INSTALLATION OF NEW DISCHARGE PIPES AT DESTREHAN PUMP STATION NO. 1 CONCEPT STUDY

FOR
ST. CHARLES PARISH, LOUISIANA

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N-Y Job No. 18013

N-Y ASSOCIATES, INC.
ENGINEERS • ARCHITECTS • PLANNERS
PROGRAM & PROJECT MANAGERS

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EXECUTIVE SUMMARY

N-Y Associates, Inc. was assigned the task of completing a concept study for installation of three (3) new 48-inch steel discharge pipes which have been procured by the St. Charles Parish, Department of Public Works. Included in the study is a topographic survey and geotechnical investigation in order that preliminary drawings of the installation could be completed along with details of the new required pile supported pipe supports.

The ends of the three existing 48" steel discharge pipes will be removed in order that the new discharge pipes approximately 27 feet in length may be welded to the existing pipes. Two timber piles are required for each pipe support along with new steel support beams and steel saddles. Each discharge pipe requires two new pipe supports to replace the existing timber supports which are in poor condition. The opinion of probable construction cost to install the new discharge pipes and pipe supports is $165,000.

BACKGROUND

TOPOGRAPHIC SURVEY:
A topographic survey of the three existing 48" diameter discharge pipes and discharge basin was completed by Riverlands Surveying Company. The sealed topographic survey was delivered to the Owner and utilized for the New Discharge Pipe Plan and Elevation included in the report.

GEOTECHNICAL INVESTIGATION:
A geotechnical exploration was completed by Eustis Engineering, LLC. A soil boring was taken within the discharge basin near the existing discharge pipes in order that a pile capacity table could be prepared by the geotechnical engineer. This pile capacity table was utilized in designing new pipe supports for installation of the three new 48-inch discharge pipes procured by St. Charles Parish which are on site. The preliminary design of the pipe supports is included as shown on the New Discharge Pipe Plan and Elevation and the New Discharge Pipe Details included in this report. The geotechnical exploration dated November 29, 2018 is included in Appendix "A".

SITE VISIT:
A site visit was made by N-Y Associates, Inc. on November 20, 2018. The following was noted:

a) The discharge pipes in the canal have corroded at / below the water surface.

b) Each pipe is supported by piles and saddles at three locations. The original support at the canal bank consisting of timber piles, a wood beam and wood saddles was left in place and a parallel set of wood piles with a steel beam, wood saddles and steel pipe straps was installed rather recently.

c) The pipe supports at the mid span consists of timber piles, a wood beam, wood saddles and steel pipe straps. These are original supports which have deteriorated significantly and require replacement.

d) The pipe supports below the water surface also consists of timber piles, a wood beam, wood saddles and steel straps as communicated to N-Y by a representative of the Department of Public Works. These are original supports which have deteriorated significantly and require replacement.

PILE CALCULATION METHOD

Calculation for the number of and the embedment depth of the timber piles for the new pipe supports were calculated as follows:

Equation No. 1: (1.3 x L.L. + D.L.) x F.S. = Design Loading

L.L. = Live load, water in the 48-inch pipe.

D.L. = Dead load, weight of the pipe, W – beam and pipe saddle.

F.S. = Factor of safety, 3 (three)

Calculated pile capacity per pile = 17 tons

The calculations require two (2) piles for each pipe support. The piles are Class B timber piles with a 12-inch butt, 7-inch tip and an embedment depth of 60 feet.

SUGGESTED SEQUENCE OF CONSTRUCTION

1. Drive piles to an embedment depth of 60 feet for the new pipe supports at the mid span and at the end of the discharge pipes.
2. Sandbag area around discharge pipes and dewater the area with pumps.*
3. Install W – beam, and pipe saddles for the new pipe supports.
4. Remove approximately 27 feet from the three existing 48-inch discharge pipes.
5. Install / weld three (3) new discharge pipes to existing pipes supported by new saddles.
6. Install pipe straps.
7. Remove original wood beams and wood saddles for original pipe supports.
8. Remove (cut off) piles of original pipe supports to 1 foot above grade.
9. Remove sandbags.

* Upon dewatering, inspect the area around the 48-inch discharge pipes to ascertain if the existing rip-rap beneath these pipes is adequate to prevent undermining of the bottom of the discharge basin. We have included a contingency in the opinion of probable construction cost for additional concrete rip-rap.

RECOMMENDATIONS

1. Replace the pipe supports at the mid span and near the end of the discharge pipes with new pile supported pipe supports as shown on the drawings.
2. Once the new pipe supports and saddles are installed beneath the existing pipe remove the existing pipe and place the new pipe in preparation for welding.
3. Follow a sequence of construction which minimizes the amount of time the discharge pipes are out of service.

The opinion of probable construction cost for this work is $165,000 as outlined in Appendix "B".