Construction of Drainage Pumping Station No. 1 was contracted for in Contract "E", July 1899, for the bid of $224,500.00 (Sewerage and Water Board 1908:66-67). Construction of the station was by the National Contracting Co. of New York (Sewerage and Water Board 1911:125).

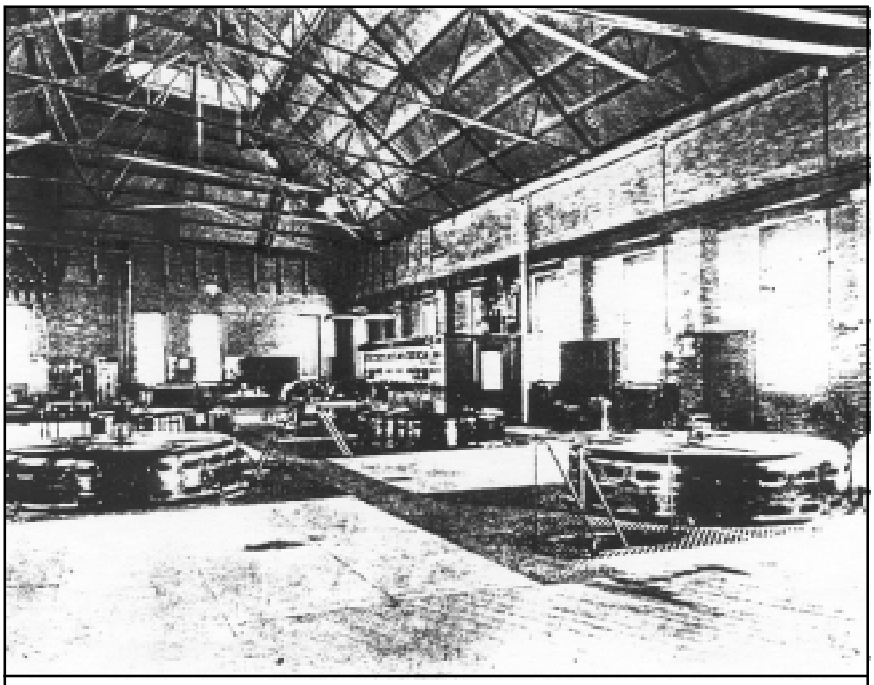

Figure 17. Interior of Drainage Pumping Station No. 1, ca. 1906 (from Earl 1906).

As originally constructed, Drainage Pumping Station No. 1 (Figure 17) had three vertical pumps, manufactured by the E.P. Allis Co. of Milwaukee. Each pump had a capacity of 250 cubic feet per second, with a lift of five feet from the level of the suction basin to the level of the discharge basin. The screw impellers of the pumps had eight blades, with a total diameter of 108". The pumps, of the type shown in Figures 18 through 20, were set in pits below the floor of the station. The pumps were driven by means of 200 kilowatt synchronous motors, each pump being connected to its motor directly by a vertical shaft and the motors turning at 88 revolutions per minute. The pump motors were manufactured by the General Electric Co. of New York. The suction and discharge pipes of the pumps were eight feet in diameter. A small centrifugal pump was installed in the station for use in pumping the dry weather flow. This pump was of single suction vertical shaft type, with an enclosed impeller of 49½" diameter; its capacity was 40 cfs with a lift of 10 feet. It was also driven by a synchronous motor (Sewerage and Water Board 1904b:2; Sewerage and Water Board 1910:159; Sewerage and Water Board 1911:124-125).

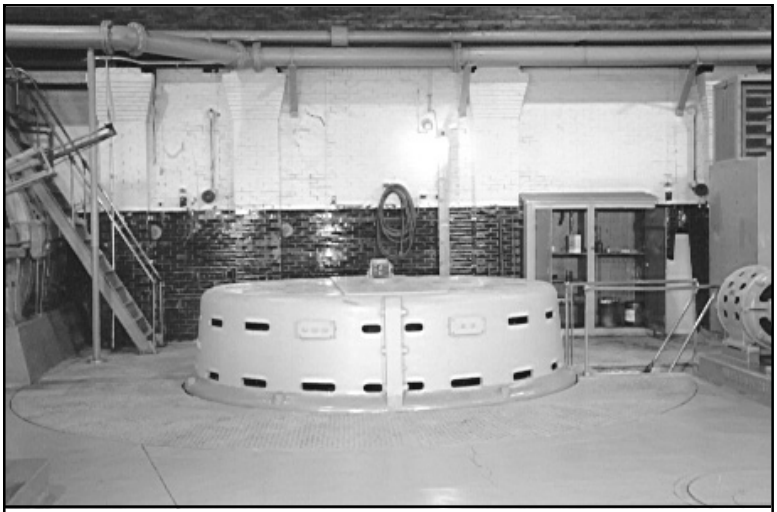

Figure 18. Vertical centrifugal pump motor housing of the type originally installed in Drainage Pumping Stations Nos. 1, 6, and 7, 1897-1903. This pump was manufactured by the E. P. Allis Co. and this motor was manufactured by the General Electric Co. This example remains at Drainage Pumping Station No. 7.

The exact date of completion of the Drainage Pumping Station No. 1 building, or the date of installation of its first set of pumps, is not clear. *The Sixth Semiannual Report of the Sewerage and Water Board of New Orleans* states that the station was "not quite complete" at the end of 1902 (Sewerage and Water Board 1902:36), implying the station would be done in 1903. However, the *Tenth Semiannual Report* states that the contractor turned the station over to the Sewerage and Water Board in May 1904, ready "to be operated

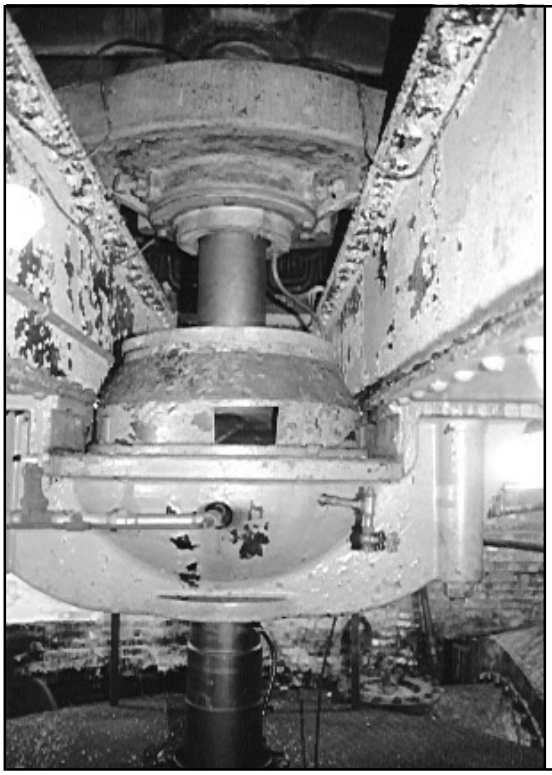

Figure 19. Lower portion of vertical centrifugal pump motor and drive shaft, of the type originally installed in Drainage Pumping Stations Nos. 1, 6, and 7, 1897-1903. Photographed at Drainage Pumping Station No. 7.

