

Executive Summary

The objective for Phase I of this project was to investigate the project for its intended use of improving drainage and being navigable at North Beach. LAN developed and analyzed two different options or configurations for the canal; Option 1 includes an inlet/outlet to the bay at the northern end; Option 2 is a shorter canal with an inlet/outlet to the bay at the center of the North Beach.



Figure 1 – Option 1 Outlet at Jetties



Figure 2 – Option 2 Outlet at Mid-Beach

Drainage

LAN first evaluated the existing drainage system. Based on our review of previous studies and field inspections performed by LAN, we have concluded that the existing storm sewer system has issues such as siltation in the pipes, flow line elevation below mean sea level and collapsed pipes. These in of itself create problems with providing adequate drainage during routine rainfall events.

LAN's drainage analyses concluded that the proposed canal could improve drainage from rainfall and tidal events; however, to achieve maximum benefit:

- The adjacent areas would need to be raised to a minimum elevation of +6.5 (NAVD-88) near the beach property lines and along Seagull Boulevard.
- The existing storm sewer system would have to be replaced and redirected towards the canal rather than the current north-south conveyance in-place.
- Raising of North Beach to the necessary elevations would require an average of 2-3 feet of fill over the entire project area.
- The amount of fill required, exceeds the quantities of what would potentially be dredged from the canal; therefore, suitable material would have to be imported from somewhere else.
- Raising the site would likely be a long-term initiative required as part of a master development plan that coincides with the drainage system. It would need to be developed and enforced by the City.

- Addressing existing structures and future development plans to accommodate the filling, grading and building the new storm sewer system was not included in this phase of the project.

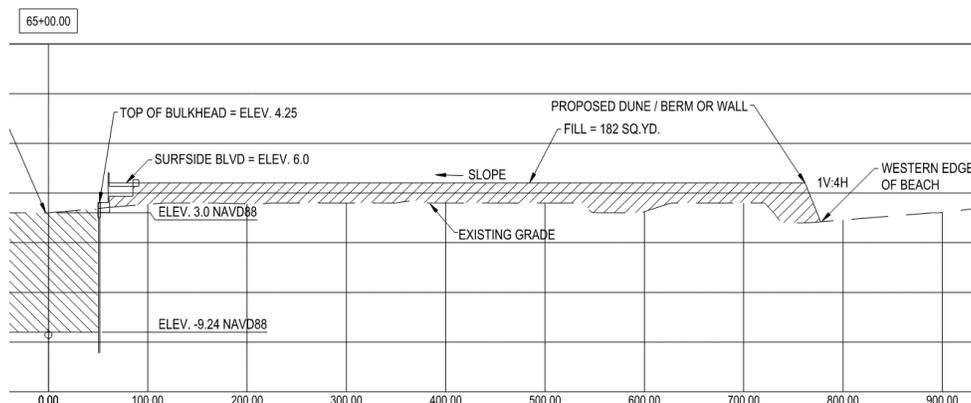


Figure 3 – Typical Fill (East of Canal to Edge of Beach)

Navigability

With regards to navigability, the proposed canal would be accessible to most recreational pleasure craft that are common to the Coastal Bend. There are restrictions however for larger watercraft, such as long yachts (+50-foot length) and tall sailboats (+20-foot height). Primarily because water crossings would be necessary over the canal to accommodate traffic and not exacerbate public safety concerns by limiting access from east to west. These water crossings limit the types of watercraft on the canal.

