

Beal Slough Relief Trunk Sewer Alignment Study Report

Introduction

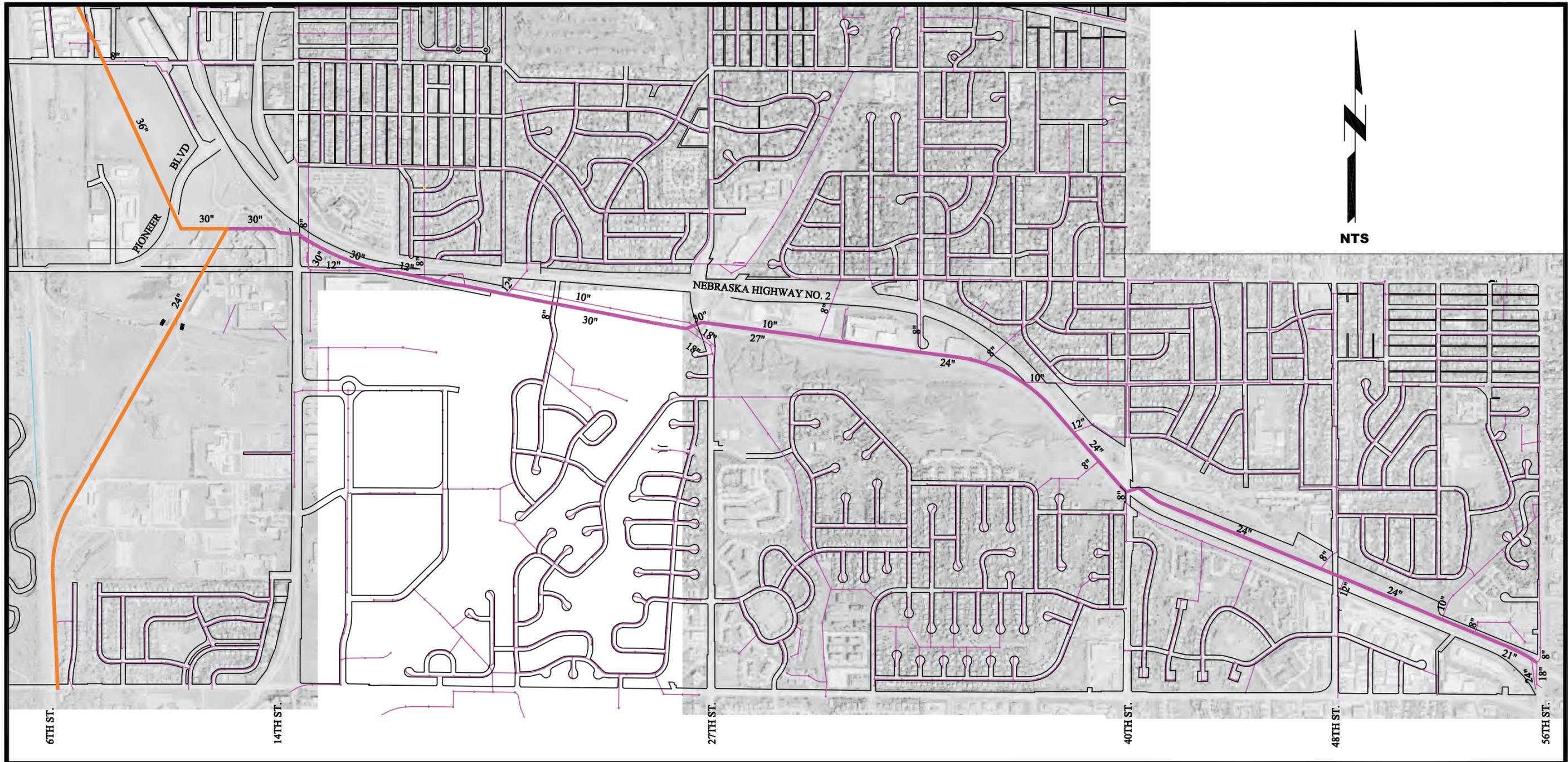
1.0 Introduction

1.1 Scope of Study

The purpose of this alignment study report is to provide the Lincoln Wastewater System (LWWS) with information pertaining to advantages and disadvantages of three potential alignments for the Beal Slough Relief Trunk Sewer Phases I & II and to identify a recommended alignment for preliminary design. This study includes a description of the proposed alignments, findings and evaluation of alignment selection factors, and development of opinion of probable project costs for each alignment. The conclusions and recommendation section identifies the recommended alternative. Based on the recommended alternative, an analysis for replacing the existing sewer was conducted.

