

## CHAPTER 7 RECOMMENDATIONS

It is recommended in Chapter 6 that Drainage Pumping Stations Nos. 1, 3, 6, and 7 should be considered eligible for nomination to the National Register of Historic Places. Furthermore, it is recommended that these stations along with their associated canals should be considered contributing elements of a drainage system National Historic District. Thus, the effects of Southeast Flood Control Project and the Lake Pontchartrain and Vicinity, Louisiana Hurricane Protection Project on these structures, their associated engineering apparatuses, and canals must be evaluated.

### Effects Of Proposed Improvements

**Drainage Pumping Station No. 1.** The work to be conducted on Drainage Pumping Station No. 1 under the Southeast Flood Control Project consists generally of an enlargement of the station, installation of two new pumps in the building addition, cosmetic alterations to the existing building, and alteration of the existing drainage basin. Figure 94 shows a plan of the areas of potential effect on Drainage Pumping Station No. 1. Figure 95 shows an overall view of the Station after proposed construction.

The addition to the existing structure consists of an extension, measuring 105' 11" by 53' 8", attached to the to the south end of the building. The existing south wall, constructed ca. 1930 for installation of the 14' Wood screw pumps, will be removed. Two 11' horizontal screw pumps are to be installed in the new addition to the structure, while the arrangements of pumping equipment in the existing station will not be altered. Other alterations will be made to the present building structure. Proposed plans call for reroofing the existing building main roof and monitor by removing the asphalt roofing and replacing it with standing seam copper roofing, consistent with the new construction. The wooden siding currently covering the monitor windows is to be

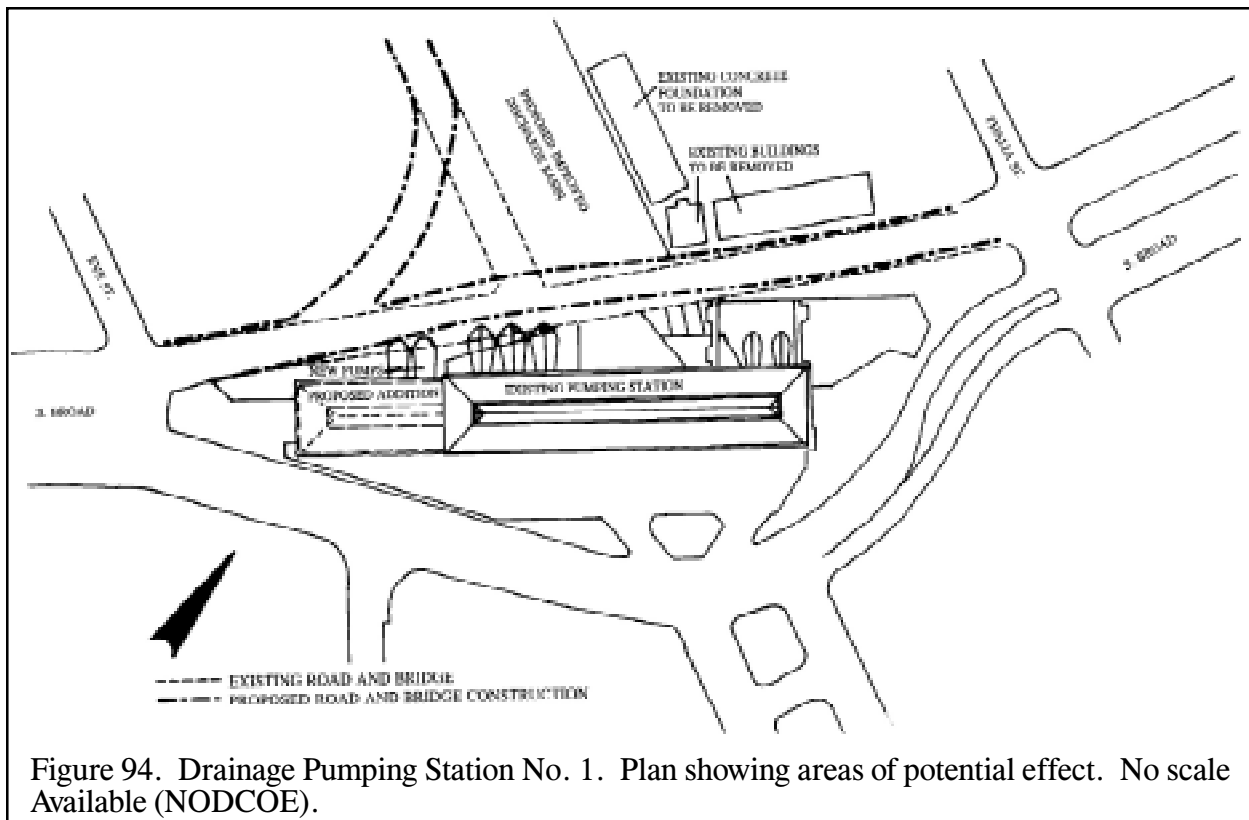


Figure 94. Drainage Pumping Station No. 1. Plan showing areas of potential effect. No scale Available (NODCOE).

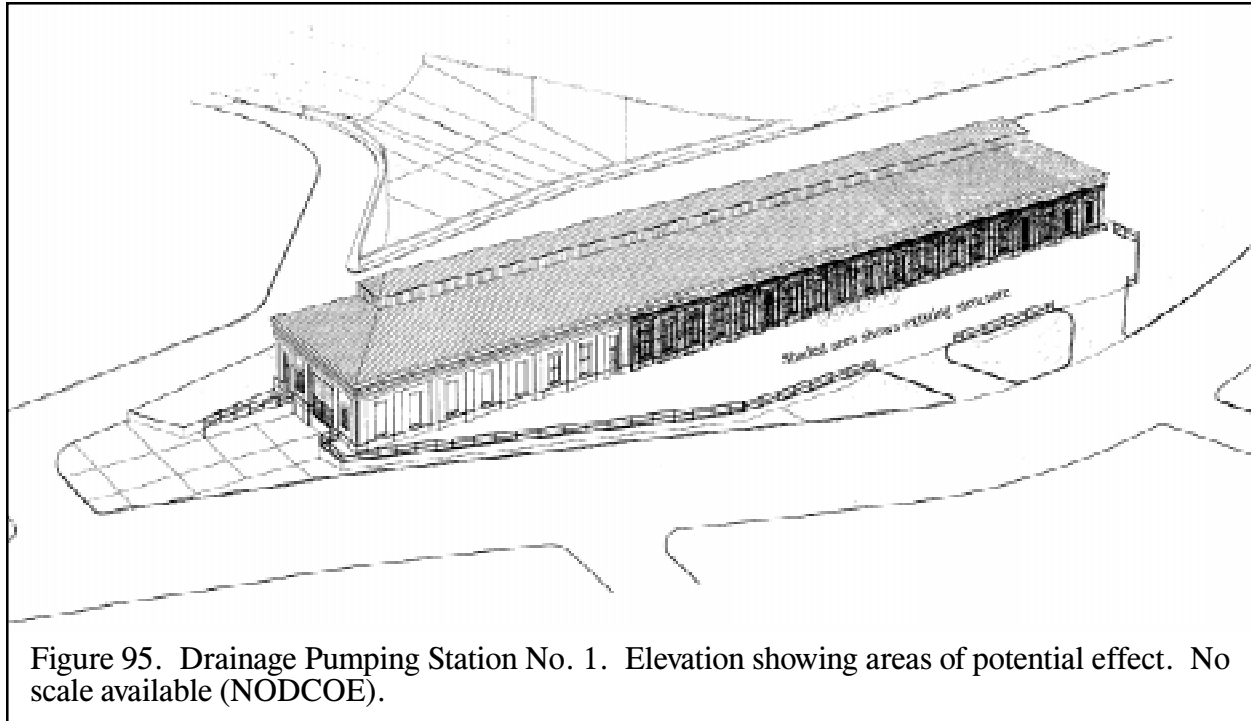


Figure 95. Drainage Pumping Station No. 1. Elevation showing areas of potential effect. No scale available (NODCOE).