Figure 20. Vertical centrifugal pump pit, showing top of discharge pipe at right. These original pump pits, dating to 1897-1903, have been altered or eliminated at all stations except at Drainage Pumping Station No. 7, shown here.

for drainage purposes pending final tests and acceptance… the final test awaits the completion of the improvements to the Melpomene Canal from Claiborne to Broad" (Sewerage and Water Board 1904a:70). Figure 13 is a photograph of the exterior of Pumping Station No. 1 in its original configuration. Figure 17 shows the interior of the Station in 1904; the electric pump motors are pictured. Figure 21 shows one of the initial tests of Drainage Station No. 1, with one of the screw pumps then in place, pumping 250 cubic feet of water per second over a weir in the Melpomene Canal.

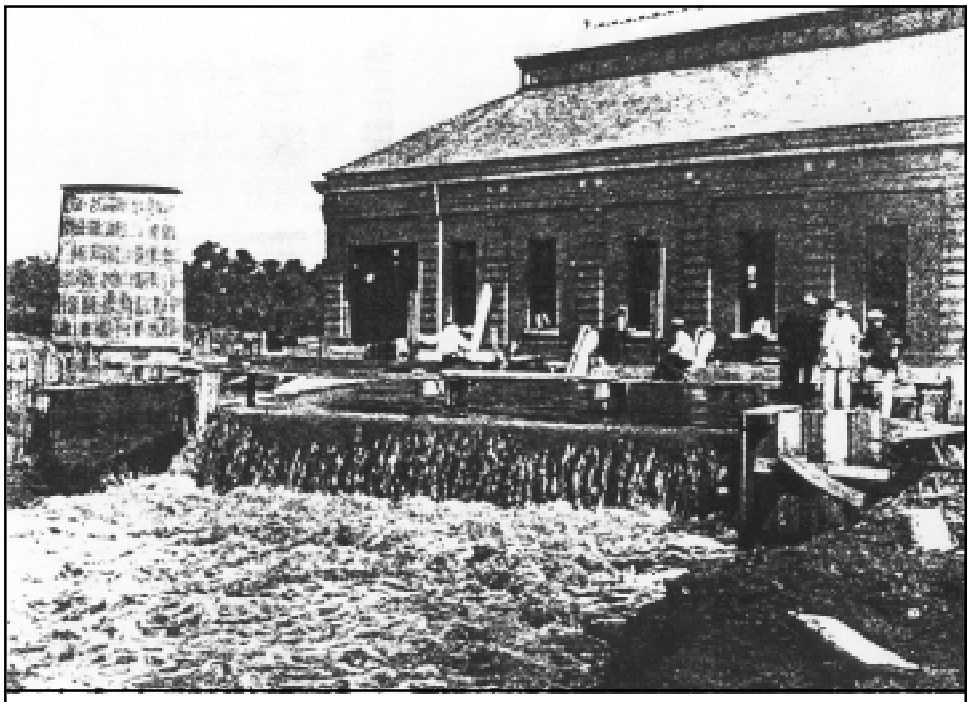

Figure 21. Drainage Pumping Station No. 1 during pump testing, 1904. The original caption states: "…shows one pump throwing 250 cubic feet of water per second over a weir erected for testing capacity of pumps. There are three similar pumps at this station' (from Sewerage & Water Board 1904).

On September 12, 1913, in anticipation of increased capacity at Drainage Pumping Station No. 1, the Sewerage and Water Board signed contract 55-D with Hampton Reynolds, a contractor of New Orleans, to enlarge the station and to build new suction and discharge basins and a portion of the Broad Street wood-lined Canal (Figures 22 and 23). The contract price was $86,400.00. A 60' by 50' addition was made on the eastern end of the station to house the 12' pumps, seen clearly in Figures 22 and 23. The work was 94% completed by December 1914; the floor of the station and a portion of the wood-lined canal could not be completed until all the pumping and electrical machinery had been installed. The contract was finally completed and accepted in April 1915, at a total cost of $91,742.43. Wooden sluice gates to control the direction of flow of the drainage water were contracted (Contract 56-D) to the Roe, Stephens

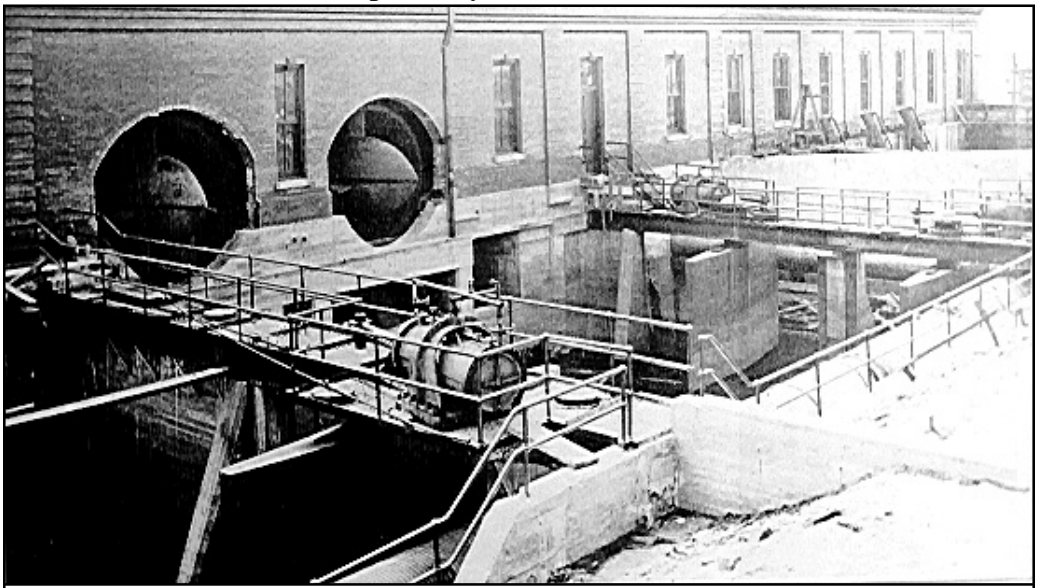

Figure 22. Exterior of Drainage Pumping Station No. 1, after alteration for 12' Wood screw pumps, ca. 1914-1915. Original caption states: "…showing the hydraulically operated flood gates and the discharge end of the twelve-foot screw pumps" (from Sewerage & Water Board 1914).

