guidance systems, electronic devices, airframes, radar equipment, etc. (Ibid) Missile development work at the former NHC facility included research, both theoretical and applied, and the construction of components and entire units. (*Los Angeles Times,* "Corona Hospital to be Used for Guided Missile Research," 1-30-1951: A-1)

b. Detachment Corona's Association with the Department of Defense (DoD)

By 1953, NBS Corona's relationship with the DoD had grown extremely strong.
In view of this, the decision was made to reassign the Corona Laboratories from the NBS to the DoD. In July of 1953, the Defense and Commerce Secretaries announced the decision to put the Corona Laboratories under the direct command of the U.S. Navy. Thus, in September of 1953, NBS, Corona became Naval Ordnance Laboratory, Corona (NOLC) under the Navy's Bureau of Ordnance. (NAVSEA, *A Tribute to 60 Years of Service to the Navy*, 2000, Corona, CA: 7)

With a change in affiliation came a change in leadership. In December of 1953, Dr. Huntoon resigned as Corona's Technical Director and returned to the NBS Washington DC facility to become Associate Director of Physics. Replacing Dr. Huntoon was Ralph Lamm, formerly the director of NBS Corona's Missile Division. (*Corona Daily Independent*, 10-4-1955: 5) About three years later, Dr. Stanley Atchison took charge of the facility and remained its leader until December of 1968.

Most of the Corona lab's needs were accommodated in existing buildings. A small number of activities were accommodated in new buildings. These improvements, both old and new, provided space for laboratories, machine shops, wind tunnels, jet engine testing facilities, altitude chambers, missile assembly facilities, and a major reference library. Perhaps the biggest change to the property was the large array of specialized outdoor structures, built for testing purposes. (*Corona Daily Independent,* "The Importance of Fuses", 9-16-1958: 1 and 8)

A significant aspect of the RDT&E work at Corona involved the use of computers to analyze flight simulation data and trajectories. Mathematical equations that would have taken weeks for trained mathematicians to solve manually were completed in minutes by NBS computers. (Ibid)

Environmental testing facilities were also critical to the cost-effective development of weapons systems. An environmental test laboratory was added to NOLC to provide a facility for the testing of missile components under a wide range of conditions, including "…the searing heat of supersonic flight, the intense cold of the arctic, and wide ranges of

humidity, altitude, and acceleration." Environmental test facilities also provided for the testing of missiles and missile components under extreme conditions of shock, vibration, and corrosion. (Ibid)

Starting with just one entity in 1951, over the years, the Corona labs evolved into a multi-part organization addressing a wide range of guided missile RDT&E activities. This growth in mission was accompanied by significant increases in scientists, engineers, and other staff. Operating with a staff of 250 employees at its beginning in 1951, by 1968, the employee count had grown to over 1,000. (*Naval Weapons Center, Corona Laboratories*, U.S. Navy, November 1968: 2) Of this staff, over 400 were engineers and scientists and an additional 175 were skilled technicians. (*Rocketeer*, 4-26-1968, "Naval Weapons Center Corona Laboratories": 5)

On July 1, 1967, NOLC was functionally merged with the Naval Ordnance Test Station, China Lake and renamed the Naval Weapons Center Corona Laboratories (NWCCL). This change was part of an effort to save money by creating a more consolidated weapons RDT&E effort. (The History of the Naval Weapons Station, Seal Beach and Fallbrook and FMSAEG Annexes 1941-1971: 135)

The consolidation was part of a broader naval plan to merge its laboratories into seven centers. Part of this overall effort involved the merging on December 20, 1967, of the research departments of China Lake and Corona. No aspect of Detachment Corona was relocated at this time, however; as the merge was an organizational change only. This change also brought about a greater amount of collaboration with Naval Weapons Center, China Lake. (Ibid)

Part 3, SECTION 3, HISTORICAL THEMES OF DETACHMENT CORONA

By 1957, a number of RDT&E functions were being carried out at NOLC. These tasks, assigned by the Bureau of Ordnance, consisted of the following:

- The technical direction of Navy's guided missile fuze R&D program.
- Fuze RD&TE, including the certification of fuzes for Fleet use.
- The design and management of systems to track the "shelf life" of missiles, both in storage and onboard ships (referred to as "surveillance.")
- RD&TE to reduce missile vulnerability to interference and countermeasures.
- Research in the physical sciences for improved materials, devices, and techniques for anticipated naval ordnance needs.
- Weapons systems feasibility studies.
- Missile guidance systems RDT&E.
- RDT&E for other DoD agencies and contractors.
- The evaluation of missile performance and reliability.
- The evaluation of missile quality control. (ASM 2011: 75)

A good indicator of the significance of Detachment Corona overall is the number of patents recorded by its staff. Over 70 patents were recorded between 1957 and 1964. (Naval Ordinance Laboratory Corona, *Abstracts of U.S. Patents obtained by the NOLC office of Patent Counsel* 1957-1964)

Accomplishing all of these tasks necessitated the division of Detachment Corona into working entities. The organizational structure of Detachment Corona was not a static thing, however; rather, it changed with changes to its priorities and range of responsibilities. Consequently, it is not possible to present one organizational structure as representative of the entire period of significance of 1951-1971. However, we can take a snapshot of NOLC's organizational structure at one point in time, and a 1968 NOLC publication accomplishes this objective very nicely. In 1968, NOLC was organized into the following major functional areas:

- Guided Missile Fuze Department.
- Advanced Systems Group.
- Missile Systems Department.
- Research (originally Physical Sciences) Department.
- A guided missile evaluation department, known as FMSAEG. (*Naval Weapons Center, Corona Laboratories*, U.S. Navy, November 1968)

A Navy publication summarizes the extent to which the Fuze Department was involved in the development and application of fuzes: "The people involved In this type of project at Corona Labs have a 'cradle to grave mentality' meaning from original Idea to deployment in the Fleet. Actually, they're never free of the demand from the Fleet for assistance pertaining to the fuzes, even though

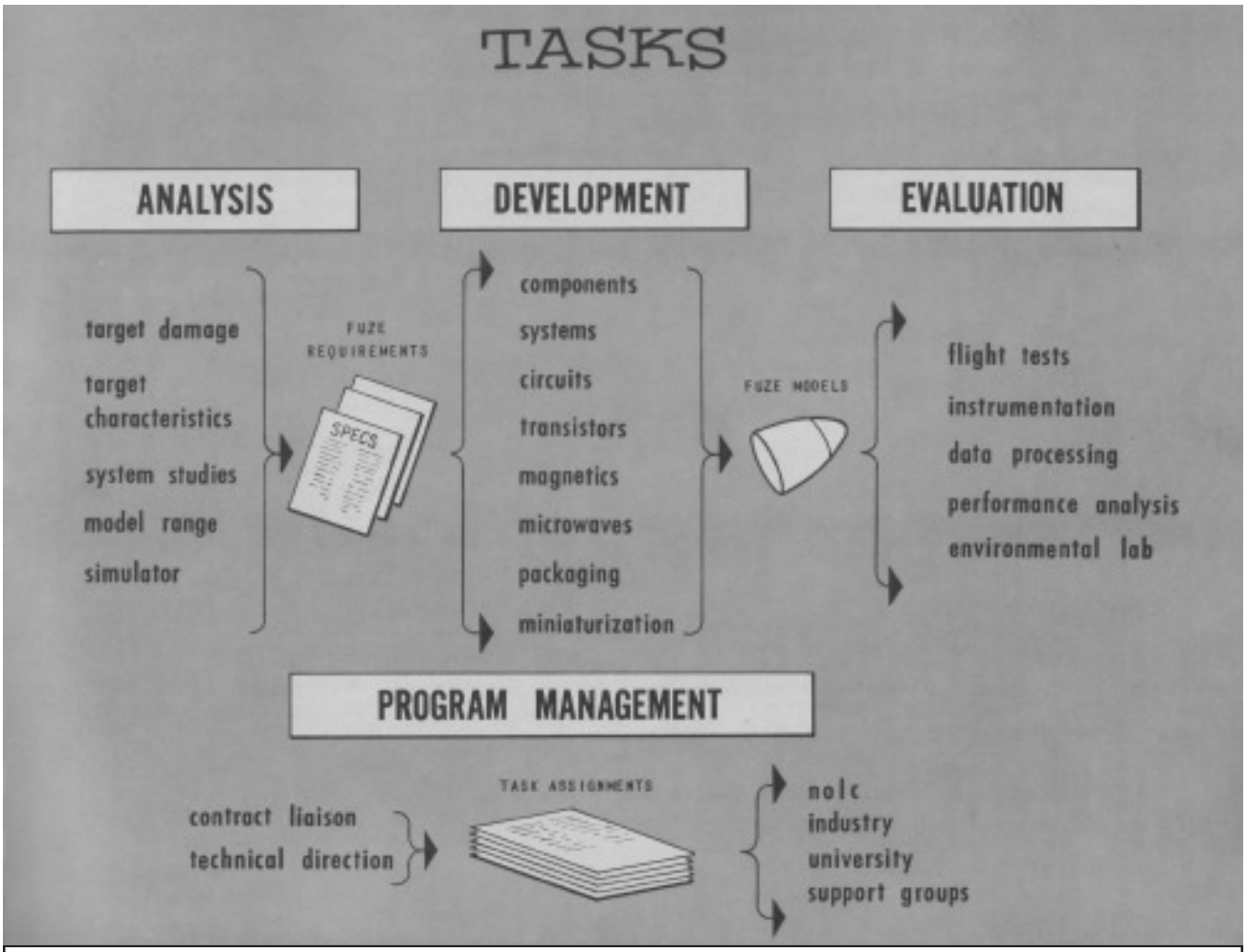


FIGURE 109: FUZE DEPARTMENT ORGANIZATIONAL CHART

Source: U.S. Navy, *NOLC,* 1958

the fuze might have been in production for many years." (*Rocketeer*, 4-26-1968, "Naval Weapons Center Corona Laboratories": 9)

The following subsection examines the activities of the first four entities in the above list. Corona's fifth group, the department charged with the overall evaluation of missile performance is addressed in Part 3, Section 4.

1. Theme One: Corona's Fuze Department, Advanced Systems Group, Missile Systems Department, and Research Department

a. Guided Missile Fuze Department

Figure 109 is an organizational chart of the Fuze Department, taken from a 1958 Navy publication. According to a China Lake newsletter: "The main areas of work at…Corona Laboratories deal with proximity fusing of guided missiles, and development of missile systems as a whole" (Ibid)

Another Navy publication describes NOLC's Guided Missile Fuze Department as follows:

> "Most persons who are not engaged in guided missile development have little Idea of the nature of the fuze system of one of today's missiles. Second only to the missile's guidance system in its complexity, a typical proximity fuze for a modem missile is a highly specialized sensing device that is designed to detect the target and to deliver a firing pulse to the warhead at the precise instant when the warhead will have maximum lethality. Certain systems also include contact fuzes to assure effective warhead detonation on target impact. Finally, each fuze system includes an electromechanical safety-arming device, which, operating in response to conditions during and after the launching of the missile, delays arming of the warhead until the missile has reached a safe separation distance from the launcher. Because of the great differences in the characteristics of tactical missiles, each fuze system must be tailored specifically to the requirements of the missile in which it is to be employed.
>
> "Since 1954, the Naval Weapons Center Corona Laboratories have been responsible for the development of fuzes for all Navy tactical missiles, and have developed all of the fuzes for all tactical missiles in use in the Fleet. The fuze program covers a wide spectrum of activity, ranging from exploratory research to monitoring the performance of fuzes that have entered Fleet use. The research effort involves the investigation of a variety of phenomena - optical, microwave, radio, magnetic, acoustic, mechanical, barometric - that may be useful in detection and identification of targets, transmission of information, and fuze actuation. Scientists and engineers seek new fuzing techniques and new components in an effort to meet increasingly stringent requirements for fuze precision and discrimination. Target characteristics are carefully studied, and analyses of warhead-target intercepts are made using specialized facilities. Electronic and mechanical engineers translate new fuze concepts into prototype hardware in designs combining the utmost assurance of safety from accidental detonation prior to launch with the highest degree of reliability within the missile-target intercept geometry. After extensive laboratory and field testing of the prototype hardware, fuze engineers follow their designs through pilot production into final production and Fleet use." (*Naval Weapons Center, Corona Laboratories*, U.S. Navy, November 1968)

One of the most significant scientific developments of World War II was the development of the proximity fuze by NBS scientists and engineers. This invention made it possible to time the detonation of a fuze within a specified distance of a target in order to cause maximum damage. Once a functional proximity fuze had been developed, NBS scientists continually improved it to maximize its reliability and accuracy. An important aspect of the proximity fuze was its safety in storage and aboard ship. World War II torpedo fuzes were not stable under all conditions, and known to explode before they were launched, with predictable catastrophic results. The NBS scientists and engineers who were responsible for the proximity fuze were among those who were transferred to the Corona Laboratories in 1951 (*Naval Ordnance Laboratory Corona California*, U.S. Navy, August 1958: no page numbers)

Between the end of World War II and 1950, the Bureau of Ordnance directed all fuze R&D. NBS and all contractors involved in fuze work reported directly to the Bureau of Ordnance.

In November of 1950, technical direction of all fuze R&D was assigned to the National Ordnance Laboratory, White Oak. (NAVSEA, *A Tribute to 60 Years of Service to the Navy*, 2000, Corona, CA: 6)

In February of 1954, the DoD designated NOLC as the *Technical Director of all naval fuze R&D work*. However, NOLC was more than just a "director" of fuze work; it also did significant fuse RDT&E on the Corona campus. In April of 1954, the Navy's guided missile fuze work being conducted at the Army's Frankford Arsenal was transferred to NOLC. The Terrier and Sparrow missile fuze engineering work formerly conducted at Frankford Arsenal was reassigned by the Bureau of Ordnance to Eastman Kodak, Bendix-York, and Philco, under NOLC's technical direction. (Ibid)

A 1958 NOLC publication observes that "NOLC is assigned primary responsibility for the development of guided missile fuzes for the Navy, and this assignment constitutes one of the Laboratory's major programs." (*Naval Ordnance Laboratory Corona California*, U.S. Navy, August 1958: no page numbers)

However, the publication is careful to explain that NOLC scientists did not accomplish everything alone. Rather they worked with "A large number of industrial laboratories…particularly in the product engineering and production stages. Other governmental installations figure prominently in the evaluation phases." (Ibid) But, again, all of this work was under NOLC's direction.

The 1958 publication referenced above does a particularly good job of describing the complexity of NOLC's fuze work as follows:

> "Research is conducted in a wide range of field phenomena – optical, microwave, radio, magnetic, acoustic – of possible utility for detection purposes. NOLC scientists and engineers are engaged continuously in a search for new fuzing techniques and new devices for fuzes. Target properties are carefully studied. Detailed analysis of the warhead-target intercept provides important design data. The translation of concepts into prototype hardware is accomplished by several development groups which are engaged in systems, circuit, and component development. The fuze work encompasses many scientific and technical fields, including physics, electronic engineering, mechanical engineering, mathematical analysis, and general engineering." (Ibid)

The *Corona Daily Independent* summarized the importance of the guided missile fuze as follows: "Since the early days of the antiaircraft guns, long prior to World War II and especially since the advent of guided missiles, the fuze has been a device of unique importance. It is the component that times the detonation of the missile warhead. The fuzing of present-day guided missiles is extremely critical because of the high missile and target velocities involved." (*Corona Daily Independent,* 9-16-1958) Several months later, the *Independent* had this to say about NOLC's role in fuze RDT&E: "During its operation as a Navy facility, NOLC has become internationally known in the guided missile field and in many associated fields" (*Corona Daily Independent,* 2-5-1959)

In the fuze arena, NOLC had significant involvement in the fuzes for:

- The air-to-air Sidewinder, Sparrow I, II, and III missiles.

- The Corvus long-range air-to-surface missile.
- The Terrier, Tartar, and Talos surface-to-air missiles.
- The Bullpup air-to-surface guided missile.
- The Air Force's Falcon and other such guided missiles. (Ibid)

The responsibility of the Fuze Department can be explained in simple terms as follows:

- Whenever the Navy decided to develop a new missile, the Fuze Department at NOLC was given the job of developing a fuze to work with the missile.

- NOLC's mathematicians used NOLC computers to establish the parameters of fuze functionality.

- NOLC's development group then engineered the fuze.

- Private industry used NOLC's engineering drawings and specifications to manufacture the fuze.

- The produced fuzes were then sent to NOLC for testing and to make sure they remained safe prior to use. When used in the field, NOLC tests made sure the fuzes detonated at the right moment to inflict maximum damage. (*Corona Daily Independent*, "Paradox Marks the Fuze's Job," 5-12-1965: 3)

Fuze RDT&E work was conducted both at NOLC and through contractors associated with NOLC. NOLC was charged with selecting all contractors for research, development, and engineering, with ultimate approval the responsibility of the Bureau of Ordnance. The purpose of this work was to design and develop guided missiles in compliance with Bureau of Ordnance specifications. It was NOLC's job to provide technical and scientific planning and coordination and to assure that projects were completed on time and within established specifications. NOLC also provided cost estimates for the Bureau of Ordnance. (ASM 2011: 63)

The fuze related work conducted by NOLC was coordinated with a number of other naval RDT&E organizations, such as:

- Naval Ordnance Laboratory, White Oak (warhead systems.)
- Naval Air Missile Test Center, Point Mugu (water related testing.)
- Naval Ordnance Test Station, China Lake (land related testing.) (Ibid 66)

NOLC also worked with a number of private contractors in the 1950s, including:

- Applied Physics Laboratory
- Convair, Pomona
- Diamond Ordnance Fuze Laboratories
- ITT Laboratories
- McDonald Aircraft Corp.
- Lockheed Aircraft Corp.
- Melpar Inc.
- Microwave Associates
- Minneapolis-Honeywell Regulator Co.

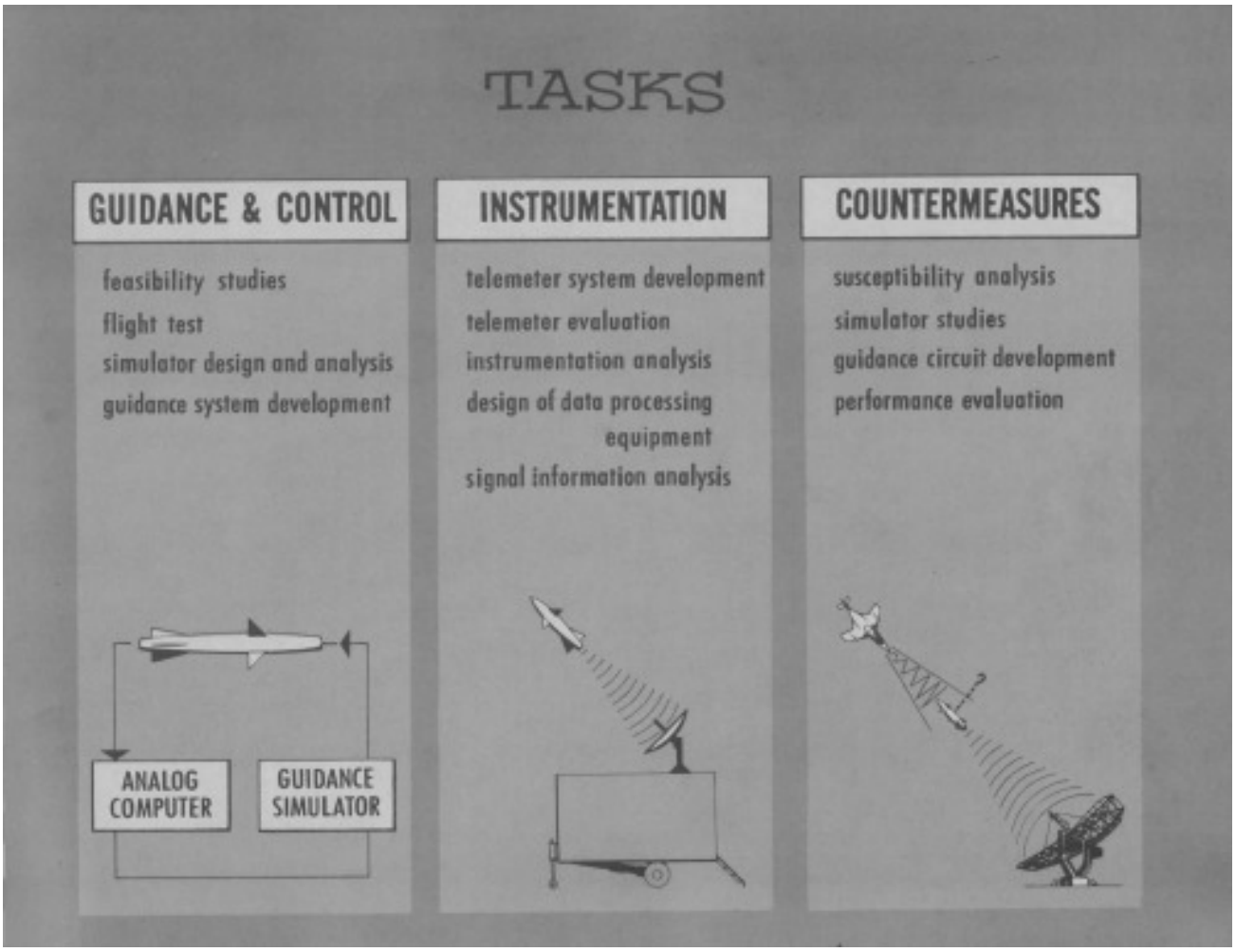


FIGURE 110: MISSILE SYSTEMS DEPARTMENT ORGANIZATIONAL CHART

SSource: U.S. Navy, *NOLC,* 1958

- Optical Coating Labs
- Packard Bell Corp.
- Philco Corp.
- Raytheon Manufacturing Co.
- Rheem Manufacturing Co.
- Santa Barbara Research
- Sperry Gyroscope Co.
- Stewart-Warner Corp.
- Sylvania Electric Products, Inc.
- Temco Aircraft Corp.
- Texas Instruments Inc.
- Universal Match Corp.
- Vitro Labs, Pomona
- Wyle Labs, Norco (Ibid: 64)

As noted earlier, to be effective, a fuze had to detonate at a pre-determined distance from the target. Fuzes also needed to perform reliably in widely varying conditions. Thus, environmental laboratories were a key means for testing performance in a large span of atmospheric extremes, including high and low temperatures, humidity, altitudes, accelerations, shocks, vibrations, and corrosion. (Ibid) Miniaturization was particularly important and was among the more significant achievements made at NOLC.