replaced with standing seam copper siding. The existing galvanized iron roof guttering is to be removed and replaced with copper guttering. The current plywood one-piece window shutters are to be removed and roll-up shutters installed on most windows of the existing structure. Four sliding-sash windows in the existing structure will be replaced with fixed aluminum louvers.

The existing discharge basin is to be altered by the removal and replacement of 8' 11" flap valves and removal and reuse of 48" flap valves. The southern side of the discharge basin is to be enlarged by relocation of Martin Luther King Blvd. at its intersection with the southbound lanes of S. Broad Ave., creating a bend in Martin Luther King Blvd. where it currently intersects S. Broad Ave. in a perpendicular fashion. The currently straight S. Broad Ave. bridge over the discharge basin is to be replaced by one of greater length to span the enlarged basin, and which will curve slightly to provide greater distance between S. Broad Ave. and of the 14' Wood screw pump discharge tubes.

On the northern side of the discharge basin, two buildings adjacent to the basin and to S. Broad Ave. are to be removed. 1431-1433 Broad Street is a two-story frame building which is covered in corrugated metal on the Broad Street side. The first story on the other three sides is 10" or 11" vertical boarding with battens. The second floor has wide horizontal drop siding with several six over six windows with shallow mullions. There are uncovered exterior stairs to the second story. 1415 Broad Street is a long, one-story, gable roof building with a variety of exterior surfacing on the Broad Street side. These include corrugated metal, horizontal drop siding in wood, and artificial brick or stone on the northern half. There is a more consistent building system of a wall midsection with large "shop" windows (four) and vertical boarding which is held by two feet or so, at the top of the wall and bottom, of clapboards on the western half. The rear of this section has vertical boards and battens with horizontal boarding on top. The south end wall is corrugated metal. Both buildings rest on slab foundations and appear to represent mid-twentieth-century vernacular construction. It is likely that they were constructed after 1945, and neither is eligible or potentially eligible for nomination to the National Register of Historic Places.

**Drainage Pumping Station No. 3.** Proposed improvements to Drainage Pumping Station No. 3 under the Lake Pontchartrain and Vicinity, Louisiana Hurricane Protection Project consist



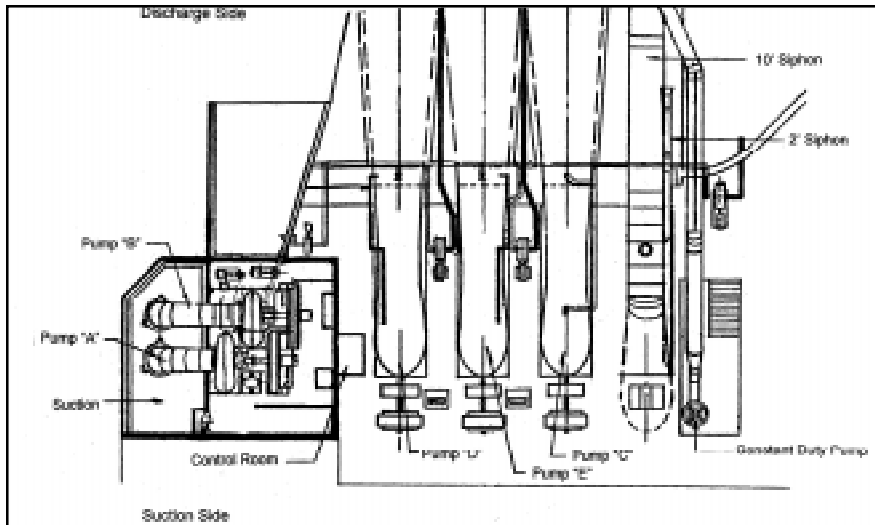


Figure 98. Drainage Pumping Station No. 4. Plan of existing station (NODCOE).

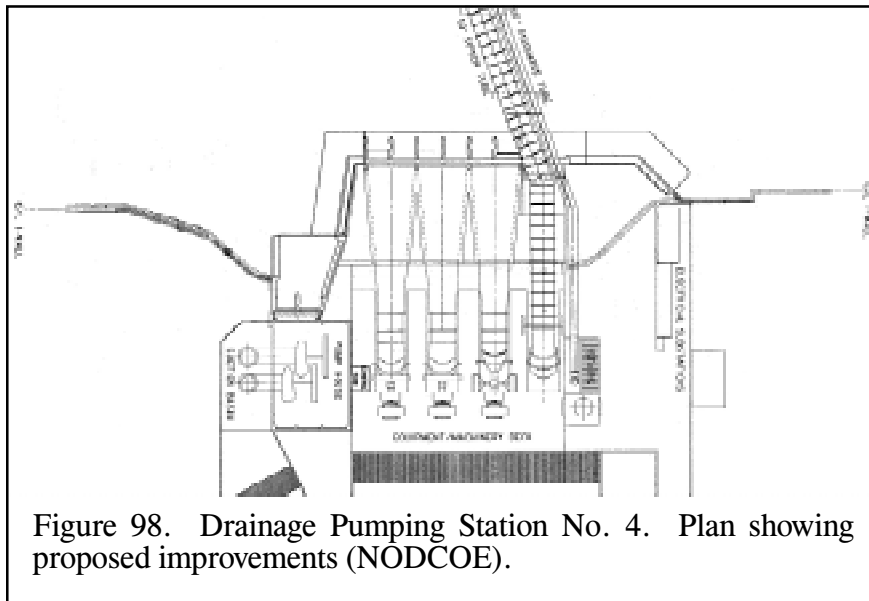


Figure 98. Drainage Pumping Station No. 4. Plan showing proposed improvements (NODCOE).

emergency closure capabilities in the event of pump failure. The single gated monolith in front of the three 1000 cfs horizontal pumps will be built as close as possible to the existing culverts, and will have six sluice gates. Each of the discharge culverts for the three 1000 cfs horizontal pumps will be fronted by two gates. The discharge basin for the two 320 cfs centrifugal pumps will be removed, and a new discharge basin, incorporating two gates at the face of the existing pumping house, will be installed. Concrete T-wall and concrete-capped I-wall will tie the new protection with the protection adjacent to the pumping station. A T-wall will saddle the existing cross-canal siphon. Gate power will be supplied by a separate 25 Hz circuit of an existing Sewerage and Water Board electric switchboard. Portions of the reinforced concrete discharge area liner that are removed during construction will be replaced upon completion of the fronting protection (from United States Army Corps of Engineers 1994:4-

6). Figure 98 is a plan of Drainage Pumping Station No. 4 as it exists today, and Figure 99 is a plan of the station after proposed improvements.

