

Section 1

CULTURAL RESOURCE INVESTIGATIONS

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Introduction

New Orleans District has completed studies of all potentially significant historic properties in the area to be impacted by construction of the new lock.

In 1987 the New Orleans District completed a study that determined the Inner Harbor Navigation Canal Lock eligible for the National Register of Historic Places (Dobney, et. al. 1987).

In 1991 the New Orleans District completed a research design for archeological and architectural investigations in the project area (Franks, et. al. 1991). This study concluded that the St. Claude Bridge was eligible for the National Register of Historic Places. It presented a research design for archeological investigations in the Holy Cross Historic District.

The New Orleans District completed an archeological study of the Holy Cross Historic District. Archeological testing concluded that archeological features associated with a 19th century brickyard and slave quarters, late 19th to early 20th century residences, commercial establishments and truck farms were eligible for the National Register of Historic Places. A data recovery plan for mitigation of adverse impacts to these historic properties was developed (Earth Search 1992a).

The New Orleans District contracted for a study of Sewerage Pumping Station B that concluded that the property is eligible for the National Register of Historic Places because of its architectural and engineering significance (Earth Search, Inc., 1992b).

A comprehensive architectural assessment and preliminary archeological review of 64 city blocks west of the IHNC was completed by R. Christopher Goodwin & Associates, Inc., under contract to the New Orleans District from November 1991 to January 1992. This draft study concluded that it is unlikely that significant prehistoric archeological deposits are located within the project area. Archeological testing was recommended to determine if historic sites exist in the project area. Architectural investigations concluded that the project area contains a number of structures that contribute to the significance of the Bywater Historic District.

Prehistory of the study area

Cultural resource investigations have traced the prehistory of the project area beginning with the Tchula Period

(250 B.C. to A.D. 0). Tchula period occupations in the Lower Mississippi Valley are associated with the Tchefuncte culture, the early ceramic period in the area.

The Tchula period was followed by the Marksville Period (A.D. 0 to A.D. 300). The Marksville period is associated with a Hopewellian culture and tradition manifested throughout the Lower Mississippi Valley.

The Baytown Period (A.D. 300 to A.D. 700) was the next period in Southeastern Louisiana. It has been defined as the interval between the end of Hopewellian/Marksville culture and the emergence of Coles Creek culture.

The Coles Creek Period (A.D. 700 to A.D. 1000) was characterized by small ceremonial centers with mounds. These were surrounded by villages of varying size. In southern Louisiana generally, the early phase for the Coles Creek period is Bayou Cutler, and the late phase is Bayou Ramos. However, in southeast Louisiana, only the Bayou Cutler phase is recognizable.

The Mississippi Period (A.D. 1000 to A.D. 1700) is associated with the Barataria phase. Shell middens, shell mounds, earth and shell mounds, and probable extensive habitation areas are represented in this complex.

Aboriginal occupation during the Colonial Period is difficult to determine because the identities and locations of Indian tribes in Louisiana cannot be definitively determined for any period prior to ca. 1700. The protohistoric and early historic periods were traumatic for aboriginal society in southeastern Louisiana. The effects of disease and of the ever-increasing European population are reflected in the declining aboriginal population and in the migrations by remnants of various tribes. Internecine warfare typified relations between the various groups.

Review of archaeological studies in the area revealed no evidence of prehistoric archaeological sites. The project area is located adjacent to the Mississippi River in a section of the Mississippi River delta plain which was deposited only a few thousand to a few hundred years ago. The extensive disturbance resulting from construction at the existing lock and other factors has destroyed any prehistoric sites that may have existed in the project area.

History of New Orleans area

New Orleans has a rich and fascinating history during the 18th, 19th, and 20th centuries. New Orleans was founded as a result of French attempts to colonize the Mississippi River and Gulf Coast. Although LaSalle had claimed for France all of mid-continental America drained by the Mississippi in 1682, France

initially did little to develop the new territory. In 1698, Pierre LeMoyne d'Iberville, accompanied by his younger brother Jean-Baptiste LeMoyne de Bienville, was sent to establish French sovereignty over the Mississippi Valley and the Gulf Coast in the vicinity of the river's mouth. Bienville established Fort Maurepas at Biloxi Bay in 1699, and the following year he founded Fort de la Boulaye on the east bank of the Mississippi River. Both sites were abandoned within a few years, and a settlement at Mobile became the center of French activity.

John Law's Company of the West assumed responsibility for the Louisiana colony in 1717. That same year, the Company directed that a city named New Orleans be established on the Mississippi River some thirty leagues from the mouth.

In 1718, Bienville, now commandant general of the colony, selected the site of the present-day Vieux Carré as the locale for establishing this new city. Colonists were recruited in France, Germany, and other European countries, and they were granted large concessions on the Mississippi River and some of its tributaries.

Construction began in 1718. An area was cleared for construction for a store-house, warehouses, barracks, and residential cabins. The earliest clearing probably was located at the foot of present-day Conti Street.

The engineer De la Tour and his assistant Pauger were responsible for a series of plans for the city drawn up between 1720 and 1723. A plan dated April of 1722 placed the public square (Place d'Armes) in the center of the city. The city extended for four square blocks above and below the square, and six blocks back from the river. The blocks flanking the public square were reserved for use by the Crown and the church. Squares as far back as Bourbon Street were divided into lots, which were to be granted to those individuals best able to construct houses. Subsequent plans from the 1720s show the city extended along the river to provide a total of eleven squares front.

Early concessions of land were granted above, below, and across from the city. Bienville received a concession extending from the upper limits of the Vieux Carré to a point near the present-day Orleans/Jefferson Parish boundary. He also received a large concession across from the city, extending from just below Algiers Point for a distance of two leagues downriver. A series of smaller concessions below New Orleans and on the same side of the river were granted to several individuals.

In September of 1722, a hurricane destroyed most of the public and private buildings within the city proper. Immediately afterwards, Bienville ordered the inhabitants to enclose their houses or lands within wooden palisades or forfeit their property to the Company.

One significant achievement of the 1720s was construction of a levee to prevent inundation of the city by the river's floodwaters. Construction represented either replacement or improvement of an earlier levee built under the direction of Claude Dubreuil. In 1724, the levee was almost 3000 feet in length. By 1727, it was 5400 feet long, three feet high, and eighteen feet wide at the top with a roadway on its crown. By 1735, the levee extended about twelve miles below and thirty miles above the city.

When the Crown took possession of Louisiana in 1731, total population of the territory was about 5000, of whom approximately 3000 were slaves. The population was concentrated in New Orleans and its environs, and included 1000 soldiers and male civilians. Population remained stable in the city until 1745. The 1730s and 1740s were arduous for the colonists, as hurricanes and flooding alternated with years of drought. Crop losses were frequent and severe.

Between 1745 to 1763, the population in New Orleans increased. Port traffic also increased as ocean-going vessels, canoes, dugouts, pirogues, batteaux, and flats anchored in the vicinity of the market, the King's Storehouses, and the Intendant's quarters. During this period, New Orleans was a frontier market town, a seaport, a provincial capital, and a military center.

Owners of large and well-equipped plantations in the vicinity of New Orleans probably cultivated indigo as the major cash crop, while rice was grown on at least some tracts. Large herds of cattle were maintained, and corn and vegetables were supplemental crops.

France had, then, succeeded in establishing a settlement on the Lower Mississippi that would in the next century become, for a time, one of the world's major ports. Further, she had fostered the growth of a plantation system capable of partially supplying the local market with food and of producing some exportable commodities. However, French economic policy in the colony was largely a failure, for it enhanced the position of neither the mother country or the colony in the developing world economy.

Hostilities between France and Britain subsequently termed the Seven Years' War in Europe and the French and Indian War in North America, with Spain intervening on the side of France, ended in 1763 with the signing of the Treaty of Paris. New Orleans and all of French territory west of the Mississippi were ceded to Spain. Spain's initial attempts to take control of the colony were marked by disorder.

During the six years (1763-1769) when the Spanish presence was inadequate to govern affairs in the colony, trade and commerce at New Orleans were conducted primarily by British citizens. The 1763 treaty had granted Great Britain the right

to navigate the Mississippi. British merchants brought flour to New Orleans which alleviated a food shortage, and thereby established a pattern whereby British and American traders furnished the city with most of its food supply through the remainder of the century. Britain also used the period of political instability to consolidate her hold on the Indian and fur trades.

The final three decades of French rule of Louisiana had seen little change in population size or productive capacity. It was during the Spanish period that new settlements grew throughout the entire Mississippi Valley which was New Orleans' natural hinterland. The city's promise as a major port, foreseen by early Company officials such as Bienville, began to be realized.