Manufacturing Company of Detroit, and completed on August 6, 1914. These sluice gates allowed water from the 12' pumps to be directed to either Pumping Station No. 6 on the Metairie Outfall Canal, or to Pumping Station No. 2, at Broad and St. Louis Streets. In order to install the pumps and other heavy equipment in Drainage Pumping Station No. 1, the Sewerage and Water Board issued contract 57-D, for a 15-ton hand operated crane to be erected in the drainage station. The

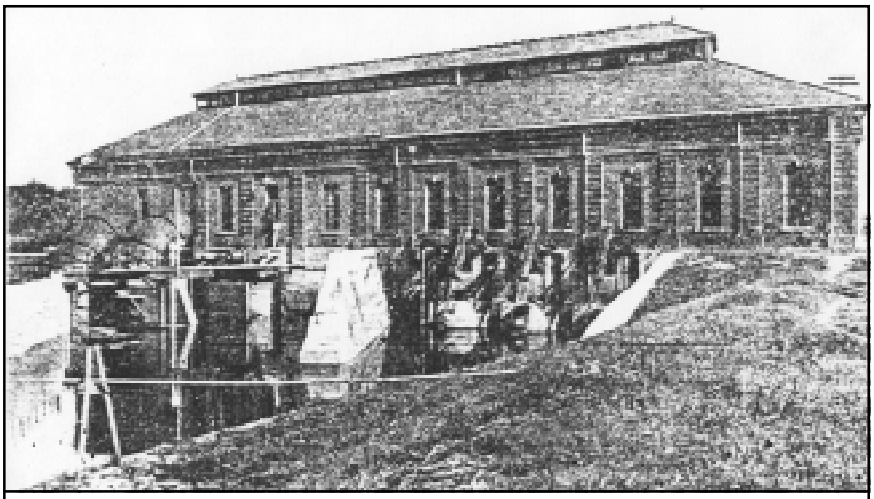

Figure 23. Exterior of Drainage Pumping Station No. 1, after alteration for 12' Wood screw pumps, photographed ca. 1915-1926 (from Sewerage & Water Board n.d.).

The first two of the 12' pumps were installed at Drainage Pumping Station No. 1 (Figures 24, 25, and 26) between December 1914 and April 1915, and were operating by the end of the first half of 1915. Testing of the Wood 12' pumps (Figures 27 and 28) was supervised by Professor W.H. Creighton, Dean of the Department of Technology, Tulane University. He was assisted by other engineers and Tulane students. Concerning the tests, Creighton stated:

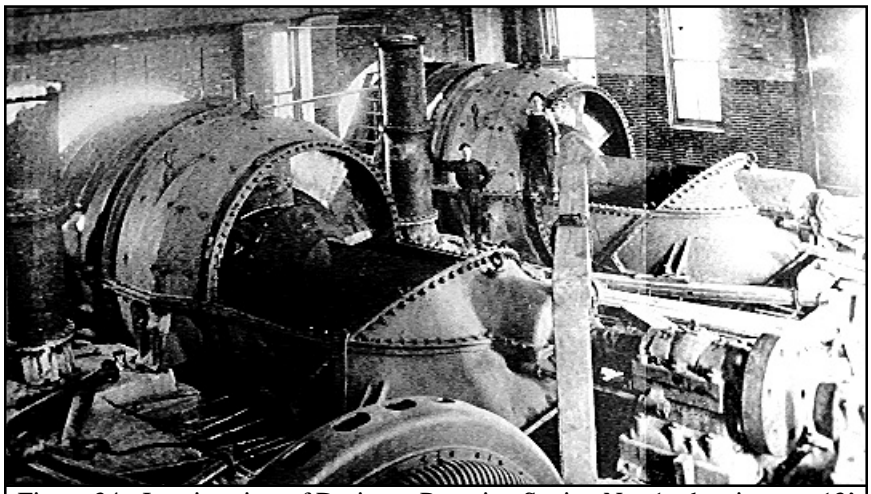

Figure 24. Interior view of Drainage Pumping Station No. 1, showing two 12' Wood screw pumps during installation, ca. 1914-1915 (from Sewerage &Water Board 1914).

> …the pump is… 12 feet in diameter of horizontal type, designed to give 225,000 gallons per minute against a 7 foot lift at 75 RPM and to work at this constant speed driven by a 600 hp synchronous motor for any lift from 0 to 10 feet… while the Wood screw pump surpasses in efficiency, under normal conditions, those of previous installations, the superiority is much greater just when the

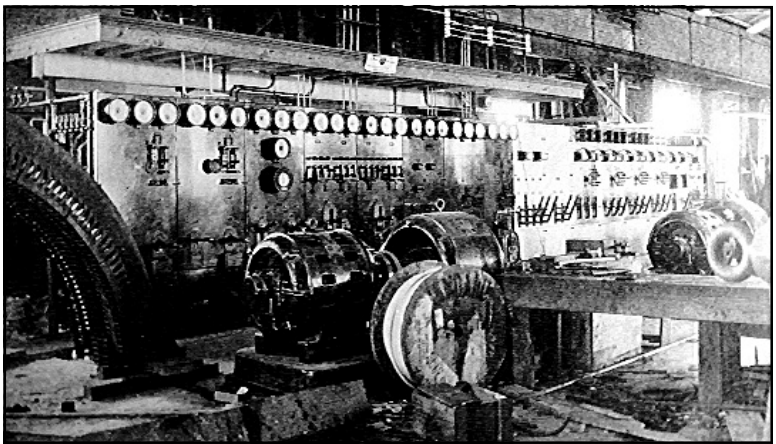

Figure 25. Interior view of Drainage Pumping Station No. 1, showing switchboard and rotary apparatus during installation, ca. 1914-1915 (from Sewerage & Water Board 1914).

> greatest service is required. Emergency service is probably the weak point of the old pumps. It is the forte of the new… results show that the pump easily answered all requirements and that they are the largest and most efficient low lift pumps in the world [quoted in Thompson n.d.:14].

Creighton's observations were widely reported in professional journals; *The Engineering News* (1/13/1916), *The Engineering Record* (1/8/1916), and also in *The Municipal Journal* (1/6/1916) (Sewerage and Water Board 1915:51).