As noted in Chapter 6, Drainage Pumping Station No. 4 is not in and of itself eligible for nomination to the National Register of Historic Places. Proposed improvements to this station are only of concern insofar as they affect the drainage system as a whole.

**Drainage Pumping Station No. 6.** The proposed improvements to Drainage Pumping Station No. 6 under the Lake Pontchartrain and Vicinity, Louisiana Hurricane Protection Project consist of fronting protection in the form of pile-founded concrete monolith structures with sluice gates at all of the existing discharge tubes associated with the existing horizontal pumps. Portions of the existing concrete discharge basin slab will be removed in the areas where a new sluice-gate control structure is to be constructed. Each horizontal pump will be provided with its own reinforced concrete discharge tube. Each reinforced concrete discharge tube will be fronted by two gates. The sluice gates will provide emergency closure capabilities in the event of pump failure.

The bottom slab I-walls will provide closure east and west of the two 590 [550] cfs and four 1080 [1000] cfs pumps. The I-walls will complete the closure of the east side pumps. The I-walls will complete the closure of the east side pumps. The concrete sluice gate monoliths include center columns and side wall enlargements at the ends of the discharge tubes. Existing narrow common walls between pump tubes are to be widened at the monoliths to accommodate adjoining sluice gate frames. Additionally, center columns are to be installed in each monolith to facilitate the use of two gates at each pump. Figure 100 is a plan of Drainage Pumping Station No. 6 as it currently exists. Figure 101 is a plan of the Station after proposed improvements.

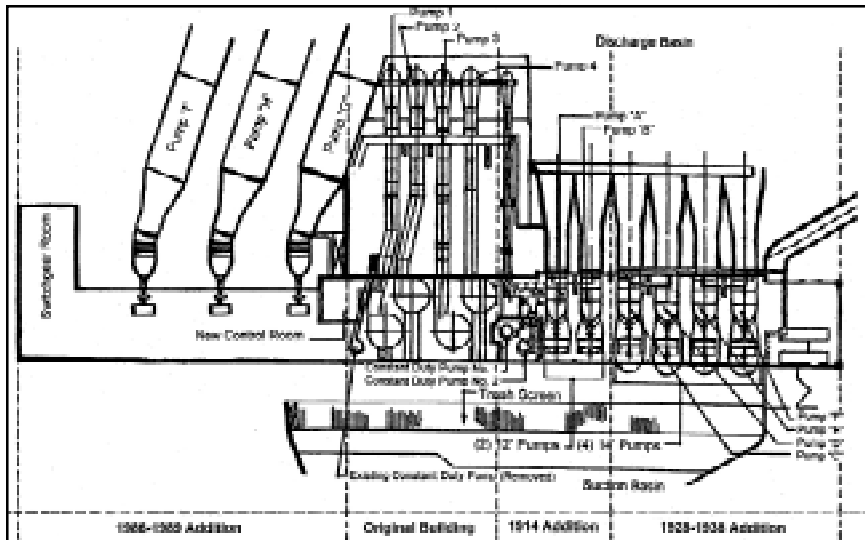


Figure 100. Drainage Pumping Station No. 6. Plan of existing station (NODCOE).

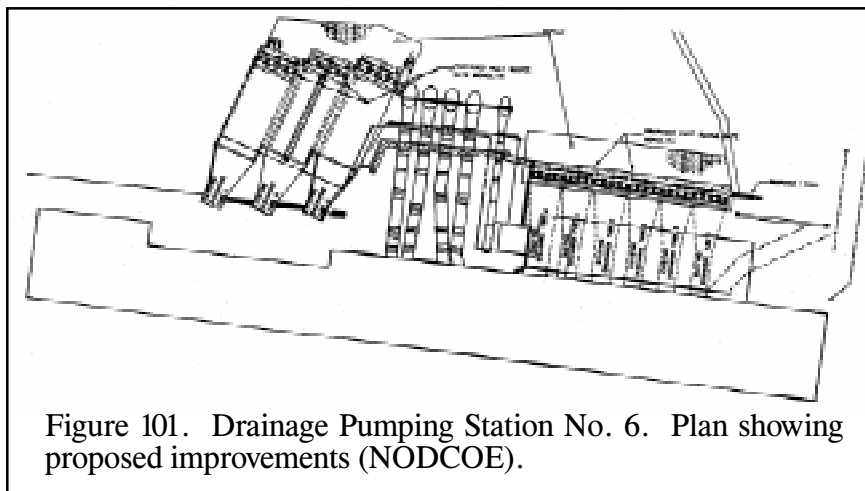


Figure 101. Drainage Pumping Station No. 6. Plan showing proposed improvements (NODCOE).

**Drainage Pumping Station No. 7.** Proposed improvements at Drainage Pumping Station No. 7 under the Lake Pontchartrain and Vicinity, Louisiana Hurricane Protection Project consist of fronting protection in the form of pile-founded concrete monolith structures with sluice gates at all of the

existing discharge tubes associated with the existing horizontal and vertical pumps. Portions of the existing concrete discharge basin slab will be removed in the areas where a new sluice-gate control structure is to be constructed. Each pump will be provided with its own reinforced concrete discharge tube. Each reinforced concrete discharge tube will be fronted by two gates. The sluice gates will provide emergency closure capabilities in the event of pump failure. The T-wall monoliths will be constructed to connect the existing canal floodwalls to the ends of the new gate control structures. The gate control structures will be joined together at the center of the discharge basin by another T-wall monolith. The concrete sluice gate monoliths include center columns and side wall enlargements at the ends of the discharge tubes. Existing narrow common walls between pump tubes are to be widened at the monoliths to accommodate adjoining sluice gate frames. Additionally, center columns are to be installed in each monolith to facilitate the use of two gates at each pump. Figure 102 is a plan of Drainage Pumping Station No. 7 as it currently exists. Figure 103 is a plan of the Station after proposed improvements.