1.2 Background

The existing Beal Slough Trunk Sewer, shown on Figure 1-1, begins at the northwest corner of Highway 2 and 56th Street and extends west adjacent to Highway 2 and the Beal Slough to the connection with the Salt Valley Trunk Sewer west of the State Penitentiary. The existing sewer ranges in size from 21 to 30 inches in diameter and is 18,800 feet in length, with materials of construction consisting of reinforced concrete pipe, vitrified clay pipe, and cast iron pipe. The existing sewer is overloaded during wet weather events and is not sized for anticipated future development. To resolve these issues the LWWS intends to design and construct a parallel relief sewer to convey peak wastewater flow for ultimate development of the Beal Slough drainage basin. The Beal Slough Relief Trunk Sewer will be constructed in two phases. Phase 1 is to extend from its connection at the Salt Valley Relief Trunk Sewer at 4th Street to approximately 27th Street and Highway 2. Phase 2 is to extend from 27th Street and Highway 2 to 56th Street and Highway 2. Downstream sections in the Salt Valley Trunk Sewer system are being upgraded prior to capacity relief being provided in the Beal Slough sewer. Phase IV of the Salt Valley Relief Trunk Sewer will be constructed prior to Phase I of the Beal Slough Relief Trunk Sewer, thus eliminating downstream surcharge concerns. LWWS recently completed the installation of a 24 inch sewer at Highway 2 and 56th Street which conveys flow from southern portions of the drainage basin into the existing Beal Slough Trunk Sewer.



LEGEND

-  EXISTING SALT VALLEY TRUNK SEWER
-  EXISTING BEAL SLOUGH TRUNK SEWER
-  EXISTING SEWERS
-  STREETS

City of Lincoln, NE
**Beal Slough Relief Trunk Sewer
 Phases I & II
 Alignment Study**

**Existing Beal Slough
 and Salt Valley Sewers**
 October 2003

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The existing Salt Valley Trunk Sewer begins in southwest Lincoln and conveys flow north and eastward to the Theresa Street Wastewater Treatment Plant for a total distance of 8.6 miles. The sewer parallels Salt Creek for the entire length and ranges in size from 24 to 60 inches in diameter. Major laterals connecting to the Salt Valley Trunk Sewer include the Beal Slough, Campus Feed, and Antelope Creek sewers. Surcharging of the existing line occurs during heavy rainfall events from inflow and infiltration through leaky joints, manholes, and pipes. To eliminate the surcharging and provide for future growth, LWWS has begun an improvement project to parallel the existing Salt Valley Trunk Sewer with a relief sewer constructed in five phases. Phases I and IIA, at the north end near the WWTP, have been constructed and Phases IIB and IIIA were bid in May of 2003. Phase IV will be constructed in 2004 and will include a location for connecting the Beal Slough Relief Trunk Sewer.

1.3 Study Area

The study area for this report, shown in Figure 1-2, consists of the Beal Slough drainage basin, which is located in the southern portion of Lincoln. The current Beal Slough drainage basin is divided into 21 areas identified as BS-1 through BS-21. In addition to these existing sections, future development of areas BS-30 and BS-31 will increase the hydraulic loading on the Beal Slough drainage basin.

Primary alignment corridors for the Beal Slough Relief Trunk Sewer extend from the connection to the Salt Valley Phase IV Trunk Sewer at 6th Street and Pioneers Blvd. to Highway 2 and 56th Street, as shown in Figure 1-2. The following alignment combinations were considered for the three alternative alignments identified in this study.

- Alignments along existing route of Beal Slough Sewer.
- Alignments along Beal Slough stream corridor.
- Alignments along either side of Highway 2 and within City park locations.
- Alignments adjacent to the State Penitentiary.
- Alignment options for connecting the Beal Slough Relief Trunk Sewer to the Salt Valley Relief Trunk Sewer.