During the 1790s, most of the plantations along the Mississippi River from Baton Rouge to south of New Orleans switched from cultivation of indigo to sugar production.

Louisiana, including New Orleans, was retroceded to France in 1803, and in the same year became a part of the United States. In 1805, the City of New Orleans incorporated with its downriver boundary at Canal des Pecheurs (Fisherman's Canal) just below the U.S. Barracks.

Development of those portions of Esplanade Avenue below the original city was underway by 1810. Five years earlier, Bernard de Marigny had received permission from the City Council to subdivide his plantation below Esplanade Avenue and fronting the river, whereupon the tract was surveyed for sale as small residential lots. In 1810, the City bought Claude Treme's plantation that extended along the Old Bayou Road. This, and the adjacent commons beyond Ramparts Street, were surveyed and lots sold. The city, having already expanded upriver, was now growing in all available directions.

The antebellum years of rapid population growth resulted in subdivision for residential use of many of the old plantations below Faubourg Marigny.

Because of early surrender in the Civil War, New Orleans' port and commercial facilities and residential neighborhoods were undamaged by the war. Plantations in southern Louisiana were generally less devastated than those elsewhere in the South.

In 1896, the Board of Commissioners for the Port of New Orleans was established by law. That group, commonly referred to as the "Dock Board," undertook projects from 1900 to 1910 to rebuild and expand the city's port facilities.

Inner Harbor Navigation Canal lock

The Inner Harbor Navigation Canal lock complex is located at the intersection of Urquhart Street and the Inner Harbor Navigation Canal (also called the Industrial Canal). Construction of the lock complex was begun in 1918 and completed in 1921, when the canal was connected to the river and the lock complex first was opened to traffic.

The Inner Harbor Navigation Canal lock consists of a reinforced concrete lock chamber with a usable length of 675 feet; the usable width is 75 feet. The machinery used to open and close the massive gates at the locks is very similar in design to that at the Panama Canal. In addition, the complex contains an emergency dam which is utilized when the lock is dewatered; it also serves as a defense mechanism against storm surges. The IHNC lock facility has been in continuous operation (with the exception of occasional dewaterings for maintenance purposes) since it was completed in 1923. Several of the components designed and constructed at the IHNC locks were the first of their kind.

The construction of the lock and of the Industrial Canal was funded through bond issue by the citizens of New Orleans. The catalyst for the project was the decline in shipping which occurred in New Orleans during the late nineteenth and early twentieth centuries. The port was growing at a rate during this period that demanded comprehensive planning in order to maximize economic benefits to the community and the state. Louisiana's General Assembly responded to this need by creating the Board of Commissioners of the Port of New Orleans in 1896, popularly known as the "Dock Board."

In July, 1914 the state legislature authorized the Port Commission to build the Industrial Canal at a location to be determined by the Commission Council of New Orleans. The Dock Board was given the right to expropriate any property necessary and to issue bonds to pay for the construction.

The Industrial Canal originally was planned as a barge canal. Even that modest conception was delayed by the outbreak of World War I. In 1915, the project was revived by a group of businessmen and newspaper editors, spurred by the growing realization of the opportunities offered by the opening of the Panama Canal. The engineering firm of Ford, Bacon, and Davis was retained to prepare a "Report on the New Orleans Ship Canal and Terminal" issued in 1915.

The engineers proposed a barge canal 175 feet wide at the top, 80 feet wide at the bottom, 10 feet deep, and 5.3 miles long. On January 16, 1916, Governor Luther E. Hall endorsed the project. In August, the Governor dismissed the Board of Commissioners and appointed a new Board. During the resultant reorganization, the project once again was delayed.

By 1918, there was a growing need for ships as a result of the pressures of World War I. A group of New Orleans civic leaders formed the "Shipbuilding Committee," and in February of 1918, they proposed plans for an industrial basin to be connected to the Mississippi River by a lock.

The actual location of the canal was to be determined by the Commission Council of New Orleans. The Council decided on a site in the Third Municipal District which was virtually uninhabited. The site chosen for expropriation was 5 1/3 miles long, 2,200 feet wide covering 897 acres. The canal was projected to be 18 feet deep, and the lock was to be 70 X 600 feet. Before construction began, the dimensions were altered again. By June 11, 1918, a 25-foot channel had been designed, increasing the projected cost to \$6 million.

On March 15, 1918, the George W. Goethals Company, Inc. was retained by the Dock Board as consulting engineers. Goethals had been Chief Engineer in charge of the construction of the Panama Canal from 1907-1914. By 1917, he had retired from the U.S. Army and announced his intention to work as a consulting engineer in a firm that changed its name to take advantage of his fame. But Goethals had very little involvement in the design and construction of the Inner Harbor Navigation Canal and Lock in New Orleans. George M. Wells designed the lock, Henry Goldmark designed the gates, and Colonel George R. Goethals, George W. Goethals' son, was the resident engineer. The similarity of names and the fact that both served as colonels in the Army probably are responsible for the confusion about whether the Chief Engineer of the Panama Canal built the Inner Harbor Navigation Canal and Lock. Records indicate that George W. Goethals lived in New York throughout the period of construction. His son, on the other hand, lived in New Orleans from 1919 to 1920.

Construction of the IHNC lock and canal complex began on June 6, 1918. The canal site presented a variety of problems and challenges to the engineers. The area nearest the river consisted of low, flat, meadowland occupied by a few houses. The middle part of the site was a cypress swamp. The lake end was a soft prairie marsh.

The levees were constructed by hand. The material dug from the canal's path served as banks for the lock and canal and prevented the excavated liquid material from running back into the excavation.

In addition to the men building the levees by hand, a dredge was sent to the lake end of the canal to begin excavation. The Mississippi batture could not be breached until the lock was in place, so excavation was limited to the area between the lock and the lake. The 2000-foot stretch between the river and the lock would be excavated last, when the lock was completed and the new levees in place. Because the turning basin site was located only a few hundred yards from Bayou

Bienvenu (which empties into Lake Borgne), an excavator was sent to open a small channel into the turning basin. This channel was significant because it enabled the huge 22-inch suction dredges to get into the turning basin and work outward toward both the lake and the lock site.

Completion of the canal was set for January, 1920. The cost of the canal continued to escalate. By mid-1919, George Wells of the Goethals Company had informed the Board that skyrocketing labor and material costs had doubled the anticipated cost of the project. At this point, and for the final time, the scope of the project was changed again. The Goethals Company engineers raised the question of whether New Orleans really wanted a 25-foot deep lock when most loaded ocean-going vessels required a 27-foot draft. Therefore, the engineers recommended a 30-foot depth. These changes were adopted, requiring another \$7.5 million, bringing the total cost of the canal and lock to \$19.5 million.

Throughout these changes in plans, excavation of the canal continued. The excavation ultimately would amount to between eight and ten million cubic yards; 95 per cent was wet excavation using 20 and 22-inch suction dredges. Innovative thinking was required to make the process efficient, because of the subsurface conditions with huge stumps and buried tree trunks. Even with 1,000 horsepower engines, the dredges could not remove the wood. An employee of the city's sewerage and water department, A. B. Wood, already had designed a centrifugal impeller to handle sewerage containing trash. When W. J. White, superintendent of dredging on the project, learned of this design, he asked Wood to adapt his design for use on the dredge "Texas." The results were impressive: average excavated yardage increased from 152 to 445 cubic yards per hour. By September, 1919, the entire canal had been dredged except for the last 2,000 feet between the lock and the river.

The greatest challenge of all was construction of the lock. The lock was unique in that it was the only lock in the world with a high water level at either end of the lock. Under normal circumstances, the Mississippi River is higher than Lake Pontchartrain; however, if the river should be at extreme low stage at the same time that strong winds push waters through the Rigolets causing the water to back up in the canal prism north of the lock, the lake end can be higher than the river end of the lock. This unique situation posed unusual engineering problems. Both the gates and the control machinery had to be designed to cope with the possibility of high water at either end of the lock.

The foundation of the lock required an excavation fifty feet deep. Quicksand and swamp gas caused problems in the excavation. The only reliable construction method was by driving 10-inch pipe casings, two or three feet at a time, excavating, then repeating the process until the desired depth was reached.

Excavation of the lock site began in November, 1918. The excavation would be 350 feet wide by 1500 feet long, with a very gradual slope (one-to-four ratio) to the center of the canal to retard crumbling and sliding of the banks. The outside dimensions of the lock to be built in this excavation were 1,020 by 150 feet. Two hydraulic dredges which had been working on the canal were assigned to begin dredging the lock site. They operated on either side of the center line, making a cut twelve feet deep the entire length of the lock prism. The process was repeated four times until the project depth was achieved.