**Canals Associated with Drainage Pumping Stations Nos. 1, 3, 4, 6, and 7.** As stated in Chapter 6, the individual canals making up the major features of the New Orleans drainage system network have all undergone alteration since construction began of the system 100 years ago. Nonethe-

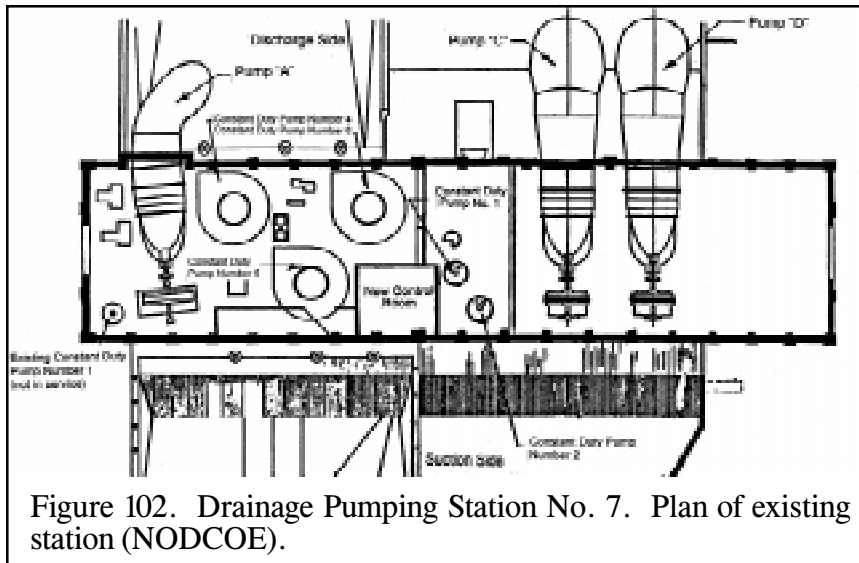


Figure 102. Drainage Pumping Station No. 7. Plan of existing station (NODCOE).

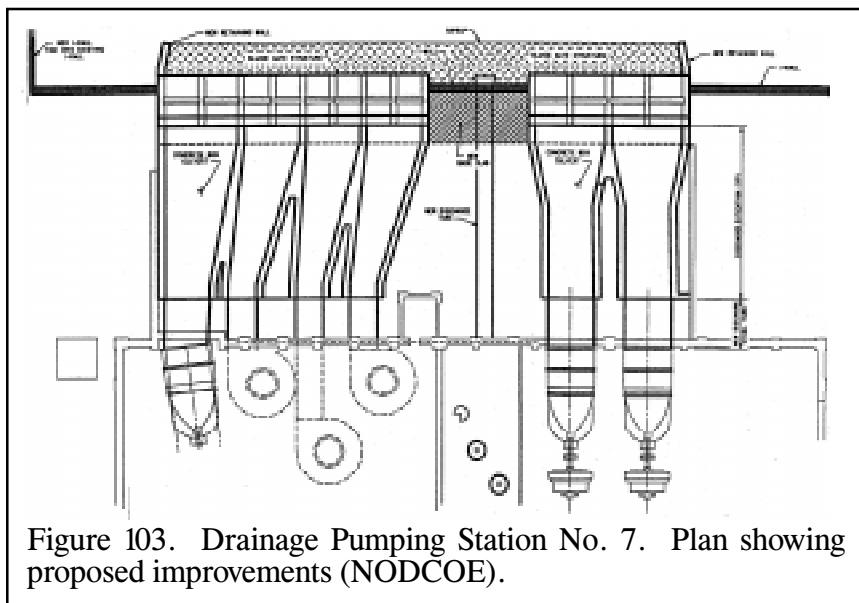


Figure 103. Drainage Pumping Station No. 7. Plan showing proposed improvements (NODCOE).

less, the canals as functional elements of the system remain in place and in use. The proposed improvements to Drainage Pumping Stations Nos. 1, 3, 4, 6, and 7 will have a negligible effect on the drainage network because only the discharge basins of the individual stations will be modified. These discharge basins all have been enlarged and modified several times since their original construction.

**Effects of Proposed Improvements on Associative Significance (Criterion A)**

The proposed improvements under the Southeast Louisiana Flood Control Project will have no adverse effect on the associative significance of Drainage Pumping Station No. 1. The expansion of the structure will not affect the integrity of either the significant engineering or architectural features of the structure. In addition, the proposed expansion is for the purpose of improving drainage in the city. This emphasizes the strength of the associative significance of this station rather than diminishes it.

Similarly, the proposed improvements under the Lake Pontchartrain and Vicinity, Louisiana Hurricane Protection Project will have no adverse effect on the associative significance of Drainage Pumping Stations Nos. 3, 6, and 7. The fronting protection construction will not affect the integrity of either the significant engineering or architectural features of these structures. In addition, the intention of the project is to improve the system by protecting the stations from storm surge, which emphasizes rather than diminishes the strength of the associative significance.

Finally, because there will be no adverse effect on the associative significance of the pumping stations and their associated engineering features and canals as a result of these two projects, we can conclude that there will be no adverse effect on the associative significance of the system as a whole.

**Effects of Proposed Improvements on Architectural Significance (Criterion C)**

**Drainage Pumping Station No. 1.** The proposed expansion of Drainage Station No. 1 is, for the most part, well designed and will have no adverse effect on the historic building. The

architects of the expansion are to be commended for the care they have taken to replicate Harrod's detailing. As an extension of the overall massing, the architectural rhythms, details, and materials of the existing building, the new fabric will increase the station's monumental presence. Isolated by streets and resting temple-like on its podium next to its canal, the building could stand as a textbook example of the ideal relation between a fine monument and ambient neighborhood of small vernacular units. Only the heavy traffic of Broad Street, which cuts the monument off from its community on the west, and the fact that it is not a public use structure — there is no reason for residents to approach it as they would a library or a market — spoils the illusion.

Extending the drainage station is historically appropriate because the existing building is the result of three separate construction episodes. The first two (1899-1904 and 1913-1915) are almost impossible to distinguish from each other, and the third (1930) is revealed only by a slight change in brick color. It should be noted that the proposed addition, while compatible with the historic character of the existing station, will be distinguishable from the earlier construction as is recommended by the *Secretary of the Interior's Standards for Rehabilitation*. Structural requirements necessitate double pilasters at the junction of the existing and new construction. These then, will serve to demarcate the older and newer parts.

Nonetheless, some of the changes for the proposed fourth extension raise some concerns for discussion. First, the present roof will be replaced with a new copper seamed roof. Historic records indicate that the original roof was slate. While the seamed metal roof is not historically inappropriate, the terra-cotta crests on the monitor ridge on the existing structure will be removed according to the plans. It is recommended that the terra cotta monitor crests be replaced on the new copper roof on both the existing structure and the new addition.

The plans for the addition also indicate the installation of four metal doors and windows with frames in the new construction rather than historically appropriate wooden doors and windows. It would be preferable to maintain the pattern of the existing doors and windows and to duplicate them in wood insofar as is possible in the new construction.

Also, plans call for the addition of exterior metal rolling shutters with projecting casings positioned over the lintel of each window. These are intrusive and will disturb the effect of the subtle profile of projecting and receding bricks. A dark color for both the casings and shutters might help if this equipment absolutely must be utilized. The matte-finish, brown-gray metal utilized for the shutters at the Citrus Pumping Station (No. 10) is recommended for use on Drainage Pumping Station No. 1. Similarly, ventilation louvers should all be manufactured from this matte-finish, brown-gray metal.

