GALVESTON COUNTY RURAL RAIL TRANSPORTATION DISTRICT

PELICAN ISLAND RAIL AND VEHICULAR ACCESS FEASIBILITY STUDY

SEPTEMBER 2015

THE GOODMAN CORPORATION

HDR Engineering, Inc.

Executive Summary

Chapter 1 – Introduction

Chapter 2 – Proposed Rail Bridge and Approach Track Analysis

Rail Bridge Alignment Descriptions 2-3
Summary of Costs 2-13

Chapter 3 – Existing and Proposed Vehicular Bridge and Roadway Analyses

Current Status of Structural Condition 3-3
Impacts of Doing Nothing 3-6
Current Operating and Maintenance Costs 3-6
Vehicular Roadway Capacity 3-7
Rehabilitation Options for Existing Causeway and Bascule 3-7
Bridge Replacement and Approach Roadway Geometry Options 3-9
New Bridge Options 3-10
FHWA and TxDOT Coordination 3-15
Summary of Costs 3-16
Summary and Recommendations 3-21

Chapter 4 – Environmental Regulatory Review

Regulatory Programs and Recommendations on How to Proceed 4-2
Navigation 4-2
Water Quality 4-5
Wetlands 4-6
Endangered Species 4-11
Essential Fish Habitat 4-13
Cultural Resources 4-14
Texas GLO Coordination 4-15
Migratory Birds 4-16
Flood Plain Management 4-17

Traffic 4-18
Parking 4-18
Energy Requirements and Potential for Conservation 4-18
Historic Properties and Parklands 4-18
Aesthetics 4-22
Community Disruption 4-22
Safety and Security 4-22
Secondary Development 4-23
Hazardous Materials 4-23
Consistency with Local Plans 4-23
Seismic Hazard 4-25
Environmental Justice 4-25
Non-Governmental Organizations 4-25
Land Use and Zoning 4-26
Air Quality 4-26
Noise 4-26

Chapter 5 – ROW Acquisition and Utility Easement Analysis
ROW Acquisition 5-1
Easement Analysis 5-5

Chapter 6 – Regional Deep Water Port Market Analysis

Chapter 7 – Financial Analysis
Life-Cycle Cost Analysis 7-1
Benefit/Cost Analysis 7-2
Other Factors To Be Considered 7-4
Risk Analysis 7-6
SWOT Analysis for Pelican Island 7-7
Pursuit of Funding 7-8
Federal Sources 7-8
State Sources 7-14

Local Sources 7-14
Public Private Partnerships 7-15
Financial Modeling 7-16

Chapter 8 – Economic Impact Analysis
Jobs 8-2
Personal Income Earnings 8-3
Revenue 8-3
Local Purchases 8-4
State and Local Tax Impacts 8-4

Chapter 9 – Next Steps
Funding and Implementation 9-4
Vehicular Bridge Replacement 9-4
Vehicular Bridge Funding 9-6
State of Texas Mobility Funding 9-6
Vehicular Bridge Local Share 9-6
Rail Bridge Funding 9-7
U.S. Congress New Authorization of Transportation Funding 9-7
Summary 9-8

Appendices
*Appendix **A*** – GLO Application for State Land Use Lease
*Appendix **B*** – GLO Instructions for Preparing Exhibits for ME Applications
*Appendix **C*** – GLO Leasing and Easement Guidelines
*Appendix **D*** – Title Search

Figures

Page
Fig. 1.1 – Pelican Island Aerial 1-4
Fig. 2.1 – UPRR/BNSF Switching Yard on Galveston Island 2-2
Fig. 2.2 – Typical No. 15 Power Switch 2-3
Fig. 2.3 – Rail Bridge Option I Alignment 2-4
Fig. 2.4 – Rail Bridge Option II Alignment 2-6
Fig. 2.5 – Rail Bridge Option III Alignment 2-8
Fig. 2.6 – Rail Bridge Option IV Alignment 2-10
Fig. 2.7 – Texas Class I Railroads 2-18
Fig. 3.1 – Vehicular Bridge and Land Uses 3-5
Fig. 3.2 – Cross-sections by Phase 3-9
Fig. 3.3 – Fixed Span Bridge Option 1 3-12
Fig. 3.4 – Fixed Span Bridge Option 2 3-13
Fig. 3.5 – Fixed Span Bridge Option 3 3-14
Fig. 4.1 – TAMUG Wetlands Mitigation Bank Pelican Island 4-7
Fig. 4.2 – TAMUG Infrared Wetlands Map Pelican Island 4-8
Fig. 4.3 – Port of Galveston 1903 4-21
Fig. 4.4 – TAMUG Campus Master Plan Map 4-24
Fig. 5.1 – Port Development Property on Pelican Island 5-3
Fig. 5.2 – Property Tracts along Stakeholder Preferred Rail Alignment 5-7
Fig. 6.1 – Texas Deep Water Sea Ports 6-2
Fig. 6.2 – Post-Panamax Canal Locks and Ships 6-4
Fig. 6.3 – Ship-to-Shore Containerized Cargo Cranes 6-5

Tables

Page
Tab. 2.1 – Available Development Acres on Pelican Island 2-1
Tab. 2.2 – Pelican Island Freight Rail Alignments 2-12
Tab. 2.3 – Rail Bridge Option I Cost Estimate 2-14
Tab. 2.4 – Rail Bridge Option II Cost Estimate 2-15
Tab. 2.5 – Rail Bridge Option III Cost Estimate 2-16
Tab. 2.6 – Rail Bridge Option IV Cost Estimate 2-17
Tab. 2.7 – Summary of Rail Bridge Options 2-18
Tab. 3.1 – Rehabilitation In Place Options 3-8
Tab. 3.2 – Vehicular Bridge Replacement Options 3-11
Tab. 3.3 – Movable Span Bridge Cost Estimate 3-17
Tab. 3.4 – Fixed Span Bridge Option 1 Cost Estimate 3-18
Tab. 3.5 – Fixed Span Bridge Option 2 Cost Estimate 3-19
Tab. 3.6 – Fixed Span Bridge Option 3 Cost Estimate 3-20
Tab. 3.7 – Summary of Vehicular Bridge Replacement Options 3-21
Tab. 6.1 – Ports and Vessel Calls 2012 6-3
Tab. 6.2 – Predominate Import/Export Cargos by Port 6-6
Tab. 6.3 – Regional Port Market SWOT Analysis 6-7
Tab. 7.1 – Model Comparison 7-4
Tab. 7.2 – Emissions (grams per ton-mile) 7-4
Tab. 7.3 – Estimated Capital and Development Cost Summary 7-5
Tab. 7.4 – Pelican Island SWOT Analysis 7-7
Tab. 7.5 – Model Inputs 7-16
Tab. 8.1 – Economic Impact Analysis for Galveston 2011 8-5
Tab. 8.2 – Summary of Impacts Generated by Port of Houston 2012 8-6

Acronyms

	Chapter
AA – Alternatives Analysis	4
ADSCR – Annual Debt Service Coverage Ratio	7
BA – Bridge Administration	3
BCA – Benefit/Cost Analysis	7
BEA - Bureau of Economic Analysis	8
BMP – Best Management Practices	4
BNSF – Burlington Northern Santa Fe	1
BO – Biological Opinion	4
BPA – Beaumont/Port Arthur	6
BRINSAP – Bridge Inventory, Inspection, and Appraisal Program	3
BRN – Brownsville	6
BRRP – Bridge Replacement and Rehabilitation Program	3
CBG – Concrete Box Girder	2
CC – Corpus Christi	6
CDG – Concrete Deck Girder	2
CE – Categorical Exclusion	5
CFR – Code of Federal Regulations	3
CO – Carbon Monoxide	7
CO_2 – Carbon Dioxide	7
CPA – Calhoun Port Authority	6
DCF – Discounted Cash Flow	7
DOT – Department of Transportation	6
EA – Environmental Assessment	5
EDC – Economically Disadvantaged County	3
EFH – Essential Fish Habitat	4
EIS – Environmental Impact Statement	4
ENV – Environmental Affairs Division	4
EO – Executive Order	4
ESA – Endangered Species Act	4
FEIS – Final Environmental Impact Statement	5
FEMA – Federal Emergency Management Agency	3
FHWA – Federal Highway Administration	3
FIRM – Flood Insurance Rate Map	4
FONSI – Finding of No Significant Impact	5

	Chapter
FP – Freeport	6
FPAA – Federal Project Authorization Agreement	5
FRA – Federal Railroad Administration	2
GARVEE – Grant Anticipation Revenue Vehicles	7
GCAD – Galveston Central Appraisal District	5
GCND – Galveston County Navigation District No. 1	3
GCRRTD – Galveston County Rural Rail Transportation District	2
GDP – Gross Domestic Product	6
GLO – General Land Office	4
GWI – Genesee and Wyoming Railroad Company	9
HABS – Historic American Building Survey	4
HAER – Historic American Engineering Record	4
HALS – Historic American Landscape Survey	4
HBRRP – Highway Bridge Replacement/Rehabilitation Program	7
HC – Hydrocarbons	7
HDP – Heritage Documentation Program	4
H-GAC – Houston-Galveston Area Council	4
HGAP – Houston-Galveston Area Ports	1
HMD – Harborside Management District	2
IP – Individual Permit	4
IRR – Internal Rate of Return	7
JEM – Joint Evaluation Meeting	4
LCCA – Life-Cycle Cost Analysis	7
LLCR – Loan Life Coverage Ratio	7
LOS – Level of Service	3
MARAD – Maritime Administration	6
ME – Miscellaneous Easements	5
MHT – Mean High Tide	2
MOU – Memorandum of Understanding	1
MPO – Metropolitan Planning Organization	1
NDA – Non-Disclosure Agreement	1
NFIP – National Flood Insurance Program	4
NGO – Non-Governmental Organization	4
NMFS – National Marine Fisheries Service	4

	Chapter
NOAA – National Oceanic and Atmospheric Administration	4
NOx – Nitrogen Oxides	7
NRHP – National Register of Historic Places	3
OMB – Office of Management and Budget	7
P3 – Public/Private Partnership	7
PAB – Private Activity Bonds	7
PE – Preliminary Engineering	9
PHA – Port of Houston Authority	1
PIO – Pelican Island Organization	2
PLCR – Project Life Coverage Ratio	7
PM-10 – Particulate Matter	7
PN – Public Notice	4
POG – Port of Galveston	2
POTC – Port of Texas City	4
RFQ – Request for Qualifications	9
RIMS II - Regional Income Multiplier System	8
RIOMS – Regional Input-Output Modeling System	8
ROD - Record of Decision	5
ROW – Right-of-Way	1
RPLS – Registered Professional Land Surveyor	4
RRIF – Railroad Rehabilitation and Improvement Financing	7
RTP – Regional Transportation Plan	9
RFQ – Request for Qualifications	9
SAFETEA-LU – Safe, Accountable, Flexible/Efficient Transportation Equity Act: a Legacy for Users	7
SHPO – State Historic Preservation Officer	4
SIB – State Infrastructure Bank	7
STB – Surface Transportation Board	9
STIP – Statewide Transportation Improvement Program	5
SWG – Stakeholder Working Group	9
SWOT – Strengths, Weaknesses, Opportunities, and Threats	6
TAMUG – Texas A&M University at Galveston	1
TCEQ – Texas Commission on Environmental Quality	4
TEA-21 – Transportation Equity Act for the 21st Century	7

	Chapter
THC – Texas Historical Commission	3
TIFIA – Transportation Infrastructure Finance/Innovation Act	7
TIGER – Transportation Investment Generating Economic Recovery	7
TIP – Transportation Improvement Program	9
TNRC – Texas Natural Resources Code	5
TPG – Through-Plate-Girder	2
TPWD – Texas Parks and Wildlife Department	4
TRZ – Transportation Reinvestment Zone	7
TTC – Texas Transportation Commission	5
TTI – Texas A&M Transportation Institute	7
TxDOT – Texas Department of Transportation	1
UPRR – Union Pacific Railroad	1
USACE – U.S. Army Corps of Engineers	1
USCG – U.S. Coast Guard	1
USFWS – U.S. Fish and Wildlife Service	4
USGS – U.S. Geologic Survey	4
VOC – Volatile Organic Compounds	7
VPD – Vehicles Per Day	3
WACC – Weighted Average Cost of Capital	7
WRRDA – Water Resources Reform and Development Act	7
YOE – Year of Expenditure	2

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EXECUTIVE SUMMARY

As part of Galveston, Pelican Island has had a long history and life of service to the City, the region, Texas, and the nation. As a natural deep draft harbor, Galveston's importance was recognized as early as 1816 when a naval base was established there in support of the Mexican Revolution against Spain. In 1825, the Mexican government declared Galveston a customs entry point and, subsequent to Texas Independence, in 1837, the United States Congress declared it a port of entry. A "quarantine station" was built on Pelican Island in 1892 that merged with federal operations in 1919. Over a 35-year period, the Pelican Island facility welcomed 30,000 foreign marine cargo carriers that also brought over 750,000 immigrants to Texas. Pelican Island has also been home to the first U.S. Coast Guard rescue station in the region and also to heavy marine industry, most notably the Todd Shipyards.