The prototypes for fuze tests were either built by other entities or they were manufactured in-house. Systems analysis relied largely on simulation, including that conducted via sophisticated computers. NOLC also provided technical assessment services for Bureau of Ordnance contractors, the DoD, and other federal government agencies. These included reports, standards, drawings, publications, and training on missile systems. (Ibid: 62)

Despite NOLC's status as the Technical Director of all naval fuze development, there was some overlap. The Naval Ordnance Laboratory, White Oak retained technical direction responsibilities for projectile, bomb, and rocket fuzes, and later acquired responsibility for overall warhead system development. Naval Ordnance Test Station, China Lake retained design leadership of a number of rocket fuzes with testing facilities for projectiles, rocket, and guided missile fuzes. (Ibid: 61) J.S. Ramer, director of NOLC's Fuze Department, expressed concern that these overlapping responsibilities could lead to confusion and increased costs. (Ibid: 73)

b. Missile Systems Department

Figure 110 is an organizational chart for the Missile Systems Department. The Missile Systems Department had the following mission:

> "The Missile Systems Department of the Corona Laboratories is conducting a variety of programs directly related to the development of Navy guided missiles. The Program Management Office of this department carries out the Laboratories' assigned responsibility for technical direction of the development of Standard ARM, a major new air-launched attack system - the latest in a series of air-to-surface missiles whose development has been directed by the Laboratories. The Guidance Division is engaged in the analysis, design, development, and flight testing of advanced missile guidance systems. Current effort is concentrated in the areas of advanced microwave and electro-optical guidance techniques, with special emphasis on means of extending operating capability. The Instrumentation Division is responsible for the development of telemetry systems, subsystems, and components. Its program includes the design, development, and evaluation of data handling techniques and devices for guided missiles and space probes. Because of its recognized leadership in the field of telemetry, this group has been assigned responsibility for planning and coordinating the Navy's program for switchover of telemetry systems to the new UHF bands by 1970.
>
> "The Countermeasures Division of the Missile Systems Department has the exacting task of determining the susceptibility of missile guidance systems to enemy countermeasures and developing methods of reducing such susceptibility. It conducts both laboratory and field evaluations of the effects of counter measures on missile-borne guidance systems and weapons control radars. Finally, the Dynamics Division is engaged in determining

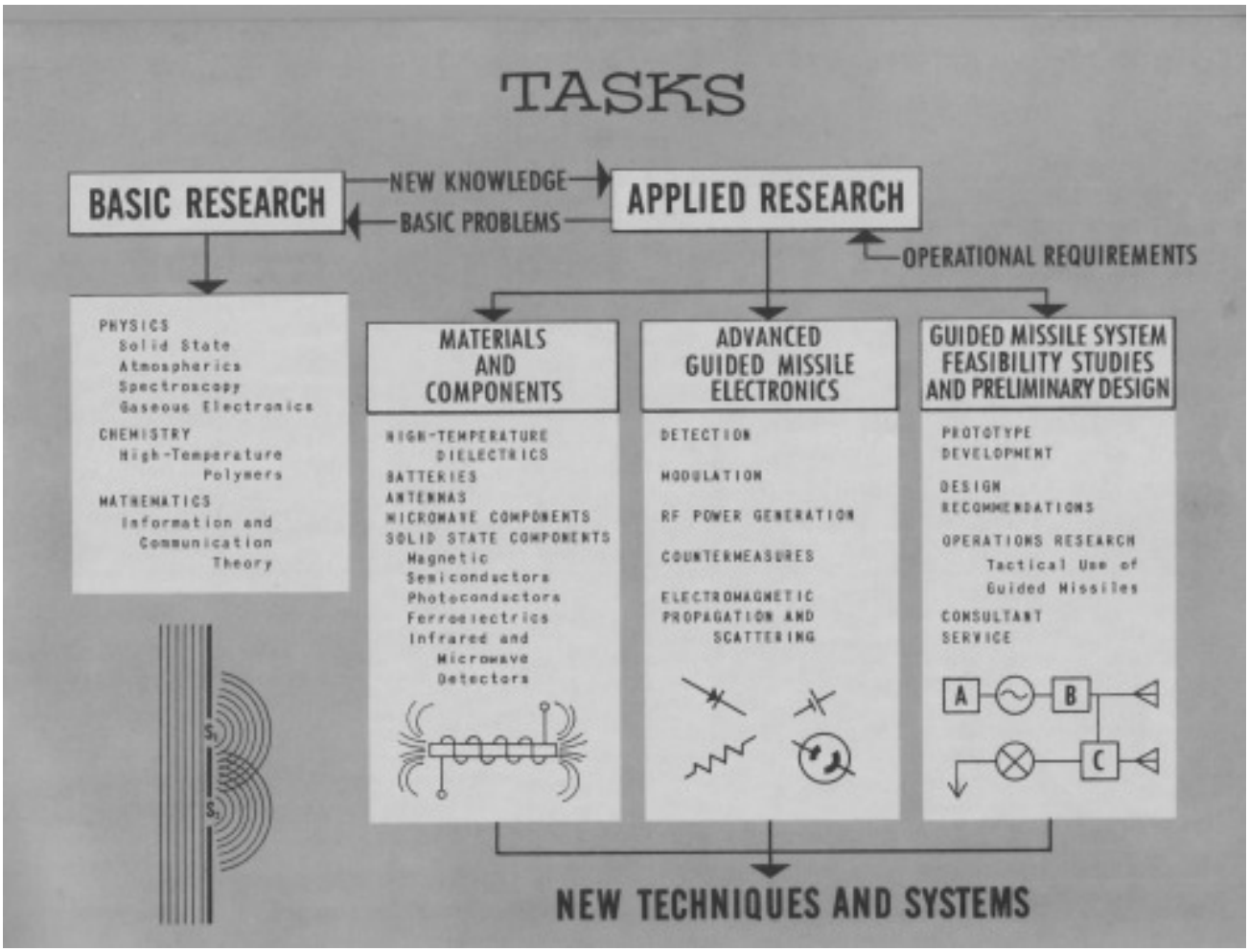


FIGURE 111: RESEARCH DEPARTMENT ORGANIZATIONAL CHART

Source: U.S. Navy, *NOLC,* 1958

guided missile system design parameters, including airframe, propulsion, trajectory, and flight control system requirements. In this work, personnel of this division operate the Corona Laboratories Simulator and Hybrid Computer Facility, which includes one of the largest Government-owned analog computers in the West." (*Naval Weapons Center, Corona Laboratories*, U.S. Navy, November 1968: 9-10)

Making sure a missile and its target meet at the right time is not an easy task; especially when both entities are traveling at supersonic speed. According to a Navy publication: "The proximity fuze is a very complex device which has to take into account many and varied signals. One is the exact time to trigger the warhead. Measured in milliseconds, it has to be accomplished at exactly the right time or the warhead will be almost completely ineffective. It cannot pass the target or trigger before it gets to the target. Some of these fuzes are actually miniature radars; either very short pulse radars or ones which work on infra-red radiation. (*Rocketeer*, 4-26-1968, "Naval Weapons Center Corona Laboratories." : 9)

Computer calculations were a major factor in the success of these efforts, and the ability of the computers at NOLC to process and analyze data resulted in significant cost savings, through the elimination of multiple field tests. (Ibid)

NOLC's dynamic analysis facility was capable of performing aerodynamic tests of missile equipment for both the military and private contractors. Sophisticated equipment included a microwave dark room that simulated free-space conditions, and missile system test rooms. While NOLC's core mission was to support Navy guided missile development, it also provided assistance to the Army's Corporal missile program and the Air Force's Titan missile program. (Ibid)

c. Advanced Systems Group

The Advanced Systems Group's responsibilities were as follows:

> "The work of the Advanced Systems Group includes determining the requirements of future Navy guided missile systems, formulating the concepts of systems which may meet these requirements, and assessing the feasibility of such systems. Certain personnel of the Advanced Systems Group perform a continuing analysis of future threats, based on their evaluation of information on the equipment and tactics of potential enemies. Other personnel are concerned with the exploratory development of new systems which exploit the latest advances in guided missile technology. These development efforts are frequently carried out in conjunction with personnel of the Missile Systems Department, notably those of the Dynamics Division. Because of their established expertise in the missile systems area, personnel of the Advanced Systems Group are frequently called upon to evaluate proposals for new missile systems by other Government agencies or private contractors.
>
> "The exploratory development efforts of the Advanced Systems Group are concerned with new air-launched missile systems, primarily those of an air-to-surface type. These may utilize microwave guidance techniques with novel antenna designs, advanced microwave signal processing circuitry, and special tracking and computer circuit designs; or they may utilize new laser-related or low-light level optical techniques, including new imaging tubes and other sensors developed for the purpose. Missile aerodynamic designs, stabilization and control techniques, propulsion systems, and warheads are also studied and selected for use, although not developed in detail by the Advanced Systems Group." (*Naval Weapons Center, Corona Laboratories*, U.S. Navy, November 1968: 6-7)

WHS did not find an organizational chart for the Advanced Systems Group

d. Research Department

Figure 111 is an organizational chart for the Research Department. The duties of the Research (formerly Physical Sciences) Department were as follows:

> "The development of advanced weapon systems for the Navy is dependent upon advances in research. The four divisions of the Naval Weapons Center

> Research Department located at the Corona Laboratories are conducting basic and applied research in materials and physical phenomena directed toward both the improvement of present weapon systems and the development of new concepts and components for future weapons. The Electricity and Magnetism Division is engaged in research in thin magnetic films, magnetic components, plasma physics, and lasers. In the Infrared Division, emittance, transmittance, and reflectance studies, involving both electro-optical and magneto-optical techniques, are made on solid state materials through the spectral range from wavelengths near 0.2 micron up to 1000 microns. This division also operates an internationally recognized laboratory for the evaluation of infrared photodetectors. The chemistry Division is conducting research on polymers capable of withstanding the high temperatures encountered in missile flight and on batteries for use as power sources for missile fuzes and as missile auxiliary power supplies. The program of the Electronics Division encompasses theoretical studies and experimental work in electro-magnetic wave propagation and scattering phenomena, detection techniques, very-low frequency superdirective array antennas and environmental physics; in addition, applied research is being performed on microwave and millimeter-wave radiometric systems and components." (Ibid: 12)

A 1958 U.S. Navy publication described the importance of the Research Department as follows: "The Naval Ordnance Laboratory Corona is one of the key laboratories of the Bureau of Ordnance." (Naval *Ordnance Laboratory Corona*, U.S. Navy, August 1958: no page numbering) In support of this assertion, the Navy publication identifies a number of tasks as critical to the Research Department's work:

- The Research Department provides the foundation of a weapons development program, responsible for the development of materials, components, and techniques that do not exist when a new weapons system is conceived.

- The infrared program, among the oldest of the Research Department's responsibilities, provides basic information on detectors and filters and on characteristics needed in the development of missile systems. This work was particularly important in regard to creating guidance systems that could hone in on enemy aircraft exhaust.

- Chemical research includes the synthesis of inorganic and semi-organic polymers with electrical systems capable of operating at high temperatures.

- Work with semiconductors, ferromagnetic, and ferroelectric materials has proven useful in improving missile electronics.

- The laboratories at NOLC have the capacity to grow, refine, and shape experimental quantities of materials for missile electronics.

- Among the results of the Research Departments work identified in this publication are: computer storage elements of microscopic size, miniature refrigeration systems, and low noise microwave amplifiers. (Ibid)

Summarizing the significance of the Research Department's work, the 1958 publication asserts: "The research scientist has an important task in defining the characteristics of targets, aircraft, or vessels. Analytical studies of the reflecting and radiating characteristics of targets form the basis for guidance system design." (Ibid)

In 1961 the Research Department began conducting simulations of television-guided air-launched missiles of the Corker program. The Research Department also worked on developing a basic anti-radar missile seeker. Continuing responsibilities included R&D for the Sidewinder, Bullpup, and Polaris missile programs. (ASM 2011: 73-74)

By the mid-1960s, the Research Department's work included:

- Conducting basic and applied research (a part of NOLC's original 1951 directive.)
- Infrared research.
- Solid-state physics (ferromagnetism, ferroelectricity, dielectrics, and semiconductors.)
- Feasibility studies for advanced radar concepts and techniques.
- New electronic circuits and devices.
- Theoretical studies and experiments on electromagnetic wave propagation, detection techniques, electronic systems, and chemical studies on inorganic and organometallic polymers for high temperatures.
- The development of effective reserve batteries for missiles.
- The development of new fuze techniques and components.
- The development of prototypes by those that designed the systems, circuits, and components.
- Technical and supportive research on optical, microwave, radio magnetic, aerodynamic, and mechanical phenomena.
- Work conducted on guided missile systems included analyzing future threats, enemy equipment, enemy tactics, weapon trends, and the effect of those on the Naval Fleet in an effort to formulate new requirements for missile systems.
- Feasibility studies including work on the airframe, propulsion, trajectory, and flight control systems, all in an effort to formulate requirements.
- One group of scientist conducted research on telemetry and command communication systems by developing, designing and evaluating data handling and the instrumentation used for guided missiles. (*By this time, NOLC had developed a reputation as a leader in the development of missile instrumentation.*)

- Another group of scientist worked on how susceptible missile guidance systems were to countermeasures and focused on ways to resolve those weaknesses. (Ibid: 78)

NOLC's scientists and facilities put it in a position to *pioneer numerous technologies that significantly contributed to U.S. efforts to protect its citizens and allies around the world*. Among the technological advancements NOLC contributed to the free world's security were the following:

- Telemetry systems.
- Counter-counter measures.
- Electro-optical and anti-radar guidance systems, including the Walleye guidance system and guidance systems for advanced Standard anti-radar missile (ARM) weapons.
- Computer component development.
- Infrared spectroscopy.
- Infrared detector evaluation.
- Polymer chemistry.
- VLF transmission systems.
- Microwave radiometry. (Ibid: 79)

Dr. Curtis J. Humphreys: NOLC benefitted from numerous talented scientists. However, one in particular stands out as exceptional. Dr. Curtis J. Humphreys *was "…recognized internationally for his scientific breakthroughs in atomic spectroscopy."* (NAVSEA, *A Tribute to 60 Years of Service to the Navy*, 2000, Corona, CA: 7) Before his arrival at Corona, he had established his place in scientific history for having determined the correct placement of uranium on the periodic series. He was also the first to measure the sixth series of atomic hydrogen, a breakthrough so important that it was named the Humphreys Series. (Ibid)

The following are some of Dr. Humphreys' more significant achievements as a scientist at NOLC:

- In 1961, he made important contributions to the Wavelength Commission, submitting important data for review at Wavelength Commission conferences.
- In 1963, the Navy honored Humphreys with the Navy award for

FIGURE 112: DR. CURTIS J. HUMPHREYS

Source: Kevin Bash Collection

FIGURE 113: NOLC TECHNICAL LIBRARY, BUILDING 511, c. 1956

Source: Kevin Bash Collection

distinguished achievement in science for his outstanding contributions to atomic line emission spectroscopy.

- In 1966, Humphreys served as the co-author of an important book, *Wavelength Standards in the Infrared*.
- In 1973, he received the Meggers Award of the Optical Society of America for achievement in spectroscopy.
- Humphreys was particularly noted for his work in the establishment of atomic wavelength standards in infrared. (ASM 2011: 81)

Under Dr. Humphreys' direction, the Infrared Spectrometry Division made significant contributions to the work of the Fuze Department and advanced several technologies that were of broader application:

- The division conducted important research on the *creation of an international system of wavelength standards. This work alone was recognized in 1960 to be of international importance.*
- In the 1950s, the division made significant technological advancements that were considered to have *"revolutionized the techniques of radiometry and spectrophotometry."*

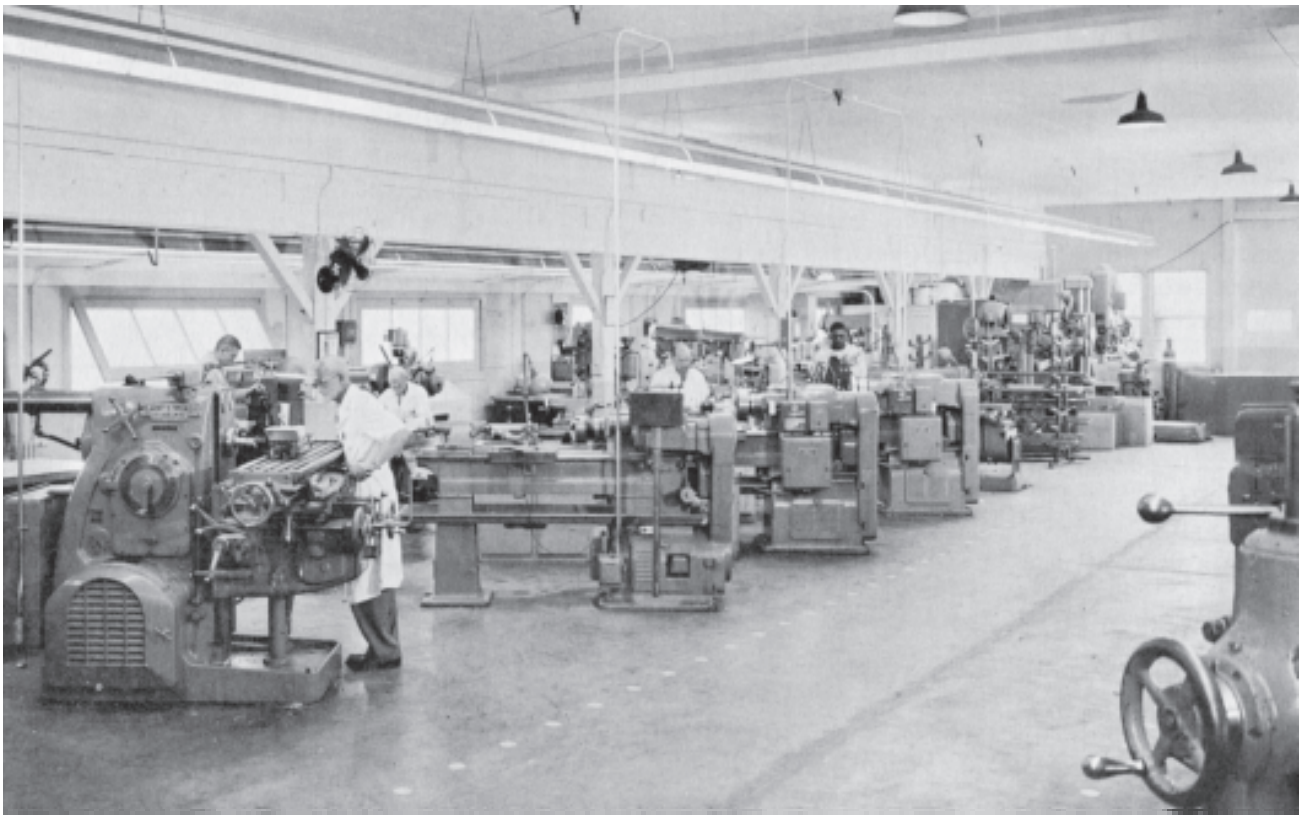


FIGURE 114: NOLC MACHINE SHOP

Source: U.S. Navy, *A Tribute to 60 Years of Service to the Navy, Corona Division, Naval Surface Warfare Center:* 9

- Of particular importance was the division's success success in creating large artificial crystals, critical for infrared transmissions. The natural crystals previously used were difficult to find, expensive, and imperfect. The petrochemical industries particularly benefitted from the invention of artificial crystals.

- The division also made significant advancements in photoconductivity, a critical component of heat sensors in missile guidance systems. *NOLC's infrared detector program was considered to be the largest in the USA, in terms of the time devoted to it and the number of personnel assigned to it.*

- The lab's scientists provided important assistance to China Lake's Sidewinder project in standardizing the detectors for the heat-seeking missiles. This was accomplished by testing detectors from various sources and determining if they met established performance specifications. The results of this important work were published in the *Journal of Optical Society of America* and the *Journal of Applied Optics*.

- These scientists also developed a technique for high-speed magnetic domain reversal phenomena. (Ibid: 79-81)

The practical value of the above achievements was that a guided missile could be programmed to target a specific heat emission. Thus the missile could distinguish between a variety of objects and hone in on the specific object at which the missile was aimed. This heat seeking capability revolutionized guided missile design and greatly improved the success of U.S. guided missiles. (*Rocketeer*, 4-26-1968, "Naval Weapons Center Corona Laboratories": 9)

Humphreys' lab was also responsible for the invention of thin magnetic film that could store data. "The basic patent on thin film memory belongs to Dr. R. L. Conger, head of the Electricity and Magnetism Division." In 1956, a contract was entered into with Remington Rand to develop it to a point where it could be used in a digital computer. (Ibid)

In summarizing the importance of the guidance system work accomplished at Humphreys' lab, a Navy publication had the following to say: "Corona Laboratories in its historical position has been a pioneer in evolving guidance concepts and implementing those concepts; in electro-optical guidance in particular and in initial work on anti-radar guidance. In addition to the missile systems, Corona Labs, not only historically, has had an active participation in theory and application conception of guidance systems, but their work is continuing as an active part of the missile systems research at the Laboratory. Humphreys retired in 1967, however, he continued to consult with Detachment Corona through 1971. (*Rocketeer*, 4-26-1968, "Naval Weapons Center Corona Laboratories": 9)

e. Detachment-wide Support Groups

Technical Library: Situated within World War II era Building number 511, NOLC's Technical Library (Figure 113) contained a collection of at least 10,000 books, 450 periodicals, and 30,000 documents. Services available through the library included literature searches, abstracting, and translations of foreign technical literature. The Technical Library was a key facility that supported the RDT&E work of all NOLC's departments. (Ibid) NOLC's Technical Library housed all of the Research Department's R&D technical reports. It also kept all of the Fuze Department's literature. NOLC's Technical Library also supplied technical reports to other armed forces entities, federal agencies, and allied governments. A Technical Information Division provided editing, illustration, and copying via a print shop and photography laboratory. (Ibid)

Fabrication Shop: Skilled craftsmen (Figure 114) performed machine work, metal forming, welding, and glass blowing as needed for the fabrication of missile component prototypes and experimental models. (Ibid)

Computer Facilities: Established in 1951, Computer Group was a critical part of Detachment Corona's operations. While not formallty designated a "department" in its early years, it operated as a department, serving the needs of the entire detachment. Eventually, it was given "department status", in recognition of its semi-independent nature and its ability to address the needs of a wide cross-section of NOLC functions.

f. Disestablishment of NOLC

By April of 1969, 36 military installations were targeted for closure, including NOLC, at that point carrying the name Naval Ordnance Weapons Center Corona Laboratoryy (NWCCL.) Concerned about economic impacts to the local economy, the Norco City Council voiced

strong opposition to the proposed closure. Unfortunately, pressures to keep NWCCL open were unsuccessful and its functions began to be dispersed elsewhere. The first function to be moved was NWCCL's infrared function, which on September 25, 1969, was directed to the Naval Electronics Laboratory at San Diego, California. On January 1, 1970, the balance of NWCCL became an annex of China Lake, and in 1971, it vacated the Corona labs and moved to China Lake. (Ibid: 82)

Missile evaluation remained at the old Naval Hospital Corona property, however, and continued to grow into a substantial operation, taking over the former NWCCL (Unit 2) buildings and adding new buildings of its own. A detailed review of Corona's Missile evaluation function is addressed in the following section.