During dredging a wooden sheet pile cofferdam was constructed to cut off the flow from the first stratum of quicksand. The cofferdam served the additional function of maintaining the water table in the surrounding area, in order to minimize settling of nearby buildings when the water level was lowered in the lock prism. When excavation was well along, a second ring of sheet piling was driven 150 feet inside the original cofferdam to cut off the second stratum of quick sand located only a foot below the planned level of the floor of the lock. The second cofferdam was completed in May, 1919. The land between the south end of the lock and the river had not been disturbed, so the lock prism was enclosed once a temporary cofferdam and earth dike was placed across the north end of the lock.

The next problem was to remove the water from the canal prism without allowing the banks to collapse or the bottom to blow up as a result of the pressure from the quicksand. It was also important to follow procedures which would not damage the integrity of the clay stratum separating the second and third quicksand strata. Once the second cofferdam was in place, the dewatering process began. However, after pumping out 6.5 feet of water to -3.5 feet below Cairo datum, trouble developed. Cracks appeared along the top of the south and east banks. These rapidly widened and in a short period about one-third of the south bank was in motion. This bank movement consisted of a vertical drop followed by lateral movement toward the center of the lock. The force of the movement was great enough to shear off 300 linear feet of the inner cofferdam and deposit it 30 feet closer to the center of the lock.

After the cofferdam was repaired, a third cofferdam built of steel was driven adjacent to the line of outer lock wall construction. By enclosing a relatively small area, it would be possible to install cross-braces (wooden beams ten inches square) to prevent collapse.

Another safeguard took the form of artesian wells. One hundred and thirty ten-inch steel pipes were driven into the third quicksand stratum, which had a static head of 75 feet. These wells were located inside the steel cofferdam. Gravel was forced down and beyond the bottom of the pipe, forming a bulb which acted as a filter. Gravel was also placed in the pipe proper for a distance of twelve feet from the bottom. An

additional fifty-six wells were driven to dry out the second stratum of quicksand as much as possible. Half of these wells were driven between the second and third cofferdam.

On November 18, 1919, the dewatering process was resumed. Initially, the level was dropped one foot every other day to allow observation of possible effects on the banks. The work was completed on January 4, 1920.

The next task was to drive the 24,000 piles on which the lock would rest. These piles were fifty to sixty feet long. The concrete was laid in fifteen-foot sections because only a few braces could be removed at one time. The final product, finished in April, 1921, was a steel and stone monolith weighing 225,000 tons, including gates and machinery. Filled with water, it weighed 350,000 tons. It was 1,020 feet long, 150 feet wide, and 68 feet high. The walls of the lock were 13 feet thick at the bottom, and 2 feet at the top. The 90,000 cubic yards of concrete required 125,000 barrels of cement. Lock construction required six thousand tons of reinforcing steel and two and half million feet of lumber for building forms. To withstand the pressures of the quicksand, a unique lock design was developed.

The usable dimensions of the lock as finally built were 640 feet long, 75 feet wide, and 30 feet deep (at minimum low water level in the river). The top of the lock stands twenty feet above the ground. The design utilizes the natural gravity flow of water to raise and lower the water level in the locks. A series of culverts was built into the base, each culvert measuring 8 by 10 feet (narrowing to 8 x 8 feet at the opening). They are closed off by eight sluice gates, each operated by a 52 horsepower electric motor. To fill the lock, the sluice gates at the river end would be opened; to empty it, the lake end sluice gates would be opened. It could be filled or emptied in ten minutes. The lock was equipped with five sets of gates, each 4 1/2 feet thick and weighing 200 tons. Four pairs of gates were 55 feet high; one pair was 42 feet high. The gates were designed by Henry Goldmark, who also designed the gates at the Panama Canal.

The lock and canal formally were dedicated on May 2, 1921. However, the 2,000-foot section between the lock and the river had not yet been excavated. The final cut would not be made until January 29, 1923. Completion of dredging took several days, and the canal finally was opened to river traffic on February 6, 1923. Regular barge line service through the canal was inaugurated by the Mississippi Warrior Barge Line on February 22, 1923.

The first two tenants on the canal were companies dependent on World War I shipbuilding contracts. The number of industries operating on the canal between the wars was modest: Jones & Laughlin Steel (1923); Lone Star Cement (1925); Gulf, Mobile, and Northern Railroad (1931); U.S. Lighthouse Service (1934); Lester F. Alexander's ship repair service (1936-37); and

the Louisiana Material Company (1939). World War II meant that shipyards once again would become important tenants on the canal.

Another event which moved the Industrial Canal closer to full utilization was the designation of the lock and part of the canal as an integral section of the Gulf Intracoastal Waterway. The GIWW was a federal project designed to provide a sheltered waterway along the Gulf Coast from Apalachee Bay, Florida, to Brownsville, Texas. Some of the elements of the GIWW were executed before the idea of a GIWW had been conceptualized.

The Rivers and Harbors Act of 1910 authorized the construction of a number of projects which would become part of the GIWW. By 1925, a continuous waterway existed from the Mississippi River to the Sabine River. The River and Harbor Act of 1942 assured the successful completion of the GIWW. It authorized a channel 12 feet deep and 125 feet wide from Apalachee Bay, Florida, to the Mexican border. This Act also authorized Federal acquisition and control of the state owned Inner Harbor Navigation Canal and Lock.

The Dock Board had approached members of Congress as early as 1939 about making the Industrial Canal part of the GIWW. However, the outstanding debt on the canal prevented an outright transfer of ownership. The bonds which paid for construction of the canal and lock were not liquidated until 1960. The bonds also required the Board to operate and maintain the canal and lock. The New Orleans District leased the IHNC in March of 1944. Under the terms of the lease, the Government would pay the Dock Board \$240,000.00 a year, and would operate and maintain that section of the canal from the point at which the GIWW entered the canal to the Mississippi River, including the lock, the St. Claude Avenue Bridge, and the Florida Avenue Bridge. The Dock Board's primary obligation was for major repairs.

The GIWW eventually entered the Industrial Canal through the Vickery Canal. Higgins Industries, Inc. was awarded a government contract to build ships at a place called Michoud Station. Although the plant was well along in construction, and ships were being fabricated, there was still no access to the Gulf. On April 16, 1942, dredging began in the Industrial Canal. A canal was dredged to the Michoud Shipyard (a distance of seven miles).

In 1976, the Dock Board requested a renegotiation of the rent to reflect changed economic conditions. After four years of study, the Government agreed to increase the annual rent from \$240,000.00 to \$1.2 million. A corollary Agreement to donate Real Property was basically a lease/purchase agreement.

The transfer of title would occur once rental payments equaled \$11,752,624.00 (fair market value as of the date of the

agreement), or if the Government should request land for construction of a new lock as provided in Public Law 455 dated March 29, 1956. In effect, the United States Government committed to the eventual acquisition of total ownership of the leased facilities.

The Inner Harbor Navigation Canal Lock has been determined eligible for the National Register of Historic Places. Demolition of the IHNC Lock required by this project will be mitigated by recordation of the structure to Historic American Engineering Record standards.

Sewerage Pumping Station B

Sewerage Pumping Station B was built during the first decade of the twentieth century and represents one of the original components of New Orleans' sewerage system.

A study for the New Orleans District based on archival research, architectural and engineering studies, and on-site evaluations of Station B. recommended that it should be considered eligible for inclusion in the National Register of Historic Places. The State Historic Preservation Office has concurred with this recommendation.

Since the founding of New Orleans in 1718, two of the most fundamental problems faced by its citizens were drainage and the sanitary disposal of sewage. The 1890s was a crucial decade in terms of public utilities for New Orleans. In 1893, prominent citizens of New Orleans came to realize that an adequate drainage and sewerage system and an adequate supply of drinking water were necessary for further economic growth. The New Orleans Drainage Commission was organized in 1896 to address this issue. The sewage problem was to be addressed by a private firm, the New Orleans Sewerage Company, beginning in 1894.

Little progress was achieved on New Orleans' drainage, sewerage, and water supply problems until the creation of the New Orleans Sewerage and Water Board by the Louisiana State Legislature in 1899. The Sewerage and Water Board planned to build three sewerage pumping stations from which waste would be pumped into the Mississippi River, including one at St. Claude Street in the Ninth Ward. The centrifugal pumps located in these stations would drive the sewage into cast iron force mains leading uphill to the river. By 1905, construction of the sewerage system had begun.

Sewerage Pumping Stations B and a number of others were completed in 1906. Most of the sewers were put into operation in that year. At this date there were 304.48 miles of sewers. The system had two steam driven and one electrically driven pumping stations discharging into the river, and had six intermediate lift stations.