The most serious problem with the proposed addition is the new south facade, which does not measure up to the otherwise excellent effort to maintain and extend Harrod's fine design. This side of the structure is the most visible to the community. While the irregular bay scansion of the facade is awkward, it duplicates the existing facade. More problematic are the square, louvered, ventilation windows. Harrod's architectural system — indeed, all of classicism — depends on the consonance of proportions between the windows and the bays in which they rest, rectangle within rectangle. The tops of all doors and windows should align, which is not the case in the present plans. The proposed ventilation windows must be restudied to the proportions of the other windows. It is recommended that the louvers and fans be set into bricked-in "window" rectangles such as are planned for the east facade of the addition. The fans and the louvers should be in the brown-gray, matte-finished metal recommended above for the rolling shutters and casings.

Finally, the proposed aluminum pedestrian door of the south facade is also of concern. The aluminum of this door will contrast unpleasantly with the bricks, and the little window in the middle of the door is awkward. It is recommended that the door on the existing south facade be reutilized on the addition. If this is not possible, it is recommended that a molded metal door of

similar appearance (and with a less-obtrusive window) be utilized. The glass of the transom should be set into a wood frame so as not to juxtapose the glass with the brick walls of the structure.

**Drainage Pumping Stations Nos. 3, 6, and 7.**

There will be no adverse affect on the architectural integrity of the three pumping stations from the construction of fronting protection because the modifications are physically separate from the buildings, and the existing structures will not be altered in any way. However, the construction of the fronting protection will result in visual effects which have the potential to adversely impact the integrity of the setting of these significant structures.

*Visual Effects to Drainage Pumping Station No. 3.* Figure 104 presents a view of Station No. 3 from the north. As shown, the view of the pumping station is partially blocked from this vantage point by a pipeline running behind the station. Plans call for the removal and relocation of this pipeline and for the construction of a fronting wall. Figure 105 presents a computer-generated hypothetical view with the fronting wall in place.

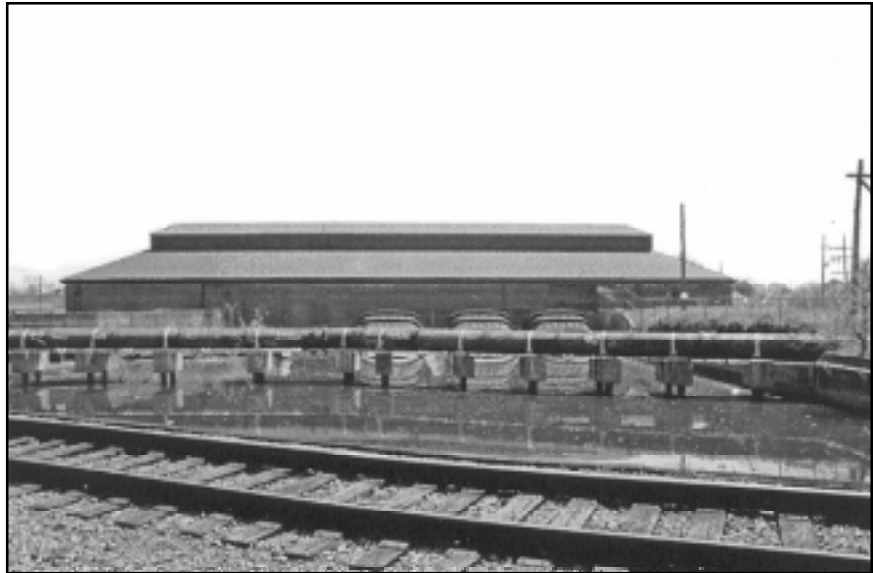


Figure 104. Drainage Pumping Station No. 3. Currently existing station viewed from the north.

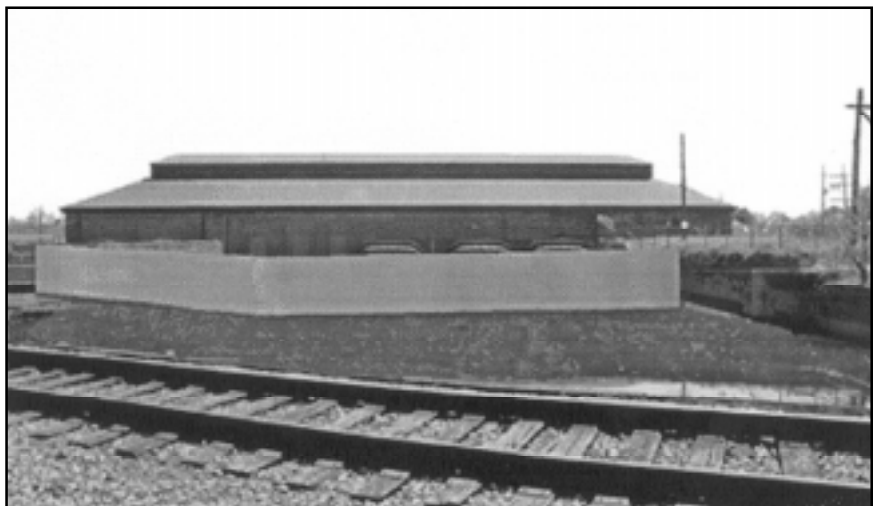


Figure 105. Drainage Pumping Station No. 3. View after construction of proposed improvements.

Comparison of Figures 104 and 105 shows that the fronting wall obscures the view of station very little more than does the pipeline which is already in place. It may in fact be argued that the fronting wall is more aesthetically pleasing in that it provides a cleaner line than does the existing pipeline. Moreover, the height of the floodwalls constructed along the London Outfall Canal make it difficult to view the station on its discharge basin side. The vantage point of Figures 104 and 105 is not readily accessible, since the Norfolk-Southern Railroad trestle crossing the relief outfall canal at this point is posted as off-limits to pedestrians. The fronting wall will not be visible from the vantage point that the station is seen by most viewers, which is the southern side (Figure 42).



Thus, construction of the fronting wall at Drainage Pumping Station No. 3 does not present an adverse visual effect. The fronting wall will not obscure the view of the station much more than does a currently-extant pipeline. Additionally, access to the vantage point from which the fronting wall will be visible is at best difficult; the area is posted as being off-limits to pedestrians. The fronting wall will not be visible from the vantage point from which the station is most easily viewed.

*Visual Effects to Drainage Pumping Station No. 6.* Figure 106 presents the view of Drainage Pumping Station No. 6 from along the Metairie Outfall Canal. The height of the floodwalls constructed along the canal make it difficult to view the station on its discharge basin side. Figure 107 presents a computer-generated hypothetical view of the station following construction of the fronting wall. Comparison of Figures 106 and 107 shows that the proposed fronting wall blocks less of the view of the station than does the existing berm and discharge pipes. In addition, the fronting wall will not be visible from the southern side of the station, which is the vantage point from which the station is most easily seen.

Construction of the fronting wall at Drainage Pumping Station No. 6 does not therefore present an adverse visual effect. The station generally cannot be viewed from the angle where the fronting wall will be seen. In addition, the existing berm and discharge pipes block more of the view of the station than does the proposed fronting wall.