2. Theme 2: The Missile Evaluation Program – 1952 – Today

The previous section documented the accomplishments of Corona's Fuze Department, Advanced Systems Group, Missile Systems Department, and Research Department. When these departments were disestablished in 1971, the missile evaluation function remained at Detachment Corona and it is still there to this day.

The missile evaluation function involved a considerable amount of laboratory related testing. But it also involved the monitoring and evaluation of Fleet missile firing tests, including recommendations for new or improved contractor or field activity facilities. The missile evaluation group also studied intelligence reports to develop recommendations for countermeasures. NOLC's technical library in Building 511 served as a major repository of literature and data on guided missiles. (Ibid: 64)

Missile evaluation at Corona has had several names of the years as follows:

- Missile Evaluation Department (MED)
- Fleet Missile Systems Analysis and Evaluation Group (FMSAEG)
- Fleet Analysis Center (FLTAC)
- Naval Warfare Assessment Center (NWAC)
- Naval Warfare Assessment Division (NWAD)
- Naval Surface Warfare Center (NSWC)

This section examines the work of the missile evaluation program under all of these names.

a. Importance of the Independent Assessment Agent

An independent evaluation group is known in naval circles as an "Independent Assessment Agent" (IAA). Dennis Casebier is a retired scientist who worked as a physicist and supervisor in Corona's missile evaluation program from 1960 through 1989. Today, Mr. Casebier is recognized as a respected guided missile historian of the Cold War era. In a paper he wrote in 2003 as a consultant to Computer Sciences Corporation, Casebier explained the significance of the IAA at Corona as follows:

> "There are many significant programs at the Naval Warfare Assessment Station [Detachment Corona] that are vital in different ways to Fleet combat readiness, but the Independent Assessment Agent function is unique among them. It is difficult to explain, hard to understand, and at times controversial. But *there is nothing else in the Navy* like it - it is the

> most certain guarantee the operating forces have that their systems will work the way they expect them to work when the balloon goes up." (Casebier, Dennis, "Independent Assessment Agent Naval Sea Systems Command, Navy Surface Warfare Center Corona, California", Self-Published Paper, 1-26-2003)

In another paper Casebier explained the need for an IAA in the broader sense:

> "The need for independent assessment arises from basic human characteristics. It is not a question of honesty – it has to do with reality and common sense about human nature. It is unreasonable to ask anyone to be totally objective in the appraisal of anything for which they have personal responsibility." (Casebier, Dennis, "Independent Assessment: The Need for an Independent Assessment Agent and Characteristics of the Discipline, Self-Published Paper, 1-26-2003)

FMSAEG's Commander in 1965, Glenn Estes Jr., explained the importance of the IAA in simpler terms as follows:

> "We're the umpire. We don't design, produce or maintain – we just keep score on what's being done. If we were a part of NOLC, it would be a little like having a baseball umpire in a Dodger uniform." (*Corona Daily Independent,* "Comdr. Estes in Umpire's Role", 5-13-1965: 3)

The initial need for the IAA can be traced back to the failure of torpedoes during World War II. Torpedoes would sometimes explode onboard a ship before they were launched. At other times, they would reach their target, but not detonate. This would alert the enemy to the location of the ship firing on the it and allow the enemy to fix on the firing ship's location. Both instances would result in loss of U.S. military life and property. (Casebier, Dennis, "Independent Assessment Agent Naval Sea Systems Command, Navy Surface Warfare Center Corona, California", Self-Published Paper, 1-26-2003) The story of torpedo failures is dramatically and accurately told in the 1955 book *Run Silent, Run Deep,* by Commander Edward L. Beach Jr. (Beach, Edward L. Jr, *Run Silent, Run Deep,* Henry Holt & Co., 1955)

Why did the torpedoes (and missiles) fail? As Casebier observes:

> "There was no agent involved in this process with complete, unquestioned objectivity. Someone that would have the "…the analytical perspective and insight to say "These fuzes are not adequately tested and the assumptions we make about them are vital to success." And then when the called-for testing got conducted, say 'Hey, these fuzes don't work!'" (Casebier, Dennis, "Independent Assessment Agent Naval Sea Systems Command, Navy Surface Warfare Center Corona, California", Self-Published Paper, 1-26-2003)

The torpedo example demonstrates how important an IAA is for the safety and effectiveness of the military. The idea of creating such a program at Corona came with the post-war shift to guided missiles. These "beam riding" missiles, originally represented by the TERRIER

surface to air missile, depended entirely on electronics to make sure they performed to the highest level. Unfortunately, Casebier notes, "…*these weapons were defective."* (Ibid)

b. Missile Evaluation Department (MED) 1952-1964

In 1952, an important event occurred that added a significant dimension to NBS Corona's work. The Terrier Missile had just been completed and the Navy felt there was a need for an objective evaluation of its performance. Given the well-established relationship between the Navy and NBS Corona, it was natural that Corona would be given the task of accomplishing the needed evaluation. Thus was created a new function for NBS, Corona, a function that later became its own department in 1954 and was designated the Missile Evaluation Department (MED.) (NAVSEA, *A Tribute to 60 Years of Service to the Navy*, 2000, Corona, CA: 5)

When the missile evaluation program was first established in 1952 as a function of NBS, Corona, it was the smallest of the laboratory's functions. By 1957, MED had surpassed the *combined size* of both Fuze Department and Physical Science (Research) Department. (Ibid: 7)

MED's experience with the evaluation of the Terrier missile led to it being assigned responsibility for the analysis and evaluation of the *Navy's entire weapons system*, including both shipboard systems and missile systems. As the Navy's missile program expanded, *MED was assigned responsibility for evaluating every new Navy missile.* (Ibid: 8)

From its beginning, a significant aspect of MED's work centered on creating a viable data processing system, through which to evaluate data from test firings of the Terrier missile. This work continued throughout the 1950s and 1960s. Using the results of this evaluation process, NOLC advised the Bureau of Ordnance of needed design and development changes. For this purpose, NOLC created specialized test equipment along with manuals for their use. (Ibid)

The first Terrier data tests were derived from firings on the USS Mississippi and the USS Norton Sound. Increasingly MED's responsibilities expanded into evaluating the production quality of missiles, surveillance* programs, and new missiles as they entered Fleet for service. MED was responsible for the development of methods, techniques, and standards for assessing missiles and their components. The objective was to evaluate these things in regard to quality, design, and reliability. (Ibid) (* Surveillance is the process of keeping track of the "shelf life" of a missile in storage and onboard a ship.)

Telemetry remained an important component of MED's operations for compiling missile flight data. To do this effectively and within a reasonable amount of time, it was necessary to store large amounts of data through which to consistently analyze test results. (ASM 69-70) Large-scale digital computers were increasingly available in the 1950s and were constantly being improved. These computers and their progressive improvement remained as the cornerstone of MED's ability to do its work. For its work in this area, *MED was recognized as the Navy's central computer facility from 1954-1963*. Through the work it did in advancing the analytical capabilities of computers, MED was largely responsible for critical improvements in the quality and performance of naval missile systems. (Ibid)

In September 1959, MED moved into several former hospital buildings near the Fifth Street gate. These included the former Corpsmen's Quarters, WAVES' Quarters, and the old

Norconian Resort Chauffeurs' quarters. With this move, the activities at MED became physically separate from those at NOLC. (Ibid: 89)

In November 1961, the balance of the hospital property, vacant since the closing of Naval Hospital Corona in 1957, was turned over to the Government Services Administration (GSA.) Shortly thereafter, on March 30, 1962, the GSA transferred this part of the hospital to the California Department of Corrections for conversion into a prison specialized in the incarceration and treatment of drug addicted inmates. The newly created institution was named the "California Rehabilitation Center" (CRC.) Essentially CRC's property consisted of everything north of the lake. (Ibid)

FIGURE 115: FMSAEG OPERATIONS BUILDING (Former Corpsmen's Qtrs) and HEADQUARTERS (Former WAVES' Qtrs, Demolished)

Source: U.S. Navy, *NOLC,* 1958

While missile firing evaluations remained a central focus of MED, it also took on two additional evaluation tasks:

- The first area addressed production quality, including the evaluation of a manufacturer's ability to consistently produce a reliable product. This included the effectiveness of the manufacturer's acceptance inspection procedures, its production proof test firing plans, its simulation tests, its calibration programs, and its test equipment compatibility studies.

- The second area consisted of the quality of weapons surveillance programs, essentially programs to track and document the "shelf life" of weapons in storage and onboard ships. (Ibid)

By 1964, MED had become a significant contributor to the Navy's Fleet Readiness Program. *It was the single entity to which the Navy turned for objective evaluations of missile performance and reliability.* By that time, its evaluation of ballistic and guided missiles had expanded to include the Talos, Terrier, Tartar, Typhoon, Sidewinder, Sparrow, Bullpup, Shrike,

and Polaris missiles. In addition, MED provided the Special Projects Office with analyses of ballistic missile systems. (ASM 77-78)

c. Fleet Missile Systems Analysis and Evaluation Group (FMSAEG) 1964-1976

While MED was highly effective in accomplishing its task of evaluating weapons, there were still problems. In the early 1960s, Captain (later Rear Admiral) Eli T. Reich, Commanding officer of the guided missile cruiser the USS Canberra, found that, despite the quality of MED's evaluation work, missile systems could still not be depended upon for consistent performance. Additionally, the elements of various systems tended to give conflicting data. To address these issues, Reich founded "Code G" in the Bureau of Weapons to focus on improving missile quality. He also initiated operational test programs with the objectives of assuring that a ship's missile systems and people would work effectively against targets, and that a battle group would be effective in war-gaming exercises. (NWAD, United States Navy Fact Sheet. Naval Warfare Assessment Division, 1997: 2)

To accomplish these objectives Reich recognized the need for a sound analytical model and a truly unbiased agent to perform and communicate its weapons evaluations. (NAVSEA, *A Tribute to 60 Years of Service to the Navy*, 2000, Corona, CA: 15) While NOLC's MED was fully capable of producing the competent and unbiased reports needed to accomplish these goals, Reich recognized that MED lacked the *direct reporting relationship* necessary to assure that its reports would reach their intended destinations in an unbiased form. With Reich's leadership, MED was given the independence it needed to eliminate bias in the reporting of its evaluations. To accomplish this MED was given complete organizational separation from the balance of NOLC. With this change, MED had the needed direct reporting relationship to assure the unadulterated delivery of its test results. (Ibid)

Thus was born the Fleet Missile Systems Analysis and Evaluation Group (FMSAEG.) FMSAEG was formally implemented on February 24, 1964, with authorization from the Secretary of the Navy. FMSAEG's mission: "To provide the Navy Department, the operating Forces, and appropriate organizations of the Shore Establishment with evaluation of performance, reliability, readiness, and effectiveness of missile weapon systems, subsystems and assemblies, and associated test equipment and checkout systems." (Ibid)

MED's core mission remained unchanged in its new identity as FMSAEG. Specifically, it focused on the evaluation of the quality and reliability of all Navy missile systems. FMSAEG analyzed shipboard firings, static tests, and manufacturing operations. To make its work effective, FMSAEG used telemetry ground stations, spectrum analyzers, and an IBM 7074 digital computer. (Ibid) FMSAEG also continued to occupy the former Naval Hospital Corona's WAVES' and Corpsmen's Quarters, home to MED since 1959. (Figure 115)

FMSAEG was a separate and completely independent Navy entity, the professional staff of which was largely made up of electronic engineers, general engineers, physicists, mathematicians, and statisticians. (*Naval Weapons Center Corona*, U.S. Navy, November 1968: 15)

FMSAEG was also an entirely unique organization in the Navy. Its mission critical role was that of rigorous and fully objective evaluations aimed at assuring Navy guided missile weapon systems were ready, reliable, and effective. Its work was not a one-time effort. Rather, FMSAEG performed a continuous evaluation of missile weapon systems, subsystems, and assemblies, associated test equipment, and checkout systems. (Ibid)

FMSAEG operated in four major areas at this time, with departments for each area serving to carry out its related responsibilities:

- The Surface-Launched Missile Systems Department was responsible for the readiness, reliability, performance, and effectiveness of surface-launched missiles.

- The Air-Launched Missile Systems Department was responsible for the readiness, reliability, performance, and effectiveness of air-launched missiles.

- The Ballistic Missile Systems Department was responsible for assessing the quality and reliability of the Fleet Ballistic Missile Weapon System.

- The Missile Systems Test Equipment Department was charged with the task of monitoring and evaluating the performance and reliability of production and tactical test equipment. (NWAD, United States Navy Fact Sheet. Naval Warfare Assessment Division: 92)

FMSAEG was responsible for the evaluation of all Navy guided missile weapon systems, as well as underwater torpedoes, as follows:

- The air-to-air Sidewinder, Sparrow lll, and Phoenix.

- The air-to-surface Bullpup, Shrike, and Walleye.

- The surface-to-air Terrier, Tartar, Talos, and Standard Missile.

- The underwater-to-surface Fleet Ballistic Missile Weapon Systems Polaris and Poseidon.

- All underwater torpedoes. (*Naval Weapons Center Corona*, U.S. Navy, November 1968: 15)

In the arena of air-launched and surface-launched missiles, FMSAEG was responsible for instrumentation, data collection and processing, missile firing analysis, systems operability analysis, and system readiness evaluation. Data on the missiles would come to FMSAEG from Fleet and shore units. FMSAEG's analyses of these data were then distributed to appropriate commands and activities throughout the Navy. (Ibid)

In the ballistic missile systems arena, FMSAEG was responsible for three significant programs:

- The operation of the Fleet Ballistic Missile Weapon Systems (Polaris and Poseidon) development, coordination/evaluation, quality assurance, and reliability programs.

- Responsibility over the Fleet Ballistic Missile Weapon Systems Trouble and Failure Reporting Program (FARADA.)

- The maintenance and operation of a central collection and distribution center for missile weapon and aerospace systems component and part quality and reliability data. (GIDEP) (Ibid: 16)

FMSAEG was also responsible for the development, maintenance, and evaluation of specialized test equipment necessary for the effective execution of its mission. This aspect of its mission involved the analysis and evaluation of both manufacturer production test equipment and the field tactical test equipment used in evaluating Navy missile systems. To keep test equipment technologically up-to-date, FMSAEG regularly performed surveys of test equipment and made recommendations to correct design issues and eliminate problems. FMSAEG also carried out certification and correlation programs to assure the adequacy of test equipment and the compatibility of test results. (Ibid: 17)

FIGURE 116: FMSAEG STAFF JOHN FISHELL, RON REYNOLDS, AND RON SHORTT ABOARD USS NORTON SOUND

Source: Kevin Bash Collection

Vital to its effectiveness was FMSAEG's digital computer facility, equipped with both IBM 7074 and a IBM System 360130 computers. These computers would take raw data from factories, depots, ships, and test firings, and translate them into a usable form. The ability of this computer system to readily retrieve any needed data from a large quantity of stored data made FMSAEG the central missile weapon system data collection, storage and retrieval facility for the Navy. (Ibid)

Other FMSAEG specialized equipment included photo-optical equipment, capable of translating information on film into digital data. In this form, data could be fed into the computers, and telemetry equipment. (Ibid 18)

While separate entities; both NOLC and FMSAEG shared data and facilities. They were also supported by cutting edge computers and a dedicated computer staff. (NWAD, "United States Navy Fact Sheet" Naval Warfare Assessment Division: 92)

From 1964 -1971, in its traditional role of IAA, FMSAEG experienced significant expansion. This expansion was due to:

- An increase in Surface Missile Systems and air-launched missile firings.
- The continued deployment of Fleet Ballistic Missile submarines.
- The assignment of additional responsibilities to FMSAEG.
- An increase in FMSAEG's direct involvement in Fleet firing programs. (Ibid: 93)

New responsibilities included testing and evaluating new missile systems (Standard, Sea Sparrow, Shrike, Walleye, Standard ARM, and Poseidon), and assessing the quality and reliability of torpedoes and other underwater systems. Studies and analysis were also done on air-launched missile test equipment for the Sparrow III, Sidewinder, Phoenix, Bullpup, Walleye, Shrike, Standard Arm, and Chaparral missiles. (Ibid: 93-94)

FMSAEG's growing participation in Fleet firing operations led to an increase in the number of FMSAEG-operated telemetry stations. Starting with just one installation in 1964, FMSAEG's telemetry stations increased to six in 1971. As a group, the telemetry stations encircled the entire globe. Manned by FMSAEG employees on a full-time or as-needed basis were the following stations:

- Poro Point in the Philippines.
- White Beach in Okinawa.
- Naval Air Station Oceana in Virginia.
- The Marine Corps Air Station Cherry Point in North Carolina.
- The Atlantic Fleet Weapons Training Area in Puerto Rico.
- The NATO Missile Firing Installation in Crete. (Ibid: 94)

In an effort to detect malfunctioning missiles prior to aircraft launch, FMSAEG designed and constructed a portable telemetry unit that could be operated by one man on the flight line. By 1968, this unit was in use at all of FMSAEG's East Coast ranges. (Ibid: 115)

In its early days, FMSAEG's primary function in regard to firing exercises involved analyzing the results of missile firings. Secondarily, FMSAEG also participated in the planning of data collection, analysis, and threat engagement reporting. FMSAEG's dedicated staff, cutting edge equipment, and innovative techniques greatly enhanced the analysis of test firings. FMSAEG created equipment helped assure consistency in the collection, storage, and evaluation of data. Digital recording systems, via FMSAEG's Univac 1108 computer, were essential to data consistency documenting the variables of missile systems tests. Previous manual systems were error-prone, time-consuming, and often incomplete. FMSAEG's importance to the success of these exercises resulted in its evolution from outside observer to active participant and valued advisor. (Ibid: 94) Figure 116 is a photograph of FMSAEG staff members John Fishell, Ron Reynolds, and Ron Short aboard the USS Norton Sound during a test of the AEGIS System.

FMSAEG proved itself over time to be *a bastion of military efficiency and effectiveness*. And, as its trust was earned, it was given more responsibilities. For example, FMSAEG was given responsibility for:

- Preparing and issuing requirements for components of missile systems.

- Continued work on the reliability issues of the Terrier, Tartar, and Talos missiles.

- Continued responsibility for the viability of test equipment used for the Terrier and Tartar missile readiness evaluations.

- Determining the true readiness of the Bullpup and Shrike missiles using “real time” information from state-of-the art computers.

- Implementing special projects and testing for Sidewinder and Polaris’ tactical test equipment.

- Evaluating all equipment used for Standard Missile components and assemblies during production.

- The collection and analysis of Walleye missile data.

- Auditing and evaluating the reliability and quality programs of the Polaris and Poseidon missile contractors.

- Processing and analyzing data acquired via Trouble and Failure Reports (TFRS) for the Polaris, Poseidon and Trident missiles. (ASM 2011: 86)

As noted earlier, on July 1, 1967, NOLC was organizationally merged with the Naval Ordnance Test Station, China Lake, and became Naval Weapons Center Corona Laboratories (NWCCL.) While NWCCL remained on the Detachment Corona campus, it was no longer organizationally the same operation. FMSAEG retained its independent status and was not included in this organizational change. (The History of the Naval Weapons Station, Seal Beach and Fallbrook and FMSAEG Annexes 1941-1971: 135)

In 1969, FMSAEG celebrated its fifth anniversary and published a bulletin to commemorate this milestone. Here is how the Navy summarized FMSAEG in this bulletin:

> “For services to the Navy and its far-flung fleet, to other branches of the Armed Services, and to the NATO countries, global recognition is enjoyed by this young activity. The many commendable accomplishments of the past few years are a direct result of the unique position the Group has earned in the evaluation of naval Ordnance through the leadership and professional competence of a dedicated work force….”
>
> “Growth in size, as well as in depth and scope of service has surpassed all expectations. FMSAEG enters its sixth year with confidence of even greater service to the cause of peace.” (“FMSAEG Fifth Anniversary”, FMSAEG Information Bulletin #41, 2-17-1969: 1)

On September 25, 1969, NWCCL’s infrared function was authorized for transfer to San Diego and on June 30, 1971, NWCCL was physically moved to China Lake. FMSAEG remained on the Corona campus, however, and continued to operate as before. FMSAEG expanded its operations into the vacated NWCCL quarters.

In 1970, the Navy Ordnance Systems Command directed FMSAEG to act as program coordinator in developing procedures and instructions for the Navy Ordnance Systems Command Field Activities Standards Quality Assurance Program, for all ordnance. Once all the procedures and instructions were completed, FMSAEG was directed to incorporate them in a *Standard Quality Assurance Program Manual*, as a replacement for the then existing QAP-6000 document: *Quality Assurance Program Requirements for Fleet Issue of Naval Ordnance*. (The History of the Naval Weapons Station, Seal Beach and Fallbrook and FMSAEG Annexes 1941-1971: 131)

During 1970, FMSAEG provided significant support for the Navy's Air-Launched Missile Programs. Weapons supported included the Sparrow III, Shrike, Standard ARM, Bull Pup, Sidewinder, and Walleye missiles. FMSAEG's independent evaluation reports on the Terrier in 1970, led to the discontinuation of both the beam-riding and homing versions of the retrofitted missiles. (Ibid).

The year 1971 saw FMSAEG providing considerable firing exercise telemetry support to the Navy and Marine Corps for Sparrow III. The reliability of this missile was also a significant aspect of FMSAEG's work during these operations. In fact, Detachment Corona was "…responsible for design, development, and evaluation of data-handling techniques and instrumentation for almost all Navy missiles. (*Rocketeer*, 4-26-1968, "Naval Weapons Center Corona Laboratories": 7)

FMSAEG's operations as a purely independent entity ended on June 30, 1971 when it became an Annex of the Naval Weapons Station, Seal Beach. At the same time, NWCCL was also disestablished, with most of its technical personnel transferred to China Lake. The one exception to this transfer was a small group of former NWCCL technical personnel who remained at Corona to operate Corona's Fuze Model Range and the Missile Component Test Facility. (Barnes, P.A., "Naval Warfare Assessment Division, Naval Ordnance Center's Premier Testing and Research Facility", *PM*, July-August 1997: 75)

d. Fleet Analysis Center (FLTAC) 1976-1989

The Period of Significance of this historic resources survey and evaluation extends from 1951 through 1971. For the sake of continuity and because Corona's function as an Independent Assessment Agency remains in place to this day, the history beyond 1971 is also addressed in this document. The reader should bear in mind, however, that the analysis of the property's historic significance only includes events that took place through 1971.