In 1955, development to design, fund, and build a combination rail and vehicular bridge to Pelican Island commenced and was opened to traffic in 1959. After a short period, freight rail service ended leaving the vehicular bridge component in place. In 1965, George P. Mitchell purchased a large tract of land on Pelican Island at the bridge's gateway that included the former railroad easement.

Pelican Island has been the subject of several studies, some as recently as 2012, that sought to explore the efficiency of establishing a large port facility on the island. Each of these studies recommended, as part of the analysis, that re-establishment of freight rail service to the island was crucial to port and industrial development because the expansion of the Panama Canal and the resultant increase in waterborne tonnage to the region.

In order to locally address this need to re-establish freight rail to Pelican Island, Galveston County Commissioners Court approved the formation of the Galveston County Rural Rail Transportation District (GCRRTD) in 2013. Shortly after formation of GCRRTD, this feasibility study was initiated. The primary purpose of the study is to explore the need, associated benefits, and costs to re-establish freight access to and from Pelican Island.

The proposed rail bridge and approach analysis was conducted by HDR Engineering, Inc., in Fort Worth, Texas. HDR independently assessed four rail alignment alternatives that would connect to the two Class 1 railroads, BNSF and UPRR, on Galveston Island in the vicinity of 77th Street and terminate at either the entrance to Pelican Island parallel to Seawolf Parkway at the TAMUG campus or at an as yet to be determined point on PHA property north of the TAMUG campus.

The estimated cost to develop, design, and build the four bridge options (two different switching yard alignments combined with two different Pelican Island access points) ranged from $262 million to $306 million. These costs do not reflect the cost to establish an internal rail network on Pelican Island. Future port development proposals will dictate the rail distribution schematic route and storage design.

After conferring with affected stakeholders, most particularly, the Port of Houston Authority (PHA), the Port of Galveston (POG), and Texas A&M University at Galveston (TAMUG), it is their preference for a future freight railroad to make landfall on PHA-owned property on Pelican Island north of the campus.

During the course of this study, it was determined that the existing vehicular bascule bridge serving Pelican Island is deficient in function and in structural integrity. Although the vehicular bridge analysis was not a primary function of this study, it quickly became apparent that there is an immediate need to replace the vehicular bridge and two bridges in an improvement strategy that would actually complement each other. In the short run, a new vehicular bridge would support industrial development that could lead to the need for rail facilities. Construction of a new rail bridge would spur further heavy industrial and port development. Any increased industrial vehicular traffic would have a detrimental effect on the existing bridge by accelerating its deterioration.

HDR's Houston office performed an independent analysis of the condition of the existing bridge and proposed the most efficient and economical solution. The existing two-lane vehicular bascule bridge is too narrow and eligible for replacement under federal aid guidelines. Currently, Average Daily Traffic (ADT) counts on the bridge total approximately 8,000, making this bridge eligible for widening to four lanes, according to Texas Department of Transportation (TxDOT) roadway and bridge design guidelines. The bascule lift mechanism is manned 24-hours daily to operate the mechanism for the approximate 2,500 vessel openings occurring in the last year, causing vehicular delays.

Several alternatives were investigated including "do nothing," "rehabilitation-in-place (repair)," and "replacement of the bascule with a clear span bridge."

Do-Nothing. It was estimated that if the do-nothing alternative were followed, barring another catastrophic event, the bridge has a useful life of less than 15 years under its current level of ongoing routine maintenance.

Rehabilitation in Place. The cost to repair the bridge was estimated to range between $38 and $73 million. It should be noted that these repairs address only a third of the bridge at the most damaged area, leaving the remainder of the over 55-year old bridge intact.

Replace Bascule with an Expanded Capacity Bascule. This option would replace the existing two-lane bascule with a four-lane bascule next to the existing bridge alignment. This option would require continued 24-hour bridge operations and would not relieve travel delays due to bridge openings and would result in increased vehicular traffic through the TAMUG campus. At a cost of over $108 million, not including future operations and maintenance costs, a moveable span bridge is not a valid option.

Replace Bascule with Clear Span Bridge. The cost to replace the bridge is dependent on the alignment chosen; however, for the alignments that terminate at TAMUG, the costs range between $53 and $82 million. The two landfall alignment options for the rail bridge also apply to a parallel vehicular bridge. For a bridge alignment to terminate at PHA, the cost is estimated at $102 million. All of the clear span bridges would have a useful life of 75 years.

In addition to rail and vehicular bridge analyses, an environmental- regulatory review was conducted that addressed potential impacts related to the development of new freight rail and vehicular access between Pelican Island and Galveston Island. The regulatory review explains permitting programs, processes, and the procedures required to successfully navigate these environmental regulatory requirements.

This report addresses environmental areas of concern such as navigation, water quality, wetlands, endangered species, and fish habitat.

The relevant agencies that oversee these permitting processes were contacted, including the following:

- U.S. Coast Guard (USCG)
- U.S. Army Corps of Engineers (USACE)
- U.S. Fish and Wildlife Service (USFWS)
- U.S. Environmental Protection Agency (EPA)
- Texas Parks and Wildlife Department (TPWD)
- Texas Commission on Environmental Quality (TCEQ)
- Texas General Land Office (GLO)
- Texas Historical Commission (THC)

One crucial initial step in the environmental process is to request a permit pre-application screening and review by USACE and other regulatory

agencies. This pre-screening process is also known as a Joint Evaluation Meeting (JEM). USACE coordinates the review of the proposed bridge project scope with all affected state and federal regulatory agencies and collectively renders an opinion on the project's ability to obtain necessary approvals to move forward. This screening is conducted early on before developmental expenses have been incurred. This review provides guidance on how to correct any flaws in the project scope to assure that development moves forward.

Acquisition of ROW and access easements will be necessary and critical to the success of the bridge development efforts. This study explored various rail and roadway alignments. The only two viable access portals onto Pelican Island are on property owned by PHA and TAMUG. These entities have agreed that a rail bridge and a vehicular bridge that makes landfall on PHA property would be the most advantageous and least disruptive.

For PHA, these routes would spur economic development and enhance the value of its properties. For TAMUG, the route around the campus would enhance campus safety by not introducing industrial vehicle traffic through the campus.

Chapter 6 includes an analysis of the regional deep water port market, the Texas ports and vessel calls by type to reveal cargo-type patterns of these competing public ports, categorizes the most predominate occurring import and export cargos by each Texas deep water port; and the results of the data input as a 'Strength, Weakness, Opportunity and Threat' (SWOT) analysis indicating each Texas deep water port's attributes in each of the SWOT areas.

One dilemma facing governments is the commitment of funding to capital improvement projects that will successfully attain the desired goals while utilizing limited taxpayer funds to the most effective result. This measured and deliberate funding commitment process begins with a financial analysis that identifies and examines the best use of available funding. A financial analysis of proposed projects is an essential first step in determining project viability. The financial analysis includes a Life-Cycle Cost Analysis (LCCA), a Benefit/Cost Analysis (BCA), an Options Analysis, and a Risk Assessment.

Potential federal, state, local and private funding sources and mechanisms are listed below:

- Transportation Investment Generating Economic Recovery (TIGER)
- Transportation Infrastructure Finance and Innovation Act (TIFIA) Credit Program
- Federal Railroad Administration (FRA) Grants and Loans
- Water Resources Reform and Development Act (WRRDA) of 2014

- Federal Highway Administration (FHWA) Highway Bridge Replacement and Rehabilitation Program (HBRRP)
- FHWA Private Activity Bonds (PAB)
- FHWA Section 129 Loans
- TxDOT State Infrastructure Bank (SIB)
- TxDOT Texas Ports Capital Program
- TxDOT Transportation Reinvestment Zone (TRZ)
- Municipal Bonds
- Public Private Partnerships (P3)
- Due to a large and growing gap between government infrastructure needs and the inability to pay for those needs, using traditional financing methods, innovative financing tools need to be explored.
- One of the fastest growing innovative financing tools being utilized in the United States is Design-Build contracting. This approach has a long history in Europe and is beginning to emerge in the United States. Design-Build contracting, in the form of "Public/Private Partnerships" (P3), gives private firms the authority and ability to fund and build public infrastructure projects.
- P3s are based on the idea that the government can maximize the value of the public's assets by taking advantage of the private sector's profit motive and market discipline. P3s can also be an excellent project delivery method that shifts sufficient amounts of risk to the private sector.

In 2008, Martin Associates prepared an Economic Impact Analysis for the Board of Trustees of the Galveston Wharves (POG) that measured the baseline impacts of increased port development on the local and regional economies.

In 2012, Martin Associates prepared an Economic Impact Analysis for PHA using the same data sources and methodologies as used in the 2008 POG analysis to produce a matrix of existing jobs and revenues and their impacts on local and regional economies.

As part of a larger and more comprehensive economic impact analysis of the State of Texas Port and Maritime Transportation System, Martin Associates prepared a separate report[1] for the POG in October 2012, which summarized the local economic impacts of marine cargo and cruise vessel calls at the port for 2011. The POG and PHA reports presented economic impact models for marine cargo and passenger cruise vessel activities that measured the impacts from those activities at all public and private terminals. The results were then used to develop operational models for POG and PHA facilities.

[1] *The Local and Regional Economic Impacts of Marine Cargo and Passenger Cruise Activity at the Port of Galveston, 2011*, October 3, 2012, Martin Associates.

Chapter 1 - INTRODUCTION

Pelican Island's history reveals its strategic importance and the potential it holds for marine cargo interests in the Houston-Galveston region. In 1837, the United States Congress declared Galveston a port of entry. Unregulated entry through the Port of Galveston by immigrants during this period contributed greatly to outbreaks of Yellow Fever. This caused the City of Galveston to institute quarantine measures and in 1853 the first "quarantine station" was built on the eastern tip of Galveston Island at Fort Point. Over the following decades additional outbreaks forced the State of Texas to build a quarantine station on Pelican Island in 1892. The quarantine station and several other facilities merged with federal operations in 1919. The Pelican Island facility closed in 1950 after 35 years of operation in which 30,000 ships were inspected that brought over 750,000 immigrants.

In 1955 the State of Texas deeded the existing Seawolf Parkway submerged Right-of-Way (ROW) to the City of Galveston to allow for the design and construction of a causeway to Pelican Island to serve business and port interests. After the bridge was opened to traffic in 1958, most ferry operations from Galveston to the ferry landing at the Todd Shipyards on Pelican Island ceased, with the ferry being sold to the Mexican government in 1960 to provide ferry service to Isla Mujeres off the coast of Cancun, Mexico.

The freight rail component of the new causeway was never utilized due to it being deemed a deficient design and ideas of rail operations to Pelican Island were abandoned. After commercial and industrial development never reached expectations, a local citizen, George P. Mitchell, purchased a large tract of land on Pelican Island and, in 1965, donated the land for the permanent site of the Texas Maritime Academy, now known as Texas A&M University at Galveston (TAMUG).

To further emphasize the economic potential of Pelican Island, the Port of Houston Authority (PHA) purchased approximately 1,100 acres of waterfront and interior property on Pelican Island in anticipation of future port development.

The *Waterborne Freight Corridor Study*[1] was completed in 2011 for the Texas Department of Transportation (TxDOT), with the goal of creating a strategic vision for the Texas waterborne freight system with a phased implementation plan to guide TxDOT and its partners, such as ports, port authorities, Metropolitan Planning Organizations (MPO), railroads, U.S. Coast Guard (USCG), and U.S. Army Corps of Engineers (USACE), in achieving this goal. The corridor study developed an extensive list of infrastructure, operations, and policy solutions to address critical bottlenecks and deficiencies of the State's various marine terminals, navigable waterways, and port-highway and port-railroad connections.

The corridor study provided a Master Project List that identified "chokepoints," "critical issues," and "remedies" identified by TxDOT and its partners. The project list identified five projects of interest to the Houston-Galveston Area Ports (HGAP) associated with Pelican Island, as follows:

- **Project 70** indicated "lack of rail access to Pelican Island" as an issue with the remedy being "construct a new rail bridge," and a notation that the bridge would be required only if a PHA-associated facility were to be located on Pelican Island. The corridor study did not go into greater detail due to a Non-Disclosure Agreement (NDA) between PHA and its consultant.
- **Projects 71 and 72** were submitted to address dredging needs that would accommodate vessels with deeper drafts.

[1] Cambridge Systematics.