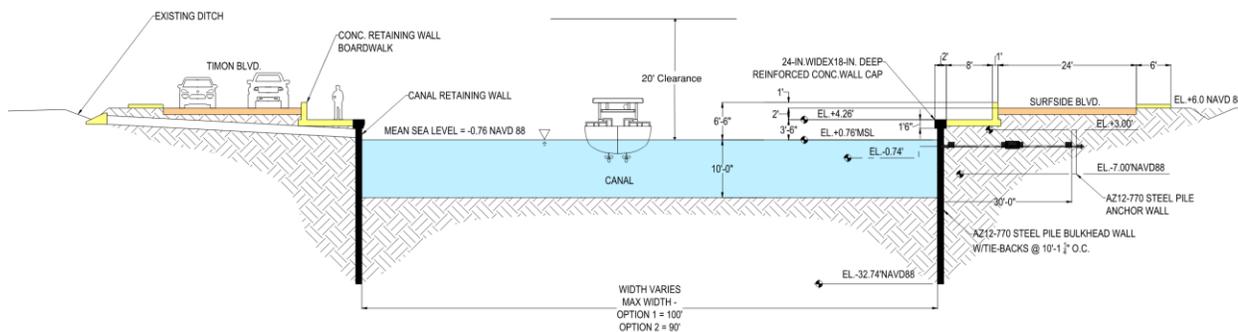


Figure 4 – Typical Cross Section

Water Quality

Numerical modeling was conducted to help evaluate tidal exchange between the proposed North Beach Navigable Canal and Corpus Christi Bay, and to evaluate Water Quality conditions that may occur in the canal under various design layouts. The modeling results show that both proposed layouts can meet TCEQ’s Dissolved Oxygen (DO) criteria. The additional culvert on the south end of the proposed canal would promote better exchange of water in and out of the canal to the bay. The results of the modeling showed that DO levels at the bottom of the canal could be a concern and might produce bacteria in excess of limits established by TCEQ. Not being able to meet DO criteria would also affect the environmental permitting of the project. Long-term siltation and maintenance dredging were not included in the study.

Trafficability

Traffic patterns to four key destinations on North Beach were assessed to develop impacts that may come as a result of the proposed canal improvements. Based on assessments, the proposed canal will cut off traffic from east to west across the entire area, side streets that typically carried traffic from US181 to key destinations would be cut-off, and traffic would have to be routed differently than it is now. Additionally, due to the fact that Harbor Bridge will only provide for one exit to North Beach, increased quantities of traffic have the potential for reducing the levels of service at Beach Avenue. Several short term and long term recommendations to mitigate these impacts were presented in the report, including improved signage, striping, and routing of traffic at the Beach Avenue exit, capacity improvements to several key collector streets, and conversions of some of the roadways from one-way to two-way streets. To address access from one side of the canal to the other, bridge crossings are recommended for both Options.

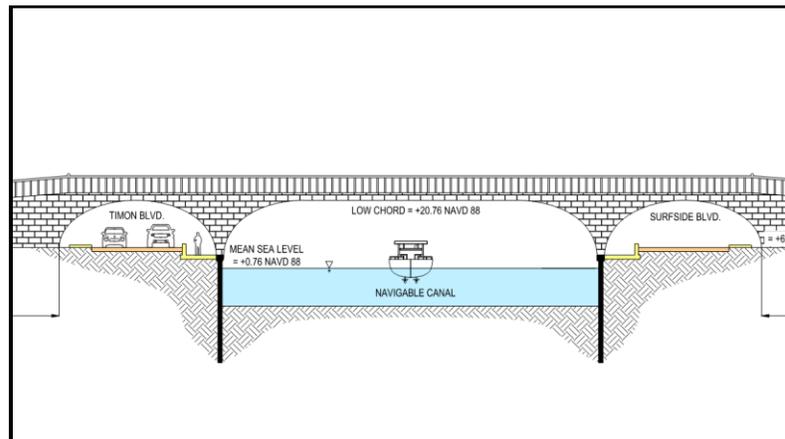


Figure 5 – Conceptual Canal Crossing- Detail

Regulatory

LAN made initial coordination with the United States Army Corps of Engineers (USACE) to discuss potential regulatory requirements for the proposed canal. We also completed desktop assessments to determine potential impacts to Waters of the United States, wetlands, threatened and endangered species, and cultural resources, located in or near the project area. Based on the USACE, an Individual Permit would be required; this permit may take 18-24 months to receive and will require public and interagency input and coordination. Our initial assessments discovered minimal impacts to wetlands, endangered species, or cultural resources; however, the permitting process will determine further requirements to mitigate impacts.

Summary

In order to construct the canal improvements proposed in this study, attain maximum drainage benefits, and accomplish the goals of previously adopted and on-going City of Corpus Christi Plans and Initiatives, the project should be phased with short-term, mid-term, and long-term improvements.

- Phase I – Project Definition (**this contract**)
- Phase II – Project Feasibility (Funding / Permitting / Utility Conflict Analysis)
- Phase III – Navigable Canal Design
- Phase IV – Navigable Canal Construction (North)
- Phase V – Navigable Canal Construction (South)
- Phase VI – Public Access / Safety Improvements

In summary, either canal option can improve drainage from both rainfall and tides, but to accomplish maximum benefits, storm sewer systems will need to be improved and the areas filled and regraded. Additionally, it is important to note that effects from storm surge or hurricanes will not be addressed with construction of a canal. Only raising North Beach to a higher elevation and/or constructing other resiliency measures such a seawall, similar to the flood protection system in Downtown Corpus Christi, would provide protection from large surge events. With regards to navigability, the canal can work for a large array of vessels. A shallower canal and or other water quality features as additional outlets, could improve water quality and not cause restrictions to navigation.