In January of 1976, FMSAEG became Fleet Analysis Center (FLTAC). (Ibid) Departments and offices within FLTAC included the:

- Ship Systems Department.
- Air and Ocean Systems Department.
- Strategic Weapons Systems Department.
- Fleet Support Department.
- Data Automation Department.
- Product Assurance Office.
- Government-Industry Data Exchange Program (GIDEP) Operations center.
- Failure Rate Data (FARADA) Program. (http://www.navsea.navy.mil/nswc/corona/content/history.aspx, Accessed 2015)

The change in name to FLTAC was the result of FMSAEG's ever expanding role in missile evaluation. FMSAEG had been given major assignments in the surface and air launched missile systems and in the Fleet Ballistic Missile Weapons Systems program. Its assumption of responsibility for GIDEP's predecessor, the Inter-service Data Exchange Program (IDEP) and the Failure Rate Data (FARADA) program had represented significant expansions of FMSAEG's responsibility for missile cost and reliability matters. By the time FMSAEG's name was changed to FLTAC, however, it was already involved in these areas. (Ibid)

Accordingly, the change from FMSAEG to FLTAC was not accompanied by any significant change in mission. Like FMSAEG, FLTAC directed its efforts at:

- Improving Fleet's missile systems using FLTAC developed evaluation and assessment criteria.
- The management of and training on the use of instrumentation systems.
- Data collection and analysis using computers.
- Product quality assurance.
- The management of GIDEP and FARADA, where both governmental and industrial entities could find information on product quality and reliability. (Ibid)

During the 1980s, the Reagan administration supported the Navy by increasing funding for the use of the RDT&E efforts of the 1960s and 1970s to produce improved weapon systems. (Barnes, P.A., "Naval Warfare Assessment Division, Naval Ordnance Center's Premier Testing and Research Facility", *PM*, July-August 1997: 75) By 1985 the role of Naval Weapons Station, Seal Beach was largely directed toward the rearming of Fleet with upgraded weapons capabilities. The 1971 disestablishment of FMSAEG as a purely independent entity was reflected in the increased number of operational sites where its mission was carried out. These included Seal Beach, Corona, Fallbrook, and Pomona. (ASM 2011: 85)

Also, during the 1980s, the NWS Seal Beach Technical Directorate was formed. This action incorporated FLTAC, the Navy's Metrology the Gage and Standards Center, and the Weapons Quality Evaluation Center into a coordinated unit. On October 9, 1987, Vice Admiral William B. Rowden established the Naval Ordnance Centers of Excellence for its shore ordnance operations. By doing this, Rowden recognized the Technical Directorate's Centers of Excellence for their roles in:

- Measurement Science.
- The assessment of combat systems' performance.
- Product quality assurance. (NWAD, United States Navy Fact Sheet. Naval Warfare Assessment Division, nd: 2)

This action formally recognized FLTAC as the management entity for the above functions. (http://www.navsea.navy.mil/nswc/corona/content/history.aspx: Accessed 2015)

e. Naval Warfare Assessment Division (NWAD) 1989-1998

On April 1, 1989, the Technical Directorate was renamed the Naval Warfare Assessment Center, Corona (NWAC.) This action helped to better reflect the overall mission of the newly consolidated scientific and technical organization. (*A Tribute to 60 Years of Service to the Navy*, Corona Division, Naval Surface Warfare Center, October, 2002: 58)

On September 14, 1993, NWAC was renamed the Naval Warfare Assessment Division (NWAD.) This change corresponded with the realignment of the Corona Labs under the Naval Ordnance Center. http://www.navsea.navy.mil/nswc/corona/content/history.aspx: Accessed 2015)

On April 6, 1994, NWAD dedicated a new 48,000 square-foot Warfare Assessment Laboratory on the Corona campus. Costing $9,425,523, the laboratory served to provide a consolidated and secure location where Fleet readiness and capability could be analyzed. With the completion of this lab NWAD gained the capability of providing improved integrated analytical support to Navy Fleet and shore organizations. Further, the laboratory greatly enhanced NWAD's ability to provide detailed evaluations of the readiness and effectiveness of DoD weapon systems. In the lab, NWAD personnel used state-of-the-art technology to assess combat systems performance. Through hyper-speed computer networks, near real-time assessments of exercises from the overall battle group to the individual unit can be generated. (Ibid)

f. Naval Surface Warfare Center, Corona Division (NSWC) 1998- present

On February 15, 1998, NWAD was transferred from the Naval Ordnance Center to the Naval Surface Warfare Center and was renamed the Naval Warfare Assessment Station (NWAS.) This realignment allowed greater technical synergy and more effective relations with the Naval Surface Warfare Center engineering entities. Overall command came from the Naval Sea Systems (NAVSEA.) Command's new logo was unveiled in 2000, and in March 2001 the center's name was changed to Naval Surface Warfare Center (NSWC), Corona Division. (http://www.navsea.navy.mil/nswc/corona/default.aspx, Accessed 2015)

The Navy's weapons evaluation function remains to this day at Detachment Corona in Norco, California, and continues to provide critical independent evaluation services to the Navy. Here is what the NSWC's web site says about the critical mission carried out at its Norco, California facility:

> "NSWC Corona is the Navy's independent assessment agent and home to three premier national laboratory and assessment centers: the Joint Warfare Assessment Lab [JWAL]; the Measurement Science and Technology Lab; and the Daugherty Memorial Assessment Center [DMAC.] Along with the renowned "Corona Engineers," these state-of-the-art facilities enable Corona to fulfill its unique mission for the Navy. The JWAL and DMAC are at the core of Corona's integrated approach to warfare assessment, and the Measurement Science and Technology Lab is where Corona researches and establishes the metrology and calibration standards and procedures for the Navy and Marine Corps.

"Using a rigorous, disciplined independent assessment process, Corona provides the fleet program managers and acquisition community with the objective assessment needed for the Navy to gauge war fighting capability of ships and aircraft, assess warfare training and analyze new defense systems – even those systems in the concept phase. This commitment to independent assessment allows the Navy to achieve the greatest value for acquisition, material readiness and lifecycle management programs – for Today's Navy, the Next Navy, and the Navy After Next. As the Navy's metrology and calibration authority, Corona also sets the measurement science and calibration standards to support proper weapons operation, interoperability and peak readiness for the fleet. Corona uses innovation and automation to also reduce burdensome workload for Sailors, while reducing maintenance costs and increasing readiness for the Navy.

Technical capabilities and unique expertise – ranging from missile defense assessment to range and test instrumentation to setting measurement standards – enable Corona to support in-service and emerging weapons and combat systems for key customers in critical areas:

- Trusted agent for Operational Test and Evaluation Force analysis and assessment.
- Worldwide connectivity to enable analysis and reporting of assessment results in near real-time.
- Integrated performance and readiness assessment of weapons and combat systems.
- Range instrumentation management and engineering.
- Test systems effectiveness and measurement integrity.
- Weapons and combat systems product integrity." (Ibid)

Under NAVSEA's umbrella, NSWC is one of NAVSEA's 33 activities located in 16 states. NAVSEA is the largest of the Navy's five commands, employing some 60,000 military, and contract support personnel. (Ibid)

NAVSEA is essentially a coordinating entity, the purpose of which is to bring all of the various resources necessary to build effective weapons together in a technologically advanced, cost effective manner. Quoting from its web site, NAVSEA has the following responsibilities:

"NAVSEA strives to be an efficient provider of defense resources for the nation, and it plays an important role in the Navy Enterprise. As a Provider Command, it has the responsibility of directing resource sponsors into the proper mix of manpower and resources to properly equip the fleet.

NAVSEA has the further responsibility of establishing and enforcing technical authority in combat system design and operation. These technical standards use the organization's technical expertise to ensure systems are engineered effectively, and that they operate safely and reliably." (Ibid)

3. Theme 3, Government Industry Data Exchange Program (GIDEP) and Failure Rate Data Program (FARADA)

To this day, two important programs are associated with the Corona labs. With roots going back as far as the late 1950s, these programs have been a mainstay of Corona's operations, and remain so to this day. These programs are known as the Government Industry Data Exchange Program (GIDEP,) and the Reliability-Maintainability Data Interchange program, formerly the Failure Rate Data Program (FARADA.)

By the late 1950s, MED had acquired extensive information on the reliability of electronic and mechanical components. Consequently, MED was given responsibility for providing the contractors involved in the Fleet Ballistic Missile Weapons System, reliability data regarding components being considered for use in the Polaris missile. In 1959, this resulted in the establishment of Inter-service Data Exchange Program (IDEP.) IDEP was a cooperative effort of the Army, Navy, and Air Force, the purpose of which was to reduce duplications in the testing being conducted by various contractors. By facilitating the sharing of test data on missile parts with defense contractors, IDEP served to eliminate duplications of components, and staff time, a huge cost to the nation's defense efforts. (www.gidep.org/about/opmanual/appen-g.pdf*, Accessed 2015: 1)*

In its initial form, IDEP's sole responsibility was the ballistic missile program. While IDEP only had one data exchange, each service maintained its own management office. Over time, the number of participants in IDEP increased. Significant among these participants was NASA, which joined in 1965, and the Canadian Department of Defense, which joined in 1966. The addition of these organizations to IDEP led to a slight change in its name from the Independent Data Exchange Program to the *Interagency* Data Exchange Program. The program continued to grow as a result of mergers and the addition of new participants. By the end of the 1960s, over 130 industry contractors were on the distribution list for data indexes. (*Ibid: 2)* In 1968, GIDEP assumed the responsibility for or the collection and distribution of the hard copy calibration file previously maintained at Vandenberg Air Force Base. (http://www.gidep.org/about/history.htm, Accessed 2015)

IDEP's increased size led to the realization that the program needed to be consolidated into one entity. Thus, in 1970, the offices of the three armed services were consolidated at Corona's FMSAEG facility. At this point the program was renamed the Government-Industry Data Exchange Program (GIDEP.) At its Detachment Corona location, the program continued to grow and expand, with additional data exchanges added over time. (Ibid)

In 1971, FMSAEG assumed operational responsibility for the entirety of GIDEP as the program's Administration Office. Between January and June of 1971, FMSAEG worked to establish the parameters of the new GIDEP program, and on July 1, 1971 it was fully operational. (Ibid)

It did not take long for GIDEP to demonstrate its value. *The 1970 GIDEP report, published in March of 1971 documented cost avoidance savings of $5,277,304, a 20 percent improvement over 1969.* Some 1,800 test reports and calibration procedures were organized and made available to program participants between January and June of 1971. At the time of FMSAEG's assumption of the overall GIDEP program, 190 contractors and commercial and government laboratories were participants in the data exchange program. (Ibid)

Another data exchange program, the Failure Rate Data (FARADA) program, also has a significant history at Detachment Corona. FARADA was established in the early 1960s. Assigned to the Navy, FARADA simplified the problem of determining the reliability of components by making the most current failure rate data available to military and space contractors. The data was published in a

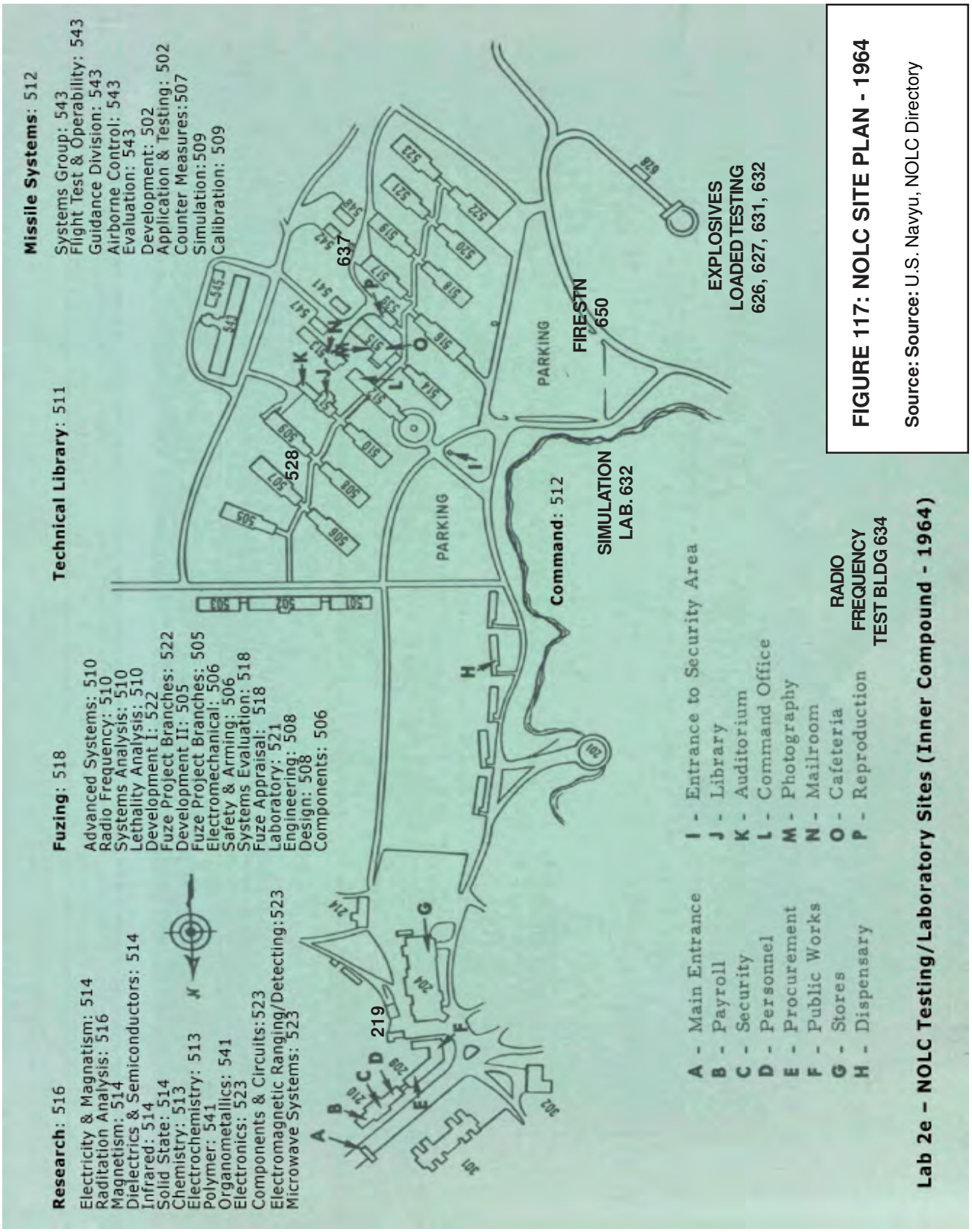


FIGURE 117: NOLC SITE PLAN - 1964

Source: Source: U.S. Navyu, NOLC Directory

series of books known as the Failure Rate Data Handbooks that became widely used throughout the defense and aerospace fields. FARADA was used in a wide array of applications, including those associated with aircraft, missiles, satellites, radar, sonar, computers, and communications

BLDG #	HOSPITAL ERA USE	WEAPONS ERA USE (1964)	YEAR BUILT	DESCRIBED PT 2, SECT 4
N/A	Lake, Southwest Landscape	Lake, Southwest Landscape	1928	4-d
201	Officers' Club	Conference Center	1928	1-m
203	Boathouse and Docks	Boathouse and Docks	1929	1-l
204	Garage, Gas Pumps, Laundry	Stores (Laundry Section Demolished)	1930	1-o
208	Fire Stn & Electric Shop	Not Identified	1929	1-q
209	Old WAVES' Quarters	Public Works, Procurement	1929	1-n
213	Plumbing Warehouse	Not Identified	1942	1-p
214	Truck Shelter	Not Identified	1942	1-p
215	Grease Rack	Not Identified	1942	1-p
218	Gardeners Tool Shed	Not Identified	1942	1-s
220	Animal House	Not Identified (Also listed as Bldg 217)	1946	1-r
300	Main (Fifth Street) Gate	Main (Fifth Street) Gate	1943	1-j
301	Corpsmen's Quarters	FMSAEG Operations	1943-4	1-k
501	TB Corpsmen's Quarters	Not Identified	1943	2-i
502	TB Corpsmen's Quarters	Development, Application & Testing	1943	2-i
503	TB Corpsmen's Quarters	Not Identified	1943	2-i
504	Bag Storage/Not Identified	Not Identified	1943	2-i
505	Phase 2 TB Officers' Ward	Development II, Fuze Project Branches,	1943	2-g
506	Phase 1 TB Officers' Ward	Electromechanical, Safety & Arming, Components	1943	2-g
507	Phase 1 TB Officers' Ward	Counter Measures	1943	2-g
508	Phase 1 TB Ward	Engineering, Design	1943	2-f
509	Phase 1 TB Ward	Simulation, Calibration	1943	2-f
510	Phase 1 TB Ward	Advanced Systems, Radio Frequency, Systems Analysis, Lethality Analysis	1943	2-f
511	Theater & Recreation	Technical Library, Auditorium	1943	2-c
512	Command Office/	Command Office, Missile Systems Admin	1943	2-b
513	Power House	Mail Room, Chemistry, Electrochemistry	1943	2-e
514	Phase 1 TB Ward	Electricity & Magnetism, Dielectrics & Semiconductors, Infrared, Solid State	1943	2-f
515	Subsistence	Photography, Cafeteria	1943	2-e
516	Phase 1 TB Ward	Research Dept Admin, Radiation Analysis	1943	2-f
517	Phase 2 TB Ward	Laboratory	1944	2-f
518	Phase 1 TB Ward	Fuzing Admin, Systems Evaluation, Fuze Appraisal, Laboratory	1943	2-f
519	Phase 2 TB Ward	Laboratory	1944	2-f
520	Phase 2 TB Ward	Laboratory	1944	2-f
521	Phase 2 TB Ward	Laboratory	1944	2-f
522	Phase 2 TB Ward	Development I, Fuze Project Branches	1944	2-f
523	Phase 2 TB Ward	Electronics, Components & Circuits, Microwave Systems, Electromagnetic Ranging & Detecting,	1944	2-f
539	Bag Storage	Reproduction	1943	2-f
555	Phase 1 Covered Walkway	Phase 1 Covered Walkway	1943	2-h
556	Phase 2 Covered Walkway	Phase 2 Covered Walkway	1944	2-h
650	Not Applicable	Fire Station	1964	N/A
808	Not Applicable	Unknown	1957	N/A

FIGURE 118: DESCRIPTION LOCATIONS, PREVIOUSLY DESCRIBED BUILDINGS

Source: WHS

and navigation systems. (Ibid) The FARADA program had some 276 contractors, governmental agencies, consultants, and educational institutions as participants. FARADA's Handbooks contained some 60,000 entries of failure rate dada and some 3,000 entries of failure mode data.

(*The History of the Naval Weapons Station, Seal Beach and Fallbrook and FMSAEG Annexes* 1941-1971: 135)

Initially, FARADA was simply located in the same building as GIDEP. In 1973, however, the two programs were merged together, operating as one coordinated entity. At this point, the name FARADA was changed to the Reliability-Maintainability Data Interchange. (http://www.gidep.org/about/history.htm, Accessed 2015)

During the 1970s, GIDEP continued to grow. In this decade, it took on programs previously managed by the Air Force, Secretariat for Electronic Test Equipment, and the National Bureau of Standards. (Ibid)

The 1980s and 1990s saw further growth, as the Department of Energy joined GIDEP. GIDEP's effectiveness also continued to grow, thus enhancing the agency's ability to have an even greater effect on the efficiency and cost effectiveness of the programs for which it was responsible. In 1995, GIDEP expanded its purview even further as it took on the problem of parts obsolescence. The balance of the 1990s and through the 2000s, GIDEP's efficiency and effectiveness were improved through further technological advancements. (Ibid)

In 2007, the GIDEP program was realigned from the Department of the Navy to the Defense Standardization Executive, Defense Standardization Program office. (Ibid) GIDEP's offices are presently located in a facility just outside of the NSWC compound at a business named Computer Sciences Corp. (CSC), situated at 2727 Hamner Avenue, Norco, California.

Part 3, SECTION 4: IDENTIFICATION OF WEAPONS RDT&E BUILDINGS, STRUCTURES, and FEATURES

This section of the report consists of descriptions of the various buildings, structures, and equipment in use at Detachment Corona during the period of significance (1951-1971.) Surviving buildings and structures are illustrated with current photos and described architecturally. Buildings and structures that are no longer on the property are described in narrative form only, with historic photos used as available.

1. Site Plan

The site plan in Figure 117 was taken from a 1964 NOLC directory. WHS has added some annotations to the map to indicate the locations of the three most prominent testing buildings and structures that were not present when this map was created. These consist of the Radio Frequency Test Building, the Simulation Encounter Building, and the Explosives test complex. Of these buildings, only the Radio Frequency Test Building remains fully intact. All that remains of the Simulation Encounter building is its slab foundation. As for the Explosives Test Facility, only the two bunkers and two of the dozen or so lab buildings survive.

2. Descriptions of Buildings, Structures, and Features Previously Described

The table in Figure 118 summarizes the Detachment Corona buildings that were surveyed and described in Part 2 of this report, addressing the overall property's life as Naval Hospital Corona. The fifth column lists where in Part 2, Section 4 the descriptions of these buildings, structures, and features may be found.

3. Descriptions of Buildings, Structures, and Features Not Previously Described:

Below are descriptions of buildings built during the period of significance (1951-1971) that were not described in the Hospital Era section of the report. Only those buildings considered by WHS to be reasonably substantial are described. Beyond these are numerous small structures that WHS did not believed merited space in this report.

a. Paint Shop (Bldg. 219, 1954)
Figure 119

Building 219 was erected in 1954 for spray painting. It is located east of the resort era Garage/Laundry Building. This utilitarian single story, corrugated metal building is situated on a rectangular concrete slab foundation and has a gabled metal corrugated roof. All windows are multi-paned types with frames and divisions between frames made of metal. Most of the doors are simple metal man doors. The south elevation is penetrated by a pair of corrugated metal sliding doors large enough to permit vehicular access. One of these

FIGURE 119: SPRAY PAINTING SHOP (Bldg. 219)

Source: ASM, 2011

doors is equipped with a window, typical of the others on the building. East of this pair of sliding doors, a pair of hinged metal doors provides access to the spray booth portion of the building. This is a small support building that does not appear to have played a significant role in the RDT&E functions of Detachment Corona. Therefore it would not constitute a contributor to a Weapons Era historic district, nor would it be individually eligible for National Register listing.

FIGURE 120: SUPPORT BUILDING (Bldg. 528)

Source: ASM, 2011

b. Support Building (Bldg.528, 1954) Figure 120

Building 528 was erected in 1954, to the north of Lab Building 509. It is a utilitarian, single story, stucco clad building situated on a rectangular concrete slab foundation with a gabled composition shingle roof. The building only has two windows, both on the west elevation. These windows appear to be aluminum framed sliders, but they are obscured by metal security grilles, making the specific window type difficult to discern. There is only one door, a metal man door, penetrating the south elevation. This is a small support building that does not appear to have played a significant role in the RDT&E functions of Detachment Corona. Therefore it would not constitute a contributor to a Weapons Era historic district, nor would it be individually eligible for National Register listing.