Station B was the largest of the sub-stations. It contained two 18" centrifugal pumps directly connected to 100 H.P. 200 volt vertical shaft, variable speed induction motors. The pumps are designed to discharge 670 feet per minute against a 44 foot head. A new force main from Station B to the River was in place by the end of 1919. Wood trash pumps were installed in Station B during 1930 or shortly thereafter.

The sewerage station was not built exactly to the plans of 1903-1904. The original plans indicated that the first two pumps and motors would be installed at positions on the south side of the octagonal portion of the structure. However, the 1929 plans indicate that the original pumps and motors had been installed on the north side, which is the side closest to the main entrance of the structure. Minor changes were made to the facility after 1949, including replacement of the original wooden doors with metal doors in 1954.

Sewer Station B is associated with the career of Albert B. Wood. His work for the Sewerage and Water Board resulted in new pump designs that were subsequently adopted throughout the world. Wood was born in New Orleans in 1879. In 1899 he graduated from Tulane University in engineering. He accepted a job as a mechanical inspector for the newly formed New Orleans Sewerage and Water Board. He continued his association with that body from 1899 until his death in 1956. In 1906, Wood was promoted to the position of mechanical engineer. In 1908, he was placed in charge of the water works pumping station and the various sewerage stations. In 1939 Wood was elected general superintendent of the Board.

In 1906, Wood invented a six-foot centrifugal pump which was the answer to New Orleans' need for large capacity, low head pumps for its drainage system. At the time, it was the largest of its kind in the world. A short time later, he invented "flapgates" to stop water from backing up when the pumps were stopped. These flapgates soon became the industry standard.

In 1912, the City of New Orleans recognized its urgent need for increased drainage pumping station facilities. Wood offered to design a special pump, and in 1913 presented plans for the twelve-foot Wood Screw Pump. The pump consists of a siphon in the summit of which a screw type, steel bladed impeller rotates. The casing is split horizontally to facilitate access to the interior of the pump. The pumps were placed at the summit of a pipe siphon and pipe connections are made to the suction and discharge canals without the intervention of valves or gates. Priming is accomplished by means of rotary vacuum pumps. By admitting air to the casing before stopping the pump the vacuum is broken and the water prevented from siphoning back into the suction basin. Wood's twelve-foot screw pump was the largest and most powerful in the world, and it attracted the attention of engineers both in the United States and abroad.

Four of the pumps were installed and tested in 1915. In 1916, Wood patented his Trash Pump which revolutionized the sewerage system in New Orleans and throughout the world. He designed it to solve the problem of rags and trash, which were being introduced into the sewers and clogging the system. The invention alleviated the need for on-site attendants to unclog the screens needed on the pumps then in use. As a result, New Orleans' sewerage system was the first in the United States to become automatically operated.

James Wadsworth Armstrong was the architect of Pumping Station B and all of the other New Orleans Sewerage and Water Board buildings designed before 1910. Unfortunately, little is known of his early life and professional training. However, based on documented aspects of his career in New Orleans and Baltimore, it appears that he may represent an important figure in the history of American public works. He came to New Orleans in 1899 to work for the Sewerage and Water Board. Three years later, Superintendent Earl placed him in charge of pumping, power, and purification plant design. Prior to 1909, Armstrong provided the architectural design for all of the New Orleans buildings that were used for pumping sewage, pumping water, and purifying water, as well as the associated power stations.

The station today, which retains its original color scheme, stands alone on a block bounded by St. Claude, Sister, Marais, and Jourdan Streets. The station and its concrete yard are surrounded by a chain link fence. The yard and fence were added in the late 1970s. The rest of the block is a grassy lot. Originally, there was a small shed behind the station and a superintendent's house to the east of it. They were removed sometime between 1937 and the present.

Sewerage Station B is a two story, octagonal building with a one story, rear wing. The structure features a stucco wall treatment over brick that is accented with a reddish trim. The specifications called for terra cotta trim, but it appears to have been made of concrete with an integral dye. This appears to represent a difference between the plans and the "as built" structure.

The roofs of both sections of the building are clad in asphalt shingles and display exposed rafter ends. The roofs were originally covered in red tiles. The front and side planes of the octagon each display a round arch accented in trim and resting on pilasters crowned by simple capitals. The slightly recessed area under each arch contains either a round-arched window or, in the case of the front plane, a double-leaf, round-arched door. The present-day metal doors are replacements for the original, wooden doors. The original doors were flat topped with a round-arched fanlight above them. Two of these early windows are still extant, but the other round arched window openings contain louvers.

On the second story, above each arch, are triads of narrow, round-arched windows which are either boarded up or contain louvers. Originally, these window spaces contained pivoted, single-light windows. All of the windows have lugsills. On the rear elevation, an exterior stuccoed chimney rises above the hip roof of the wing and pierces the main roof. Plans for the building had specified brick corbelling. The chimney is now shorter and much plainer than the construction plans indicate. No historic photographs obtained for this study showed views of the original chimney so no determination could be made concerning whether the present chimney is a replacement or an "as built" modification to the original design plans.

The engineering aspects of Station B are relatively simple. Two 24-inch Wood trash pumps with drive motors and associated controls are present. When the water coming in from the sewers gets high enough, a float mechanism turns the pumps on, and when it decreases the mechanism turns them off. There are valves on the inlet and outlets of the pumps to allow them to be isolated and check valves are present to prevent backflow under unusual conditions. A new addition, which does not affect the station's integrity, is the addition of other valves which allow the outflow to be piped to the new treatment plant rather than the river. The old valves could be used to divert outflow to the river should an emergency make it necessary, but the present operational procedure calls for any diversion to take place at the treatment plant. A cleanout is provided for the pump sumps by means of a two-inch connection to city water so that it can be flushed. This simple arrangement is possible because the pumps will not clog with trash.

Two of the original pumps remain in place without motors and are considered spares. These are the predecessors of the trash pumps designed by A. Baldwin Wood. They had been installed and were operational by 1907. Also present are the two Wood trash pumps installed about 1930 and still in use. Two 275-horsepower Westinghouse motors are present. They were installed at the same time as the Wood trash pumps. Some rewiring of the motors has been done by Westinghouse.

Some changes have been made to the exterior of Station B. Nevertheless, the building retains its architectural character. The major alterations to the structure are: (1) the roof is now covered in asphalt shingles; (2) the majority of the windows have been replaced by metal louvers and those on the rear wing have been stuccoed over; (3) the original wooden doors with their fanlights have been replaced by taller, metal doors, and the fanlights have been removed; (4) the chimney has apparently lost its brick corbelling.

Despite the alterations, Sewerage Pumping Station B retains its original architectural character. Its massing and form have not been changed. The structure has not received any additions. The building's original color scheme is still extant. The heavy, stuccoed walls and round arched openings

inherent in the Mediterranean style are still present on Station B. The original concrete trim which articulates the structure's round arches and octagonal form can still be seen.

Although Sewerage Station B has lost some of its architectural details, it still retains sufficient integrity to represent an important example of a locally significant building type that is associated with New Orleans' early-twentieth-century sewerage system as well as with the city's architectural history during the same period.

It is recommended that Sewerage Station B should be considered significant in terms of association (Criterion A), architecture (Criterion C), and engineering (Criterion C).

In terms of engineering, as well as architectural design, Sewerage Station B retains its historic integrity. Two of the original centrifugal pumps remain in place, although these are no longer used. Also, two Wood Trash pumps that were probably installed in ca. 1930 are present. These are still in use. The ca. 1930 changes made to the station in order to increase its capacity were the last major renovations made. These changes consisted of the installation of new pumps and new motors. The original 1904 plans were drawn with this installation in mind. Also, until those changes, few if any modifications had been made to the station since it was built during the first decade of the twentieth century.

Area West of the Industrial Canal

A comprehensive architectural assessment and preliminary archeological review of 64 city blocks west of the IHNC was completed by R. Christopher Goodwin & Associates, Inc., under contract to the New Orleans District from November 1991 to January 1992. No subsurface archeological testing was conducted. Fieldwork consisted of architectural evaluation and recordation of 179 buildings and industrial complexes, as well as assessment of the project area's potential to contain significant archeological deposits.