*Visual Effects to Drainage Pumping Station No. 7.* Figure 108 provides the only view of the Drainage Pumping Station No. 7 from which the fronting wall will be vis-



Figure 106. Drainage Pumping Station No. 6 Currently existing station viewed from the north.



Figure 107. Drainage Pumping Station No. 6. View after construction of proposed improvements.



Figure 108. Drainage Pumping Station No. 7. Currently existing station viewed from the north.

ible to pedestrians; the railroad embankment which extends across the relief outfall canal is posted as off-limits to pedestrians. As shown, view of the station is largely blocked by the U.S. Interstate 610 overpass, and only a small portion of the discharge pipes is visible. Figure 109 presents a computer-generated hypothetical view of the station from this vantage point following construction of the fronting wall. Comparison of Figures 108 and 109 shows that while the fronting wall blocks the view of the discharge pipes, the station itself is already obscured by the Interstate 610 overpass.



Figure 109. Drainage Pumping Station No. 7. View after construction of proposed improvements.

Construction of the fronting wall at Drainage Pumping Station No. 7 does not therefore present an adverse visual effect. The station is not readily visible from the angle where the fronting wall will be seen. In addition, the fronting wall will not be visible from the southern side of the structure, which provides the only unimpeded view of the station (Figure 56).

**The Drainage System.** Because there will be no adverse effect on the architectural significance of Drainage Pumping Stations Nos. 1, 3, 6, and 7 as a result of planned improvements under the Southeast Louisiana Flood Control Project and the Lake Pontchartrain and Vicinity, Louisiana Hurricane Protection Project, either in terms of direct adverse impact to the structures or visual effects that would effect their integrity of setting, we can conclude that there will be no adverse effect on the architectural significance of the drainage system as a whole.

#### **Effects of Proposed Improvements on Engineering Significance (Criterion C)**

**Drainage Pumping Station No. 1.** The Southeast Flood Control Project will add two new horizontal screw pumps to Drainage Pumping Station No. 1. These are rated at 1200 cfs. These will have a different type of electrical motor than the existing pumps, in that they will be driven by 60-cycle current. The motors will be of a higher speed than the pumps, so a speed reducer will be coupled to the pump. These additional pumps will provide the station with greater reliability. In the event that one or more pumps is rendered inoperable in a storm, the additional pumps can handle the storm flow without a reduction in station capacity. However, the station capacity will not be substantially improved, because capacity is limited by what the outflow channel to the next station can carry.

The proposed improvements will have no adverse effect on the existing Wood pumps, which will be left in place and will be unaltered by this project. Similarly, the proposed improvements will have no adverse effect on the complex as an engineering structure, because the new pumps will be contained within an addition, rather than juxtaposed with the existing pumps. Thus, the historic configuration and organizational pattern of the pumps will not be disturbed.

Proposed improvements to the canals and suction and discharge basins will not have a substantial effect on the carrying capacity of the outflow canals unless major alteration are performed to improve their conveyance (carrying capacity) under gravity conditions. Minor refurbishing of the canal and basin retaining walls, consisting of re-concreting and removal of plant growth, will have no adverse effect on these structures since they will not alter their visual appearance. Moreover, the expansion of the discharge basin is a functionally necessary result of the addition of the new pumps and is consistent with the history of improvements to the station.

To summarize, proposed improvements to Drainage Pumping Station No. 1 will have no adverse effect on the individual Wood pumps, the complex of pumps within the station as an engineering structure, or the associated canals. In addition, the proposed improvements will provide an increase in station reliability. They therefore should be considered a continuation of the original concepts for both the station and the drainage system as a whole.

**Drainage Pumping Stations Nos. 3, 6, and 7.** One of the weak points in the protection of New Orleans from hurricane-related flooding are the drainage pumping stations. Recent studies have indicated that hurricane driven waters from Lake Pontchartrain may, under certain conditions, reach levels of 11.9 ft. NGVD (sea level). While most of the outflow pumps can continue to pump against this head of water, there is a possibility of damage to the pumps from electrical overload or water action. Should power be lost, there is a chance of backflow through the pumps causing possible flooding. The designed modifications to the pump outlets proposed under the Lake Pontchartrain and Vicinity, Louisiana Hurricane Protection Project are required to prevent this backflow from happening, and will also add to the soundness of the protective levee system.

A question which must be answered is whether or not this construction will affect the appearance, historical significance, or function of the Wood screw pumps at these three stations. These pumps are axial flow pumps and, when operating, directly connect the suction pool with the discharge pool. The elevation of the discharge pool directly affects the flow through the pumps. Should the elevation of the discharge pool become too great, it could cause water to flow backward through the pump while it is running forward. The electrical demands upon the motor become excessive when the flow through the pump is reduced. If the power would shut off, the pump could become purely a resistance item to the flow, and the flow would siphon back through the pump. The pump would then run backwards and could overspeed, attaining rotational velocities higher than when driven forward under power. This would cause mechanical damage to the pump. There are brakes or ratchets on all of the outflow station pumps to prevent reverse rotation, but their performance is somewhat dubious. Thus, the proposed construction will actually provide improved protection to these significant pumps.

With respect to appearance of the pumps, there will be no change to the pumps as they appear on the suction basin side or within the pumping stations. On the exterior of the stations, the pump will look longer on the discharge side and have a gated structure at the end of the discharge pipe. Figure 110 shows a typical discharge tube and discharge tube foundation for a horizontal screw pump. Figure 111 is a plan view of a typical new discharge tube extension, and Figure

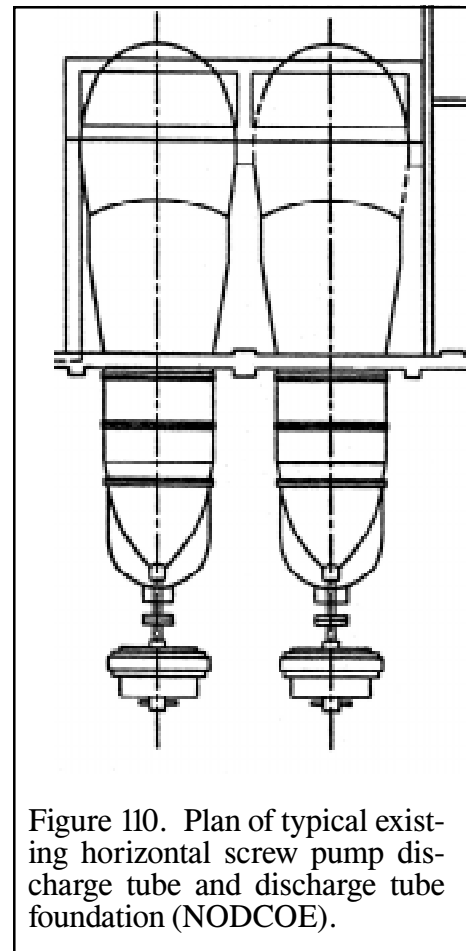


Figure 110. Plan of typical existing horizontal screw pump discharge tube and discharge tube foundation (NODCOE).