FIGURE 121: GROUNDS STORAGE (Bldg. 537)

c. Grounds Storage (Bldg. 537, 1957) Figure 121

Building 537 was built in 1957 to serve as a grounds storage shed. It is located between buildings 517 and 542. This utilitarian concrete block building is situated on a rectangular concrete slab foundation and has a flat roof with unknown cladding. The building is open along both its east and west frontages. Providing security for the spaces within are panels of chain link fencing. There are no traditional windows or doors. This is a small support building that does not appear to have played a significant role in the RDT&E functions of Detachment Corona. Therefore it would not constitute a contributor to a Weapons Era historic district, nor would it be individually eligible for National Register listing.

d. Storage (Bldg. 542,1958) Figure 122

FIGURE 122: STORAGE (Bldg. 542)

Source: ASM, 2011

Building 542 was erected in 1957 to serve as a general storage shed. It is located east of Lab Building 517. This utilitarian corrugated metal building is situated on a rectangular concrete slab foundation and has a gabled roof clad with corrugated metal identical to the building's walls. The building has large vehicle openings on both its east and west frontages, each secured by a pair of rolling metal doors. There are no traditional windows or doors. This is a small support building that does not appear to have played a significant role in the RDT&E functions of Detachment Corona. Therefore it would not constitute a contributor to a Weapons Era historic district, nor would it be individually eligible for National Register listing.

e. Guard House (Bldg. 554, 1957) Figure 123

FIGURE 123: GUARD HOUSE (Bldg. 554)

Source: ASM, 2011

Building 554 was erected in 1957 to serve as a security check point at the main vehicular access point to Detachment Corona's inner compound. It is a single story, utilitarian stucco clad building situated on a square concrete slab foundation with a flat roof sheathed in rolled composition roofing. Aside from one specialized checkpoint window, the buildings windows are double-hung wood sash types. Windows are located on the buildings east, west, and north sides. One aluminum framed storefront door on the north elevation provides access to the interior of the building. While indistinctive in design, this building has provided an important security function for the inner compound, and retains its essential integrity. As such, it would qualify as a contributor to a Weapons Era historic district, but it would not be individually eligible for National Register listing.

f. Radio Frequency Testing Building (Bldg. 634, 1960) Figure 124

Building 634 was constructed at the top of Hill B in 1960 to serve as a radio frequency test building. It is a two story, utilitarian concrete block building situated on a rectangular concrete foundation. Its flat roof is flanked on all sides by tubular metal railings, allowing it to

be used as an upper deck where testing related functions can take place. There are windows on all sides of the building; most of which appear to be divided into three horizontal lights, very similar to the windows on the surviving Explosives laboratory buildings (below.) The main entrance is via a single metal man-door situated on the south side of the building. A metal staircase adjacent to the door provides direct exterior access to the roof. While indistinctive in design, this building has served as an important location at Detachment Corona for testing purposes. It also retains its essential integrity. As such, it would qualify as a contributor to a Weapons Era historic district, but it would not be individually eligible for National Register listing.

FIGURE 124: RADIO FREQUENCY TEST BUILDING (Bldg. 634)

Source: ASM, 2011

g. Explosives Laboratory Complex (Bldgs. 626, 627,631 & 632, c.1957) Figures 125 & 126

The Explosives Laboratory facility consists of two lab buildings and two concrete underground bunkers. All of these elements are situated below and on the south slope of Hill

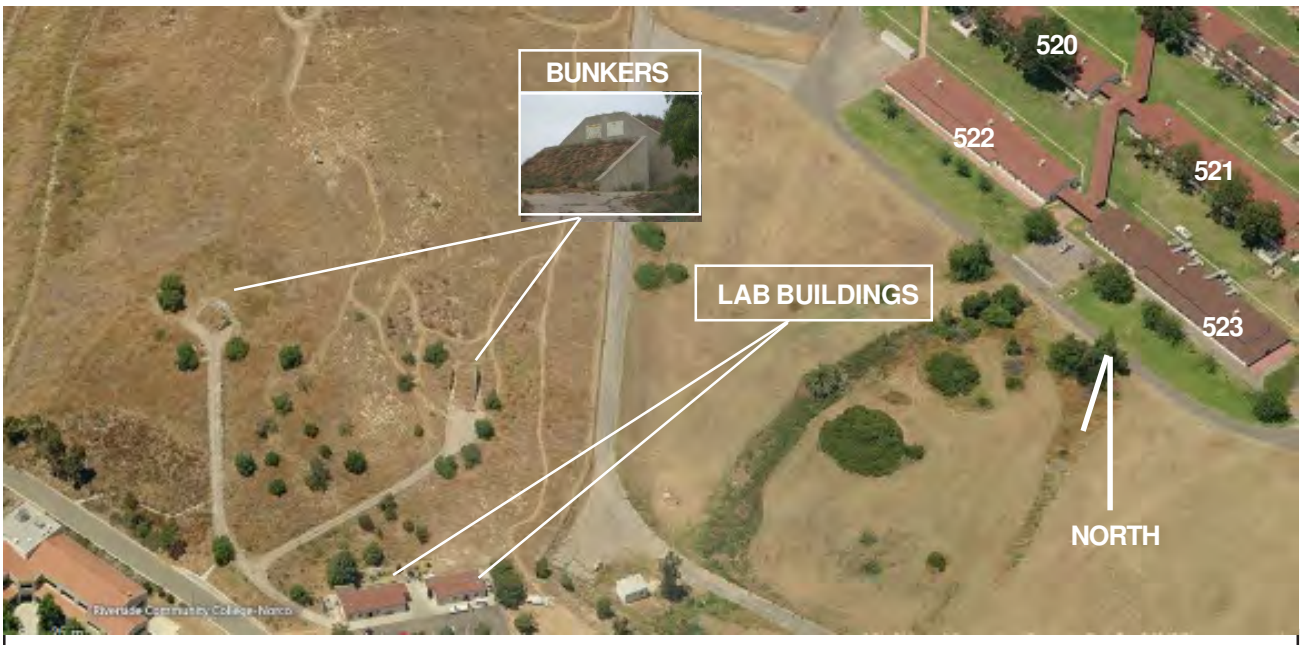


FIGURE 125: EXPLOSIVES BUNKERS (Bldgs. 631 & 632)

Source: Kevin Bash

A historic aerial photos appear to show the facility once had at least twelve buildings in addition to the two bunkers. (Figure 131)

FIGURE 126: EXPLOSIVES LABS (Bldgs 626 & 627

Source: Kevin Bash

The entirety of Hill A and its improvements are now the property of Norco College. The remaining two laboratory buildings are currently used by Norco College for maintenance functions and identified as M1 and M2. Construction on this facility began c. 1957; however, it is not known exactly when the two extant buildings were completed. The two buildings are essentially alike. Both are utilitarian one story concrete block buildings situated on rectangular concrete foundations. Each has a gabled roof sheathed with rolled composition roofing. All doors are metal or wood, with no distinctive design. All original windows are divided horizontally into three lights and that are obscured by iron security bars. One window on the north side of building M2 is a modern aluminum framed window with no security bars. Windows and doors are limited to the east, west, and south elevations. The north elevations are solid walls with no openings. Both buildings have an alcove area at one end, partially enclosed by concrete block walls and protected from the weather by extensions of the roofs. These alcoves appear to have originally provided access to restrooms. Aside from the two remaining laboratory buildings, there are two explosives bunkers. These are reinforced concrete structures embedded into the hillside of Hill A.

While indistinctive in design, these buildings and structures served an important function at Detachment Corona. Both the two lab buildings and the two bunkers also retain essential integrity. While only a remnant of a much larger complex, the remaining buildings and bunkers are sufficient to interpret this facility as an important aspect of Detachment Corona. As such, both the two lab buildings and the two bunkers would qualify as contributors to a Weapons Era historic district They would not, however, be individually eligible for National Register listing.

h. Fire Station (Bldg. 650, 1964) Figure 127

Built in 1964, the purpose of this building was to provide dedicated fire and rescue services to Detachment Corona. It is a one story, utilitarian concrete block building situated on a rectangular concrete foundation with a flat roof with a gravel finish. The building has three segments. Looking toward the building's front, the center element is dominated by four fire truck bays with sectional vehicle doors providing weather protection and security for the equipment. To the left is a personnel area, the roof of which is slightly larger than the equipment bay part of the building. The right element is a storage space with a roof similar to that over the personnel area. Both the personnel and storage areas have windows, however, it was not possible to discern the types of windows from available photographs and documentation. The rear (west facing) windows of the personnel area are obscured by

dense metal screening. All of the man-doors on the building appear to be metal. While indistinctive in design, this building has served as an important location for emergency services. It also retains its essential integrity. As such, it would qualify as a contributor to a Weapons Era historic district, but it would not be individually eligible for listing on the National Register.

FIGURE 127: FIRE STATION (Bldg. 650)

Source: ASM, 2011

i. Enlisted Quarters Administration Building (Bldg. 808, 1957) Figure 128

FIGURE 128: ENLISTED QUARTERS ADMINISTRATION (Bldg. 808)

Source: ASM, 2011

Building 808 is the last remaining building of what was originally planned to be a complex of eight triplexes for the housing of enlisted personnel associated with Naval Hospital Corona. Historic aerial photographs suggest only five of the eight triplexes were actually built. Building 808, along with its four neighbors was built in 1957 by Naval Hospital Corona, just before it closed. After the hospital was disestablished, the buildings were adapted for various uses by NOLC. Available maps do not indicate the uses assigned to all of the buildings, however, maps do show that at various times, one of the units housed the GIDEP program and another was adapted for use as a dispensary. Building 808 is a Mid-Century Modern dwelling situated on a rectangular concrete slab foundation. Its walls are made of concrete block, and its gabled roof is sheathed with built-up gravel. Windows are situated on the west and east sides of the building and consist of aluminum slider types. Doors are wood, typical of dwellings built during the mid-1950s. As noted above, Building 808 is the last of a complex of at least five buildings. Given that it is the only building left, it lacks integrity to its original site design. WHS also found no evidence of events or people of historical importance. Accordingly, Building 808 does not qualify for National Register listing as an individual resource or a contributor to a historic district.

4. Specialized Testing Buildings and Structures Historically Located at Detachment Corona.

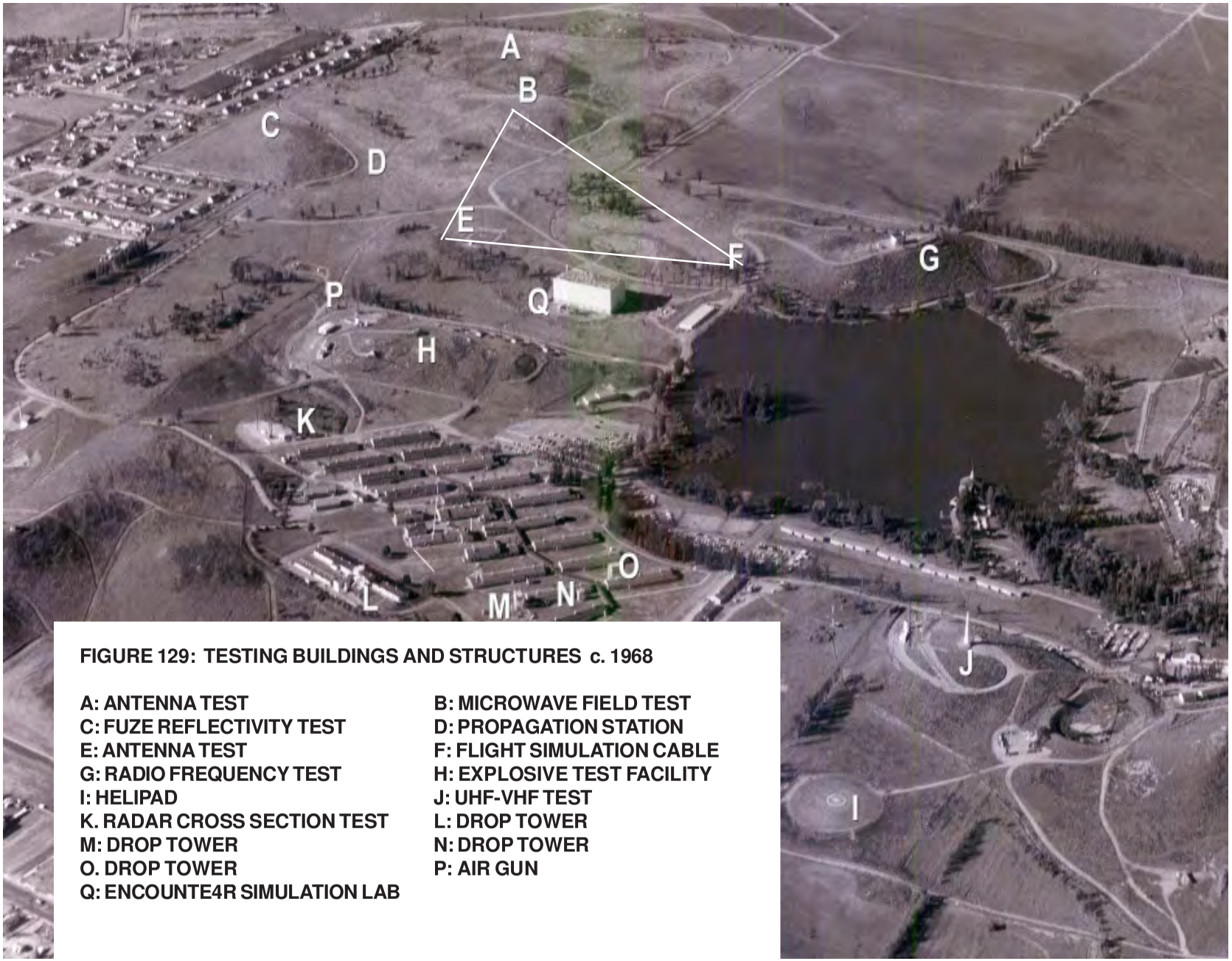


FIGURE 129: TESTING BUILDINGS AND STRUCTURES c. 1968

A: ANTENNA TEST
B: MICROWAVE FIELD TEST
C: FUZE REFLECTIVITY TEST
D: PROPAGATION STATION
E: ANTENNA TEST
F: FLIGHT SIMULATION CABLE
G: RADIO FREQUENCY TEST
H: EXPLOSIVE TEST FACILITY
I: HELIPAD
J: UHF-VHF TEST
K. RADAR CROSS SECTION TEST
L: DROP TOWER
M: DROP TOWER
N: DROP TOWER
O. DROP TOWER
P: AIR GUN
Q: ENCOUNTE4R SIMULATION LAB

Much of the RDT&E work at Detachment Corona took place in former Unit 2 hospital buildings with no dramatic outward indication of the activities within. Other functions used buildings and structures that were built especially for specific RDT&E functions. Figure 129 is a bird's eye view of Detachment Corona identifying the locations some of the more prominent testing buildings and structures in use while the property was actively used for RDT&E work. The list of buildings and structures below is not intended to be comprehensive. Nonetheless, it is highly representative of the types of testing buildings and structures once actively in use at Detachment Corona. Other than the Radio Frequency Building and a portion of the Explosives Laboratory Buildings and Structures, all of these buildings and structures have been removed from the property.

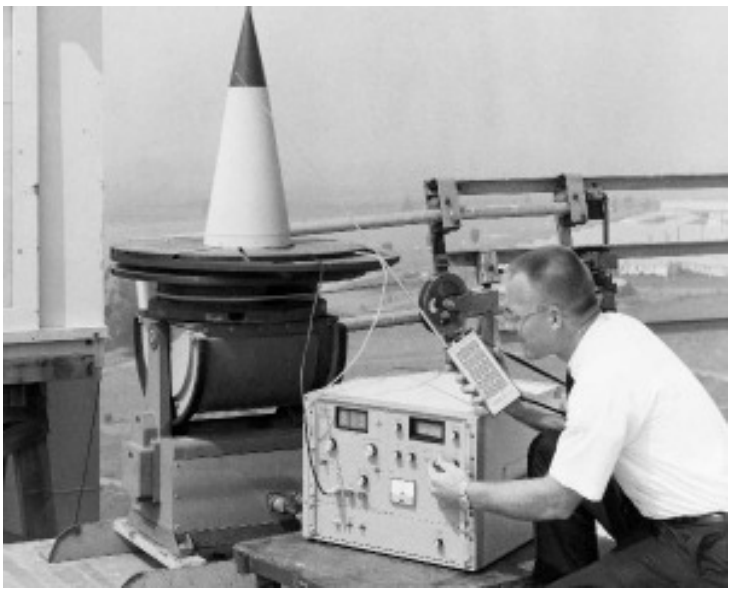


FIGURE 130: RADIO FREQUENCY TEST BLDG. c. 1960 (Bldg. 634)

Source: ASM, 2011

a. **Radio Frequency Testing Building – 1960**

Built c. 1960 and situated atop Hill B, this building (Figure 130) was used for investigating the electromagnetic radiation characteristics of experimental radio fuzes. Adjacent to the building, movable track-mounted equipment was used as part of an antenna pattern range which, in conjunction with an integrated analog computer, was uniquely capable of measuring both one- and two-way radiation patterns of radio fuze antennas. (*Naval Weapons Center Corona Laboratories*, U.S. Navy, November 1968: 22) An architectural description of this building may be found in section 3 above. This is one of three surviving purpose built RDT&E buildings.

b. Explosives Laboratory Buildings and Structures

Situated on and around the base of Hill A, this complex (Figure 131) consisted of about a dozen laboratory buildings and two earth-covered, reinforced concrete bunkers. These facilities were used for experimental explosives research, for the storage of explosive components, and for fuze-safety tests. (*Naval Weapons Center Corona Laboratories*, U.S. Navy, November 1968: 23) While both of the bunkers remain in place, only two of the

FIGURE 131: EXPLOSIVE LOADED TEST COMPLEX

Source: Kevin Bash Collection

laboratory buildings exist today. Architectural descriptions of these buildings and structures may be found in section 3 above.

c. UHF/VHF Anetnna Test Facility

FIGURE 132: UHF-VHF ANTENNA TEST FACILITY

Source: U.S. Navy, *NWCCL*: 21

This structure consisted of a rotatable 72-foot high solid-foam tower mounted on a modified naval gun mount. (Figure 132) The tower's construction of polyurethane foam allowed the isolation of a missile for the purpose of facilitating an accurate simulation of flight conditions. The tower was designed to support up to 500 pounds and withstand 100 mph wind gusts. A telemetry system was used to transmit signals from an antenna on the missile mockup to a portable antenna on a

laboratory below. (*Naval Weapons Center Corona Laboratories*, U.S. Navy, November 1968: 21)

d. Fuze Model Ranges:

- **Radio Fuze Model Range:** Situated in the first floor of the Radio Frequency Test Facility, the Radio Fuze Model Range was used in simulation encounters to determine the reactions between certain types of radio proximity fuzes and targets. Like most simulation equipment, this facility gathered much of the interaction data formerly obtained in flight tests. (Ibid 22)

FIGURE 133: SIMULATION ENCOUNTER BUILDING, DETACHMENT CORONA (Bldg. 652)

Source: Source: U.S. Navy, *A Tribute to 60 Years of*

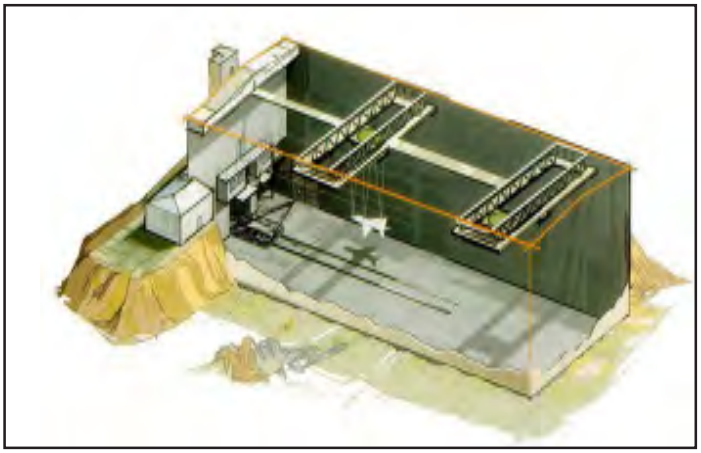


FIGURE 134: MISSILE ENGAGEMENT SIMULATION ARENA, CHINA LAKE

Source: http://www.thehowlandcompany.com/RDT-E_facilities/MESA.htm Accessed 2015

- **Optical Fuze Model Range:** This equipment was used to simulate encounters between active optical fuzes and anticipated targets. The target models were given reflective characteristics identical to those of the actual targets, and the semiautomatic range produced data on the response of the fuzes to the targets at scaled ranges. (Ibid)

- **Simulation Encounter Building (Bldg 652):** This highly sophisticated radio fuze model range (Figure 133) was added to the property in the late 1960s. Within this building, it was possible to make "…precise determinations of the triggering point of a microwave fuze on an air target, and to obtain quantitative descriptions of the physical relationship that govern the occurrence of fuze triggering. The equipment was designed to allow a model fuze to be moved past a model target. The target was designed so that it could be oriented to

simulate any possible intercept. Data recording the response of the model fuze was saved for later analysis. (Ibid) This building was replaced in 1992 by a new fuze model range, known as the Missile Engagement Simulation Arena (MESA) located at China Lake. Figure 134 is an image of the inside of the MESA facility, which is likely similar to the interior of the Simulation Encounter building at Detachment Corona. (www.chinalaketechnologies.org/NAVYPDF/**MESA**.pdf *: Accessed 2015)*

e. Near-Range Backscatter Measurement Facility

This tall metal framework structure (Figure 135) was used to hoist a full-scale target oriented toward a target intercept. From there, a model fuze target detecting device would be moved past the target to allow the recordation of the interaction between the target and the target intercept. (Ibid: 23)

f. Test Cells

A series of sixteen foot square tests cells were built to house test devices including centrifuges, X-ray equipment, jolt and jumble test machines, a vacuum steam chamber, and the like. (Kevin book: 51)

g. Incinerator

This was a concrete and steel structure used to dispose of previously used explosive components. (Ibid)

h. Dynamic Range Simulator

This equipment was built to conduct dynamic testing of radio fuze range response characteristics. (Ibid: 52)

i. Fragmentation Warhead Damage Simulator

This simulator was designed to determine the probability of inflicting lethal damage to an aircraft target. (Ibid: 53)

FIGURE 135: NEAR RANGE BACKSCATTER MEASUREMENT TOWER

Source: U.S. Navy, *NWCCL*: 23

j. Drop Towers

NOLC was equipped with several drop towers (Figure 136) used to test the dynamic performance of fuzes and other purposes. (Ibid)

k. Air Gun

Located at the Explosives Test facility, the Air Gun (Figure 137) was designed to permit the recording of fuze-functioning signals for collision and near-miss trajectories. (Ibid: 54)

l. Microwave Antenna Test Facility

These antenna facilities offered three ranges for measuring properties of microwave antennas and performance of radar systems. (Ibid: 57-58)

m. Flight Test Instrumentation

This facility was used in the development, testing, and evaluation of airborne and ground-based telemetering, data recording, and data processing equipment related to the flight testing of Navy guided missiles. (Ibid: 58)

After NWCCL (N0LC's successor) was disestablished in 1971, all of this equipment, other than the Radio Frequency Building a most of the Explosives Test facility, was removed from the property. Everything needed by FMSAEG for its operations, however, remained. Typically, this consisted of test equipment, computers, and laboratories, housed in the former hospital wards of Unit 2 and in other existing Naval Hospital Corona buildings.