- **Project 90** recognized a deficiency in the HGAP region that identified a need for a new container terminal that would be required if a container facility were to be located on Pelican Island. This need is no longer urgent due to PHA's current strategic plan to increase container capacity at its Bayport and Barbours Cut facilities.
- **Project 151** is for Harborside Drive Corridor Enhancements that would be required if a future port facility were to be located on Pelican Island. These improvements would be necessary to mitigate downstream impacts of increased rail and vehicular traffic that would negatively impact the surface transportation system. Examples of these enhancements to Harborside include railroad grade separations north of 77th Street and direct connector ramps to the IH 45 Causeway main lanes.

Another report completed in 2011, *The Potential Effects of the Panama Canal Expansion on the Texas Transportation System*[2], noted that "The Port of Galveston has made coordinating land development activities and investments with the Port of Houston a priority." The report also stated that "as part of an effort to promote and develop seaborne commerce in the upper Texas coast, the two ports signed a Memorandum of Understanding (MOU) for the ports for the joint development and use of portions of Pelican Island as a potential future container-handling facility." This MOU is no longer in force and PHA is moving forward with container capacity expansion on existing mainland facilities at Bayport and Barbours Cut.

As presented in this feasibility study, due to Pelican Island's proximity to deep Gulf waters and Union Pacific Railroad (UPRR) and Burlington Northern Santa Fe (BNSF) rail network access, a clear Post-Panamax purpose and need for rail access, improved vehicular access, and future port facilities on Pelican Island should be considered.

[2] Cambridge Systematics.

Figure 1.1 – Pelican Island Aerial

Chapter 2 – PROPOSED RAIL BRIDGE AND APPROACH TRACK ANALYSIS

At the direction of the Galveston County Rural Rail Transportation District (GCRRTD), this feasibility study examined the need, associated benefits, and costs of establishing industrial freight rail access onto Pelican Island. This study addresses the rail-related questions and concerns that were expressed by local stakeholders and other interested parties during the study efforts. The local stakeholders included the PHA, the Port of Galveston (POG), Galveston County, City of Galveston, TAMUG, Pelican Island Organization (PIO), and the Harborside Management District (HMD). Several of the more commonly asked questions concerning rail are:

- What is the estimated cost to re-establish Galveston Island Class I rail system connectivity to Pelican Island? *Chapter 2*
- What are the requirements for planning, programming, and funding a rail project through the Federal Railroad Administration (FRA)? *Chapter 7*
- What are the potential economic benefits reestablishing this system? What are the projected local and regional benefits of development of a containerized or other-cargo port facility on Pelican Island or other port use configuration? *Chapter 8*
- Which type of design would be used for the proposed rail system configuration on Pelican Island? *The rail system configuration will be driven by the type of port facility developed on Pelican Island. The results of this feasibility study determined two possible railroad landfall locations.*

Table 2.1 – Available Development Acres on Pelican Island

Entity	*Total Acres*
Port of Houston Authority	1,100
Port of Galveston	340
Private Owners	225
Total	1,665

Source: Galveston Central Appraisal District

Industrial freight rail infrastructure improvements will be required to access existing industrial facilities and the approximate 1,665 acres of developable land on Pelican Island, including property available for expansions of future PHA and POG facilities and other private interests situated on Pelican Island, as follows:

Figure 2.1 – UPRR/BNSF Switching Yard on Galveston Island

Expansion of the Panama Canal will attract more vessel traffic into the eastern United States, including deep water Gulf of Mexico ports. Port facilities developed on Pelican Island stand to benefit from the canal expansion in Panama due to its proximity to deep water for efficient and economical access to the Gulf of Mexico and beyond.

In accordance with Surface Transportation Board rules, both UPRR and BNSF (as Class I railroads *Figure 2.7*) require equal access to future Pelican Island industries, terminals, and on-island businesses through a proposed short-line freight rail interchange operating within the existing switching system on Galveston Island. Equal access for UPRR and BNSF ensures future Pelican Island port and industrial facilities unrestricted rail access to the Class I national mainland railway network.

A purpose of this feasibility study was to assess various alternative alignments to provide rail access to and from Pelican Island for potential port and industrial users. The following four alignment options provide for both UPRR and BNSF to have equal access to any future rail and port development on Pelican Island. The proposed rail bridge and approach analysis was conducted by HDR Engineering, Inc., in Fort Worth, Texas. HDR independently assessed four rail alignment alternatives that

would connect to the two Class 1 railroads, BNSF and UPRR, on Galveston Island in the vicinity of 77th Street and terminate at either the entrance to Pelican Island parallel to Seawolf Parkway at the TAMUG campus or at an as yet to be determined point on PHA property north of the TAMUG campus.

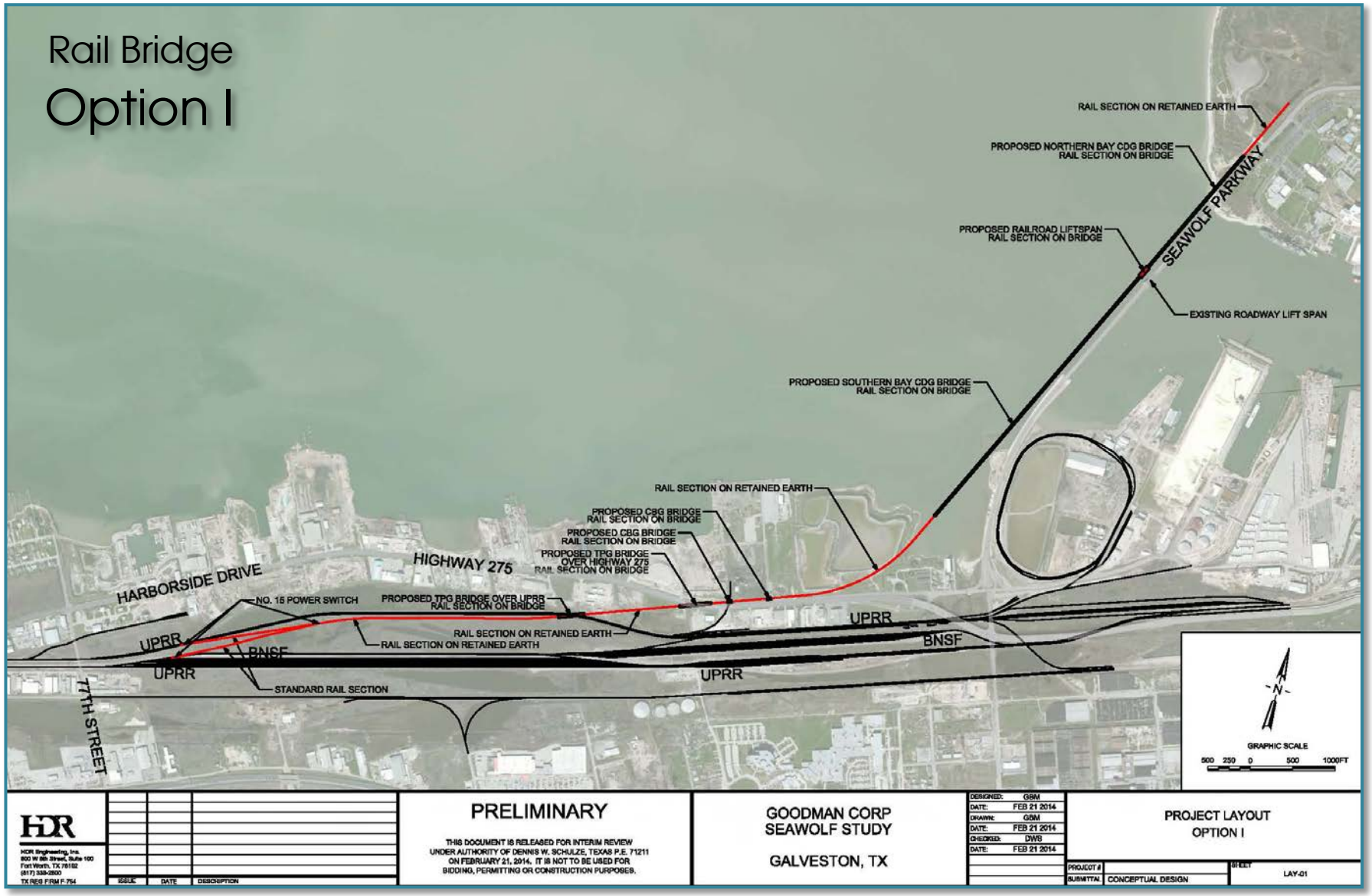
RAIL BRIDGE ALIGNMENT DESCRIPTIONS

The following four options describe workable railroad geometry with each option description beginning east of 77th Street on Galveston Island and terminating at the western shore of Pelican Island, either at the TAMUG campus or PHA property to the north.

The rail bridge alignments Options I through IV are described next and shown in *Figures 2.3 to 2.6.* These alignments begin at an eastern point near 77th Street and proceed east, ending at Pelican Island. All lengths are approximate.

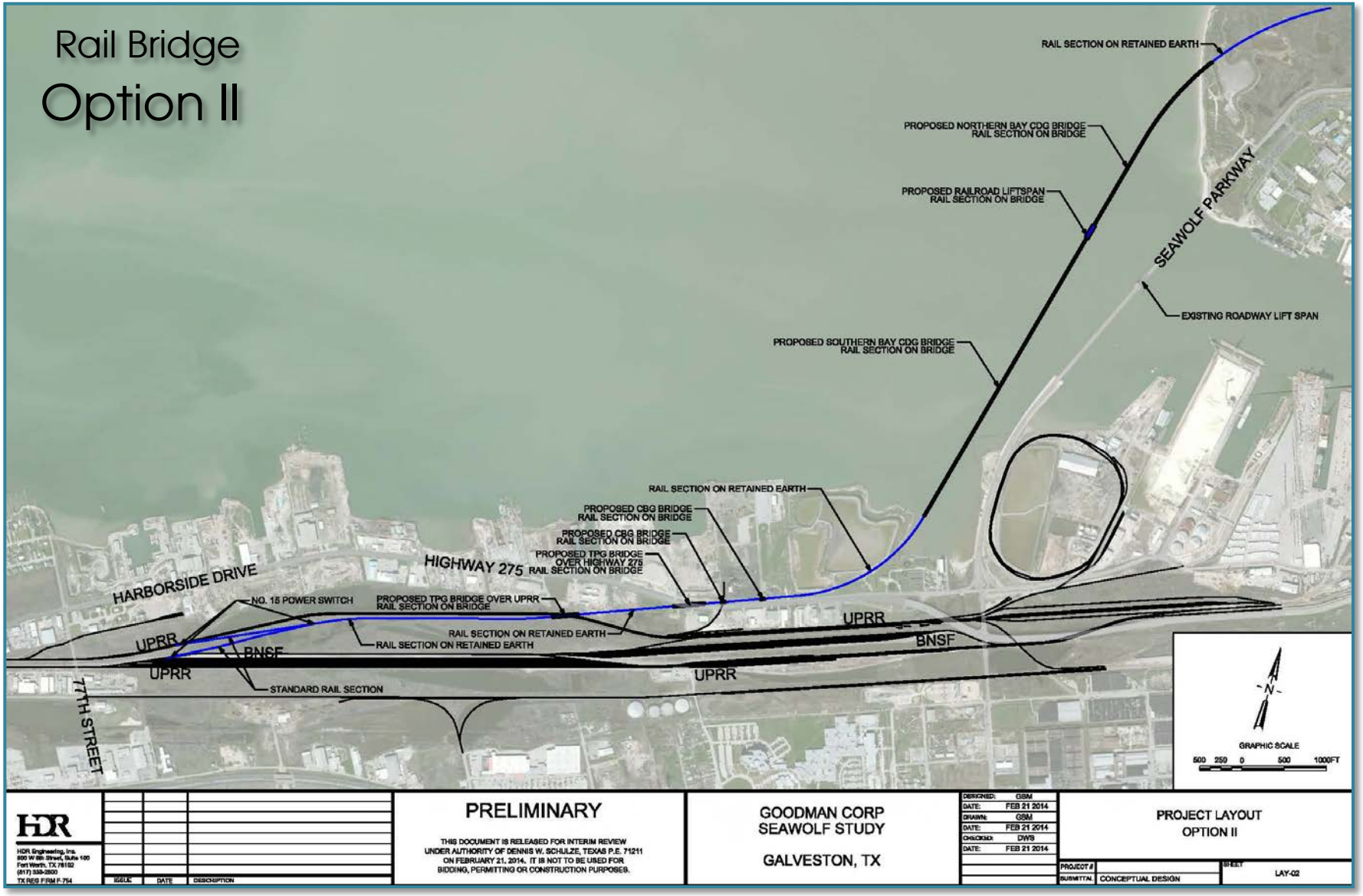
Figure 2.2 – Typical No. 15 Power Switch