112 is an elevation of a typical discharge tube extension and sluice gate, as would be constructed in the proposed improvements. These alterations will not be easily visible to the general public because the discharge pipes of the pumps are obscured from view at most vantage points by the height of the fronting protection and discharge canal floodwalls.

The alterations to the discharge pipes will also reduce discharge output of the pumps. A pump under normal usage will have its discharge responsive to the system into which it is pumping. If the difference between the suction head and discharge head (stages) would be, for example, 10 ft. (as shown in Figure 113), the flow would be that indicated by point A. If the difference in elevations were 13 ft., the flow would be as indicated at point B. Under storm conditions of 11.9 ft. difference between the suction head and discharge head, it would be as low as shown at point C. With the added losses in the proposed outlet charged to the pump, the discharge under a 10 ft head would be reduced from point D to point E (Figure 114). It should be stressed that these calculations are for a typical pump, and the stated values should be taken as merely indicative and not exact. These figures indicate that the variation or tolerance in flow is therefore less affected by reduced discharge output than by water elevation. This is demonstrated in Figure 114.

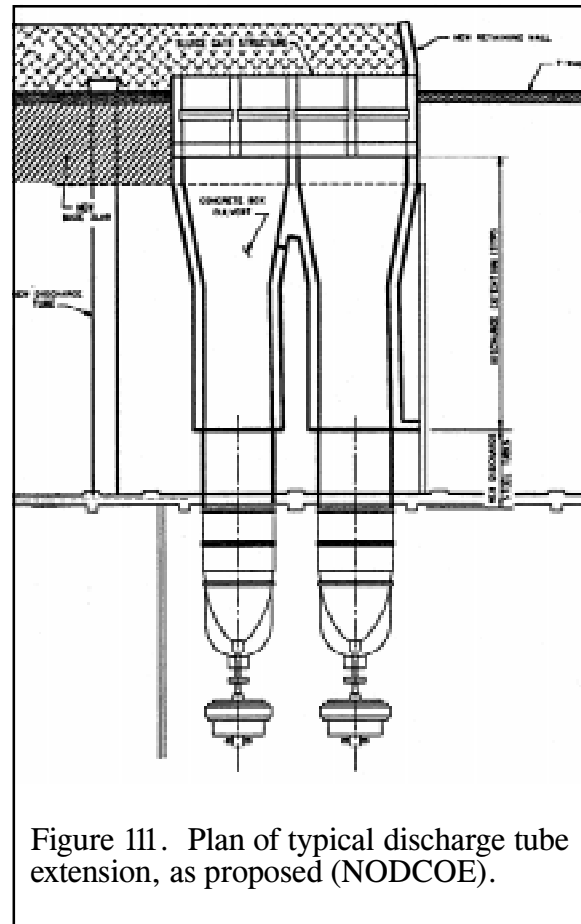


Figure 111. Plan of typical discharge tube extension, as proposed (NODCOE).

Figure 115 illustrates what would happen to the flow if the pump were to lose its electrical power. The flow would reverse, and the rotation of the pump impeller would reverse unless the brakes were applied. This situation will be prevented by the proposed improvements to the fronting protection of Drainage Pumping Stations Nos. 3, 6, and 7.

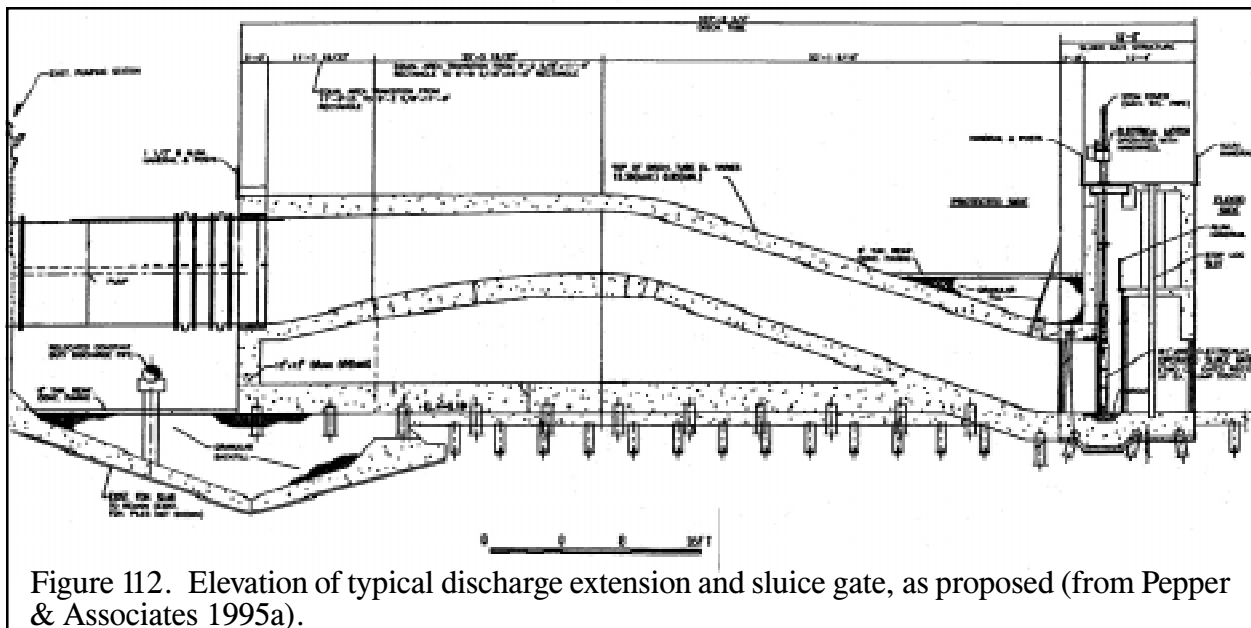


Figure 112. Elevation of typical discharge extension and sluice gate, as proposed (from Pepper & Associates 1995a).

*Pump Modification.*

The modification of the pumping stations by the addition of gates at the outlet of each pump, and the attendant connecting conduit between the pump and the gates, should properly be considered as a pump modification. Pumps of this nature are rated by their capacity flow and the ability to produce a given head (pressure rise or fluid lift) at that capacity. This head is considered to be the rise from the suction flange (inlet) to the discharge flange (outlet), considering all energy losses between as pump losses. This is necessary so as to be able to match pump capability to piping or drainage system requirements, in order to determine the flow which the combined system will produce. In the case of the New Orleans drainage system, which is subject to additional variables such as lake levels, it becomes difficult to predict the actual match flow. The designers of the system allowed for a variation in flow by making the canals as large as was practical and the pumping capacity sufficient to drain the associated land. By doing this, the system was able to carry away as much as possible. Minor changes in the pump capacity, due to reduced discharge output from the additional gates, are unimportant.