The Bywater area extends along the western side of the IHNC, from the Mississippi River northward to the northern end of the Galvez Street Wharf. Its antebellum development revolved around the Andry Plantation and the Ursuline Convent, both located near the Mississippi River. By the early postbellum period, the land was subdivided into city blocks. Other than a few residences along St. Claude Avenue, however, other postbellum development consisted of scattered truck farms and dairies. By the early twentieth century a complete rearrangement of project area settlement was underway. A combination of early twentieth century factors, including introduction of city water and sewerage services into the project area, and widespread ownership of automobiles, resulted in the subdivision of former truck farms and dairies into

residential lots. In addition, the 1918 - 1923 construction of the IHNC and the adjacent rail system prompted industrial development along the northern and eastern portions of this area. By the mid-1930s, nearly all of the farms were either subdivided into residential lots, destroyed by marine and railroad construction, or used by industry. With notable exceptions, such as razing of the Poland Street Yard, the project area structural development has remained largely intact from the late 1930s.

Extensive historical research of the project area provided the necessary context for evaluating the surviving architecture, and for ascertaining the nature and age of the area's anticipated cultural resources.

The architectural component involved recordation and evaluation of all historic standing structures situated within the project area; a number of these also are included in the Bywater Historic District. The objectives of the architectural investigations were: (1) to identify historic built resources located within the boundaries of the project area; (2) to assess the potential significance of the identified properties utilizing National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]); and, (3) to evaluate potential impacts to significant historic properties located in the project area.

The archeological component consisted of the analysis of historic data to ascertain the probable nature and distribution of the area's archeological resources; it also included the development of a research design for guiding future archeological investigations. A series of cartographic overlays was used to compile relevant archeological data concerning the historic development of the project area.

Archeological fieldwork was limited to pedestrian and drive-by survey. Fieldwork was designed to evaluate the degree to which historic and modern disturbances have impacted the area's prehistoric and historic archeological resources. Through examination of compiled historic, cartographic, and disturbance data, as well as through comparisons of other urban studies conducted elsewhere in New Orleans and the United States, a research design was developed to guide subsequent archeological testing in the project area.

Previous to this study Gagliano et al. (1975) conducted archeological survey along the Gulf Intracoastal Waterway; a portion of the survey covered those parts of the IHNC located adjacent to the Bywater project area. This is the only study conducted within the current project area. Fieldwork included bankline survey and visual inspection of known and probable site locations within the study area; the survey was augmented by pedestrian survey and surface reconnaissance at each site area. A total of 158 prehistoric sites and 42 historic sites were located during survey. Five significant prehistoric sites were

identified. Thirty-one sites were judged to be of moderate significance; eleven sites were assessed as possibly significant. None of the identified sites, however, fall within the Bywater area.

The Bywater area is best understood as part of the development of the city of New Orleans. The Creole neighborhoods below the Vieux Carré became the Third Municipality in 1836. After the Revolutions of 1848 in Europe, many German immigrants came to New Orleans and settled in the Third District.

A major feature of growth in the project area was development of streets. Streets in the area were unpaved in 1880, and their situation changed very little by 1896. The shell paving, planking, and gravel on streets in the project area in 1896 proved to be impermanent. Later in the twentieth century, New Orleans improved its streets and began to provide them with adequate hard surface paving, such as asphalt. By 1918, just before construction began on the IHNC, St. Claude Avenue, Burgundy Street, and Poland Avenue were paved. Other streets in the project area were paved soon afterwards.

During the railroad boom in 1837 a group of promoters in St. Bernard Parish chartered the Mexican and Gulf Railroad. Funded by a loan from the state and a \$30,000.00 grant from the city of New Orleans, the company began construction in 1839 by laying tracks down Good Children Street (now St. Claude Avenue). The line ran through the project area and beyond the city limits for 19 miles. After the Civil War the Mexican and Gulf went out of business.

The New Orleans City Railroad Company opened the first line in the project area on July 1, 1861. Known as the Rampart and Dauphine line, it originated, like all the lines, on Canal Street. By 1884 one of the routes, known as the Levee and Barracks line, ran through the project area. Its cars came down Chartres Street to Poland Avenue, where they turned up to the car barn. The cars returned to town by Royal Street.

A sign that St. Claude Avenue in the project area was preparing for residential development was a city ordinance passed in 1897 forbidding dairies within certain limits in New Orleans. After 1900, St. Claude Avenue was no longer subject to flooding after every rainfall; new drainage machinery pumped off the water. By 1910, city water and sewerage had also been provided to residents along the street. St. Claude Avenue had been the traditional boundary between adequate and inadequate drainage in the project area and between the developed and the rural area. An examination of density of population in 1910 reveals that St. Claude Avenue also served as the boundary between inhabited and very largely unoccupied portions of the project area.

Just as New Orleanians decided to supervise and control their docks, wharves, and maritime terminals, so the city also decided to regulate railroad terminals. Closely related to the activities of the Dock Board was the operation of the Public Belt Railroad. Under public operation and control, this rail line was intended to serve the public wharves and such planned public facilities as the public cotton warehouse, the public grain elevator, the Inner Harbor Navigation Canal, and the U.S. Army Base. The Public Belt Railroad began operating in 1908. Its operations affected the project area; construction of the tracks, for example, probably forced the demolition of the Andry house. The tracks from the Mississippi River to Florida Walk originally lay on a right of way the railroad purchased from the Ursuline Convent. After plans for the IHNC were adopted, the Public Belt Railroad relocated. Its present path runs from the upper parish line to France Street, then diagonally through seven blocks in a northeasterly direction. It then runs approximately parallel to the IHNC in a northerly direction to a point near Galvez Street. From there, the tracks proceed west over a right of way immediately north of and parallel to Miro Street to its terminus at Poland Avenue, a distance of one and one-half miles.

Most of the surviving structures in this area date from the 1920s and the decades following. In the 1920s St. Claude Avenue began to change in character from a residential area to a street of small shops. The site of the old streetcars barns had been taken over by the city. In the block the city erected the Fifth Precinct Police Station, ca. 1935.

Throughout its history the project area remained a neighborhood that developed differently from uptown New Orleans. Project area settlement throughout the postbellum period consisted of the Ursuline Convent, the Andry Plantation, and scattered family truck and dairy farms. The blocks between Chartres and N. Rampart streets (south of St. Claude Avenue), and north of Marais Street (north of St. Claude Avenue) were occupied entirely by farmers and their families.

However, land-use patterns gradually changed during the first few decades of the twentieth century. A number of blocks formerly used for farming were being subdivided into residential lots; much of the project area continued in cultivation and pasture in 1910.

The area's transformation from a predominantly agrarian economic base to a mostly residential and industrial area accelerated following construction of the IHNC; by the late 1930s, farming accounted for a very small portion of the area's economic base and land-use. By the late twentieth century, the property no longer was cultivated as a commercial farm.

An influx of small, typically family-owned businesses in the project area mirrored the area's postbellum and twentieth century development. Little is known about small business

development over the next several decades. A variety of small businesses were operating within the project area by 1937.

If project construction activities occur in the Bywater area, mitigation of adverse impacts to archeological properties will be necessary. Archeological investigations carried out during a disturbance study performed during January 1992 indicate four levels of perceived subsurface disturbance throughout the project area. These designations refer to anticipated integrity of potential archeological resources, and not to the current accessibility of those resources. Minor disturbance generally was assigned to empty lots, and to lots where the major structures such as residences and stores were constructed on piers. Areas designated as moderate disturbance include locations with modern constructions apparently built on fill, large parking lots, and lots with historic buildings apparently constructed on slabs. Heavily industrialized or commercialized properties, in which considerable subsurface disturbance has occurred, were classified as areas with major disturbance. Portions of these areas include whole blocks, small parts of which may exhibit only minor or moderate disturbance. Finally, the area along the IHNC, as well as the approach to the N. Claiborne Avenue Bridge, exhibited total disturbance, i.e., no substantive in situ archeological deposits are anticipated. Portions of that area may be covered with 1 to 3 m of dredged material deposited during excavation of the Industrial Canal.

Both surface and buried archeological deposits can be expected to occur within a natural levee. Unfortunately, these are also the areas that have been disturbed greatly by agriculture along with residential and industrial development. Given the degree the surface of the natural levee has been disturbed, it is highly unlikely that intact, undisturbed prehistoric archeological deposits will be found within the project area. Only those prehistoric sites buried under a protective layer of fill prior to intensive industrial and urban development of the project area have any chance of remaining intact and undisturbed. Although known examples are lacking, archeological deposits could be found buried within the natural levee terrain. Because the natural levees of the Mississippi River had been continuously aggrading since 1000 to 1300 years B.P., Troyville, Coles Creek, Mississippian, or Protohistoric archeological deposits might have accumulated on and would have been buried within the natural levees. However, it is unlikely that significant prehistoric archeological deposits are located within the project area.

As discussed earlier, historic development of the project area began in the early nineteenth century with the Ursuline Convent and the Andry Plantation. By that time, the established artificial levee system contained the Mississippi River, and prevented the deposition of large quantities of flood deposits into the project area. Therefore, historic sites buried by

natural levee deposits are not anticipated within the project area.