Figure 2.3 – Rail Bridge Option I Alignment



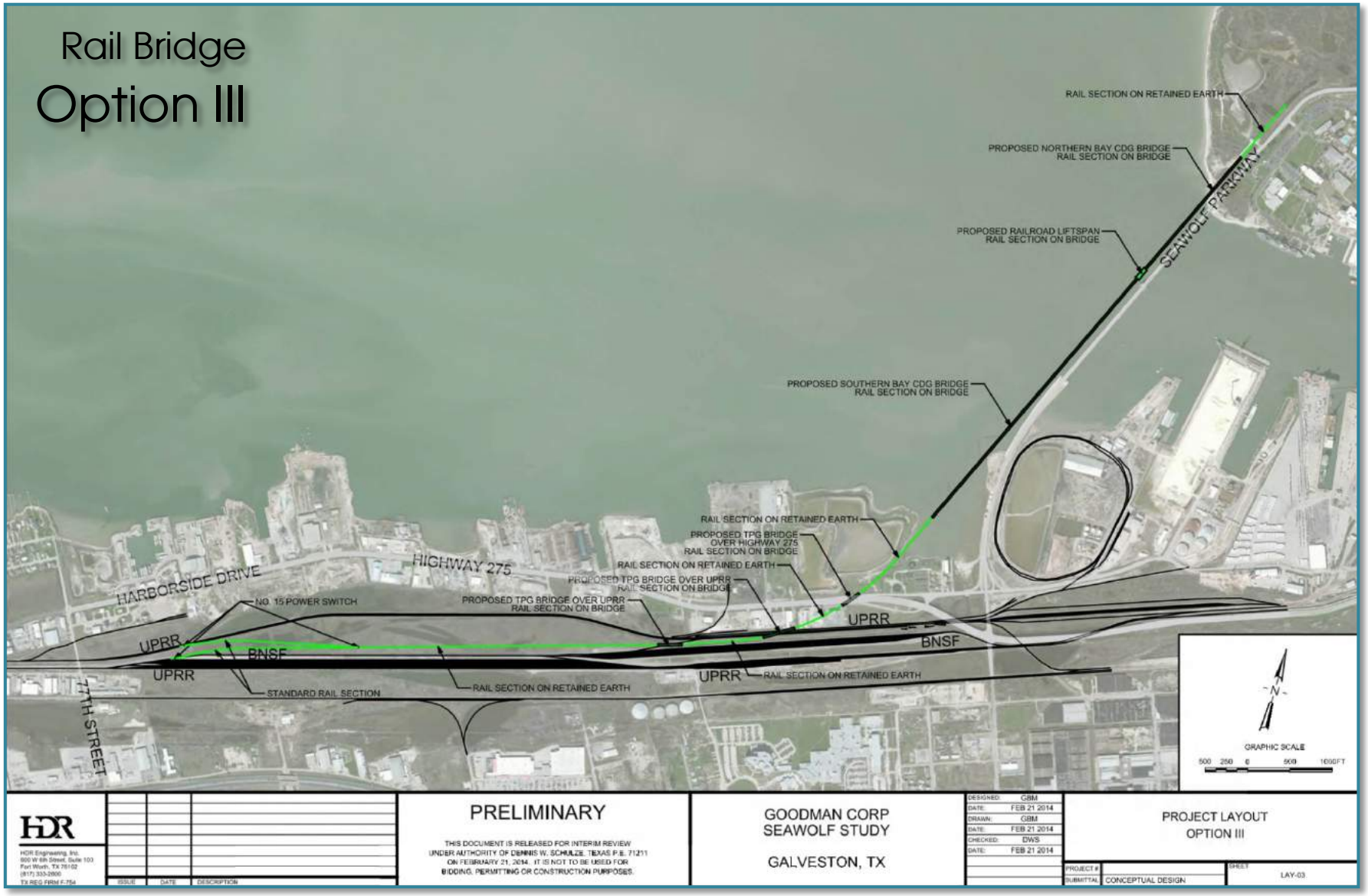
- **Option I** requires a new No. 15 power switch, a mechanism that enables railway trains to be guided from one track to another track at speeds of up to 30 mph, from the southern track of the northern branch of the UPRR switching yard 1,200 feet east of its at-grade crossing at 77th Street.
- The proposed UPRR spur will continue east 1,500 feet before tying into the proposed BNSF spur with its own new No. 15 power switch.
- The proposed BNSF spur will require a new No. 15 power switch at the northern track of the south branch of the UPRR yard switch 1,100 feet east of UPRR's at-grade crossing at 77th Street.
- The proposed BNSF spur, after a set of slight reverse curves (two 2-degree curves) totaling 1,700 feet in length, will connect to the proposed UPRR spur with another new No. 15 power switch.
- The shared BNSF/UPRR industrial lead will continue east after this Y tie-in for 3,000 feet on retained fill. The track increases in elevation at a 1% grade immediately after the two spurs converge to cross over the double track at-grade north UPRR branch on a 200-foot long ballasted Through-Plate-Girder (TPG) single-track bridge.
- The track section returns to retained fill for 1,100 feet. The elevated track will cross SH 275 (Harborside Drive) on a 300-foot long ballasted TPG single-track bridge.
- After crossing Harborside, the track section returns to retained fill for 200 feet, at which point it will grade cross a private at-grade industrial rail spur on a 50-foot ballasted precast Concrete Box Girder (CBG) bridge.
- After crossing the private rail spur, the track section returns to retained fill for 400 feet, at which point it will grade cross a private industrial access road on a 50-foot long ballasted precast CBG bridge.
- After this small bridge, the track returns to retained fill and commences a 1% grade descent for 2,500 feet to a lower track elevation. The retained fill track section continues out into the bay for 500 feet before transitioning to a ballasted precast Concrete Deck Girder (CDG) railroad bridge to cross the Galveston Navigation Channel. This over-water crossing alignment will be parallel to the adjacent Seawolf Parkway within the existing over-water ROW.
- At the point of intersect with the navigation channel, a 150-foot long vertical lift-span will be constructed in-line with the existing vehicular bascule span channel at Seawolf Parkway to allow marine traffic to cross under the proposed railroad. The vertical railroad lift span clearance at the soffit will match the soffit elevation of a proposed fixed span vehicular bridge on Seawolf Parkway of 73 feet at Mean High Tide (MHT).
- Total length of the bay bridge (including lift span), from Galveston Island to Pelican Island, is 5,500 feet. The railroad bridge will continue 500 feet onto Pelican Island, descending to an at-grade track section terminating within the roadway ROW at the TAMUG campus. From that point, future industrial rail facilities to be considered for Pelican Island can be determined.

Figure 2.4 – Rail Bridge Option II Alignment



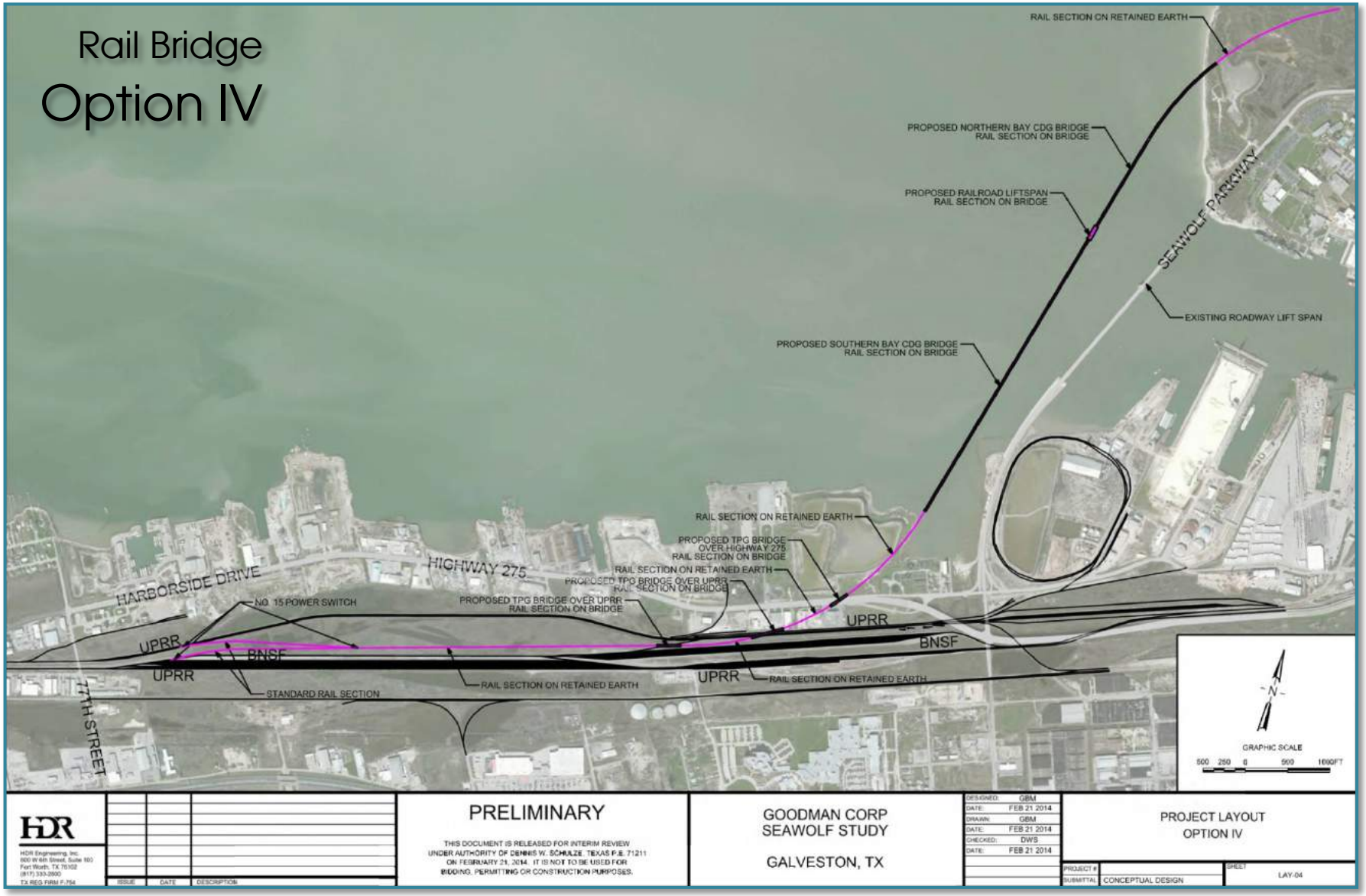
- **Option II** requires a new No. 15 power switch from the mainline south track of the northern branch of the UPRR switching yard 1,200 feet east of UPRR's at-grade crossing at 77th Street.
- The proposed UPRR spur will continue east for 1,500 feet before tying into the proposed BNSF spur with its own new No. 15 power switch.
- The proposed BNSF spur requires a new No. 15 power switch at the north track of the southern branch of the UPRR's yard switch 1,100 feet east of UPRR's at-grade crossing at 77th Street. This spur, after a set of slight reverse curves (two 2-degree curves) totaling 1,700 feet in length, will connect to the proposed UPRR spur with another new No. 15 power switch.
- The shared BNSF/UPRR industrial lead will continue east after this Y tie-in for 3,000 feet on retained fill. The track increases in elevation at a 1% grade immediately after the two spurs converge to cross over the double track at-grade northern UPRR branch on a 200-foot long ballasted TPG single-track bridge.
- The elevated track section returns to retained fill for 1,100 feet and will cross SH 275 (Harborside Drive) on a 300-foot long ballasted TPG single-track bridge.
- The track section returns to retained fill for 200 feet, at which point it grade separates a private at-grade industrial rail spur on a 50-foot ballasted precast CBG bridge.
- After crossing the private rail spur, the track section returns to retained fill for 400 feet where it will grade cross a private industrial access road on a 50-foot long ballasted precast CBG bridge.
- After this small bridge, the track returns to retained fill and commences a 1% grade descent for 2,500 feet to a lower track elevation. The retained fill track section continues out into the bay for 500 feet before transitioning to a ballasted precast CDG railroad bridge to cross the bay. This rail alignment will diverge away from the existing Seawolf Parkway alignment and proceed over open water to a landfall point at the west shoreline of Pelican Island on PHA property north of the TAMUG campus boundary.
- At the point of intersection with the navigation channel, a 150-foot long vertical lift-span will be constructed to allow marine traffic to cross under the proposed railroad. The vertical railroad lift span clearance at the soffit will match the soffit of a proposed fixed span vehicular bridge on Seawolf Parkway of 73 feet at MHT.
- Total length of the bay bridge (including lift span), from Galveston Island to Pelican Island, is 6,200 feet. The railroad bridge will continue 500 feet onto Pelican Island, descending to an at-grade track section terminating within PHA property. From that point, future industrial rail facilities to be considered for Pelican Island can be determined.