FIGURE 136: DROP TOWER BEHIND BLDG. 543

Source: U.S. Navy, *NWCCL*: 23

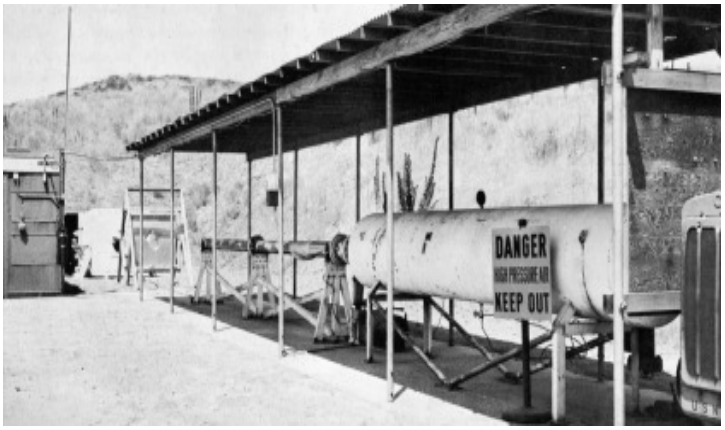


FIGURE 137: AIR GUN

Source: Source: U.S. Navy, *A Tribute to 60 Years of Service to the Navy, Corona Division, Naval Surface Warfare Center:* 10

5. Examples of Specialized RDT&E Equipment

A considerable amount of RDT&E work at Detachment Corona took place within existing Naval Hospital Corona buildings. Having little or no outward evidence of the work being conducted within, these buildings nonetheless played a significant role in Detachment Corona's work. The following are some examples of this equipment:

a. Simulator and Hybrid Computer Facility

Detachment Corona's Simulator and Hybrid Computer Facility, (Figure 138) was used for weapon system simulation studies. This specialized facility provided a means for solving various design and development issues through both mathematical calculations and physical simulation. Four principal components made up the Simulator and Hybrid Computer Facility. These consisted of an analog computer, a flight table, a digital differential analyzer, and a small digital computer. (*Naval Weapons Center Corona Laboratories*, U.S. Navy, November 1968: 19)

FIGURE 138: SIMULATOR AND HYBRID (ANALOG) COMPUTER FACILITY

Source: U.S. Navy, *NOLC,* 1958

The flexibility of this facility allowed its components to be used either separately or in combination, thus permitting the individual solution of one large problem or the simultaneous solutions of several smaller problems. (Ibid)

FIGURE 139: DIGITAL COMPUTER FACILITY

Source: U.S. Navy, *NOLC,* 1958

The analog computer was adept at solving problems involving sets of ordinary differential equations, such as occur in missile and aircraft trajectory, flight simulation, and system studies. This computer was capable of subjecting missile components to the types of roll, yaw, and pitch motions experienced in flight. These components, in turn, would generate signals used by other missile components or by the computer to determine the reaction of the aircraft or missile to these motions. (Ibid)

The digital differential analyzer was(Figure 139) designed to solve differential equations and other differential mathematical problems. This equipment was typically operated in conjunction with a small digital computer and the larger analog computer. (Ibid)

b. Inert Testing and Instrumentation Facility

This facility (Figure 140) was equipped for tests of inert or inertly loaded ordnance devices under various conditions of acceleration, shock, vibration, temperature, humidity, or pressure. (Ibid)

c. Secondary Standards Laboratory

This was a model laboratory for the Bureau of Ordnance Calibration Program, over which NOLC had scientific and technical direction. (Ibid: 57)

d. Polymer Research Laboratory

(Figure 141) This was an important laboratory used in the synthesis and characterization of inorganic and semiorganic polymers for use as dielectrics. (Ibid: 57)

e. Microwave Darkroom

This facility was designed to simulate the non-reflecting characteristics of free space in X-band microwave spectrum. (Ibid: 55)

f. Infrared Spectroscopy Laboratory

(Figure 142) This laboratory was equipped to handle most radiometric problems. (Ibid: 55-56)

g. Magnetics and Ferroelectrics Facilities

These facilities included equipment for Metallic Deposition, Magnetic Resonance, Microchemical Analysis, and Crystal Growth. (Ibid: 56)

h. Microwave Reflectivity Laboratory

This laboratory was used to investigate the electromagnet9ic reflection characteristics of various targets. (Ibid: 53)

i. Other Specialized Equipment

The above list is only a partial list of all the specialized equipment used by the scientists and engineers at NOLC. A complete list would be quite lengthy.

FIGURE 140: INERT ENVIRONMENTAL TEST FACILITY

Source: Source: U.S. Navy, *A Tribute to 60 Years of*

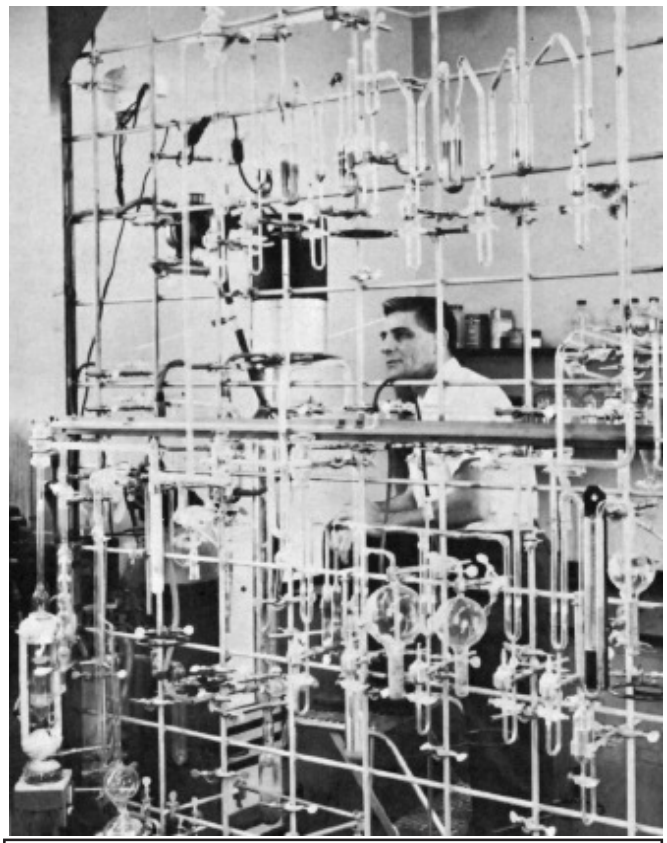


FIGURE 141: POLYMER RESEARCH EQUIPMENT

Source: Source: U.S. Navy, *NOLC,* 1958

For example, scientists of the Research Department developed a wide array of specialized equipment for use in their guided missile RDT&E work. Prominent examples include a scanning interferometer, an infrared spectral emmittance device, faraday rotation apparatus, cyclic voltammetry equipment, and microwave/radiometric research devices. (*Naval Weapons Center Corona Laboratories*, U.S. Navy, November 1968: 24)

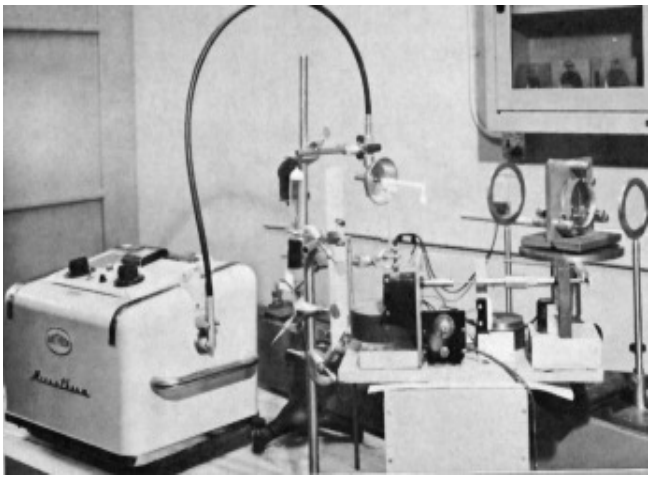


FIGURE 142: INFRARED RESEARCH EQUIPMENT

Source: U.S. Navy, *NOLC,* 1958

6. Buildings Constructed after the Period of Significance (1951-1971)

FIGURE 143: JOINT WARFARE ASSESSMENT LABORATORY (Bldg. 544)

Source: ASM, 2011

FIGURE 144: JOINT DAUGHERTY ASSESSMENT LABORATORY (Bldg. 547)

Source: ASM, 2011

a. **Joint Warfare Assessment Laboratory (Bldg. 544, 1994) Figure 143**

The 50,000-plus square foot, two-story Joint Warfare Assessment Laboratory is a Spanish Colonial Revival style building, situated on a square concrete foundation with walls finished in plaster. Roof areas have both gabled and hipped red clay tile elements around three of the building's perimeter walls, with a flat roof in the center that extends through to the rear of the building. This building houses a sophisticated system for conducting war-related exercises via computer. A detailed architectural description is not provided here, as the building does not fall within the 1951-1971 period of significance. Accordingly, it would not constitute a contributor to a Weapons Era historic district, nor would it be individually eligible for National Register listing.

b. Daugherty Memorial Assessment Center (Bldg. 549, 2009) Figure 144

Containing some 39,000 square feet, the two story Daugherty Memorial Assessment Center was built in 2009. Situated on a rectangular concrete foundation, the building has stucco finished walls and a hipped perimeter roof of red clay tile. A hipped red clay tile roofed entry portico distinguishes the front elevation from the other sides of the building. Windows are of the clerestory type. A detailed architectural description is not provided here, as the building does not fall within the 1951-1971 period of significance. Accordingly, it would not constitute a contributor to a Weapons Era historic district, nor would it be individually eligible for National Register listing.

FIGURE 145: MEASUREMEHT RTDE BUILDING (Bldg. 575)

Source: ASM, 2011

BLDG #	HOSPITAL ERA USE	WEAPONS ERA BUILDING USE (1964)	WEAPONS ERA PROPERTY TYPE	BUILT
204	Laundry	Stores	Personnel Support	1929
210	WAVES' Quarters	Payroll, Security, Personnel	Personnel Support	1944
541	Unknown	Organometallics	RDT&E	Unknown
543	Married Officers' Quarters	Guidance Division, Airborne Control, Evaluation, Guidance Division, Evaluation	RDT&E	1943
545	Married Officers' Quarters Garage	Garage	Storage	1943
548	N/A	Storage	Storage	Unknown
549- 550, 612-618, 628-630	N/A	Explosives laboratory buildings	RDT&E	c. 1957
652	N/A	Encounter Simulation Lab	RDT&E	1964
804	Enlisted Housing	Not Identified	Not Identified	1957
805	Enlisted Housing	Not Identified	Not Identified	1957
806	Enlisted Housing	Not Identified	Not Identified	1957
807	Enlisted Housing	Not Identified	Not Identified	1957

FIGURE 146: PERIOD OF SIGNIFICANCE BUILDINGS DEMOLISHED

Source: WHS

The namesake of the building is Navy Cryptologic Technician First Class, Steven Phillip Daugherty, killed by an improvised explosive device (IED) in 2007. The work conducted in

this building specializes in combating IED threats.

c. Measurement Science RDT&E Lab (Bldg. 575, 2002) Figure 145

Encompassing over 31,000 square feet, the Measurement Science RDT&E Laboratory is a two story, flat roof building situated on a rectangular concrete foundation. This is a very sparse utilitarian building having little design relationship with the balance of the property's Spanish Colonial theme. All exterior walls are finished in stucco, with a wainscot-like element at the bottom consisting of concrete. Windows are few in number and situated low on the building. Each bank of windows also has a concrete "eyebrow" element above. The only nod to Spanish Colonial Revival architecture is the building's entry portico which has a red clay tile sheathed shed roof. A detailed architectural description is not provided here, as the building does not fall within the 1951-1971 period of significance. Accordingly, it would not constitute a contributor to a Weapons Era historic district, nor would it be individually eligible for National Register listing.

7. Buildings from the Period of Significance that have been Demolished

Over the years several buildings from the property's period of significance have been demolished. Overall, though, these demolitions have not significantly compromised the site's integrity. The table in Figure 146 is a list of the buildings in question.

Part 3, SECTION 5, CORONA RDT&E HISTORIC RESOURCES EVALUATION

1. Summary

The guided missile work at Detachment Corona can be divided into two broad categories:

- Missile Component RDT&E: This aspect of Detachment Corona's work involved the development of missile components, guidance systems, and proximity fuzes. The Fuze and Research Departments worked closely with each other in this endeavor, perfecting the accuracy, reliability, and technological superiority of U.S. guided missiles in an overall effort to maintain superiority during the Cold War. The Missile Systems Departments focus was on overall missiles, rather than missile components. Another group, the Advanced Missile Systems Group was in charge of determining the requirements of future Navy guided missile systems, formulating the parameters of such systems, and assessing the feasibility of these systems. To accomplish their work, these departments used laboratories, largely within former tuberculosis ward buildings and specialized test structures situated outdoors.

- Guided Missile Independent Assessment Agency: Having a variety of unit names over the years, Detachment Corona's IAA focused its attention on already developed missiles, conducting extensive testing and analysis to determine if these missiles performed as expected. The work of this department was conducted in laboratories situated at Detachment Corona and in the field, typically accompanying Navy personnel doing test firings from ships, land, and air. Data from this field work was subjected to detailed analysis using some of the most sophisticated computers available located in the labs of Detachment Corona.

  While both aspects of Detachment Corona's work were historically significant, only the Guided Missile IAA function retains sufficient integrity to the period of significance (1951-1971) to qualify the property for Weapons Era National Register listing.

  This is not to diminish the importance of the Fuze, Research, and Missile Systems Departments. The role of the Fuze Department as the Navy's Technical Director of all guided missile fuzes, the significant contributions of its Research Department in polymer development, the invention of artificial crystals, the use of thin magnetic film as a memory storage medium, extensive work in guidance systems, and the like were all critical to the success U.S. defense systems of the Cold War. Additionally, the significance of the work of Dr. Curtis J. Humphreys in the Research Department could be used as a strong case for National Register eligibility. Unfortunately, the significance of the work of the Fuze, Research, and Missile Systems Departments is diminished by the removal of the vast majority of the testing structures and buildings used to support these activities.

  The report associated with this evaluation documents that of the 17 or so types of test structures and buildings documented to have existed at Detachment Corona prior to the departure of the Fuze, Research, and Missile Systems Departments in 1971, only two remain today. Of these two, only the Radio Frequency Building on Hill B retains a significant amount of integrity to its historical form. The other testing facility that remains today is the Explosives Test facility on Hill A. Today, while both of the fuze bunkers remain, only two of the dozen or more lab buildings are extant.

  Therefore, the case for Detachment Corona's National Register eligibility rests with its Guided Missile IAA function, an activity that occupied many of the buildings and laboratories

throughout the period of significance of 1951 to 1971. And, this Detachment Corona function continues to play a significant role in the United States' national defense program. Other than the demolition of a small number buildings and the addition of three major laboratory buildings, the Detachment Corona of today is essentially the same as it was throughout the period of significance. Consequently, a strong case can be made for the eligibility of Detachment Corona as historic district related to its Guided Missile IAA functions.

2. Background

In evaluating the historic significance of the Norconian's Weapons RDT&E Era, WHS used the model established by Goodwin in its examination of military historic resource evaluation case studies. (Goodwin 1997: Chapter 15) Goodwin's analysis addresses each case study property at two levels. At level one, Goodwin gives summary data about the installation. Sections within this part of the evaluation consist of: ***Location and Current Status*****,** ***Summary History and Historic Context*****, and the** ***Identification of Buildings*****,** organized by the various categories of use. With this basic data established, Goodwin goes on to address the property's ***Significance***, with consideration given to the: ***Nature of the Property, Historic Context Represented, Property Type, Applicable National Register Criteria, Comparison to Similar Properties, Significance Level, and Integrity.***

In using Goodwin's model, a fair amount of information already covered earlier is summarized. While duplicative, this is necessary in order to place all of the key information necessary to evaluate the property in one succinct package that can stand alone in other documents.

a. Location and Current Status

The subject property is located in the City of Norco on a 390-acre portion of the former 700-acre Naval Hospital Corona (NHC.) Approximately 102 acres of this former naval hospital land are owned by the State of California, and used as a prison, known as the California Rehabilitation Center (CRC). Approximately 100 acres is owned by Norco College, a local community college. Finally, approximately 247-acres is owned by the Navy and used as a Guided Missile IAA and data exchange center. Today the facility on this property is known as the Naval Surface Warfare Center Corona (NSWCC).

b. Summary History and Historic Context

NSWCC's roots go back to 1951 when the Unit 2 part of NHC was converted to a guided missile Research Development Testing & Evaluation (RDT&E) facility.

The property was originally improved in the late 1920s by entrepreneur Rex Clark as a luxury resort. The adjacent town of Norco, another Rex Clark creation, was founded in 1923. After the town of Norco was well established, Clark discovered underground pockets of hot mineral water near the Santa Ana River, and realized it could be the centerpiece of a luxury resort. Soon thereafter, he commenced the design and development of the Norconian Resort Supreme, completing it in 1929. Unfortunately, Clark's resort opened literally months before the onset of the Great Depression and it suffered economic challenges throughout the 1930s.

In 1941, the federal government recognized that its entry into World War II would necessitate a need for many thousands of hospital beds. One way in which it sought to satisfy this need was to take control of luxury hotels and resorts throughout the United States for conversion

to hospitals. The Navy purchased the Norconian in 1941 and converted it into a naval general hospital. Thus, the Norconian Resort became Naval Hospital Corona. The hospital consisted of converted resort buildings and numerous entirely new buildings constructed expressly for hospital purposes. The hospital was divided into three "units." Unit 1 was the main general hospital; Unit 2 was a compound of tuberculosis wards; and Unit 3 was devoted primarily to rheumatic fever, polio, and paralysis issues. A fourth unit consisted of a convalescent hospital near Pomona, California. The hospital operated during two periods. The first was between 1941 and 1949, and the second was between 1951 and 1957. The impetus for the first period was World War II and that for the second was the Korean War. The latter years of both periods served the medical needs of both military and civilian persons.

In 1951, the National Bureau of Standards (NBS) relocated its Washington D.C. based guided missile research branch to the former naval hospital property. There it became known as NBS, Corona Laboratories. While located within the community of Norco; both the hospital and weapons RDT&E facility identified themselves as Corona facilities.

Originally, the NBS hoped to secure the entire hospital property, however, the outbreak of the Korean War made it necessary reestablish the majority of the property as a naval hospital. The reopened hospital operated from NHC Units 1 and 3, while the NBS took over the NHC Unit 2. About a year after moving into the old Unit 2 buildings, the Corona RDT&E labs were removed from the jurisdiction of the NBS and transferred to the Department of Defense (DoD), under the command of the U.S. Navy. At that point, the facility's name was changed to Naval Ordinance Laboratories Corona (NOLC.)

Detachment Corona made significant contributions to the Cold War, playing a prominent role in the development of effective naval guided missiles. At the peak of its operations toward the end of the 1960s, Detachment Corona was organized into two basic entities:

- The first was its guided missile RDT&E function consisting of the Fuze Department, Missile Systems Department, Advanced Systems Group and the Research Department.

- The Second was its Guided Missile Independent Assessment Agency (IAA) function, which started life as the Missile Evaluation Department (MED) and was renamed in 1964 Fleet Missile Systems Analysis and Evaluation Group (FMSAEG.) As noted above, today the facility on this property is known as the Naval Surface Warfare Center Corona (NSWCC).

c. Guided Missile RDT&E Working Groups:

The following is a summary of the entities that made up the guided missile RDT&E aspect of Detachment Corona:

- **Fuse Department:** Detachment Corona was "best known for its work on proximity fuzing. In February of 1954, the Department of Defense (DoD) designated NOLC as the *Technical Director of all Naval fuze work.* NOLC was charged with selecting all contractors for research, development, and engineering, with ultimate approval the responsibility of the Bureau of Ordnance. It was NOLC's job to provide technical and scientific planning and coordination and to assure that projects were completed on time and within

established specifications. NOLC also accomplished significant fuze RDT&E work at Detachment Corona. The successful management of this mission required intensive laboratory and test related work in electronic circuits, microwaves, electromechanics, and component miniaturization. To accomplish this, sophisticated equipment was developed and put into use, including drop towers, massive computers, environmental laboratories, simulation laboratories, telemetering equipment, radar systems, and the like.

- **Missile Systems Department:** This department had overall responsibility for the development of Navy guided missiles. Its Program Management Office was responsible for the technical direction of the Standard ARM missile program The Guidance Division dealt with the analysis, design, development, and flight testing of advanced missile guidance systems. The Instrumentation Division was responsible for the development of telemetry systems, subsystems, and components. The Countermeasures Division had the task of determining the susceptibility of missile guidance systems to enemy countermeasures and developing methods of reducing such susceptibility. Finally, the Dynamics Division was in charge of determining guided missile system design parameters, including airframe, propulsion, trajectory, and flight control system requirements. This division operated the Simulator and Hybrid Computer Facility, which included one of the largest Government-owned analog computers in the Western United States.

- **Advanced Systems Group:** This group was in charge of determining the requirements of future Navy guided missile systems, formulating the parameters of such systems, and assessing the feasibility of these systems. Essentially, this group was responsible for the very important task of staying ahead of the enemy's missile development programs.

- **Research Department:** Originally called the Physical Sciences Department, the Research Department handled a wide variety of scientific and engineering challenges, including those related to materials, components, and guidance systems. Its work focused on guidance-control systems, telemetry, and data recording and processing.

Facilities supporting the Research Department included the following: An extensive Technical Library housed technical documents made available to all branches of the military. A Technical Information Division provided services for document editing, photography, copying, and Illustration. A Fabrication Services division was staffed by skilled craftsmen, who created components, parts, and assemblies. Scientists worked extensively with NOLC's highly sophisticated computers.

NOLC's scientists pioneered numerous technologies that significantly contributed to U.S. efforts to protect its citizens and allies around the world. Technological advancements were made in such fields as telemetry systems, countermeasures, anti-radar guidance systems, computer component development, infrared spectroscopy and detectors, polymer chemistry, radio frequency transmission, and microwave radiometry.

The Director of the Research Department, the renowned scientist Dr. Curtis Humphries, was responsible for numerous significant advancements. Humphries

was recognized internationally for his scientific breakthroughs in atomic spectroscopy. Earlier in his career he determined the correct placement of uranium on the periodic series. He was also the first to measure the sixth series of atomic hydrogen, a breakthrough so important that it was named the Humphreys Series.

At Detachment Corona, Humphreys laboratory was responsible for a number of important advancements including the creation of an international system of wavelength standards, the development of revolutionary techniques of radiometry and spectrophotometry, the creation of large artificial crystals, advancements in photoconductivity for infrared detectors, the standardization of detectors for heat-seeking missiles, pioneering work in the use of thin magnetic film for data storage, and important advancements in high speed magnetic domain reversal phenomena.

The above RDT&E working groups were disestablished at Detachment Corona 1971 and transferred to other locations.

d. Guided Missile Independent Assessment Agency:

Starting out as an integral part of the Detachment Corona RDT&E working groups, the Guided Missile IAA group was physically and organizationally separated from these groups in 1964. When the RDT&E working groups left Detachment Corona in 1971, the missile evaluation group remained, taking over the entire Detachment Corona campus.