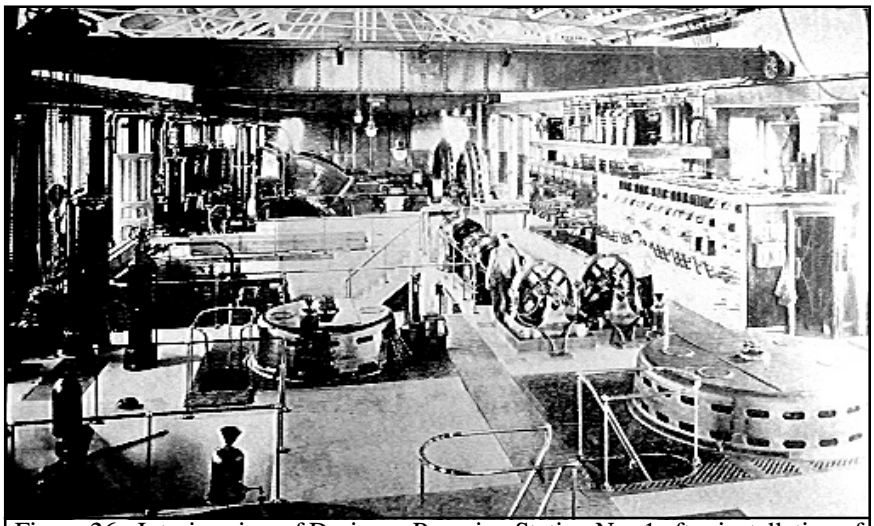

Figure 26. Interior view of Drainage Pumping Station No. 1 after installation of 12' Wood screw pumps and electrical equipment, ca. 1915. The Wood pumps are visible in the rear, the switchboard to the right, and in the foreground, the motors for the vertical screw pumps originally installed in the station ca. 1903-1904 (from Sewerage & Water Board 1915).

Following the installation of the 12' Wood screw pumps in Drainage Pumping Station No. 1 in 1915, additional alterations were made in the station's equipment. In 1916, friction clutches were installed in the old screw pumps at the station. These clutches allowed the synchronous motors driving the pumps to be started without load. This made it no longer necessary to slow down the engines of the Central Power Station in order to start the older pumps. Drainage Pumping Station No. 1 was also the site of tests of an experimental device to determine the best form of trash cleaner for adoption at all pumping station suction basins (Sewerage and Water Board 1916:78). As of 1925, all of the original pumps were still in use in Drainage Pumping Station No. 1, even though changes had been made to the electrical apparatus (Sewerage and Water Board 1925a:94).

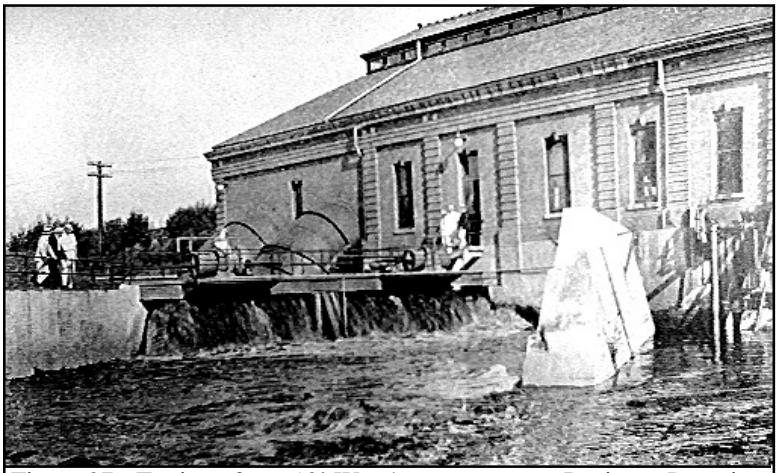

Figure 27. Testing of one 12' Wood screw pump at Drainage Pumping Station No. 1, ca. 1915. Original caption states: "…view of the discharge end of Pumping Station No. 1… pumping water from area served by Napoleon Avenue, Third Street, and Melpomene Street Canal into the Metairie Relief Canal on its way to Pumping Station No. 6. The picture shows discharge from one Wood screw pump through partly closed swinging control gates during the test. The discharge basin of this pumping station is so arranged… as to permit the discharging of the dry weather and small storm flow into the Broad Street Canal… This station is the first station designed to carry the dry weather flow across the city on its way to Lake Borgne, and thus relieve Lake Pontchartrain form the foul water which is pumped out of the city during dry weather or at the beginning of rains (from Sewerage & Water Board 1915).

On May 29, 1929, a contract was awarded to John Reiss for extension of Drainage Pumping Station No. 1 to house three of the 14' Wood pumps, at a price of $153,425.00. The structural addition and alteration was performed rapidly, because the 14' Wood pumps were reported as installed and ready for operation by April 8, 1930. As of 1930, Drainage Pumping Station No. 1 had three 14' Wood screw pumps, two 12' Wood screw pumps, three vertical shaft

screw pumps, one 42" vertical shaft centrifugal pump, and one 30" Wood screw pump. These 10 pumps had a combined capacity of 5,310 cfs (Sewerage and Water Board 1927:108, 115; Sewerage and Water Board 1929:113; Sewerage and Water Board 1930:283). With the addition of the 14' Wood pumps, Drainage Pumping Station No. 1 had a capacity seven times greater than it had when put into operation in 1904, and greater than the combined total of the seven drainage pumping stations extant in 1905.

Figure 28. Testing of the 12' Wood screw pumps at Drainage Pumping Station No 1 (background), ca. 1915. Pitot tubes have been placed in the Metairie Relief Canal to measure the velocity of flow. This data was used to calculate the efficiency of the pumps. Tulane engineering students are holding the tubes while engineers record data (from Sewerage and Water Board 1915).

When the 14' Wood pumps were installed in Drainage Station No. 1, the gates and basins at the station were arranged so that the output of these pumps was directed only towards Pumping Station No. 6. The 12' Wood pumps could still be directed towards either Pumping Station No. 6 or No. 2, and vertical screw pump units could be opened towards Pumping Station No. 2 independently of the other pumps.

In late 1927-early 1928, a 6000 kilowatt underground cable was laid between Drainage Powerhouse No. 2 and Pumping Station No. 1. The electrical switching equipment of Drainage Station No. 1 was modernized, provided with three independent busses with full relay protection, so that electrical problems could be isolated and cleared as quickly as possible; this allowed interruption to only a portion of the pumping equipment in each case of failure (Sewerage and Water Board 1928:108; Sewerage and Water Board 1929:113; *The Consultant* 1977:3).