Figure 2.5 – Rail Bridge Option III Alignment



- **Option III** requires a new No. 15 power switch from the mainline south track of the northern branch of the UPRR 1,200 feet east of UPRR's at-grade crossing at 77th Street.
- The proposed UPRR spur will curve (2 degrees) immediately after the new switch, then straighten, and continue east to the tie-in with the proposed BNSF spur, for 2,000 feet.
- The BNSF tie-in will require a new No. 15 power switch at the southern branch of the UPRR's northernmost rail yard switch, 1,100 feet east of UPRR's at-grade crossing at 77th Street. The proposed BNSF spur will connect to the proposed UPRR spur with another new No. 15 power switch after a slight curve (2 degrees) and a tangent section totaling 2,000 feet in length.
- The shared BNSF/UPRR industrial lead continues east after this Y tie-in for 3,500 feet on retained fill. The track increases in elevation at a 1% grade 500 feet after the two proposed spurs converge. The track continues to increase in elevation to elevate the at-grade crossover between the BNSF Yard and the northern branch UPRR tracks on a 250-foot ballasted TPG single-track bridge.
- After the elevated crossing of the UPRR tracks, the track section returns to retained fill for 1,000 feet, at which point the track will grade cross the northern branch of the UPRR switching yard tracks on a 375-foot curved ballasted TPG single-track bridge.
- After the elevated crossing of the UPRR tracks, the track section returns to retained fill for 650 feet, at which point it will grade cross SH 275 (Harborside Drive) on a 250-foot curved ballasted TPG single-track bridge.
- After crossing Harborside Drive, the track section returns to retained fill for 1,250 feet and commences a 1% grade descent until returning to a lower ground track elevation. The retained fill track section continues out into the Galveston Navigation Channel for 500 feet before transitioning to a ballasted precast CDG railroad bridge to cross the bay. This crossing alignment will be parallel to the adjacent Seawolf Parkway within the existing over-water ROW.
- At the point of intersection with the navigation channel, a 150-foot long vertical lift-span will be constructed in-line with the existing vehicular bascule span channel on Seawolf Parkway to allow marine traffic to cross under the proposed railroad. The vertical railroad lift span clearance at the soffit will match the soffit of a proposed fixed span vehicular bridge on Seawolf Parkway of 73 feet at MHT.
- Total length of the bay bridge (including lift span), from Galveston Island to Pelican Island, is 5,500 feet. The railroad bridge will continue 500 feet onto Pelican Island, descending to an at-grade track section terminating within the roadway ROW at the TAMUG campus. From that point, future industrial rail facilities to be considered for Pelican Island can be determined.

Figure 2.6 – Rail Bridge Option IV Alignment



- **Option IV** requires a new No. 15 power switch from the mainline south track of the northern branch of the UPRR 1,200 feet east of UPRR's at-grade crossing at 77th Street. The new UPRR spur will have a slight curve (2 degrees) immediately after the new switch, then straightens, and continues east to the proposed tie-in with the new BNSF spur, for a total length of 2,000 feet.
- The BNSF/UPRR tie-in will require a new No. 15 power switch at the southern branch of the UPRR's northernmost rail yard switch 1,100 feet east of UPRR's crossing at 77th Street.
- The BNSF spur will connect to the shared BNSF/UPRR spur with another new No. 15 power switch after a slight curve (2 degrees) and a tangent section totaling 2,000 feet in length.
- The shared BNSF/UPRR industrial lead continues east after this tie-in for 3,500 feet on retained fill. The track increases in elevation at a 1% grade 500 feet after the two spurs converge to cross over the at-grade crossover between the BNSF Yard and the northern branch UPRR tracks on a 250-foot ballasted TPG single-track bridge.
- After elevated crossing of the crossover, the track section returns to retained fill for 1,000 feet, at which point the track grade crosses the northern branch of the UPRR switching yard tracks on a 375-foot curved ballasted TPG single-track bridge.
- After elevated crossing of the UPRR tracks, the track section returns to retained fill for 650 feet, at which point the track grade crosses SH 275 (Harborside Drive) on a 250-foot curved ballasted TPG single-track bridge.
- After crossing Harborside Drive, the track section returns to retained fill for 1,250 feet and commences a 1% grade descent until returning to a lower ground track elevation. The retained fill track section continues out into the bay for 500 feet before transitioning to a ballasted precast CDG railroad bridge to cross the bay. This rail alignment will diverge away from the existing Seawolf Parkway alignment and proceed over open water to a landfall point at the western shoreline of Pelican Island at the PHA property north of the contiguous TAMUG campus boundary.
- At the point of intersection with the navigation channel, a 150-foot long vertical lift-span will be constructed to allow marine traffic to cross under the proposed railroad. The vertical railroad lift span clearance at the soffit will match the soffit elevation of a proposed fixed span vehicular bridge on Seawolf Parkway of 73 feet at MHT.
- Total length of the bay bridge (including lift span), from Galveston Island to Pelican Island, is 6,200 feet. The railroad bridge will continue 500 feet onto Pelican Island descending to an at-grade track section terminating within PHA property. From that point, future industrial rail facilities to be considered for Pelican Island can be determined.

Table 2.2 – Pelican Island Freight Rail Alignments		
Option	*Advantage*	*Disadvantage*
I	Minimal environmental impacts	• Enters island at TAMUG campus • Requires additional landside and submerged ROW • Requires relocation of Center Point electric transmission lines • Possible relocation of gas pipeline • Elevated railroad between shoreline businesses and Harborside Drive
II	Enters island on PHA property, avoiding TAMUG May not require utility adjustments	• Requires additional landside and submerged ROW • Potential environmental impacts • Elevated railroad between shoreline businesses and Harborside Drive
III	Minimal environmental impacts No elevated railroad between businesses and Harborside	• Additional landside and submerged ROW required • Relocation of electric and gas utilities • Enters island at TAMUG campus • Additional land side ROW required at city waste department site
IV	May not require utility adjustments Enters island on PHA property, avoiding TAMUG No elevated rail between businesses and Harborside Drive	• Addition land side and submerged ROW required • Potential environmental impacts • Additional land side ROW required at city waste department site

SUMMARY OF COSTS

Cost estimates for the four proposed alignment options are presented in *Tables 2.3 to 2.6*. *Table 2.7* presents a summary of these cost estimates. These estimates have been prepared at 2014 unit costs, are inclusive of all developmental and constructions costs, and contain a 25% contingency factor. Year-of-Expenditure (YOE) costs can be extrapolated using any number of years and inflation values based on alternative development scenarios.

Option I

Table 2.3 – Rail Bridge Option I Cost Estimate

Description	*Quantity*	*Unit*	*Cost/Unit*	*Total*
Mobilization	1.00	LS	$250,000	$250,000
Site work				
Clearing	5	AC	$10,000	$50,000
Embankment	91,333	CY	$4	$365,333
Excavation	0	CY	$2.50	$0
Waste (Stockpile on site)	0	CY	$2	$0
Lime Stabilized Subgrade – 6" (4% Lime)	0	CY	$30	$0
Sub ballast	16,750	CY	$35	$586,250
Topsoil	16,750	CY	$2.50	$41,875
Fence ROW	0	LF	$10	$0
Site work Subtotal				$1,043,458
Bridges				
Over UPRR (TPG)	100	LF	$20,000	$2,000,000
Over Highway 275 (TPG)	200	LF	$20,000	$4,000,000
Over Rail Spur (CBG)	50	LF	$7,500	$375,000
Over Rail Spur (CBG)	50	LF	$7,500	$375,000
Bay Bridge South (CDG)	3,650	LF	$12,000	$43,800,000
Lift Span (150 feet)	1	EA	$50,000,000	$50,000,000
Bay Bridge North (CDG)	1,650	LF	$12,000	$19,800,000
Bridges Subtotal				$120,350,000
Retaining Walls (Both sides of track)				
West of New UPRR Bridge	90,000	SF	$250	$22,500,000
East of New UPRR Bridge	66,000	SF	$250	$16,500,000
East of New Highway 275 Bridge	16,500	SF	$250	$4,125,000
East of New Industrial Spur Bridge	24,000	SF	$250	$6,000,000
Southern Bay Bridge Approach	75,000	SF	$250	$18,750,000
Northern Bay Bridge Approach	2,500	SF	$250	$625,000
Install Main Track	16,750	TF	$175	$2,931,250
No. 15, RBM Turnout – Power	3	EA	$250,000	$750,000
Track Subtotal				$3,681,250
Subtotal I				$193,824,708
ROW Acquisition	5	Acres	$100,000	$500,000
Utility Relocation Expenses	1.00	LS	$5,000,000	$5,000,000
Subtotal II				$5,500,000
Design Engineering		% of I	5%	$9,691,235
Environmental Mitigation		% of II	15%	$825,000
Subtotal III				$10,516,235
Contingency	% of I, II, & III		25%	$52,460,236
Option I Total Cost				$262,301,180
Cost Per Mile				$91,139,873

Option II

Table 2.4 – Rail Bridge Option II Cost Estimate

Description	*Quantity*	*Unit*	*Cost/Unit*	*Total*
Mobilization	1.00	LS	$250,000	$250,000
Site work				
Clearing	5	AC	$10,000	$50,000
Embankment	91,333	CY	$4	$365,333
Excavation	0	CY	$2.50	$0
Waste (Stockpile on site)	0	CY	$2	$0
Lime Stabilized Subgrade – 6" (4% Lime)	0	CY	$30	$0
Sub ballast	17,250	CY	$35	$603,750
Topsoil	17,250	CY	$2.50	$43,125
Fence ROW	0	LF	$10	$0
Site work Subtotal				$1,062,208
Bridges				
Over UPRR (TPG)	100	LF	$20,000	$2,000,000
Over Highway 275 (TPG)	200	LF	$20,000	$4,000,000
Over Rail Spur (CBG)	50	LF	$7,500	$375,000
Over Rail Spur (CBG)	50	LF	$7,500	$375,000
Bay Bridge South (CDG)	3,800	LF	$12,000	$45,600,000
Lift Span (175 feet)	1	EA	$65,000,000	$65,000,000
Bay Bridge North (CDG)	2,200	LF	$12,000	$26,400,000
Bridges Subtotal				$143,750,000
Retaining Walls (Both sides of track)				
West of New UPRR Bridge	90,000	SF	$250	$22,500,000
East of New UPRR Bridge	66,000	SF	$250	$16,500,000
East of New Highway 275 Bridge	16,500	SF	$250	$4,125,000
East of New Industrial Spur Bridge	24,000	SF	$250	$6,000,000
Southern Bay Bridge Approach	75,000	SF	$250	$18,750,000
Northern Bay Bridge Approach	2,500	SF	$250	$625,000
Retaining Walls Subtotal				$68,500,000
Track – 136# CWR New – Wood Ties & Ballast				
Install Main Track	17,250	TF	$175	$3,018,750
No. 15, RBM Turnout – Power	3	EA	$250,000	$750,000
Track Subtotal				$3,768,750
Subtotal I				$217,330,958
ROW Acquisition	5	Acres	$100,000	$500,000
Utility Relocation Expenses	1.00	LS	$5,000,000	$5,000,000
Subtotal II				$5,500,000
Design Engineering		% of I	5%	$10,866,548
Environmental Mitigation		% of II	15%	$825,000
Subtotal III				$11,691,548
Contingency	% of I, II, & III		25%	$58,630,627
Option II Total Cost				$293,153,133
Cost Per Mile				$98,907,318