Two years after its inauguration as a Corona Labs working group, the missile evaluation group was given departmental status and named the Missile Evaluation Department (MED.) Its job was to provide objective evaluations of the performance of all Navy guided missiles. The critical importance of evaluation services was learned during World War II, when torpedoes were plagued with performance problems. In too many cases, these torpedo failures caused of loss of life of our military personnel and the destruction of our ships. The sailors responsible for using the weapons had to develop workarounds to compensate for faulty components. The lessons learned from this experience led to the establishment of a rigorous testing and evaluation program to assure that all weapons would perform as intended before being put into use. MED was the first organized entity charged with this type of work.

While MED's evaluations were highly regarded, the command system within which it worked often altered its reports, to the point that their effectiveness was greatly reduced by the time they reached the DoD. Thanks to the dedicated efforts of Rear Admiral Reich, this problem was solved with the reorganization of MED into the Fleet Missile Systems Analysis and Evaluation Grpup (FMSAEG.) Unlike MED, FMSAEG did not have an intermediate reporting system between it and the DoD. In this regard, FMSAEG is what is known as an IAA. FMSAEG became a key component in the guided missile program, saving time, money, and lives in the creation of truly effective weapons.

Government Industry Data Exchange Program (GIDEP) and Failure Rate Data Program (FARADA): By the late 1950s, MED had acquired extensive information on the reliability of electronic and mechanical components. Consequently, MED was given responsibility for providing the contractors involved in the Fleet Ballistic Missile Weapons System, reliability data regarding components being considered for use in the Polaris missile. In 1959, this resulted in the establishment of the Inter-Service Data Exchange Service (IDEP.) IDEP was a cooperative effort of the Army, Navy, and Air Force aimed at

reducing duplications in the testing of missile components. By facilitating the sharing of test data IDEP served to eliminate duplications of components, a huge cost to the nation's defense efforts.

Over time, IDEP grew as more entities made use of its services. Eventually, it became apparent that IDEP needed to be consolidated into one coordinated program. Thus, in 1970, the IDEP offices of the three armed services were consolidated at Detachment Corona as a part of FMSAEG. At this point the program was renamed the Government-Industry Data Exchange Program (GIDEP.)

In the early 1960s, another data exchange program, the Failure Rate Data (FARADA) program was established. Assigned to the Navy, FARADA simplified the problem of determining the reliability of components by making the most current failure rate data available to military and space contractors. Initially, FARADA was simply located in the same building as GIDEP. In 1973, the two programs were merged as one coordinated entity.

In 2007, the GIDEP program was realigned from the Department of the Navy to the Defense Standardization Executive, Defense Standardization Program office. GIDEP's offices are presently located in a facility just outside of the NSWC compound at a business named Computer Sciences Corp. (CSC), situated at 2727 Hamner Avenue, Norco, California.

3. Identification of Property Types

Goodwin's model for evaluating military buildings, calls for an analysis of the uses to which the buildings in the study area have been put. The table in Figure 147 lists the various buildings associated with Detachment Corona, and assigns each building to a use category.

4. Evaluation of Detachment Corona

a. Nature of Property

Date Established: June, 1951.

Function during the Cold War: Guided Missile RDT&E and Guided Missile Independent Assessment Agency.

Category of Property and Relationship to Existing and Proposed Historic Districts: The subject property qualifies as a National Register of Historic Places Historic District, composed of buildings, structures, and landscape elements. Some of the buildings, structures, and features associated with Detachment Corona are already listed on the National Register as contributors to the Resort Era National Register Historic District. The table in Figure 148 displays the components of the existing Resort Era Historic District, noting which of the buildings, structures, and features are located on the Detachment Corona property:

The implementation of the findings of the report would result in three overlapping National Register Historic Districts as follows:

BLDG #	WEAPONS ERA USE (1964)	ASSOCIATED PROPERTY TYPE	BUILT
201	Conference Center	Personnel Support	1928
203	Boat House and Docks	Personnel Support	1929
204	Stores	Storage	1930
208	Not Identified	Not Identified	1944
209	Public Works Procurement	Personnel Support	1929
213	Plumbing Warehouse	Not Identified	1942
214	Not Identified	Not Identified	1942
215	Not Identified	Not Identified	1944
218	Not Identified	Not Identified	1942
220	Not Identified	Not Identified	1946
300	Main (Fifth Street) Gate	Transportation	1942
301	Corpsmen's Quarters/FMSAEG including Surface and Air Launched Missile Systems, Ballistic Missile Systems, Missile System Test Equip	RDT&E	1943-44
501	Laboratory	RDT&E	1943
502	Development, Application & Testing,	RDT&E	1943
503	Laboratory	RDT&E	1943
504	Laboratory	RDT&E	1943
505	Development II, Fuze Project Branches,	RDT&E	1943
506	Electromechanical, Safety & Arming, Components	RDT&E	1943
507	Counter Measures	RDT&E	1943
508	Engineering, Design	RDT&E	1943
509	Simulation, Calibration	RDT&E	1943
510	Advanced & Radio Frequency, Systems Analysis, Lethality Analysis	RDT&E	1943
511	Technical Library, Auditorium	Personnel Support	1943
512	Command Office, Missile Systems Admin,	Administration	1943
513	Mail Room, Chemistry, Electrochemistry	RDT&E	1943
514	Electricity & Magnetism, Dielectrics & Semiconductors, Infrared, Solid State,	RDT&E	1943
515	Photography, Cafeteria	RDT&E, Personnel Support	1943
516	Research Dept Admin, Radiation Analysis	RDT&E	1943
517	Laboratory	RDT&E	1944
518	Fuzing Admin, Systems Evaluation, Fuze Appraisal, Lab	RDT&E	1943
519	Laboratory	RDT&E	1944
520	Laboratory	RDT&E	1944
521	Laboratory	RDT&E	1944
522	Development I, Fuze Project Branches	RDT&E	1944
523	Electronics, Components & Circuits, Electromagnetic Ranging & Detecting, Microwave Systems	RDT&E	1944
539	Reproduction	RDT&E	1943
554	Guard House	Security	
555	Covered Walkway	Transportation	1943
556	Covered Walkway	Transportation	1944
650	Fire Station	Personnel Support	1964
808	Not Identified	Not Identified	1957

FIGURE 147: BUILDING PROPERTY TYPES

Source: WHS

- Resort Era Historic District, consisting of buildings, structures, and features in operation during the Resort Era, from 1929-1941. (Already a National Register Historic District)

RESORT ERA HISTORIC DISTRICT CONTRIBUTORS LOCATED ON DET. CORONA PROPERTY		
CONTRIBUTORS	**LOCATED WITHIN DET. CORONA?**	**COMMENTS**
BUILDINGS		
Hotel/Club	NO	
Teahouse	NO	
Power Plant	NO	
Laundry/Garage	YES	Laundry portion of bldg demolished by Navy in the year 2000.
Casino/Pavilion	YES	Used for social gatherings at Det. Corona.
Boathouse	YES	
Maids'/Chauffeurs' Quarters	YES	
FEATURES		
Man-Made Lake	YES	Used for target simulation testing.
Historic Landscaping	YES	
Footbridge	YES	
STRUCTURES		
Powerhouse/Smokestack	NO	
Gazebos	YES	
Gasoline Station Island	YES	

FIGURE 148: RESORT ERA CONTRIBUTORS WITHIN DET. CORONA

Source: WHS

- Naval Hospital Era Historic District, consisting of all of the Resort Era Historic District contributors, plus the Naval Hospital Corona Historic District, consisting of buildings, structures, and features built to meet the needs of the property's conversion to a naval hospital. (Found eligible in this report for National Register listing.)

- Guided Missile IAA Historic District, consisting of a combination of any of the above contributors adapted for weapons RDT&E purposes and any additional contributing construction built between 1951 and 1971 to support the weapons evaluation functions of Detachment Corona. (Found eligible in this report for National Register listing.)

b. Historic Context Represented

Period of Significance: For historic resources evaluation purposes, the period of significance of this property is 1951-1971. The year 1951 corresponds with the year the

NBS moved into Unit 2 to conduct guided missile research. 1971 represents the year the guided missile RDT&E working groups were relocated to other Navy facilities, leaving the missile evaluation function (FMSAEG) to occupy the entire Detachment Corona property.

Historic Context: The historic context is the Evaluation of Cold War Guided Missiles.

c. Property Type and Significance in Illustrating the Historic Context

The property type is Cold War Naval Weapons RDT&E. Detachment Corona is significant in illustrating an important aspect of the Cold War arms race. As a Navy RDT&E entity, Detachment Corona is associated with significant advancements in guided missile desigh, particularly in regard to fuzes and guidance systems. Its Fuze Department was the designated the Technical Director of all Navy fuzes. Its Research Department was responsible for significant advancement in guidance systems and the use of computers for data analysis and simulation. Its Guided Missile IAA function was a unique entity, responsible for the unbiased evaluation of naval guided missiles. As explained later, because of integrity issues related to the RD&T aspects of Detachment Corona's history, qualification for National Register listing is only applicable to the property's history as a Guided Missile IAA.

d. Applicable National Register Criteria

Qualification as a National Register Historic District

As noted above, Detachment Corona qualifies as a National Register Historic District for its history as a Guided Missile IAA. National Register Bulletin 15 defines a historic district as follows: *"A district possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development."* The Guided Missile IAA aspect of Detachment Corona qualifies the property for listing on the National Register of Historic Places as a Historic District on the basis of Criterion C (architecture and physical design) and Criterion A (association with events significant in history.) A map showing the boundaries of the Detachment Corona Guided Missile IAA may be found in Figure 149. Contributors to the Historic District are listed in the table in Figure 150. Both of these figures may be found at the end of this part..

Criterion C:

As displayed in Figure 148 three of the buildings occupied by Detachment Corona, the Pavilion, Chauffeurs' Quarters, and the Garage/Laundry were designed by Master Architect Dwight Gibbs and are already listed as contributors to the Norconian's Resort Era National Register Historic District.

The vast majority of the other buildings occupied by Detachment Corona were designed by Master Architect Claud Beelman for use as NHC's tuberculosis wards and supporting buildings. Beelman chose the Spanish Colonial Revival style both to coordinate with the architecture of the existing Norconian Resort and to reflect the traditions of California's cultural heritage and architecture.

The roots of Spanish Colonial Revival architecture in the United States extend back to the 18th century, originating from the Spanish colonization of the Americas. California is considered to be the major center of the U.S. expression of the Spanish Colonial Revival style. This style was particularly popular in coastal cities, but it also found favor well inland.

The popularization of the style in California is generally attributed to the 1915 Panama-California Exposition in San Diego. The City of Santa Barbara is considered a Mecca of this architectural style, having mandated the use of Spanish Colonial and Mission Revival architecture for the reconstruction of a large part of the city after the 1925 Santa Barbara earthquake. While, the Spanish Colonial Revival movement enjoyed its greatest popularity between 1915 and 1931, it has remained a popular architectural style in California throughout the 20th century and into the 21st century.

Tying the District together is a landscape, consisting of 60-acre manmade lake, surrounding formal landscaping, and a natural area of hills and valleys referred to here as the Southwest Landscape.

The following Criterion C related factors support the eligibility of Detachment Corona for National Register listing as a Historic District:

District Continuity of Architectural Style: Beelman's use of Spanish Colonial Revival architecture is found in all of the major NHC buildings used by the Guided Missile IAA group of Detachment Corona. These include all of the Unit 2 buildings, Unit 1 Corpsmen's Quarters, and the resort era Garage/Laundry Building, Chauffeurs' Quarters, and Pavilion Building. The theme is carried out in the use of red clay tile roofing, stucco finished exterior walls, Spanish style cupolas for attic ventilation, and many other design details in the buildings throughout Detachment Corona.

Beelman used variants of Spanish Colonial Revival architecture, depending upon the scale of the buildings involved. The buildings of Unit 2, which make up the majority of the buildings in Detachment Corona, are designed in a Spanish ranch, or village-like variant of Spanish Colonial Revival architecture to give the unit a residential ambiance. Contributing to the residential scale of these latter buildings is their low-profile single story height, and the use of shallow pitched roofs, shed roofed porches, covered walkways, and residential scale windows and doors. Exceptions include the multi-story WAVES' Quarters (previously demolished) and the Unit 1 Corpsmen's Quarters.

Rare Intact Example of World War II Pavilion Site Planning: Unit 2 is an excellent example of military pavilion style site planning. By the beginning of World War II, pavilion site planning had fallen out of favor. During World War II, however, this military site planning style returned to favor and was extensively used. Unit 2 is a rare surviving example of military pavilion site planning that retains integrity to its World War II origins.

Work of a Master Architect: Claud Beelman, the architect of NHC's Units 1 and 2, was a master architect of the twentieth century with at least a dozen buildings on the National Register of Historic Places. He was a highly versatile architect with National Register listed buildings representing a wide range of architectural styles, including Classical Revival, Renaissance Revival, Beaux Arts, Art Deco, Streamline Moderne, and International Modern. Units 1 and 2 represent the only examples of a large Beelman designed complex using Spanish Colonial Revival architecture.

Criterion A:

Numerous events could be cited as contributing to Detachment Corona's qualification for the National Register, including the role of its Fuze Department as the Technical Director of all naval guided missile fuze development, the significant contributions of its Research Department in polymer development, the invention of artificial crystals, the use of thin magnetic film as a memory storage medium, extensive work in guidance systems, and the like. As noted later in this section, however, integrity issues detract from the eligibility of these Detachment Corona activities for listing on the National Register. One major activity, however, stands out as both singularly important and also retaining a high level of historical integrity. This activity is Detachment Corona's Guided Missile IAA function, with FMSAEG as the crown jewel of this missile evaluation program. FMSAEG was the Navy's first truly Independent Assessment Agency for guided missile evaluation.

As weapons became more sophisticated, the potential for performance failures rose. The critical importance of the independent evaluation of weapons was a lesson that had to be learned over and over before the establishment of Detachment Corona's missile evaluation function in 1952, its formal organization as the Missile Evaluation Department in 1954, and its perfection as FMSAEG in 1964.

Perhaps the most dramatic example of a lack of adequate weapons evaluation occurred during World War II. Early in the war, malfunctioning torpedo fuzes caused significant loss of U.S. military property and life.

To be effective, a torpedo's fuze needs to detonate its weapon at a specific point in relation to the target. But, the torpedo fuzes in use during World War II had not been adequately tested and thus were prone to failure. In some cases, fuzes were known to detonate before a torpedo was even launched. In other cases a torpedo would launch successfully, but not detonate in the vicinity of its target. In the first instance, direct loss of U.S. military life and property would occur from our own weapon. If a torpedo reached its target but did not detonate, the position of the firing ship would be given away, thus allowing the enemy to effectively engage the firing ship.

To assure that weapons performed as intended, there needed to be an entity charged with the responsibility of performing unbiased assessments. This concept became known as the Independent Assessment Agency, or IAA. The establishment of the first IAA occurred in 1952 when the NBS Corona was charged with the unbiased assessment of the Terrier Missile. Given the well-established relationship between the Navy and NBS Corona, it was natural that Corona would be given the task of accomplishing the needed evaluation. Thus was created a new function that later became its own department in 1954 with the designation Missile Evaluation Department (MED.)

MED's experience with the evaluation of the Terrier missile led to it being assigned responsibility of the analysis and evaluation of the Navy's entire weapons system, including both shipboard systems and missile systems. As the Navy's missile program expanded, MED was assigned responsibility for evaluating every new Navy missile. Using the results of MED's evaluation process, Detachment Corona advised the Bureau of Ordnance of needed design and development changes.

To accomplish its unique mission, MED created specialized test equipment, telemetry equipment, and new sophisticated computer programs. For its work in this area, MED was

recognized as the Navy's central computer facility from 1954-1963. Through the work it did in advancing the analytical capabilities of computers, MED was largely responsible for critical improvements in the quality and performance of naval missile systems.

MED directly participated in missile firing evaluations, becoming a valued component of a ship's crew when tests were conducted. MED also played a critical role in air and land-based testing. On land, MED also addressed production quality, including the evaluation of a manufacturer's ability to consistently produce a reliable product. MED also took responsibility of the quality of weapons "surveillance programs", programs to track and document the "shelf life" of weapons in storage and onboard ships.

By 1964, MED had become a significant contributor to the Navy's Fleet Readiness Program. It was the single entity to which the Navy turned for objective evaluations of missile performance and reliability. By that time, its evaluation of ballistic and guided missiles had expanded to include the Talos, Terrier, Tartar, Typhoon, Sidewinder, Sparrow, Bullpup, Shrike, and Polaris missiles. In addition, MED provided the Special Projects Office with analyses of ballistic missile systems.

Despite MED's effectiveness in accomplishing its task of evaluating weapons, there were still problems. In the early 1960s, Captain (later Rear Admiral) Eli T. Reich, Commanding officer of the guided missile cruiser the USS Canberra, found that, despite the quality of MED's evaluation work, missile systems could still not be depended upon for consistent quality performance

While NOLC's MED was fully capable of producing competent and unbiased reports, Reich recognized that MED lacked the *direct reporting relationship* necessary to assure that its reports would reach the DoD in an unbiased form. With Reich's leadership, MED was given the independence it needed to eliminate bias in the reporting of its evaluations. To accomplish this, MED was given complete organizational separation from the balance of Detachment Corona. With this change, MED had the needed direct reporting relationship to assure the unadulterated delivery of its test results.

Thus was born the Fleet Missile Systems Analysis and Evaluation Group (FMSAEG.) FMSAEG was formally implemented on February 24,1964 with authorization from the Secretary of the Navy. FMSAEG's mission: "To provide the Navy Department, the operating Forces, and appropriate organizations of the Shore Establishment with evaluation of performance, reliability, readiness, and effectiveness of missile weapon systems, subsystems and assemblies, and associated test equipment and checkout systems."

Like MED, FMSAEG analyzed shipboard firings, static tests, and manufacturing operations. To make its work effective, FMSAEG used telemetry ground stations, spectrum analyzers, and an IBM 7074 digital computer. FMSAEG was organized into four major departments consisting of: The Surface-Launched Missile Systems Department, the Air-Launched Missile Systems Department, the Ballistic Missile Systems Department, and the Missile Systems Test Equipment Department.

From 1964-1971, FMSAEG experienced significant expansion. New responsibilities included testing and evaluating new missile systems (Standard, Sea Sparrow, Shrike, Walleye, Standard ARM, and Poseidon), and assessing the quality and reliability of torpedoes and other underwater weapons systems. Studies and analysis were also done

on air-launched missile test equipment for the Sparrow III, Sidewinder, Phoenix, Bullpup, Walleye, Shrike, Standard Arm, and Chaparral missiles.

FMSAEG's growing participation in Fleet firing operations led to an increase in the number of FMSAEG-operated telemetry stations. Starting with just one installation in 1964, FMSAEG's telemetry stations increased to six in 1971. As a group, FMSAEG's telemetry stations encircled the entire globe. FMSAEG even designed and constructed a *portable* telemetry unit that could be operated by one man on the flight line. By 1968, this telemetry unit was in use at all of FMSAEG's East Coast ranges.

FMSAEG's dedicated staff, cutting edge equipment, and innovative techniques greatly enhanced the analysis of test firings. FMSAEG designed and built equipment and helped assure consistency in the collection, storage, and evaluation of data. Digital recording systems, via FMSAEG's Univac 1108 computer, were essential to data consistency documenting the variables of missile systems tests. Previous manual systems were error-prone, time-consuming, and often incomplete. FMSAEG's importance to the success of these naval exercises resulted in its evolution from outside observer to active participant and valued advisor. FMSAEG proved itself over time to be a bastion of military efficiency and effectiveness. And, as its trust was earned, it was given more responsibilities.

On July 1, 1967, when Detachment Corona was functionally merged with the Naval Ordnance Test Station, China Lake, and became Naval Weapons Center Corona Laboratories (NWCCL), FMSAEG remained essentially unaltered.

In 1970, the Navy Ordnance Systems Command directed FMSAEG to act as program coordinator in developing procedures and instructions for the Navy Ordnance Systems Command Field Activities Standards Quality Assurance Program, for all ordnance. Also during 1970, FMSAEG provided significant support for the Navy's Air-Launched Missile Programs. Weapons supported included the Sparrow III, Shrike, Standard ARM, Bull Pup, Sidewinder, and Walleye missiles. FMSAEG's independent evaluation reports on the Terrier in 1970, led to the discontinuation of both the beam-riding and homing versions of the retrofitted missiles.

Overall, FMSAEG was a totally unique function in the Navy, a function that was created and operated exclusively at Detachment Corona. FMSAEG's operations as a purely independent entity ended on June 30, 1971 when it became an Annex of the Naval Weapons Station, Seal Beach. Nonetheless, the role of Detachment Corona as the site of the Navy's central Guided Missile IAA function has not changed and remains in effect to this day.

e. Comparison to Similar Properties

An important factor in Goodwin's model for determining the relative significance of a military property is the significance of a property in relation to other similar properties. Detachment Corona's role as a Guided Missile IAA stands out as entirely unique and unduplicated anywhere else in the Navy. Without Detachment Corona's IAA work, weapons development would have been slower, disjointed, and more costly. Detachment Corona was the birthplace and sole location of the Navy's Guided Missile IAA program.

f. Significance Level

Detachment Corona qualifies for listing on the National Register of Historic Places as a Historic District at the National Level, CHR Status Code 3D.

g. Integrity

As noted earlier, the history of Detachment Corona as a naval weapons RDT&E facility is clearly significant. The role of its Fuze Department as the Technical Director of all naval guided missile fuzes, the significant contributions of its Research Department in polymer development, the invention of artificial crystals, the use of thin magnetic film as a memory storage medium, extensive work in guidance systems, and the like. The singular importance of the work of Dr. Curtis J. Humphreys could be used as a strong case for National Register listing. Unfortunately, the importance of the work of Detachment Corona's RDT&E program is diminished by the removal of the vast majority of the testing structures and buildings used to support these activities.

The report associated with this evaluation documents that of the 17 or so types of test structures and buildings documented to have existed at Detachment Corona prior to the departure of the RDT&E working group in 1971, only two remain today. Of these two, only the Radio Frequency Building on Hill B retains a significant amount of integrity to its historical form. In this regard the Radio Frequency Building is essentially the same as it was during the period of significance. The other testing facility that remains today is the Explosives facility on Hill A. This facility is only partially intact. In this regard it is noted that while both of the fuze bunkers associated with this facility are extant, only two of the dozen or so lab buildings remain.

Detachment Corona's Guided Missile IAA function did not make significant use of these testing structures and buildings, however, so their absence today does not detract from this function's historical integrity. Major buildings used by Detachment Corona's Naval Guided Missile IAA function include all of the Unit 2 tuberculosis ward buildings, the Corpsmen's and WAVES' Quarters of Unit 1, and the Resort Era Pavilion, Chauffeurs' Quarters, and Garage/ Laundry buildings. Of these buildings, only the following have been removed:

- The Resort Era Laundry, portion of the Garage/Laundry Building.
- The Unit 1 WAVES' Quarters.
- The Unit 2 Married Officers' Quarters.