On the other hand, historic archeological deposits have been impacted considerably by post-depositional historic and modern disturbances. The most dominant disturbances consisted of the 1918 - 1923 construction of the IHNC, and building of the adjacent New Orleans Public Belt Railroad extension. These constructions destroyed most remains associated with the Ursuline Convent, resulted in razing of the Andry Plantation structures, and covered much of the land adjacent to the canal with 1 to 3 m of dredged material from the canal. Related impacts included construction of the artificial levee which aligns the canal, erection of canal and railroad maintenance structures, and use of the northern portion of the project area as an industrial sector. All of these activities damaged and destroyed cultural resources.

The residential portion of the Bywater project area also has been damaged by late historic and modern constructions. A number of structures, especially in the vicinity of St. Claude Avenue, have been destroyed to make way for modern development. The Poland Street Yard was razed. In addition, construction of the N. Claiborne Avenue bridge approach just west of the IHNC destroyed most historic cultural resources in that area.

Archeological investigations will consist of archeological testing followed by data recovery in the small areas of the ground to be disturbed if project impacts occur in this area. Decisions on the areas to be tested must be done on a block-by-block, and lot-by-lot basis which will consider area-specific disturbances to historic resources.

Intensive architectural investigations were undertaken within an area located in and near the Bywater National Register Historic District. Architectural investigations involved archival research and field investigation. Preliminary background research focused on identifying previously recorded historic properties within and in the vicinity of the project area. The history of the area was researched through an examination of previous cultural resources reports, National Register files, historic period maps, and pertinent secondary sources. Building-specific archival research was undertaken subsequently, in order to identify historically significant events or personages associated with buildings located within the project area. Sources consulted included city directories, period insurance maps, census population schedules, and New Orleans water connection records.

Architectural field investigations then were undertaken to compile sufficient data to enable evaluation of the architectural significance and integrity of the built resources, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]).

These field investigations incorporated two levels of architectural survey. First, a comprehensive reconnaissance survey was implemented in order to assess the integrity and period of construction of each building within the project area. A total of 179 buildings, complexes, and structures were examined. Information collected included data on use, placement, general architectural characteristics, building type, architectural style, and condition. In addition, all buildings were documented using 35 mm black and white photography, and all structures were keyed to an area map using current block and street numbers. Field assessments were made concerning construction dates and architectural integrity. Based on reconnaissance field data, buildings were classified into three categories: (1) buildings constructed after 1945; (2) substantially modified buildings lacking architectural integrity from a pre-1945 construction period; and, (3) buildings requiring intensive architectural survey and further evaluation. Fifty-four buildings, complexes, or structures were constructed after 1945. Six buildings from a pre-1945 construction period were evaluated as substantially modified and lacking integrity. Buildings classified in these two categories were eliminated from further consideration. In addition, data generated through architectural reconnaissance survey and preliminary archival research were used to develop an architectural context appropriate for evaluating building stock within the project area. This analysis indicated that the appropriate working context for the project area focused on architectural, commercial, and industrial development dating from ca. 1880 to ca. 1945.

Second, 113 buildings, complexes, and structures constructed before 1945 and that retained architectural integrity from the pre-1945 period were subject to intensive architectural survey. On-site survey was limited to exterior inspection from the public right-of-way. Building interiors and secondary elevations not visible from the street were not inspected as part of this investigation. Each building was documented using Louisiana Division of Historic Preservation's Historic Structures Inventory forms. Written data were supplemented by 35 mm black and white photographs of each structure. All forms were keyed by block and street address to a current project area map. Four major categories of information were assembled for each structure. These categories included building identification, physical description, architectural significance, and historical significance.

Reconnaissance and intensive survey field forms were reviewed for content, clarity, and accuracy. Multiple-building industrial and governmental complexes were consolidated, where appropriate. Edited reconnaissance and intensive survey data forms were integrated to produce a comprehensive data base on built resources for each block within the project area.

Upon completion of archival research and field investigations, data were analyzed in accordance with the

National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]). Buildings were assessed individually and collectively using these criteria. In addition, an impact assessment was undertaken for each proposed project segment applying the Advisory Council on Historic Preservation's Criteria of Effect [Section 800.9 (a-d)].

A literature search was undertaken to identify previous cultural resource investigations related to the current project area. Four earlier studies were identified that contained information pertinent to the current architectural investigation. Each of these efforts utilized different methodologies tailored to the objectives of the respective project.

Portions of the current project area were included in the 1979 *Architectural Survey and Evaluation of the Mississippi River - Gulf Outlet Shiplock Project in the Vicinity of the Industrial Canal* undertaken by Jerry C. Toler for the New Orleans District. The dual purposes of that investigation were to identify architecturally significant historic structures and to determine their significance. The objectives of the project were accomplished through a combination of archival research, field investigation, and data analysis. Although no individual buildings of major architectural or regional importance were identified within the current area of investigation, Toler noted that the housing stock in the area west of St. Claude Avenue "illustrates an important characteristic in that many of these newer houses are constructed employing the traditional housing patterns and house types that were used in nineteenth century development."

Other studies included the 1979 study entitled *Recommendations for National Register Districts in Community Development Areas*. The firms of Koch and Wilson Architects and Urban Transportation and Planning Associates, Inc., conducted the investigation on behalf of the Historic District Landmarks Commission of the City of New Orleans; the objective was to identify potential National Register Historic Districts and individual National Register properties in selected areas of the city. The methodology adopted for the Koch and Wilson/Urban study utilized comprehensive reconnaissance survey and building evaluation. In addition, noteworthy buildings in the proposed districts were identified and discussed briefly.

Bywater was one of the potential historic districts identified in the Koch and Wilson/Urban study. The area was assessed as significant for the overall quality and design cohesion of its collection of low-scale residential and commercial structures. The boundaries proposed for the district were the Inner Harbor Industrial Canal, the Mississippi River, Press Street, and several blocks on the lake side of St. Claude Avenue. This suggested boundary incorporated the majority of the blocks included in the current project area.

Data generated as a result of the Koch and Wilson/Urban study were used in 1985 by the State of Louisiana Division of Historic Preservation, assisted by the Bywater Neighborhood Association, in the development of National Register District documentation for the Bywater National Register Historic District. This district is architecturally significant on a state and regional level for the quality of its mixed collection of residential and commercial buildings dating from the period 1807 to 1935.

The project area of the architectural study incorporates all or portions of 64 historic city blocks. The project area is urban in character and includes examples of residential, commercial, industrial, and governmental development. Commercial development is concentrated along St. Claude Avenue and in the vicinity of the N. Claiborne Avenue bridge. An historic commercial area was documented on N. Robertson Street through surviving commercial building types. These buildings are no longer in service; inspection indicates a ca. 1900 - 1920 date of construction. Industrial development in the vicinity of the IHNC includes buildings representative of both heavy and light industrial use.

The remainder of the project area is dominated by residential use. Single, double, and multiple unit structures are represented. The building stock is low scale; block density ranges from low to medium. The plan of the area utilizes a grid design, resulting in a regular sequence of rectangular blocks of varying dimensions. St. Claude Avenue and Poland Avenue serve as principal east-west and north-south transportation arteries, respectively. Both streets include landscaped central medians, features of the New Orleans streetscape that reinforce the city's pedestrian scale and serve as practical noise buffers in high-traffic areas. These major avenues are augmented by N. Claiborne Avenue, a major street providing direct vehicular access across the IHNC.

The majority of the primary and secondary streets are lined by formal and informal walkways. Paved sidewalks generally are found in the area west of Poland Avenue and along St. Claude Avenue. Informal pedestrian paths generally are located in residential blocks east of Poland Avenue. Public landscape improvements are confined to St. Claude and Poland avenues.

The buildings contained in the project area represent examples of urban vernacular design. While these buildings frequently incorporate high style ornamentation, none exemplify high style design integrating the associated architectural characteristics of scale, proportion, massing, materials, texture, and ornamentation.

Four major building types were identified in the area. These included shotguns, camelbacks, bungalows, and pyramidal

cottages. Subcategories within the building types of shotgun, double shotgun, and camelbacks also were represented.

Sixty-one per cent of the 113 buildings subjected to intensive survey were identified as shotgun building types. Subcategories in this classification include one-bay shotguns, two-bay shotguns, three-bay shotguns, four-bay double shotguns, raised two-bay shotguns, and raised four-bay double shotguns.

Built resources documented during the intensive architectural survey were assessed using the National Register Criteria for Evaluation (36 CFR 60.4 [a-d]). Each resource was evaluated individually for integrity, individual significance, and potential for contributing as elements to potential historic districts or thematic resource classifications.