Option III

Table 2.5 – Rail Bridge Option III Cost Estimate

Description	*Quantity*	*Unit*	*Cost/Unit*	*Total*
Mobilization	1.00	LS	$250,000	$250,000
Site work				
Clearing	5	AC	$10,000	$50,000
Embankment	76,333	CY	$4	$305,333
Excavation	0	CY	$2.50	$0
Waste (Stockpile on site)	0	CY	$2	$0
Lime Stabilized Subgrade – 6" (4% Lime)	0	CY	$30	$0
Sub ballast	17,500	CY	$35	$612,500
Topsoil	17,500	CY	$2.50	$43,750
Fence ROW	0	LF	$10	$0
Site work Subtotal				$1,011,583
Bridges				
Over UPRR (TPG)	250	LF	$20,000	$5,000,000
Over UPRR (Curved TPG)	375	LF	$25,000	$9,375,000
Over Highway 275 (Curved TPG)	250	LF	$25,000	$6,250,000
Bay Bridge South Tall (CDG)	3,650	LF	$13,000	$47,450,000
Lift Span (150 feet)	1	EA	$50,000,000	$50,000,000
Bay Bridge North (CDG)	1,650	LF	$12,000	$19,800,000
Bridges Subtotal				$137,875,000
Retaining Walls (Both sides of track)				
West of New UPRR Bridge	90,000	SF	$250	$22,500,000
East of New UPRR Bridge	60,000	SF	$250	$15,000,000
East of New Highway 275 Bridge	39,000	SF	$250	$9,750,000
Southern Bay Bridge Approach	37,500	SF	$250	$9,375,000
Northern Bay Bridge Approach	2,500	SF	$250	$625,000
Retaining Walls Subtotal				$57,250,000
Track – 136# CWR New – Wood Ties & Ballast				
Install Main Track	17,500	TF	$175	$3,062,500
No. 15, RBM Turnout – Power	3	EA	$250,000	$750,000
Track Subtotal				$3,812,500
Subtotal I				$200,199,083
ROW Acquisition	10	Acres	$100,000	$1,000,000
Utility Relocation Expenses	1.00	LS	$5,000,000	$5,000,000
Subtotal II				$6,000,000
Design Engineering		% of I	5%	$10,009,954
Environmental Mitigation		% of II	15%	$900,000
Subtotal III				$10,909,954
Contingency	% of I, II, & III		25%	$54,277,259
Option III Total Cost				$271,386,297
Cost Per Mile				$90,255,328

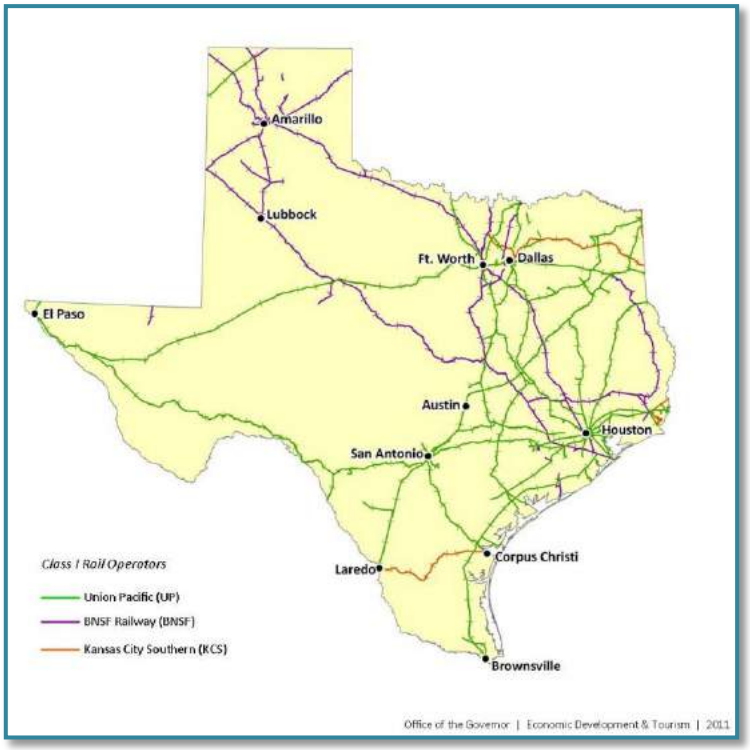
Option IV

Table 2.6 – Rail Bridge Option IV Cost Estimate

Description	*Quantity*	*Unit*	*Cost/Unit*	*Total*
Mobilization	1.00	LS	$250,000	$250,000
Site work				
Clearing	5	AC	$10,000	$50,000
Embankment	76,333	CY	$4	$305,333
Excavation	0	CY	$2.50	$0
Waste (Stockpile on Site)	0	CY	$2	$0
Lime Stabilized Subgrade – 6" (4% Lime)	0	CY	$30	$0
Sub ballast	18,000	CY	$35	$630,000
Topsoil	18,000	CY	$2.50	$45,000
Fence ROW	0	LF	$10	$0
Site Work Subtotal				$1,030,333
Bridges				
Over UPRR (TPG)	200	LF	$20,000	$4,000,000
Over UPRR (Curved TPG)	375	LF	$25,000	$9,375,000
Over Highway 275 (Curved TPG)	250	LF	$25,000	$6,250,000
Bay Bridge South Tall (CDG)	4,100	LF	$13,000	$53,300,000
Lift Span (175 feet)	1	EA	$65,000,000	$65,000,000
Bay Bridge North (CDG)	2,200	LF	$12,000	$26,400,000
Bridges Subtotal				$164,325,000
Retaining Walls (Both sides of track)				
West of New UPRR Bridge	90,000	SF	$250	$22,500,000
East of New UPRR Bridge	60,000	SF	$250	$15,000,000
East of New Highway 275 Bridge	39,000	SF	$250	$9,750,000
Southern Bay Bridge Approach	37,500	SF	$250	$9,375,000
Northern Bay Bridge Approach	2,500	SF	$250	$625,000
Retaining Walls Subtotal				$57,250,000
Track – 136# CWR New – Wood Ties & Ballast				
Install Main Track	18,000	TF	$175	$3,150,000
No. 15, RBM Turnout – Power	3	EA	$250,000	$750,000
Track Subtotal				$3,900,000
Subtotal I				$226,755,333
ROW Acquisition	10	Acres	$100,000	$1,000,000
Utility Relocation Expenses	1.00	LS	$5,000,000	$5,000,000
Subtotal II				$6,000,000
Design Engineering		% of I	5%	$11,337,767
Environmental Mitigation		% of II	15%	$900,000
Subtotal III				$12,237,767
Contingency	% of I, II, & III		25%	$61,248,275
Option IV Total Cost				$306,241,375
Cost Per Mile				$99,018,045

Table 2.7 – Summary of Rail Bridge Options		
Bridge Option	Total Cost	Cost Per Mile
I	$262 million	$91 million
II	$293 million	$99 million
III	$271 million	$90 million
IV	$306 million	$99 million

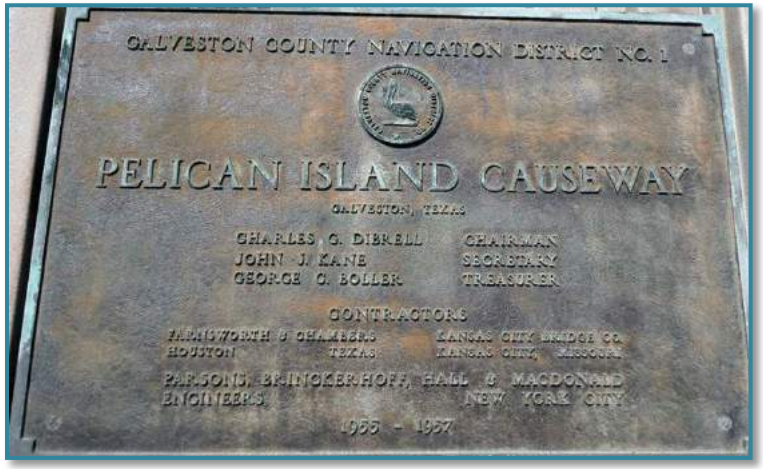
Figure 2.7 – Texas Class I Railroads



Chapter 3 – EXISTING AND PROPOSED VEHICULAR BRIDGE AND ROADWAY ANALYSES

3

This chapter explores various repair and replacement options. These options have been presented to analyze the economic costs of repair versus replacement.



Opened in 1958, Pelican Island Causeway provides the only means of road vehicle access to Pelican Island. The existing bridge with approach causeway is 3,236 feet long and originally was built to carry railroad and highway traffic. Currently, there is no railroad use on the bridge and some of the track has been removed. This Scherzer single-leaf rolling lift bascule main span is raised to allow passage of marine vessels along the Pelican Island Channel. This moveable span bridge is operated from a continuously manned control house on the south end of the bascule span.

Existing Vehicular Causeway Bridge

The bridge consists of a total of 42 individual 50-foot pre-stressed concrete beam minor-approach spans on each end of the bascule bridge. The parallel railroad spans on the east edge of the bridge are only 25 feet long due to extra independent bents (a support system consisting of support columns, column caps, and pilings) that were constructed between those that support the highway/railroad. Nine steel girder approach spans, 101.25 to 102.5 feet in length, with four spans on the south and five spans on the north, connect to and flank the main bascule span. The bascule span is a 215-foot steel deck truss.

The four southern flanking spans, the five northern flanking spans, and the concrete bascule piers are founded on concrete footings supported by timber spread-footing piles under the mud line. All other spans are supported by concrete bents (pile trestle bents) consisting of 24-inch square pre-stressed concrete piles. The highway bascule span deck consists of aluminum grating. All remaining causeway deck is concrete (26 feet wide, two-way roadway with curb and gutter). A painted steel rail is provided on both sides of the causeway deck.

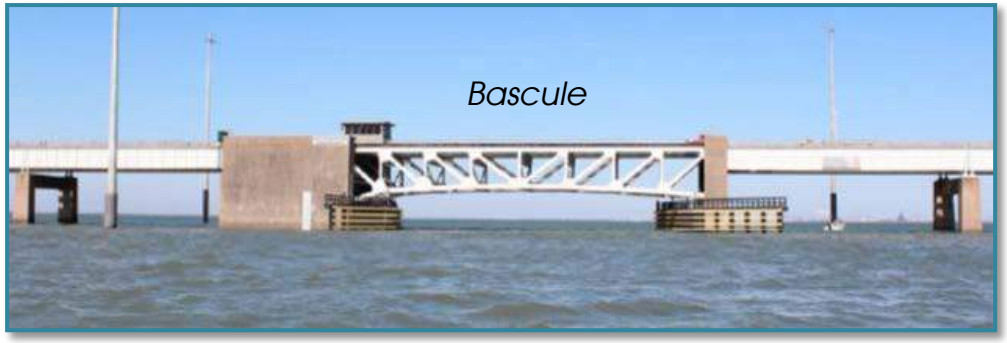
This feasibility study examines the approach roadway, causeway, and bascule bridge issues, as follows:

- ***Current Status*** of structural condition;
- ***Impacts of Doing Nothing*** and maintaining an operational *status quo*;
- ***Current Operating and Maintenance Costs*** per fiscal year;
- ***Vehicular Roadway Capacity*** current and projected;
- ***Rehabilitation Options*** for existing causeway and bascule (rehabilitation in place);
- ***Bridge Replacement Options*** for a new causeway (new bascule versus new fixed span); and
- ***FHWA and TxDOT Coordination*** of future funding sources and strategy.

CURRENT STATUS OF STRUCTURAL CONDITION

All publicly owned bridges in the United States are inspected every two years as a requirement of the federally mandated bridge inspection program. The federal program is administered by the Federal Highway Administration (FHWA) using TxDOT as its inspection and certification agent. The program is known as the Bridge Inventory, Inspection, and Appraisal Program (BRINSAP). For bridges subject to scour, underwater inspections are required every 60 months, at a minimum, but due to historical issues this bridge is inspected underwater every 24 months. Inspections are performed by licensed professional engineers with diving certifications.

The bridge is more than 55 years old and is located in a harsh coastal environment. The bridge is not exhibiting signs of structural distress; however, it has over 18 years of documented environmental distress. Environmental distress is defined as signs of distress caused by "Nature" versus distress caused by "Loads." Examples of environmental distress include salt water corrosion, marine borers, and tidal scour. This bridge has environmental distress under water. Scour has undermined the footings and has exposed the timber piles of the four southern flanking spans, the five northern flanking spans, and the bascule spans located at or near the navigation channel. Exposed timber pilings are susceptible to marine borers, fungus attack, and further decay. It is essential to note that the most important bents of this bridge are supported on timber pilings and this is the driving factor for replacement of this bridge.