In 1965, the original vertical pumps in Drainage Pumping Station No. 1 were removed, and more modern pumps of the same capacity were installed. This was the last pump replacement undertaken at the Station to date (1996). After the 1965 equipment changes, Drainage Pumping Station No. 1 had three 14' Wood screw pumps, two 12' Wood screw pumps, one 30" Wood constant duty screw pump, two vertical constant duty pumps, and two vertical pumps with 250 cfs capacity. One of the vertical constant duty pumps was recently removed (Mr. Rudy St. Germain, personal communication 1996). The sluice gates and other suction and discharge basin features have been modified several times since 1961.

Figure 29. Drainage Pumping Station No. 1. View of east facade, looking west from Martin Luther King Boulevard.

Figures 29 through 38 are views of Drainage Pumping Station No. 1 as it appears today (1996).

Drainage Pumping Station No. 3. Drainage Pumping Station No. 3, sometimes called the St. Bernard Pumping Station, is located at the intersection of Broad, London, and Marigny Avenues. It was designed to drain the area between the Carondelet ("Old Basin") Navigation Canal, Elysian Fields Avenue,

Figure 30. Drainage Pumping Station No. 1. View looking southwest.

Figure 31. Drainage Pumping Station No. 1. View looking northwest.

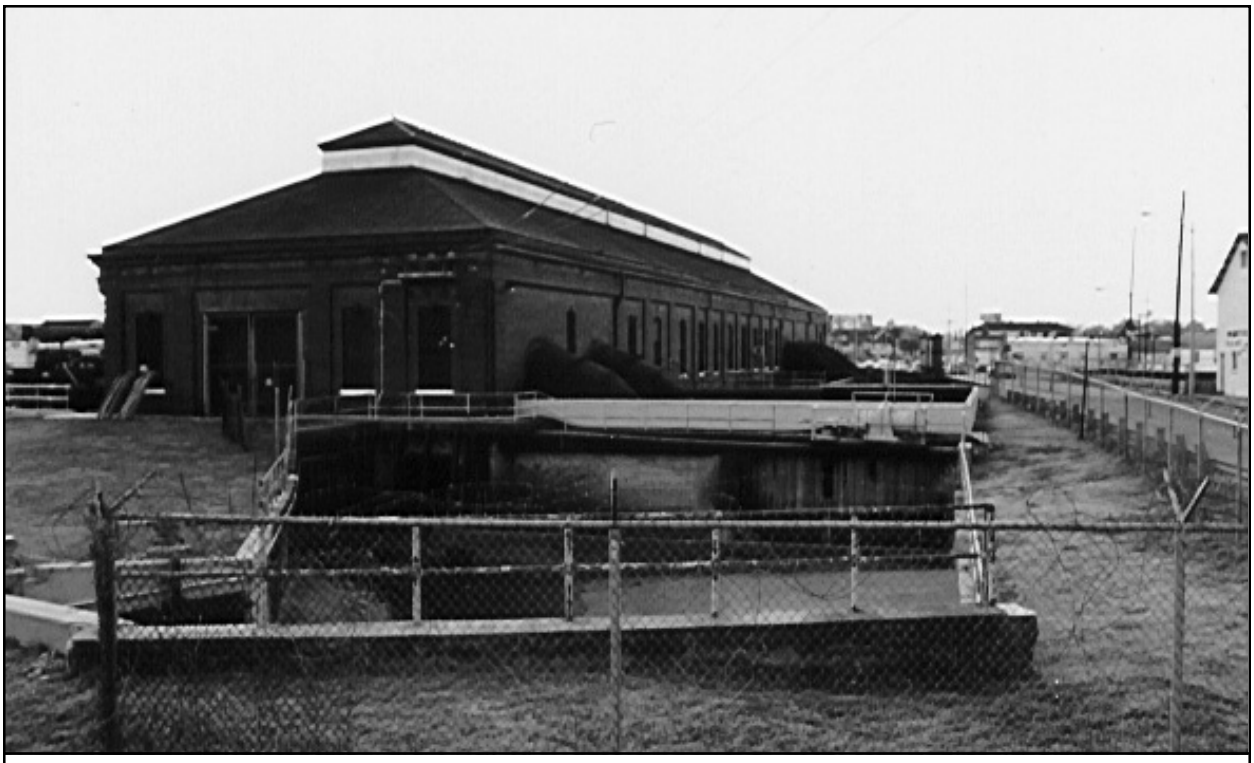

Figure 32. Drainage Pumping Station No. 1. View looking south.

Figure 33. Drainage Pumping Station No. 1. View looking southeast.