Archival research and on-site investigation indicated that three primary historic contexts were appropriate for assessing the resources contained in the project area. In addition, two buildings, 4212 St. Claude Avenue (Block 351), and the Outboard Machine Shop (Coast Guard Complex), required the development of resource-specific historic contexts to facilitate their assessment.

Six blocks fall within the boundaries of the Bywater Historic District, an area listed on the National Register of Historic Places on January 23, 1986. These are Blocks 347, 348, 349, 350, 351, and 413. The Bywater National Register Historic District is an urban historic district encompassing 120 blocks; it contains 2,051 buildings. The district is significant under Criterion C of the National Register Criteria for Evaluation. The area is important architecturally on a local and regional level for the quality and number of buildings constructed during the period 1807 to 1935. Of particular note is the district's collection of intact shotgun buildings, which accounts for 61 per cent of the building stock.

Thirty-four buildings within the Bywater Historic District are included in the area studied. Twenty-six of these buildings were investigated intensively. Five of these structures are classified as intrusions in the historic district documentation. Two additions to this category were identified as a result of the current study. Both structures have been altered substantially since the preparation of the National Register district documentation, and no longer retain design integrity from the district's period of significance.

Archival investigations indicated that one contributing building to the Bywater Historic District also was associated with a person of local significance. The building is an example of a ca. 1910 Bungalow style dwelling that has been converted to commercial use. The structure survives intact with minimal alterations to the original exterior building fabric. The building retains its overall integrity from its period of construction. The dwelling was associated with William V.

Seeber (1880 - 1954), Judge, Section C, First City Court, who resided at the address from 1908 to 1942. Seeber graduated from Tulane Law School in 1902. He practiced law and became official notary of the city of New Orleans in 1904. In the same year, he was elected to the state legislature, where he became the youngest member then serving. In 1924, he was first elected Judge, Section C, First City Court, a post he occupied until his death in 1954. At the time of his death, which was noted on the front pages of both local newspapers, he resided on Alvar Street in the Third District. The Claiborne Avenue bridge, constructed between 1953 and 1957, has as its official name the Judge Seeber Bridge.

Several additional resources within the project area were evaluated within the context of the development of the Industrial Canal zone. These include the Flintkote Industrial Complex, the Claiborne Street Storehouse, and the Public Belt Railroad Switchyard. These resources have been altered over time through modification, addition, and new construction; they do not retain integrity from the pre-1940 period of significance of the Industrial Zone.

The final structure located in the vicinity of the Industrial Canal Zone is the U.S. Coast Guard Outboard Machine Shop. This two-and-one-half story, six-bay, rectangular building is supported by a concrete slab foundation; it terminates in a shallow gable roof defined by a concrete coping. The masonry building is faced in five course common bond brick and includes Art Deco stylistic references. The building survives intact with minimal alterations. Archival research and on-site investigation do not suggest that the building possesses those qualities of significance necessary for individual listing in the National Register of Historic Places.

Holy Cross Historic District

The Holy Cross Historic District was investigated to identify and evaluate historic properties and develop a mitigation plan to avoid adverse impacts on historic properties.

An architectural survey was conducted of all areas east of the Industrial Canal which might be directly impacted, in terms of destruction or removal of structures. The purpose of the survey was: (1) to identify all historic properties located within the project corridor east of the Industrial Canal; (2) to assess the architectural significance of those historic properties according to NRHP criteria; and (3) to assess the impact to the Holy Cross National Historic District. A previous study by Toler in 1979 was also used.

Vehicular and pedestrian surveys were conducted within the study area in order to assess the architecture, streetscapes, and physical conditions of the built environment. The surveys allowed an accurate determination of the current condition of

the architectural stock. Structures that appear to be over fifty years old and that retain their integrity were evaluated in terms of NRHP criteria with the exception of structures within the boundaries of the Holy Cross National Historic District.

In the following discussion, the project corridor is divided into three sections or neighborhoods: Upper, Middle, and Lower. All three are bounded on the east by Deslondre Street and on the west by the Industrial Canal. The term "neighborhood" is used because the areas are almost exclusively residential. The "Upper Neighborhood," or northernmost section, is the area between Claiborne and Florida Avenues. The "Middle Neighborhood" is the area between St. Claude and N. Claiborne Avenues. The "Lower" or southernmost neighborhood is the area between the Mississippi River and St. Claude Avenue. The industrial facilities on the levee between N. Claiborne and Florida Avenues are described in the section concerning the Upper Neighborhood.

In summary, the three neighborhoods within the project area appear to represent three periods of settlement. The Lower is primarily historic, the Upper is modern, and the Middle represents a transition between these two. "Walls" between the three areas have been created by the up-ramps of the St. Claude and N. Claiborne Avenue Bridges. These walls further define the three neighborhoods, and represent architectural boundary lines as well. They divide areas that are distinctive in terms of architectural texture, landscaping, and building types.

Almost all of the structures in the Upper Neighborhood are modern. Dwellings built more than fifty years ago appear to be practically non-existent. This is the result of the fact that this portion of the study area was the last to be developed.

The area does not represent a typical "New Orleans Urban" scene. Rather, the Upper Neighborhood in certain places possesses rural characteristics stemming from the simplicity of the building types and their late period of construction. The majority of the homes here are side gable, four room square, or doubles of the same nature. There are few attempts to use traditional New Orleans archetypes such as shotguns or cottages. It appears, on the basis of supporting piers, that many of those which do represent such types were moved to their present sites from other parts of the city.

In recent years, that portion of Jourdan Avenue within the Upper Neighborhood has been newly paved, and a drainage canal in its center changed from open to subsurface.

The levee along Jourdan Avenue screens residences to the east from the industrial complex located to the west. Architectural evaluation of the industrial complex indicated that it is thoroughly modern. The buildings are typically steel panel industrial types. None of the structures associated with

this industrial complex exhibit historical or architectural significance.

In the middle neighborhood the architectural fabric begins to change. Historic structures older than fifty years are the exception rather than the rule. Even these few historic structures appear later than many that are present in the Lower Neighborhood. Some are typological oddities that combine architectural techniques and local building types into hybrids. The proliferation of modern, buildings is apparent. North of N. Villere Street, historic components are no longer present. The settlement pattern here is reminiscent of that of modern subdivisions: equal size houses centered on equal size lots.

The number of historic structures increases from north to south within the Middle Neighborhood. Although modern structures predominate, a greater proportion of older buildings are present here than is true of the Upper Neighborhood. Most of these are located on Jourdan Avenue.

The housing types in the Middle Neighborhood are many and varied. Some shotguns and cottages older than 50 years do exist. It is sometimes difficult to determine whether those buildings were constructed on their sites or were moved from other areas. This is a primarily modern architectural assemblage, and historic structures are a distinct minority. None of these structures are significant.

The Lower Neighborhood (St. Claude to the Mississippi River) contains a relatively large number of shotguns and doubles.

The architectural assemblage of the Lower Neighborhood is dramatically different from that of either the Middle or Upper. Much of this area is included within the Holy Cross National Historic District. Architecture here is similar to that of other historic residential areas of New Orleans. Many of the older buildings have been significantly altered, modified, or otherwise renovated.

Many of the structures here still exhibit a high degree of architectural integrity. Beautifully carved brackets and frieze mouldings along with cornices and tracery millwork adorn practically every facade. The fronts of most homes exhibit at least one local ornamental tradition.

Generally speaking, the architecture of the Lower Neighborhood consists of classic New Orleans archetypes. The majority of the homes are single and double shotguns which possess either Italianate or Eastlake details.

Several of the oldest houses in the project area present the appearance of having been severely modified. However, the nature of these modifications are not changes to the plan but to the skin. When modern building materials such as asphalt

roofing and siding and aluminum frame windows became available, many original components of older buildings were lost.

In 1991, the Museum of Geoscience of Louisiana State University submitted to the New Orleans District a final report that included a research design for archeological investigations within the Holy Cross area. Based on this research design, Earth Search, Inc. received a work order to conduct field investigations to examine the significance and integrity of archeological deposits which archival research and reconnaissance level investigation indicated might be present.

Prior to field investigations, various historic maps of the study area were digitized by the CADGIS Laboratory at the Louisiana State University College of Design. Results were used to refine previous predictions concerning locations of suspected historic features. Predicted features included remains of a nineteenth-century brickyard, a slave quarters, a truck farm, and post-1869 residential lots.