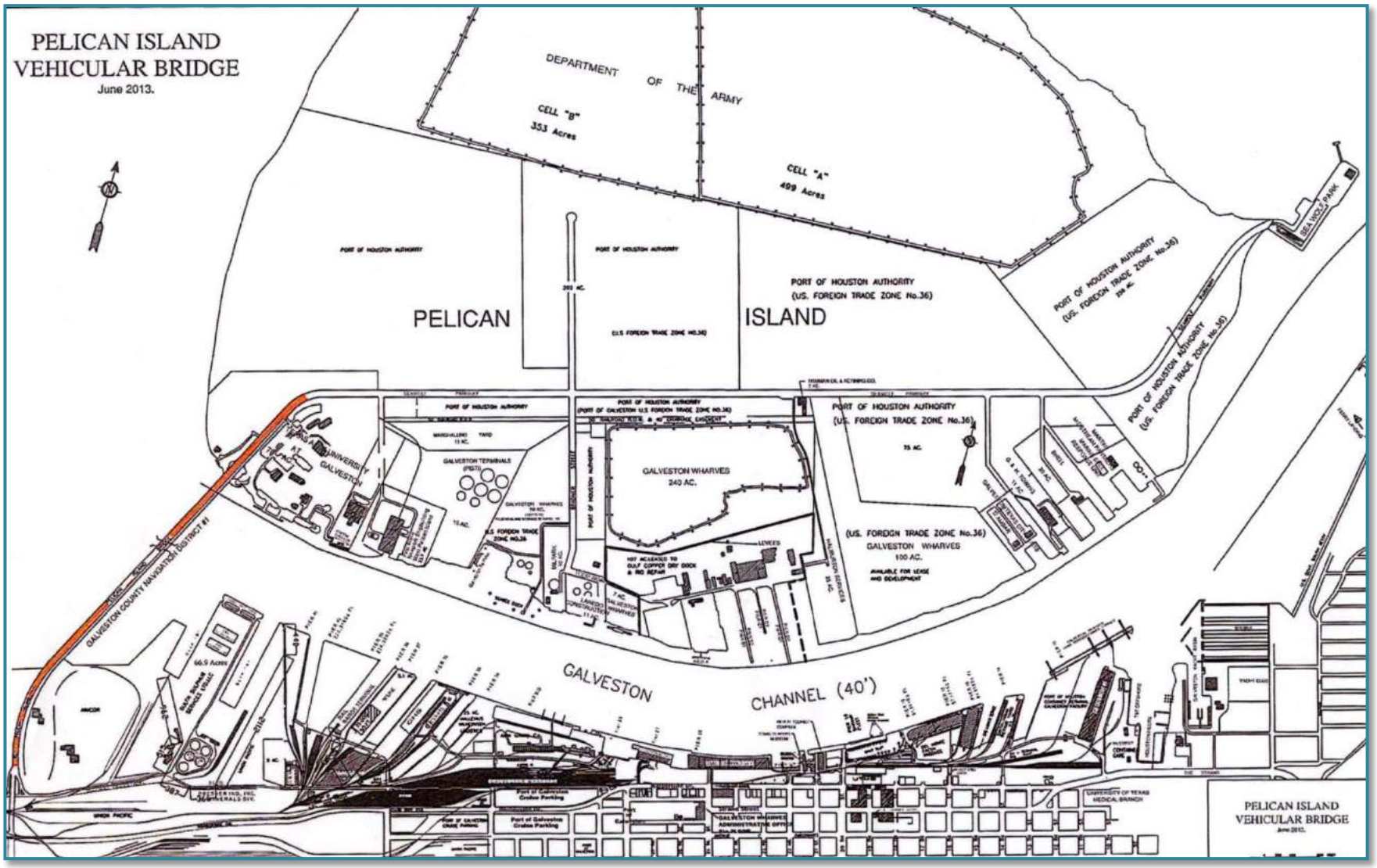
Hurricane Ike came ashore on the Galveston Island area on September 13, 2008. Due to the storm surge, the Pelican Island bascule and approaches sustained heavy damage, lost all electrical power to the bascule bridge mechanism, and suffered water damage to its sump pumps when seawater inundated the pit area and the South bascule pier where the counter weight and lifting mechanism equipment is housed. Immediately following the hurricane, the Galveston County Navigation District No. 1 (GCND) contracted for emergency repairs in order to restore essential access to Pelican Island. The marine navigation fender system sustained severe damage. In 2009, a new fender

system was installed using emergency funds from the U.S. Federal Emergency Management Agency (FEMA) available for hurricane damages. In the following year TxDOT let a construction contract for permanent repairs to the bridge approach roadway pavement to supplement the temporary emergency repairs. Select piling repairs, a new generator, painting of the steel spans, and bascule structural repairs were included in the contract.

This bridge is *eligible* for listing in the National Register of Historic Places (NRHP) and, although that does not preclude its demolition and removal, it makes such prospects more cumbersome, costly, and time consuming. Bascule bridges were introduced in the 1890s; however, very few were built from 1945 to 1965. This bridge is the only surviving bascule bridge in Texas from that period and one of only two known to have been built in Texas during that period.

If it is determined that the bridge will be demolished, officials would be required to rigorously study the alternatives, including rehabilitation or building another bridge parallel to it and leaving the original structure in place. If those options are not viable, the bridge can be demolished after gathering extensive documentation including high-quality archival photographs, images, and articles, according to officials at the Texas Historical Commission (THC). After demolition, an historic marker would be erected at the site noting its significance. It should be noted that TxDOT and THC agree that if a structure is unsafe, no matter how historical, it can be removed for the public good if all other preservation options have been exhausted. Chapter 4 presents detailed TxDOT and THC processes for addressing historic bridge replacement. Comprehensive descriptions of regulatory programs and instructions on how to proceed before the demolition process begins are included in Chapter 4 – Historic Properties and Parklands.

Figure 3.1 – Vehicular Bridge and Land Uses



IMPACTS OF DOING NOTHING

The current condition of the existing bridge requires planning for the future. The bridge is over 55 years old and has provided outstanding service. The harsh coastal environment continues to take its toll and the useful remaining life is near the end. After studying the most recent BRINSAP reports, it is assumed that, notwithstanding another catastrophic storm, and due to existing structural concerns, the bridge will need to be replaced within the next 15 years, even with the current level of care and maintenance, GCND has performed under current budgetary constraints. As the bridge condition continues to deteriorate, the load rating or load carrying capacity can decline, effectively impeding tractor-trailer units from crossing the bridge. In this event, industry shipments would be crippled and the only method of shipment would be by marine delivery. This would impact costs and require the owner of the bridge, GCND, to begin the process of acquisition of replacement funds. Obtaining equity, procuring consultant engineers, securing required environmental permits, and designing a new bridge can take up to 2½ years or more, not including the construction timeline. If a design–build approach is taken, construction can run concurrently, but only after all required permits have been issued. If design-bid-build protocols are used, construction would last for another 2½ years after letting, making the total turnkey development timeline approximately five years or more.

CURRENT OPERATING AND MAINTENANCE COSTS

Operating costs for a movable span bridge are comprised of labor costs for bridge tenders 24 hours a day plus annual maintenance costs. According to GCND staff, the annual operating budget for the current movable span bridge is approximately $600,000. Although ordinary annual operating costs for the bridge may be viewed by some as minimal, it must be considered that major rehabilitation costs occur approximately every 10 years at $6 million to $10 million each occurrence, according to past rehabilitation efforts undertaken by TxDOT. These past costs have been extrapolated to current YOE. This feasibility study compares the initial costs of a new high-level, fixed span bridge to the costs of a movable span bridge to develop a summary opinion of the best economically feasible replacement bridge.

VEHICULAR ROADWAY CAPACITY

The capacity of a roadway is defined by the volume of traffic that the lanes can handle at an acceptable Level of Service (LOS). The bridge is current a two-lane facility with no emergency shoulders and a three-foot raised curb that is too hazardous for pedestrian traffic. Current traffic counts are 7,900 Vehicles per Day (VPD). The TxDOT Highway Capacity Manual indicates that a four-lane facility is warranted when traffic counts reach 8,000 VPD. With the current traffic growth, this threshold is close to being met and is the reason the proposed cross section for a new bridge requires four lanes with emergency shoulders.

REHABILITATION OPTIONS FOR EXISTING CAUSEWAY AND BASCULE

The bridge currently is functionally obsolete due to its deficient deck width according to currently observed standards. The sufficiency rating of a bridge is a numerical representation of the sufficiency of the bridge that ranges from 0 to 100, from worst to best. The sufficiency rating serves as a basis for establishing eligibility for replacement or rehabilitation of deficient classified bridges in the federal Bridge Replacement and Rehabilitation Program (BRRP). If the bridge is deficient and the rating is less than 50, the bridge is eligible for replacement or rehabilitation under FHWA funding. The bridge currently is not on a priority list for replacement even though the BRINSAP score is 42, making it eligible for replacement. Discussions between TxDOT and GCND have been occurring in order to explore the possibility of scheduling this bridge to become top priority as a federally funded bridge replacement project. For the purposes of due diligence, this feasibility study compares repair/rehabilitation options and costs with replacement options and costs applicable to this bridge.

The remaining life of this bridge from an engineering perspective cannot be predicted with any certainty or accuracy since there are too many variables in play. The bridge undergoes underwater engineering inspections every 24 months to find any problems that may present themselves during each inspection cycle. For the purposes of this report, Kenneth Ozuna, P.E., has reviewed several cycles of underwater inspection reports and finds that all of the concerns are associated with the scour at the four southern flanking spans, the five northern flanking spans, and the bascule spans. It is his opinion that the affected spans, supported by timber pilings, need replacement as soon as feasible.

The first priority is to address the deficiencies found in the scoured and undermined footings supported by the aforementioned timber piles. Underwater bridge elements, also known as the substructure and foundation, should be replaced in order to restore the structural integrity of these foundations. Note that costs for underwater marine repair work are extremely

expensive, have high safety risks, and are difficult to inspect. However, new foundation installation would provide a service life for the next 75 years with proper maintenance and upkeep.

Two Rehabilitation In Place options will be considered, as follows:

- ***Rehabilitation Option 1*** – Complete replacement of the superstructure, substructure, and foundations at the aforementioned affected spans; and
- ***Rehabilitation Option 2*** – Replacement of the substructure only of these spans, keeping the old superstructure, girders, and deck.

Table 3.1 – Rehabilitation In Place Options

Rehabilitation Option	*Substructure Cost*	*Superstructure Cost*	*Total*
1	$29.9 million	$42.7 million	$72.6 million
2	$29.9 million	Not Applicable	$29.9 million

The most challenging aspect of the repairs is how to maintain vehicular traffic while replacing the supporting foundation and support columns. Initial rehabilitation phasing would most likely require two-way traffic on a single lane that would be achieved using temporary signals for traffic control. This method of phasing repair makes the alternate lane available for use as the construction zone. The most particularly difficult rehabilitation activity would be associated with the bascule pit foundation due to its complexity and mass.

The advantage of Rehabilitation Option 1 over Rehabilitation Option 2 is that the corroded steel girder superstructure would be replaced in Rehabilitation Option 1. The clear disadvantage to both options is that the remaining 2,102-foot length (65%) of the bridge would still be over 55 years old, which is beyond its useful service life, has deficient width, and would likely still require replacement within 15 years after repairs have been made. It is considered that Rehabilitation In Place is neither a practical nor a financially responsible use of taxpayer funds. Although rehabilitation options are available, these should be considered a temporary solution to a permanent problem. Prudent engineering judgment dictates that a bridge this old and located in this harsh coastal environment should be replaced in whole and not partially.

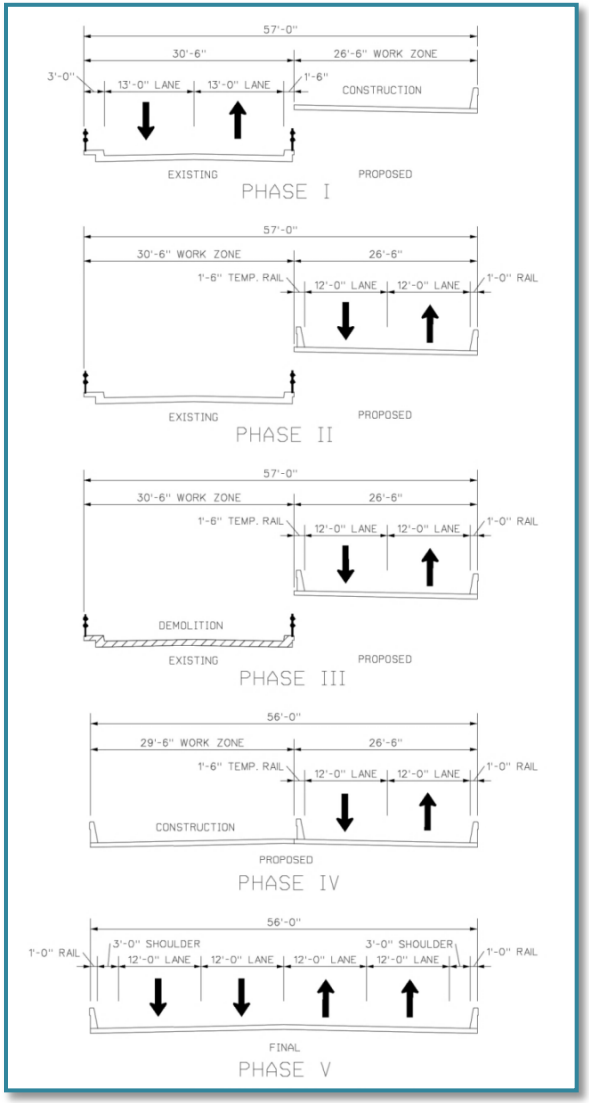
BRIDGE REPLACEMENT AND APPROACH ROADWAY GEOMETRY OPTIONS

Figure 3.2 presents cross-sections for each phase of bridge replacement construction of fixed span Options 1 and 2.