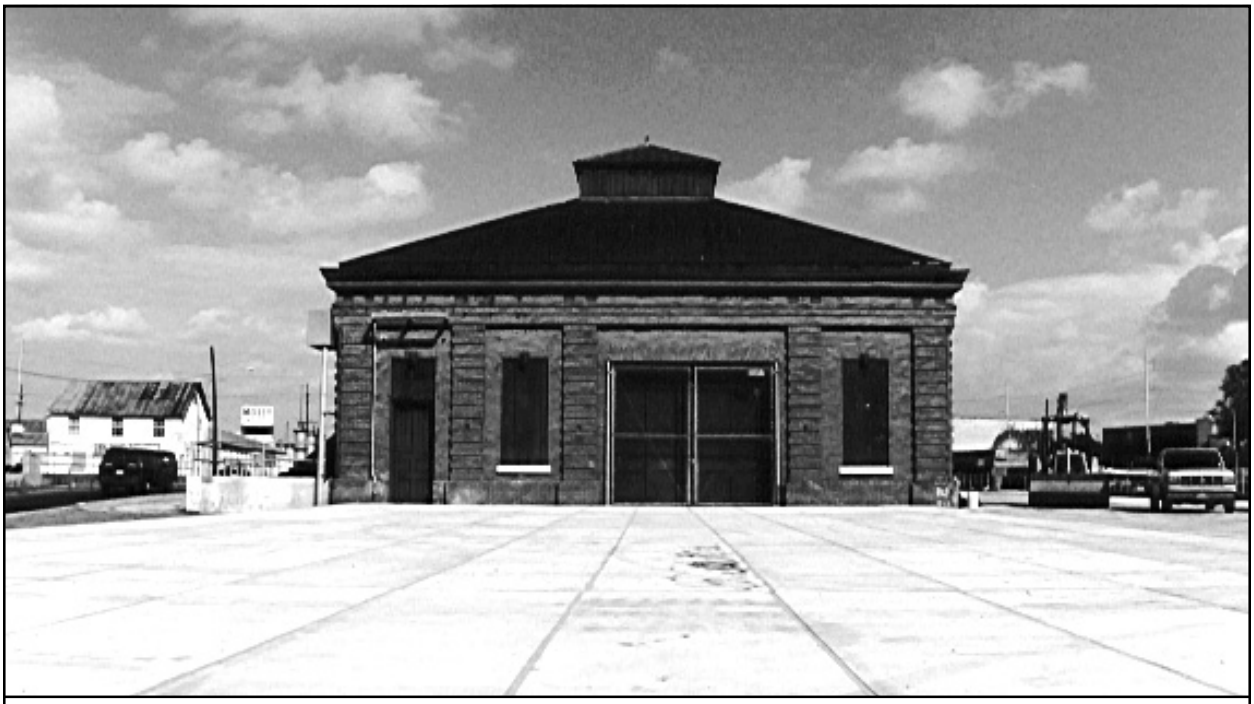

Figure 34. Drainage Pumping Station No. 1. View of south facade, looking north.

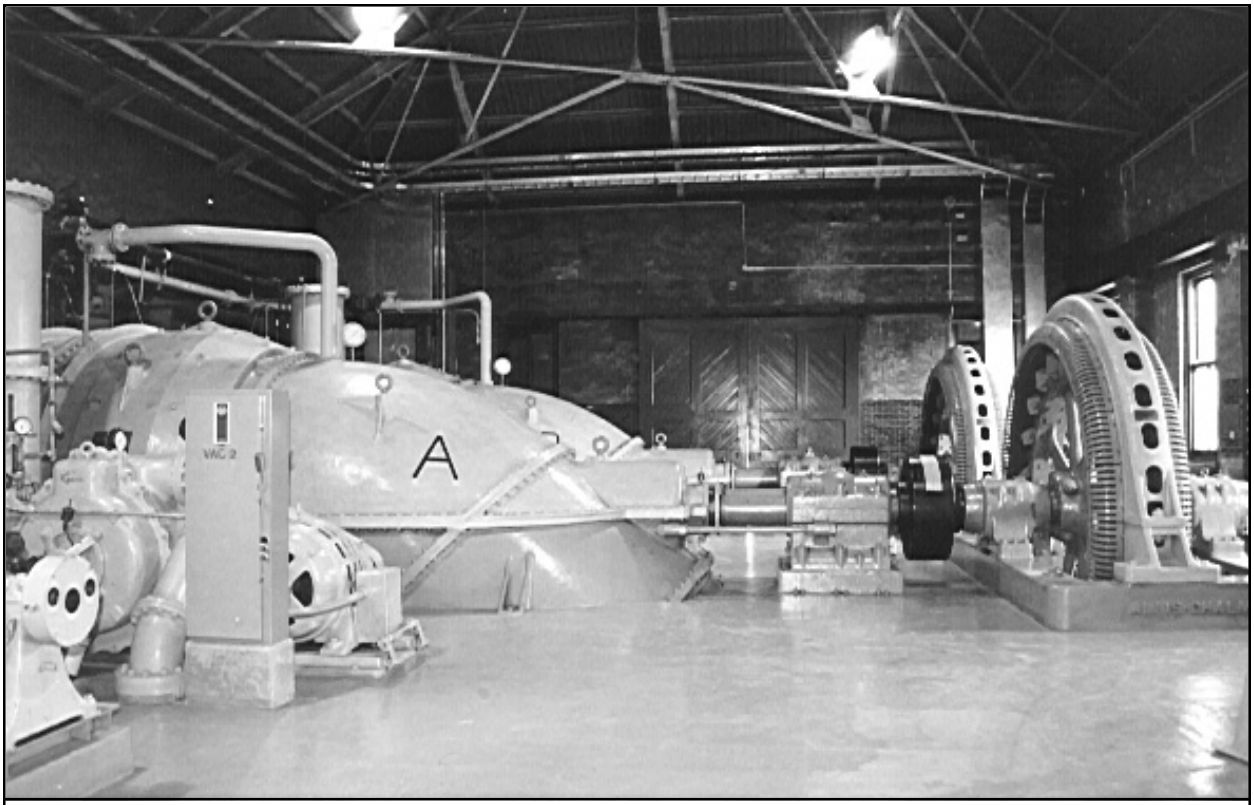

Figure 35. Drainage Pumping Station No. 1. View of northern end of interior, showing 12' Wood screw pumps and motors.