Archeological testing in the Holy Cross District was undertaken for the New Orleans District by Earth Search, Inc. Site maps were prepared for these areas, and shovel tests were excavated at 5 m gridded intervals. Subsequently, three units were excavated within these squares. The results confirmed predictions based on historical research and computerized map research. Excavations also indicated that subsurface archeological deposits in these areas have integrity and further research potential (criterion d) in that they could yield information that would advance our understanding of history.

Another goal of the research effort undertaken by Earth Search, Inc., was to determine whether significant archeological deposits were present in residential and commercial lots where structures are still standing. The New Orleans District provided Earth Search, Inc., with ownership information for selected lots which the earlier study had predicted might contain significant deposits. Earth Search, Inc., then obtained right-of-entry to some of those lots and excavated shovel tests at 5 m gridded intervals. An excavation unit was placed within one of the lots. Results of this effort indicated that archeological deposits and features are present within such lots in the study area. The results also indicated that these deposits and features exhibit the qualities of integrity and research potential, both of which are necessary for archeological sites to be considered eligible for inclusion on the National Register of Historic Places.

Excavations were not conducted within every lot or square that may be impacted by construction. However, archival research indicates that since 1869, land use has been similar on all of the squares. Therefore, the sample of squares and lots where excavations were conducted is considered to be representative of the study area as a whole.

Bridges

Modification of the IHNC Lock will require replacement of the St. Claude Avenue Bridge and alteration of the Claiborne Avenue Bridge. For this reason, the significance of these engineering structures was assessed according to National Register criteria.

Archival research was conducted to obtain dates of construction and information concerning subsequent modifications to the bridges under evaluation. Oral interviews were also conducted. The St. Claude Bridge is an examples of a type, the Strauss Heel Trunnion Bascule Bridge. The Claiborne Avenue (Judge Seeber) Bridge is an example of the vertical lift type. For this reason, research was conducted into the history of the development of movable bridge types in order to determine the place and role of these bridges in the history of their respective types. Also, research focused on determining whether there was a direct association between Joseph B. Strauss, one of America's great civil engineers, and the two bascule bridges. Finally, field visits were made to each of the bridges to assess their integrity and to obtain a photographic record for comparison with the original plans and with other, similar bridges located elsewhere.

St. Claude Bridge

The St. Claude Bridge has been determined eligible for the National Register. Built between 1918 and 1921, it crosses the canal, actually straddling the southern end of the IHNC lock. The bridge is a Strauss Heel Trunnion Bascule bridge. Two vehicular (once streetcar) lanes are located between the trusses and two cantilevered lanes outside the trusses. The northern cantilevered lane was built for a single track of the Louisiana Southern Railroad Company, leaving only one vehicular lane in 1921. There is a tower-like addition on the eastern or pivoting end of the bridge which carries a large concrete counter-weight. The opening end of the bridge rests on the west wall of the IHNC lock.

In 1949, the St. Claude Avenue Bridge was improved by the removal of the unused streetcar tracks. This resulted in a gain of two additional automobile lanes between the trusses. At this time, wooden decking was rebuilt in steel in order to meet heavier traffic loads. At this time, 9,240 pounds were added to the moving leaf and counteracted by the addition of 44 concrete blocks into the counterweight. Despite these changes the principal features of the design and construction of the bridge remain intact.

This type of bridge is significant in the history of American engineering. This was a commonly built type because it represented a relatively economic, efficient solution to the

problem of accommodating vehicular and rail traffic over navigable waterways used by commercial boats. Application of Criterion C to the St. Claude Bridge indicates that it represents a significant type of engineering structure which was in common use throughout the United States. As a representative of its type the St. Claude Bridge is eligible for inclusion in the NRHP under Criterion C.

The construction of a new lock will require destruction of the St. Claude Bridge. Mitigation will require documentation to Historic American Engineering Record (HAER) standards Level II. This level will serve to document the bridge as representative of a significant type and will result in mitigation of its research potential through curation of documents, plans, and photographs of the structures. HAER Level II Documentation consists of drawings, photographs, and a history and description of the bridge.

Claiborne Avenue Bridge

The North Claiborne Avenue or Judge Seeber Bridge is a vertical lift bridge built between 1954 and 1957. On this bridge the moving span is 360 feet long and 57 feet wide and is a steel through Warren truss with verticals. The overall bridge length, including approaches, is 2,418 feet. The approaches are of steel and concrete construction. The piles and piers are cast-in-place concrete. The raised bridge offers a 156-foot vertical clearance from mean high water, sufficient for ocean-going vessels. Closed clearance is 40 feet. The steel towers are approximately 178 feet high (230 feet above water). They contain the machinery at the top, consisting of a power cable strung between the two towers, and stairs, as well as counterweights and counterweight chains (to balance the counterweight cables).

National Register Bulletin 15 entitled "Guidelines for Applying the National Register Criteria for Evaluation" states that "...properties that have achieved significance within the past 50 years shall not be considered eligible for the National Register..." with the exception of "...a property... of exceptional importance." The North Claiborne Avenue or Judge Seeber Bridge was erected between 1954 and 1957. It is not 50 years old. Archival research and field examinations indicate that, in terms of its historic significance and engineering qualities, this bridge is not an exceptional structure. Rather, it is an ordinary bridge for its time without any particular merit in design or construction. In terms of Criterion C, then, it warrants no further consideration for nomination to the NRHP.

The North Claiborne Avenue Bridge, like many similar projects in Louisiana, was a subject of controversy among local and state politicians, particularly Mayor deLesseps Morrison and Governor Earl Long. However, the bridge itself was of minor rather than exceptional importance in terms of state and local history. In terms of Criterion A, then, it warrants no further

consideration for nomination to the NRHP. Similarly, the bridge is not directly associated with the lives of persons significant in our past (Criterion B). Further, its lack of exceptional engineering qualities obviates any potential to yield information important to history (Criterion D).

Galvez Street Wharf

The Galvez Street Wharf, designed by the office of the Board of Commissioners of the Port of New Orleans in 1922 and erected by 1929, was among four facilities established in the Industrial Canal Zone by that date. Originally known as the Claiborne Avenue Wharf, the facility was among the first improvements to the Industrial Canal Zone.

This large, single-story facility occupies a site adjacent to the canal. The rectangular, multi-bay industrial structure is supported by a metal frame and rises to a shallow gable roof sheathed in corrugated zinc. Interior bay divisions are defined by narrow tongue-and-groove paneling and accessible by steel overhead doors; natural lighting is provided by skylights. The building is functional in design and survives with its original design intact. Inspection indicates that the exterior walls, now sheathed in corrugated metal panels, originally were clad in vertical boards.

The building is significant locally and regionally for its historical associations with the early period of development of the IHNC. The building possesses those qualities of historical association with a pattern of events necessary to qualify for National Register listing under Criterion A.

The Galvez Street Wharf would be demolished for construction of the North of Claiborne alternative. The destruction of the Galvez Street Wharf would constitute an adverse effect on this historic property. Recordation of the property in accordance with standards of the Historic American Engineering Record (HAER) will mitigate this finding. The appropriate level of recordation would include documentation meeting the technical and substantive standards of HAER Level III documentation. Level III documentation requires graphic recordation of the building through large format archival photography, preparation of proportional floor plans, and compilation of summary descriptive and historical data. This permanent record of the structure would be housed at the Library of Congress in Washington, D.C.

Detour Route

A detour route will be constructed along the eastern side of the Gueringer Canal and in an area between the Walk Canal and the back protection levee. A research design for the study

of cultural resources in this area was completed for the New Orleans District (Irion, et. al., 1994).

This area consisted of undeveloped cypress swamp throughout much of its history. Based on known prehistoric settlement patterns, few if any Native American archeological deposits are anticipated in the project area. The area consists of drained inland swamp deposits, a terrain that has been not been found to be conducive to long-term occupation. In historic times, it formed the hinterlands of both the Languille and Macarty plantations, plantations that figured significantly in the Battle of New Orleans in 1815, but no activities related to the battle were in the project area. An examination of sources from the eighteenth and nineteenth centuries provided no evidence of habitation, agricultural production, or military activity in the project area. No known improvements were made in the area until the second half of the twentieth century.

Based on this intensive background research no significant cultural resources are anticipated in the area of the detour route.

Graving Site

A cultural resources investigation of the Graving Site is underway. Detailed background information on the project area has been gathered including a review of literature, maps and records to develop a comprehensive understanding of the area. This research included a review of historic maps, aerial imagery, the State Archeologists site files, the National Register of Historic Places, geological and geomorphological data, archeological reports, archives, and public records. This information allows predication of any cultural resources existing in the project area.

Background research and field inspection indicates that no cultural resources exist in the project area. A report recommending no further cultural resources investigations will be coordinated with the State Historic Preservation Office.

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