Thus, hurricane-driven waters from Lake Pontchartrain could produce tidal stages at the outlet of the existing pumps, which may cause them to allow flow to reverse through the pumps. Flow reversing through the pumps would cause damage to the pumps and possible flooding to the city. The installation of the fronting protection is intended to prevent this from hap-

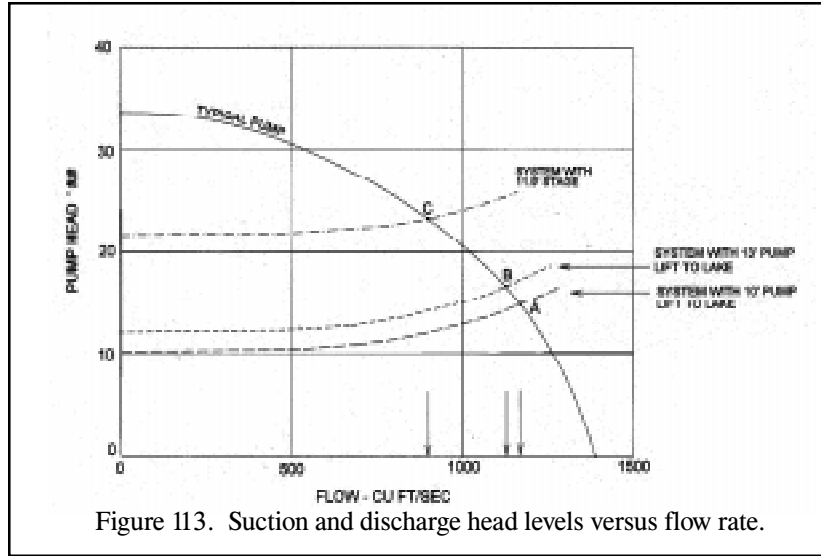


Figure 113. Suction and discharge head levels versus flow rate.

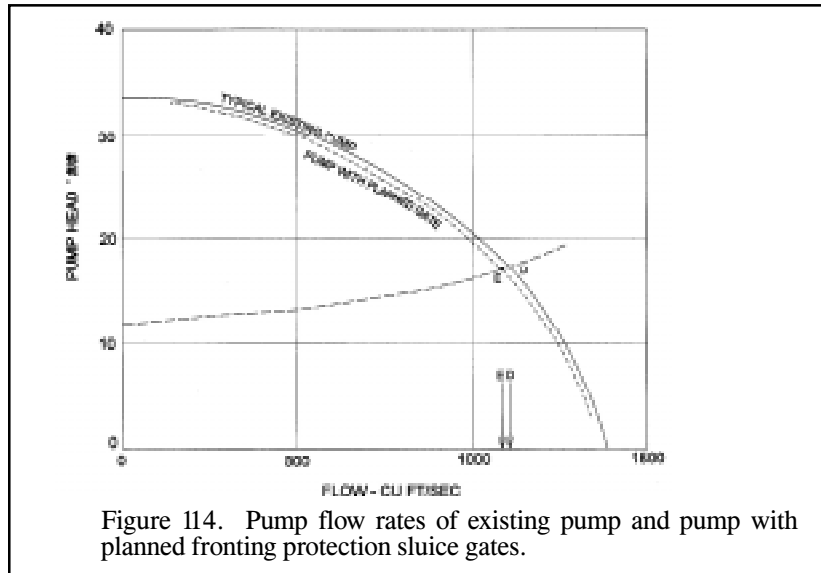


Figure 114. Pump flow rates of existing pump and pump with planned fronting protection sluice gates.

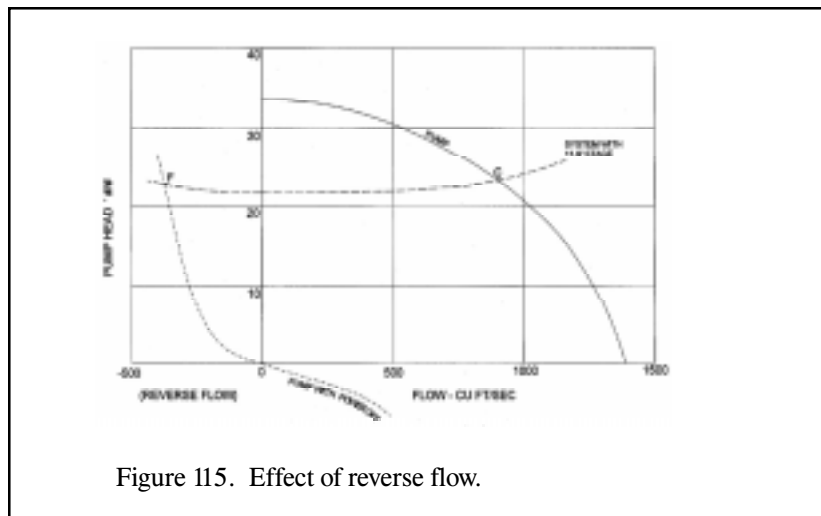


Figure 115. Effect of reverse flow.

pening. These proposed improvements, since they require alteration only to the external discharge tubes of the Wood screw pumps, would not effect the integrity of the Wood screw pumps. They are also appropriate given the history of adaptation and advancement of the drainage system and its constituent pumping capacity.

In sum, proposed improvements to Drainage Pumping Stations Nos. 3, 6, and 7 will have no adverse effect on the individual Wood pumps, which will be left in place. Thus, the complex of pumps within the stations as engineering structures will not be adversely effected, since the historic configuration and organizational relationship of the pumps will be maintained. The proposed improvements will have no adverse effect on the canals associated with the stations. No modification of the canals is included in the proposed improvements. As we have seen, all but one of these canals have all been modified within the last 50 years, and their importance is their locational integrity, which illustrates the interrelationships of the elements of the drainage system. Finally, the proposed improvements will provide an increase in station reliability and serve to protect the significant Wood pumps from damage. They therefore should be considered a continuation of the original concepts for both the stations and the drainage system as a whole.

**The Drainage System.** Because there will be no adverse effect on the engineering significance of Drainage Pumping Stations Nos. 1, 3, 6, and 7 as a result of planned improvements under the Southeast Louisiana Flood Control Project and the Lake Pontchartrain and Vicinity, Louisiana Hurricane Protection Project, either in terms of direct adverse impact to the structures or visual effects that would effect their integrity of setting, we can conclude that there will be no adverse effect on the engineering significance of the drainage system as a whole.

### **Summary of Recommendations**

Drainage Pumping Stations Nos. 1, 3, 6, and 7 should be considered individually eligible for nomination to the National Register of Historic Places. In addition, these stations along with their associated canals should be considered contributing elements of a drainage system National Historic District. Proposed improvements under the Southeast Louisiana Flood Control Project and the Lake Pontchartrain and Vicinity, Louisiana Hurricane Protection Project will have no adverse effect on the associative, architectural, and engineering significance of these stations or on the drainage system as a whole. However, some of the changes to the historic fabric under the proposed expansion of Drainage Pumping Station No. 1 have raised some concerns for discussion. While these proposed changes, as detailed above, do not themselves constitute adverse effects, it is recommended that their treatment be given the same consideration as is shown by the replication of Harrod's superb detailing in the plans for the extension.