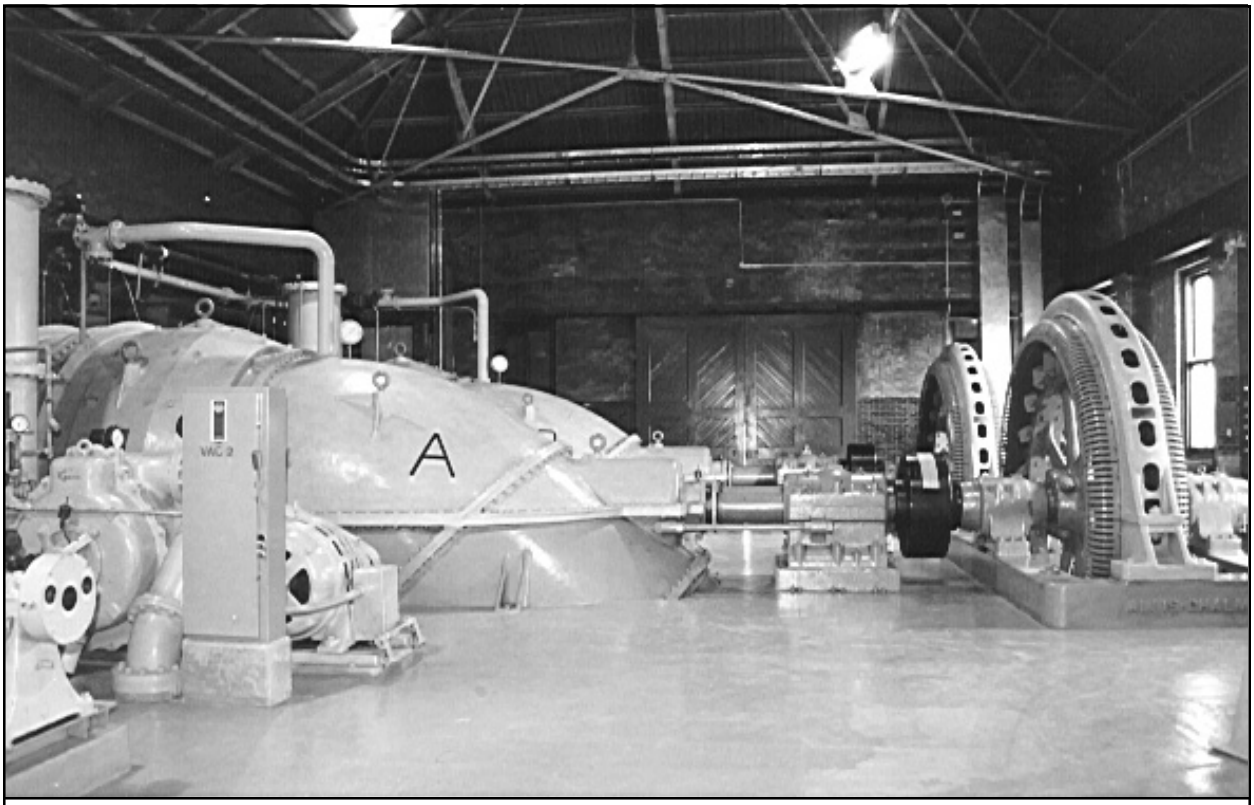

Figure 36. Drainage Pumping Station No. 1. View from southern end of interior, showing 14' Wood screw pumps.

Figure 37. Drainage Pumping Station No. 1. View of interior looking south from central portion of building. Foreground, prototype Wood screw pump on display; center, 250 cfs vertical screw pump motors.

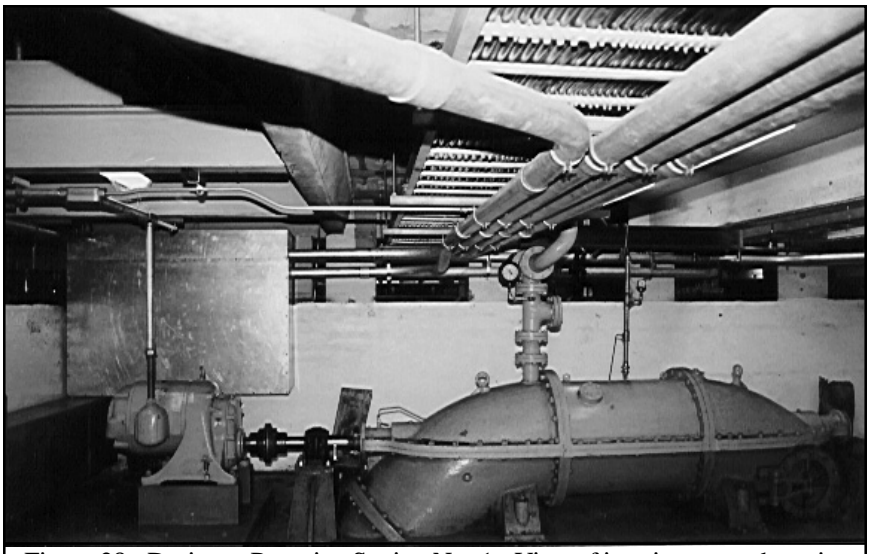

Figure 38. Drainage Pumping Station No. 1. View of interior, central portion of building, showing 30" Wood constant duty screw pump.

and Lake Pontchartrain into the Marigny Avenue Canal, and thence to the proposed the intermediate lift at Drainage Pumping Station No. 4. Station No. 4 was to pump into the Florida Walk/Florida Avenue Canal, which carried the flow to Station No. 5 at the Main Outfall Canal. Construction did not begin on the Florida Walk and Marigny Avenue canals until 1914, and the Marigny Avenue Canal was not completed until 1917. Furthermore, Drainage Pumping Station No. 4 was never built at its proposed location, the intersection of Lafayette Avenue and Florida Avenue. Instead, Station No. 3 pumped only into the London Relief Outfall Canal and Lake Pontchartrain until completion of the Marigny Avenue and Florida Walk canals (Sewerage and Water Board 1909:7; 1910:159).

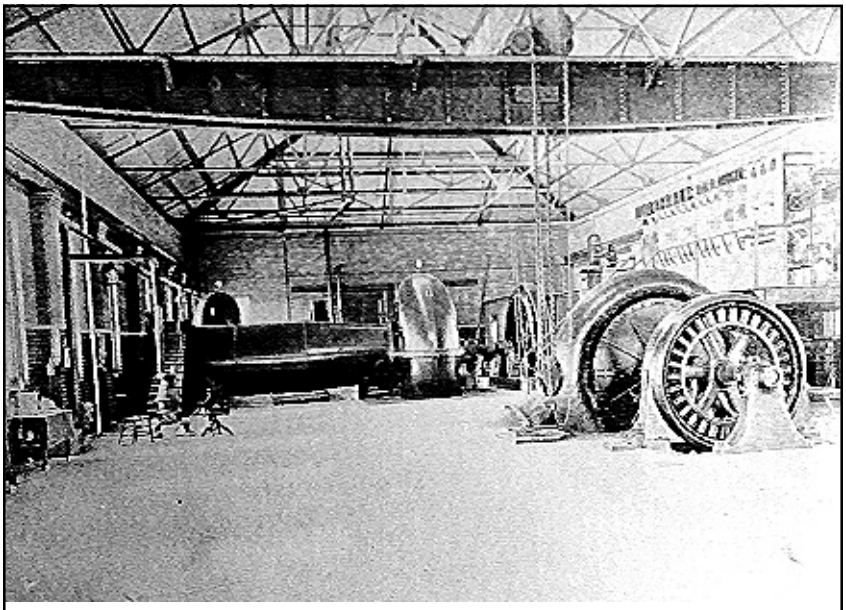

Figure 39. Interior of Drainage Pumping Station No. 3 as originally constructed, showing horizontal centrifugal pumps, 1904 (from Sewerage and Water Board 1904).

