

Sewer Relocation Evaluation
for
Lower Sycamore Creek Drainage Improvements Project
Santa Barbara, California

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CLIENT: City of Santa Barbara, Public Works

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PURPOSE OF REPORT

The purpose of this report is to identify the options available for relocating the sanitary sewer line in Punta Gorda Street as a consequence of replacing the Punta Gorda Bridge at Sycamore Creek making channel improvements which are part of the Lower Sycamore Creek Drainage Improvements Project.

LOCATION

Sycamore Creek is a perennial urban creek in the City of Santa Barbara. The study reach is located within the right of way of Soledad Street between US101 and Indio Muerto Street. The location of the bridge replacement leading to this study is on Punta Gorda Street at Sycamore Creek. See Figure A.

BACKGROUND

The Sycamore Creek Drainage Improvement Project proposes to replace the bridge at Punta Gorda Street which crosses Sycamore Creek with a wider bridge and at the same time provide channel grading that will lower the creek bottom by about 1 to 2 feet. Based on surveyed elevations recently provided by the City of Santa Barbara, there is an 8" diameter sewer line that flows very near the flow line of the existing Punta Gorda Bridge. The sewer line is protected from impacts from debris and storm water flow by the concrete paving at the bottom of the bridge.

The existing sewer line flows in an east to west direction towards South Voluntario Street where it turns south and crosses under the US101. The upstream manhole at the intersection of Punta Gorda and South Canada



Figure A - Vicinity Map



Figure B - Existing Wastewater Flow Patterns

Street (see Figure B) accepts wastewater flows from the north and east and has discharge pipes to the west and south. Under normal conditions, wastewater entering this manhole would flow down Punta Gorda Street. Under heavy flow conditions or when a short term diversion is necessary, the flow can be diverted south to the 8" sewer in South Canada Street where it crosses under the US101.

As a part of the evaluation, as-built drawings were collected from the City archives, and compared to the City Geographic Information System (GIS) database. Based on this information three concepts were designed to address this situation.

Concept 1 – reconstruct the sewer line starting at the intersection of South Voluntario Street and extending east to South Canada Street at a flatter slope, evaluating the ability of a relocated sewer line to pass under the proposed Sycamore Creek improvements with enough cover to be secure.

Concept 2 – reconstruct the sewer line in Punta Gorda Street east of Sycamore Creek to drain to South Canada Street, directing all the flow that formerly discharged to Punta Gorda Street to the South Canada Street crossing under US101. The sewer pipe under Sycamore Creek would be abandoned.

Concept 3 – Construct an inverted siphon under the new channel improvements and allow the system to function in the same manner as it currently does.

Concurrent with the preparation of the three concepts, we met with Manuel Romero (City of Santa Barbara Public Works Department, Wastewater Collection) to discuss the situation and to better understand how the system functions. Mr. Romero reviewed the concepts with us and provided the following input:

- The Punta Gorda sewer line collects flow from a fairly substantial area.
- It is nice to have the option of diverting flows to the South Canada Street crossing under US101, when needed.
- The South Canada Street undercrossing has typically been a maintenance problem due to large flows coming from the east and very little flow coming from the north (South Canada Street). Increasing the flow down South Canada Street may improve long term maintenance at this location.
- Mr. Romero was going to check to verify that the South Canada crossing under US101 was an 8" diameter line and not a 6" diameter line.
- Mr. Romero would be hesitant to recommend an inverted siphon because they typically require more maintenance. However, the most recent one constructed under Mission Creek has functioned well without much maintenance.
- Mr. Romero would go back to his supervisor and discuss the options to better determine which approach would be in the City's best interest.

EVALUATION OF CONCEPTS

The three concepts were evaluated based on available survey and topographic data, and record drawings. Evaluation consisted of determining if construction was physically feasible. It did not include costs estimates, utility relocations, or other factors.

Concept 1 is not feasible because even with a very minimal slope, the sewer pipe would not be low enough to provide sufficient cover (less than 1 foot) within the creek bottom for safe installation.

Concept 2 is potentially feasible but will eliminate the ability to provide alternate routing during high flow or other situations. Depending on the existing pipe size under US101, this may involve pipe bursting to increase the existing pipe size. The City will verify this. Also, the City will need to investigate whether increased flow down South Canada Street will reduce or increase maintenance concerns for this line.

Concept 3 is potentially feasible but introduces another inverted siphon to the City of Santa Barbara system. Inverted siphons are typically not considered beneficial to a wastewater system due to increased maintenance.

RECOMMENDATIONS

The City will need to provide further evaluation as to whether Concept 2 or Concept 3 is more beneficial to the overall wastewater collection system. Penfield & Smith is available to assist in this evaluation, if necessary, but the current project scope does not cover this work.