While the loss of these buildings is a negative factor in the degree to which Detachment Corona's Naval Guided Missile IAA function retains historical integrity, the overall complex retains a high enough level of integrity to be clearly recognizable to anyone from the period of significance.

National Register Bulletin 15 (*How to Apply the National Register Criteria for Evaluation*) defines integrity as "...the ability of a property to convey its significance." Additionally, Bulletin 15 lists seven aspects of integrity and notes that to be eligible for National Register listing, "...a property will always posses several, and usually most, of the aspects." The seven aspects of integrity are *Location, Design, Setting, Materials, Workmanship, Feeling, and Association.* All of these aspects, as applicable to NHC, are addressed below:

Location: Bulletin 15 defines *Location* as "...the place where the historic property was constructed or the place where the historic event took place." Detachment Corona retains excellent integrity of location in regard toits guided missile IAA history. While it has shrunk in

size, its location remains largely the same as it was during the period of significance. In regard to the reduction of the size of Detachment Corona, some lands previously used for testing and evaluation have been sold for development by private entities and other public organizations. Two prime examples consist of portions of the Resort golf course, sold for development with private residences, and a Hill A, sold with surrounding lands to Norco College for development as a community college. None of the lands that have been sold off over the years, however, were significantly associated with Detachment Corona's Guided Missile IAA function.

Design: Bulletin 15 defines *Design* as "...the combination of elements that create the form, plan, space, structure, and style of a property." Detachment Corona retains excellent integrity to its Cold War design, with most of the buildings used during the period of significance (1951-1971) still in place and still retaining their original form, plan, space, structure, and style. For the most part, alterations made during the period of significance consist of minor additions, and the replacement of windows and doors within their original openings. As noted above, there have also been some demolitions, consisting of the World War II era WAVES' Quarters (Building 210), the laundry portion of the Resort Era garage/ laundry building (Building 204), and the World War II era Unit 1 Married Officer's Quarters (Buildings 543 and 545.) Also removed from the site, but not significant to Detachment Corona's Guided Missile IAA function, is the former Simulation Encounter Laboratory Building (Building 652) , and many of the property's testing structures and buildings.

Setting: Bulletin15 defines *Setting* as "...the physical environment of a historic property." Detachment Corona's campus is largely unaltered since its establishment in 1951. Other than golf course and open space lands that were sold for private and governmental development, changes in setting consist largely of three new buildings. These buildings consist of the Joint Warfare Assessment Laboratory (Building 544), The Daugherty Memorial Assessment Center (Building 547), and the Measurement Science RDT&E Building (Building 575.) Two of these buildings (Buildings 544 and 547) are Spanish Colonial Revival in design. Only Building 575 deviates from this style trend, utilizing a non-descript utilitarian design. All of these newer buildings are associated with FMSAEG's successor IAA, the Naval Warfare Assessment Center, Corona. The balance of the new buildings associated with Detachment Corona consist of small utility buildings that have little or no impact on the overall character of the property.

Materials: "Bulletin 15 defines *Materials* as "...the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property." All Detachment Corona buildings retain their historic materials, with exceptions largely limited to replacements of windows and doors within original historic openings. Other minor changes in materials may be found in some of the roof vent cupolas which no longer retain their tile roofs. Additionally, the original clay tile roofs of four of the Unit 2 Phase 1 ward buildings (506, 514, 516, 518) have been replaced with composition shingles.

Workmanship: Bulletin 15 defines *Workmanship* as "...the physical evidence of the crafts of a particular culture of people during any given period in history or prehistory" Other than the above mentioned tile roof replacements and the replacement windows and doors, the workmanship of Detachment Corona remains essentially unchanged from its Naval Guided Missile IAA period of significance.

Feeling: Bulletin 15 defines *Feeling* as "...a property's expression of the aesthetic or historic sense of a particular period of time." Other than the current absence of most of the testing

FIGURE149: DETACHMENT CORONA GUIDED MISSILE IAA HISTORIC DISTRICT MAP

Source: Google.com

structures and buildings, which are not significant to Detachment Corona's Guided Missile IAA function, the buildings, setting, and site planning of Detachment Corona are largely intact.

Association: Bulletin 15 defines *Association* as " the direct link between an important historic event or person and a historic property. A property retains association if it is the place where the event or activity occurred and is sufficiently intact to convey that relationship to an observer." The important events associated with Detachment Corona's IAA function took place in buildings that are essentially the same today as they were during the period of significance.

h. District Contributors and Noncontributors

The map in Figure 149 shows the boundaries Detachment Corona Guided Missile IAA Historic District. The table in Figure 150 lists the contributors to the Detachment Corona Naval Guided Missile IAA Historic District. Smaller buildings and structures with minimal significance to the Historic District are not listed. If a building is not listed as a contributor in this table, it may be assumed that it is a non-contributor.

BLDG #	HOSPITAL FUNCTION	GUIDED MISSILE IAA FUNCTION	YEAR BUILT	DIST CONTRIB?
N/A	Lake/Southwest Landscape	Lake/Southwest Landscape	1928	Yes
201	Officers' Club	Conference Center	1928	Yes
203	Boathouse and Docks	Boathouse and Docks	1929	Yes
204	Garage/Laundry	Stores (Laundry Section Demolished)	1930	Yes
208	Fire Stn & Electric Shop	Unknown	1929	Yes
209	Old WAVES' Quarters	Public Works, Procurement	1929	Yes
213	Plumbing Warehouse	Unknown	1942	No
214	Truck Shelter	Unknown	1942	No
215	Grease Rack	Unknown	1942	No
218	Gardeners Tool Shed	Unknown	1942	No
219	Vehicle Body Paint Shop	Vehicle Body and Paint Shop	1954	No
220	Animal House	Restrooms (Also listed as Bldg 217)	1946	No
300	Main (Fifth Street) Gate	Main (Fifth Street) Gate	1943	Yes
301	Corpsmen's Quarters	Laboratory/Support	1943-4	Yes
501	Corpsmen's Quarters	Laboratory/Support	1943	Yes
502	Corpsmen's Quarters	Laboratory/Support	1943	Yes
503	Corpsmen's Quarters	Laboratory/Support	1943	Yes
504	Bag Storage	Laboratory/Support	1943	Yes
505	Ph 2 TB Officers' Ward	Laboratory/Support	1943	Yes
506	Ph 1 TB Officers' Ward	Laboratory/Support	1943	Yes
507	Ph 1 TB Officers' Ward	Laboratory/Support	1943	Yes
508	Ph 1 TB Ward	Laboratory/Support	1943	Yes
509	Ph 1 TB Ward	Laboratory/Support	1943	Yes
510	Ph 1 TB Ward	Laboratory/Support	1943	Yes
511	Theater & Recreation	Technical Library, Auditorium	1943	Yes
512	Command Office/	Administration	1943	Yes
513	Power House	Laboratory/Support	1943	Yes
514	Ph 1 TB Ward	Laboratory/Support	1943	Yes
515	Subsistence	Photography, Cafeteria	1943	Yes
516	Ph 1 TB Ward	Laboratory/Support	1943	Yes
517	Ph 2 TB Ward	Laboratory/Support	1944	Yes
518	Ph 1 TB Ward	Laboratory/Support	1943	Yes
519	Ph 2 TB Ward	Laboratory/Support	1944	Yes
520	Ph 2 TB Ward	Laboratory/Support	1944	Yes
521	Ph 2 TB Ward	Laboratory/Support	1944	Yes
522	Ph 2 TB Ward	Laboratory/Support	1944	Yes
523	Ph 2 TB Ward	Laboratory/Support	1944	Yes
528	Support Building	Unknown	1954	No
537	Not a Hospital Bldg	Grounds Storage	1957	No
539	Bag Storage	Laboratory/Support	1943	Yes
554	Not a Hospital Bldg	Guard House	1957	Yes
555	Ph 1 Covered Walkway	Ph 1 Covered Walkway	1943	Yes
556	Ph 2 Covered Walkway	Ph 2 Covered Walkway	1944	Yes
626-632	Not a Hospital Bldg	Explosive Labs and Bunkers	c. 1957	Yes
634	Not a Hospital Bldg	Radio Frequency Building	1960	Yes
650	Not a Hospital Bldg	Fire Station	1964	Yes
808	Enlisted Quarters	Unknown	1957	No

FIGURE 150: DETACHMENT CORONA GUIDED MISSILE IAA HISTORIC DISTRICT CONTRIBUTORS

Source: WHS

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2010 Lake Norconian Club Foundation to Wayne Donaldson (SHPO), Lake Norconian Club Foundation Response to ASM *"Draft Survey, Evaluation, and Update of National Register of Historic Place Eligibility at Naval Weapons Station Seal Beach Detachment Corona, in Norco, Riverside County, California,"* 11-20-2010

2011 Lake Norconian Club Foundation to Wayne Donaldson (SHPO), Lake Norconian Club Foundation Response to NAVFAC Southwest 3-23-2011 ADDENDUM "*Survey, Evaluation, and Update of National Register of Historic Places Eligibility at Naval Weapons Station Seal Beach, Detachment Corona, in Norco, Riverside County, California,"* 5-15-2011

Norco, City of

2010 City of Norco to Tristan Tozer (California Office of Historic Preservation), *City of Norco Comments on the ASM Draft Survey, Evaluation, and Update of National Register of Historic Place Eligibility at Naval Weapons Station Seal Beach Detachment Corona, in Norco, Riverside County, California, "* 12-22-2010

2011 City of Norco to Tristan Tozer (California Office of Historic Preservation), City of Norco Response to NAVFAC Southwest 3-23-2011 ADDENDUM "*Survey, Evaluation, and Update of National Register of Historic Places Eligibility at Naval Weapons Station Seal Beach, Detachment Corona, in Norco, Riverside County, California,"* 5-9-2011

2014 City of Norco to Carol Roland-Nawi, (SHPO), City of Norco Response to NAVFAC Southwest 12-20-2013 ADDENDUM "*Survey, Evaluation, and Update of National Register of Historic Places Eligibility at Naval Weapons Station Seal Beach, Detachment Corona, in Norco, Riverside County, California"* to State Historic Preservation Officer (To Carol Roland-Nawi), 3-9-2014

2014 City of Norco to Lucinda Woodward (California Office of Historic Preservation), City of Norco Application for CLG Grant, 4-9-2014

Maps and Aerial Photographs

1946 Aerial Photograph: "SP-10948, U.S. Naval Hospital, Corona, California, 28 February 1946, Three Drilled Water Wells Showing Excavated Pipe Line Trench Looking Northeasterly, Contract NOy-12819" Date Stamped 2-28-1946

1946 Aerial Photograph: "SYSP-7258, U.S. Naval Hospital, Corona, California, 6 November 1946, View Showing Addition to Bake Shop Looking Southwest, Contract NOy-13015" Date Stamped 11-6-1946

1946 Aerial Photograph: "SYSP-7256, U.S. Naval Hospital, Corona, California, 6 November 1946, View Showing Addition to Power Plant Looking Northeast, Contract NOy-13657" Date Stamped 11-6-1946

1947 Aerial Photograph: "SYSP-7579, U.S. Naval Hospital, Corona, California. 7 January 1947, View Showing Foundation for New Boiler (Old Boiler Room) Looking East, Contract NOy-13657" Date Stamped 1-7-1947

1947 Aerial Photograph: "SYSP-7572, U.S. Naval Hospital, Corona, California, 7 January 1947, View Showing Construction of Laundry Building Looking Southwest, Contract NOy-13075" Date Stamped 1-7-1947

1947 Map: "Plot Plan – U.S. Naval Hospital"

1956 Map: "Master Shore Station Development Plan," 6-1-1956

1959 NOLC Map and Directory

1964 NOLC Map and Directory

1965 U.S. Naval Ordnance Laboratory, Corona, California General Development Map, 10-1-1965

Persons Consulted

Dennis Casebier: Retired Department Head/Historian – Fleet Missile System Analysis and Evaluation Group (FMSAEG)
Jean Easum, Retired Military Historian
Dr. Loren Meissner: Retired Scientist/Computer Technology – Naval Ordinance Laboratory, Corona (NOLC)
Virginia Austerman: Professional Historic and Prehistoric Archaeologist
Kevin Bash, Norco Historian

Primary Sources

City of Norco Historic Collections, Norco, California

Corona Public Library Heritage Room Archives, Corona California

Huntington Library, Pasadena, California

Kevin Bash Historic Collections, Norco, California

Los Angeles Public Library, Los Angeles

Mayo Clinic Historical Unit, Rochester, Minnesota

National Archives, Riverside, California

National Archives, Washington, DC

National Library of Medicine

Naval Bureau of Medicine and Surgery (Office of Historian)

Naval Surface Warfare Center, Norco, California

Sea Bee Archives, Port Hueneme, California

University of Southern California Collections, Los Angeles, California

University of California at Los Angeles Collections, Los Angeles, Californiay

PART 6:
APPENDICES

APPENDIX A: QUALIFICATIONS OF CONSULTANT

RESUME, WORK HISTORY, REFERENCES

Bill Wilkman, MA
Wilkman Historical Services
P.O. Box 362
Riverside, CA 92502-0362
(951) 789-6004 (Phone/Fax)
(951) 288-1078 (Mobile)

ABOUT WILKMAN HISTORICAL SERVICES:

Wilkman Historical Services is a sole proprietorship specializing in the research and evaluation of potential historic resources. I have a Masters Degree in Urban Planning, with an emphasis in Urban History. I have also have maintained a life-long interest in architectural history, having been raised in a family where my father was a practicing architect and having taken university coursework in architectural history. I bring to my practice 32 years experience as a city planner with the City of Riverside, including six years as acting Historic Preservation Manager and four years as supervisor of the Historic Preservation Section. My business, Wilkman Historical Services, was established in 2004 and since then I have completed over 50 cultural resources evaluations and historic documentation projects. With my education and background, I meet the Secretary of Interior Professional Qualifications for Architectural Historian. More importantly, with my knowledge of city development processes, historic resource programs, the California Environmental Quality Act, and the realities of day-to-day decision making, I can provide historical evaluation services that are both highly professional and realistic.

EDUCATION:

1968 B.A. Sociology, Urban Studies Emphasis, California State University Northridge
1970 Masters of Urban Planning, Urban History/Architecture Emphasis, Michigan State University

PROFESSIONAL EXPERIENCE:

1968-1970 City Planner, City of East Lansing, Michigan
1971 City Planner, City of Riverside, CA
1972-1974 Specialist Fourth Class, United States Army, Washington D.C.
1974-1996 City Planner, City of Riverside, CA
1996-1998 City Planner and Acting Historic Preservation Manager, City of Riverside, CA
1998-2003 City Planner and Supervisor, Historic Preservation Section, City of Riverside, CA
2003-Present Owner, Wilkman Historical Services, Riverside, CA

PROFESSIONAL MEMBERSHIPS:

California Preservation Foundation
Society of Architectural Historians, Southern California Chapter
National Trust for Historic Preservation
Board of Trustees, Mission Inn Foundation

SIGNIFICANT HISTORIC RESOURCES RELATED WORK:

1975 Arlanza La Sierra Community Plan, Riverside, CA
1977 Northside Community Plan, Riverside, CA
1985 Historic Seventh Street Study, Riverside, CA

1992 Prospect Place Historic District Background Report, Riverside, CA
1994 Downtown Riverside Design Guidelines, Riverside, CA
1995 Revised Arlanza La Sierra Community Plan, Riverside, CA
1999 Arlington Community Plan, Riverside, CA
1999 Magnolia Avenue Study, Riverside, CA
2000 Riverside Historic Preservation Database, Riverside, CA
2001 Supervision, Eastside and Casa Blanca Surveys, Riverside, CA
2002 Historic Preservation Element of the General Plan, Riverside, CA
2002 Oral Histories, Eastside and Casa Blanca Historic Surveys, Riverside, CA
2003 Downtown Riverside Specific Plan, Riverside, CA
2003 Market Place Specific Plan Update, Riverside, CA
2004 Oral Histories, Arlington Community Historic Survey, Riverside, CA
2004 Cultural Resources Evaluation, 5156 Colina Way, Riverside, CA
2004 Cultural Resources Evaluation, 4480 Mission Inn Ave, Riverside CA
2004 Cultural Resources Evaluation, 4648 Ladera Lane, Riverside, CA
2005 Cultural Resources Evaluation, 4654 Sierra Street, Riverside, CA
2005 Cultural Resources Evaluation, 5173 Colina Way, Riverside, CA
2005 Oral Histories, Northside Historic Survey, Riverside, CA
2006 Historic Research Services to the law firm of Best Best & Krieger, Riverside, CA
2007 Historic Research Services to the law firm of Best Best & Krieger, Riverside, CA
2007 Cultural Resources Evaluation 4779 Tequesquite Avenue, Riverside CA
2007 Mills Act Application, Streeter Tea House, 5211 Central Avenue, Riverside, CA
2007 Cultural Resources Evaluation, 5250-5290 Golden Avenue, Riverside, CA
2007 Cultural Resources Evaluation, 4915 La Sierra Avenue, Riverside, CA
2007 Cultural Resources Evaluation, 4158 Larchwood Place, Riverside, CA
2007 Cultural Resources Evaluation, 7530 Evans Street, Riverside, CA
2008 Historic Research Services to the law firm of Best Best & Krieger, Riverside, CA
2008 Cultural Resources Evaluation, Fire Station One, 3420 Mission Inn Avenue, Riverside, CA
2008 Cultural Resources Evaluation, Realignment of La Sierra Avenue at Five Points, Riverside, CA
2008 Cultural Resources Evaluation, 4952 La Sierra Avenue, Riverside, CA
2008 Cultural Resources Evaluation, 601 N. Grand Avenue, Glendora, CA
2008 Cultural Resources Services to the City of Norco, CA
2008 Cultural Resources Evaluation, 3909-3919 Terracina Drive, Riverside, CA
2008 Cultural Resources Evaluation, All Saints Episcopal Church, 3874 Terracina Drive, Riverside, CA
2009 Historic Research Services to the law firm of Best Best & Krieger, Riverside, CA
2009 Cultural Resources Services to the City of Norco, CA
2009 Cultural Resources Evaluation and Impacts Assessment, Riverside Community Hospital, 4445 Magnolia Avenue, Riverside, CA
2009 Cultural Resources Evaluation and Impacts Assessment, 4587 Mulberry Street, 4586 Olivewood Avenue, and 5206-5226 Olivewood Avenue, Riverside, CA
2009 Architects Biography Project, Survey LA, Los Angeles, CA
2009 Historic American Building Survey, 3608 Locust Street, Riverside, CA
2009 Cultural Resources Evaluation, 2750 Tyler Street
2009 Landmark Nomination, Bobby Bonds Residence, 2112 Vasquez Place, Riverside, CA
2009 Cultural Resources Evaluation, 4307 Park Avenue, Riverside, CA
2009 Cultural Resources Evaluation, 3524 Central Avenue, Riverside, CA
2010 Cultural Resources Services to the City of Norco, CA
2010 Cultural Resources Evaluation, 3615-3653 Main Street, Riverside, CA
2010 Cultural Resources Evaluation, 1791 Orange Street, Riverside, CA
2010 Cultural Resources Evaluation, La Quinta Resort Tennis Club, La Quinta, CA

2010 Landmark Nomination and Mills Act Application, 5175 Myrtle Avenue, Riverside, CA
2011 Cultural Resources Services to the City of Norco, CA
2011 Cultural Resources Evaluation, 3861 Third Street, Riverside, CA
2011 Cultural Resources Citywide Survey and Evaluation - Pre-1946, City of Norco, Norco, CA
2011 Analysis of ADA Alterations to Riverside Community College Historic Resources, Riverside Community College, Riverside, CA
2011 Cultural Resources Evaluation, 601 North Grand Avenue, Glendora, CA
2011 History of Charles M. Dammers in relation to 6893 Victoria Avenue, Riverside, CA
2011 Cultural Resources Citywide Context Statement - 1946-1966, City of Norco, Norco, CA
2012 Cultural Resources Services to the City of Norco, CA
2012 Cultural Resources Evaluation, 5578 Norwood Avenue, Riverside, CA
2012 Secretary of Interior Standards Analysis, Alterations to FMC Building, 3080 12th Street, Riverside, CA
2012 Historic Resources Impacts Analysis, Riverside Community Hospital, 4445 Magnolia Avenue, Riverside, CA
2012 Cultural Resources Evaluation, 5211 Golden Avenue, Riverside, CA
2013 Cultural Resources Services to the City of Norco
2013 Cultural Resources Evaluation, Riverside Community Hospital Specific Plan EIR, 4445 Magnolia Avenue, Riverside, CA
2013 Historic Resources Evaluation, 3836 Second Street, Riverside, CA
2013 Historic Resources Evaluation, 2822 Main Street, Riverside, CA
2013 Historic Resources Evaluation, Riverside Community College Administration Building, Riverside, CA
2013 Historic Resources Evaluation, 3105 Redwood Drive, Riverside, CA
2013 History of Butcher Boy Foods Property, 3038 Pleasant Street, Riverside, CA
2014 Cultural Resources Services to the City of Norco
2014 Cultural Resources Services to California Baptist University, 8432 Magnolia Avenue, Riverside, CA
2014 Cultural Resources Survey and Evaluation, Riverside Free Methodist Church, 8223 California Avenue, Riverside, CA
2014 Cultural Resources Impacts Analysis, Riverside Free Methodist Church, 8431 Diana Avenue, Riverside, CA
2014 Consultation Re: Adaptive Reuse of Former YMCA, 4020 Jefferson Street, Riverside, CA
2014 Historic Collections Policies and Procedures Manual, City of Norco, CA
2015 Cultural Resources Survey and Evaluation, Norconian World War II and Post World War II Eras. City of Norco California
2015 Cultural Resources Mitigation Measures Follow-Up, Riverside Free Methodist Church, 8431 Diana Avenue, Riverside, CA

REFERENCES:

- John Brown, BB&K, 3750 University, Riverside, CA 92501, (951) 826-8206
- Kaitlyn Nguyen, City of Riverside, 3900 Main St, Riverside, CA 92522, (951) 826-2430
- Andy Okoro, Norco City Manager, 2870 Clark Ave, Norco, CA (951) 270-5628
- Erin Gettis, Associate AIA, Principal Planner and Historic Preservation Officer, City of Riverside, 3900 Main Street, Riverside, CA 92522 , (951) 826-5463
- Janet Hansen, Deputy Manager Office of Historic Resources, City of Los Angeles, 200 N. Spring Street, Room 620, Los Angeles, CA 90012, (213) 978-1191
- Other references upon request

APPENDIX B: ADDITIONAL PHOTOGRAPHS OF HISTORIC DISTRICT CONTRIBUTORS (To be added later if access to properties is granted.)

APPENDIX C: DPR FORMS (To be added later, as needed for National Register Nomination compliance.)