Construction of Drainage Pumping Station No. 3 was contracted for in Contract "I" of the Drainage Commission in July or August 1901. The contracted price for the station was $187,000 (Sewerage & Water Board 1908). The station was planned to initially have two centrifugal pumps of 250 cfs capacity, one pump of 50 cfs, and reserve space for four additional pumps. In contrast to Drainage Pumping Stations Nos. 1, 6, and 7, the centrifugal pumps at Station No. 3 were horizontal centrifugals (Figure 39), with both pumps and motors erected on the floor of the station instead of in sub-floor pits. The pumps were not submerged and were primed by means of a motor-driven vacuum pump. No gates were required in the suction and discharge basins of these pumps, and being at floor level, they were easily accessible for maintenance and repairs. The horizontal centrifugals were also more easily started than the vertical centrifugals because they were not under load until they were run at full speed, and were primed by the vacuum pump. The two larger pumps were designed for a lift of eight feet, and the smaller a lift of 12 feet across the station. Each 250 cfs pump was driven by a three phase, 25 cycle, 3,300 volt synchronous motor (Sewerage and Water Board 1904b:2; 1909:7; 1910:159; 1915:168). The 50 cfs pump was the constant-duty pump. Construction of Drainage Pumping Station No. 3 was virtually

complete by the end of 1902, and the completion of the contract was accepted by the Sewerage and Water Board in 1903. Figure 14 shows Drainage Pumping Station No. 3 as originally built. Figure 39 is an interior view of Station No. 3, showing one of the horizontal centrifugal pumps.

In 1912, planning began for an increase in pumping capacity at Stations 1, 3, 6, and 7 (Sewerage and Water Board 1912a:17). Stations 3 and 7 were enlarged after Stations 1 and 6. Contract 76-D, for construction of foundations and concrete suction pipes for two 12-foot Wood screw pumps, discharge basins, bypass, and switchboard gallery at Drainage Pumping Station No. 3, was issued to John Reiss of New Orleans on May 25, 1917. The contract amount was $60,365.00. Installation of the Wood pumps and other work was completed in 1918 (Sewerage and Water Board 1917:81; 1918:82)

Drainage Pumping Station No. 3 was modified for the installation of 14' Wood screw pumps in 1930-1931. The building's western end was extended and three 1,000 cfs Wood pumps installed in 1931 (Contracts 114-D, 116-D, 183-D, 5036).

In 1950, new flood gates were constructed at Station No. 3, and in 1970-1972, further alterations were made. These modifications in the early 1970s included the addition of a mechanical trash screen cleaner. In 1976, attempts were made to floodproof part of the machinery at the station, but these modifications were not apparently fully successful. Figures 40 through 46 show Drainage Pumping Station No. 3 as it appears today (1996).

Figure 40. Drainage Pumping Station No. 3, viewed from the northeast.

Drainage Pumping Station No. 4. Drainage Pumping Station No. 4 was not built in the location originally proposed in the 1895 Drainage Plan. Instead, Station No. 4 was not constructed until almost one-half century later, at a completely different location. Plans for a new drainage pumping station, designated Station No. 4 but located at Prentiss Avenue and the London Outfall Relief Canal, were drawn up in 1938; however, construction was not to begin until late in

Figure 41. Drainage Pumping Station No. 3, viewed from the northwest.

Figure 42. Drainage Pumping Station No. 3, viewed from North Broad Avenue.

Figure 43. Drainage Pumping Station No. 3, viewed from the northwest. Discharge basin and discharge pipes of 14' Wood screw pumps are visible.

Figure 44. Drainage Pumping Station No. 3. View of discharge basin; 12' Wood pump at left, 14' Wood pumps at right (west) end of the station.

Figure 45. Drainage Pumping Station No. 3, viewed from railroad bridge over the London Avenue Outfall Canal. View of the discharge basin.

Figure 46. Drainage Pumping Station No. 3. View of interior looking east from the central portion of the building; in the foreground are two horizontal centrifugal constant duty pumps.

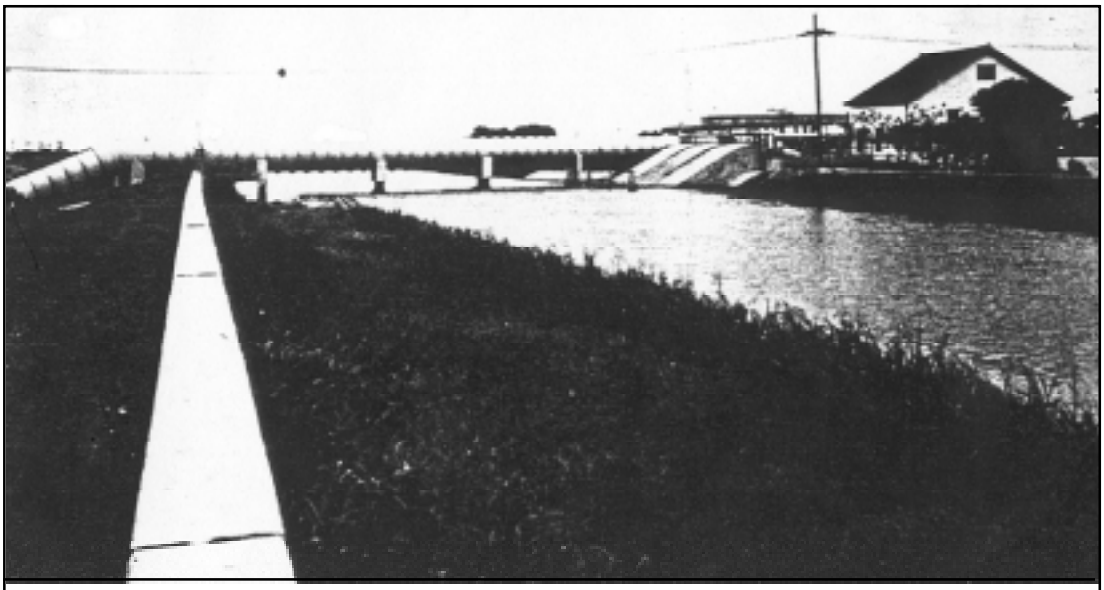

Figure 47. Drainage Pumping Station No. 4, 1962, showing new 10' steel siphon over the London Avenue Outfall Canal (from Sewerage and Water Board 1962).

World War II. On August 9, 1945, Contract 136-D was issued for construction of Drainage Pumping Station No. 4. Originally, the station was equipped with two 320 cfs horizontal centrifugal pumps. Construction of the station was completed in 1946.

Major additions were made to Station No. 4 in the late 1950s, and a 1000 cfs screw pump was installed ca. 1960. A new 36" constant duty trash pump was installed in 1963/1964. A mechanical trash screen cleaner and another 1000 cfs screw pump were added to Station No. 4 in the late 1960s. Figure 47 shows Station No. 4 in 1962. A flood protection wall was constructed on the London Outfall Canal side of the station ca. 1972. A third 1000 cfs screw pump was installed at this station an unclear date. Figures 48 through 50 show Drainage Pumping Station No. 4 as it appears today (1996).

Figure 48. Drainage Pumping Station No. 4, viewed from the southeast. Pumping equipment is obscured by a tarpaulin; sandblasting in progress.