Replacement options available for the existing bridge and approaches are presented in *Figures 3.2 to 3.4.* The top priority is always safety while maintaining traffic during construction. If the existing bridge alignment and ROW were to be used, the reconstruction plan would be accomplished in five phases, as follows:

- Phase I would involve construction of a two-lane, clear-span structure adjacent to the existing bridge on the east side (the existing railroad footprint) while maintaining traffic on the existing bridge to the west.
- Phase II would involve routing current traffic away from the existing bridge onto the new bridge to the east.
- Phase III would involve demolition of the original bridge.
- Phase IV would involve construction of a second two-lane, clear-span structure adjacent to the west of the first phase bridge on the former footprint of the demolished structure.
- Phase V would involve routing two lanes of traffic in the westbound direction and two lanes of traffic in the eastbound direction in its ultimate configuration on the two new adjacent bridges.

Figure 3.2 – Cross-sections by Phase



NEW BRIDGE OPTIONS

New bridge options to be considered include a replacement movable span structure (3.250 ft.), similar to the existing structure, or a high-level, fixed span structure (Options 1-3). The high-level, fixed span structure would rise 73 feet above MHT at the soffit for navigational clearance. This structure would require grades, up to 6%, rather than the relatively flat profile of the existing bridge. Consideration will be given to touch down points near the TAMUG campus and its impacts on the campus and the students. Four Vehicular Bridge Replacement options were considered in this feasibility study.

- ***Movable Span Bridge Option*** (3,250 ft.) is the highest cost bridge that matches the existing bascule bridge geometry. The added cost would be associated with construction of a new control building, lift motor, and counterweight for a four-lane bascule deck. This option follows the existing alignment through the TAMUG campus and would require continual 24-hour operations and associated travel delays.
- ***Fixed Span Bridge Option 1*** (3,250 ft.) is the lowest cost bridge, touches down at-grade before the TAMUG campus entrance, and matches the current bridge length *(Figure 3.3)*.
- ***Fixed Span Bridge Option 2*** (4,200 ft.) is a longer bridge connecting to two elevated lanes through the campus for industrial traffic and two lanes dedicated to at-grade entrance and exit ramps for campus traffic. The elevated lanes through the campus would create cross streets underneath, thereby promoting safe traffic flow under the bridge between the north and south campus areas adjacent to Seawolf Parkway. Although it is not a solution to division of the campus, fixed span Option 2 is a safety improvement by eliminating the interface of campus traffic and industrial through-traffic *(Figure 3.4)*.
- ***Fixed Span Bridge Option 3*** (6,000 ft.) is at a new location over open water that bears on a north-south path from Harborside Drive at 51st Street to the common boundary area of PHA and TAMUG properties *(Figure 3.5)*.

There are several advantages to Option 3. (1) It has no impact on the existing bridge or on vehicular traffic during the construction phase; (2) by connecting to PHA property, industrial and economic development would be encouraged by

providing a new, structurally sound, higher vehicular capacity bridge in place; and (3) this new alignment would create a bypass around the TAMUG campus and would foster a safer campus environment.

The current TAMUG Master Plan has accommodation for campus improvements north of Seawolf Parkway and a relatively minor modification to the internal road network planned in that area could be complemented by moving the campus entrance to the north TAMUG border with PHA. East of this new campus entrance, the remainder of traffic would be comprised primarily of industrial vehicles and some Seawolf Park traffic.

The bypass alignment could be designed to return industrial traffic back to the existing Seawolf Parkway alignment at GTI Boulevard, in order to not "land lock" existing industry locations. The current Seawolf Parkway, within the confines of the campus boundary, could then conceivably be turned over to TAMUG for maintenance and operation as an internal circulator street for exclusive university use.

Option 3 has a delta cost differential of approximately $50 million over Option 1, as presented in *Table 3.2*. Due to FHWA bridge replacement programmatic rules, only Option 1 ($53 million), or its dollar value equivalent, would be funded at 80% with federal monies ($42.4 million), with the remaining 20% ($10.6 million) being the responsibility of TxDOT and the local sponsor. Therefore, the $10.6 million local participation share for Option 1, in addition to the aforementioned $50 million delta, for a combined total of over $60 million, would have to be borne by other non-FHWA funding sources if Option 3 were pursued. In meetings with the two most affected stakeholders, PHA and TAMUG, Option 3 is the preferred alternative. It is apparent that a coalition of local stakeholders would need to be formed to seek the $60 million from other sources. These financial alternatives are described in more detail in Chapter 7.

Table 3.2 – Vehicular Bridge Replacement Options

Bridge Option	*Bridge Length*	*Description*	*Total*
Movable Span	3,250 feet	Matches existing structure	$108 million
Fixed Span Bridge Option 1	3,250 feet	Matches existing touch down points	$53 million
Fixed Span Bridge Option 2	4,200 feet	Longer bridge elevated through campus	$82 million
Fixed Span Bridge Option 3	6,000 feet	Longer bridge to PHA property	$102 million

Figure 3.3 – Fixed Span Bridge Option 1

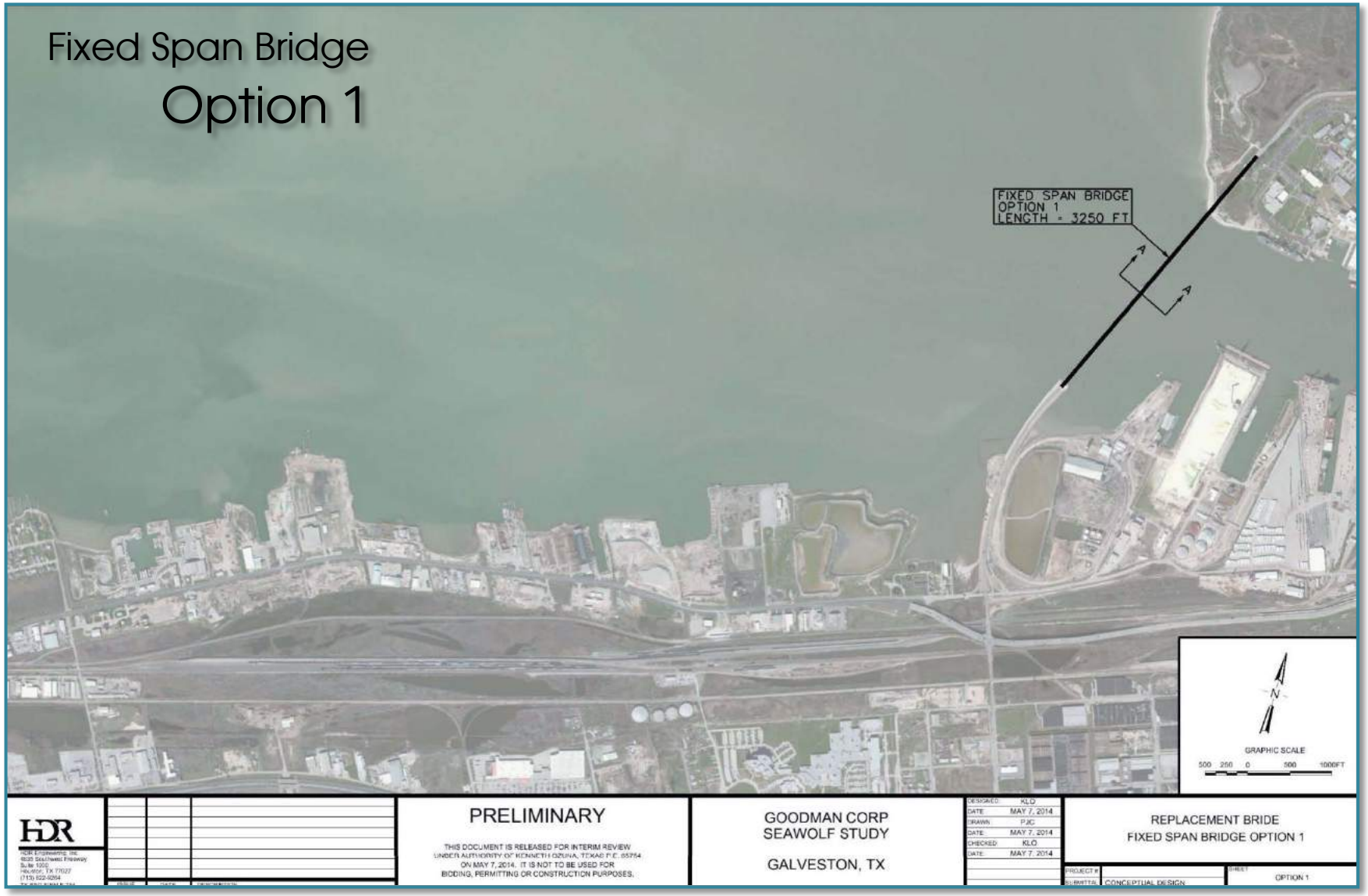


Figure 3.4 – Fixed Span Bridge Option 2

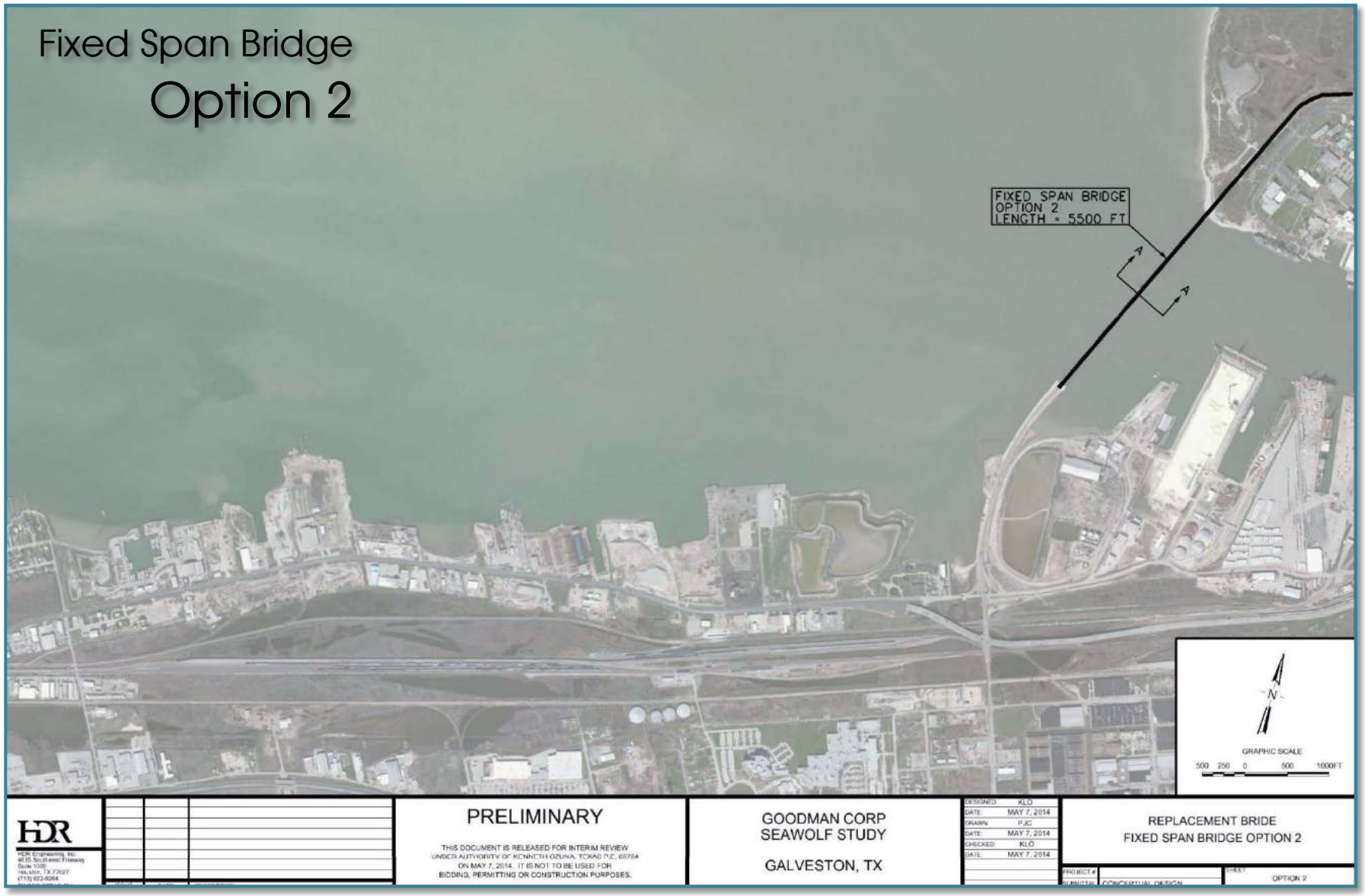
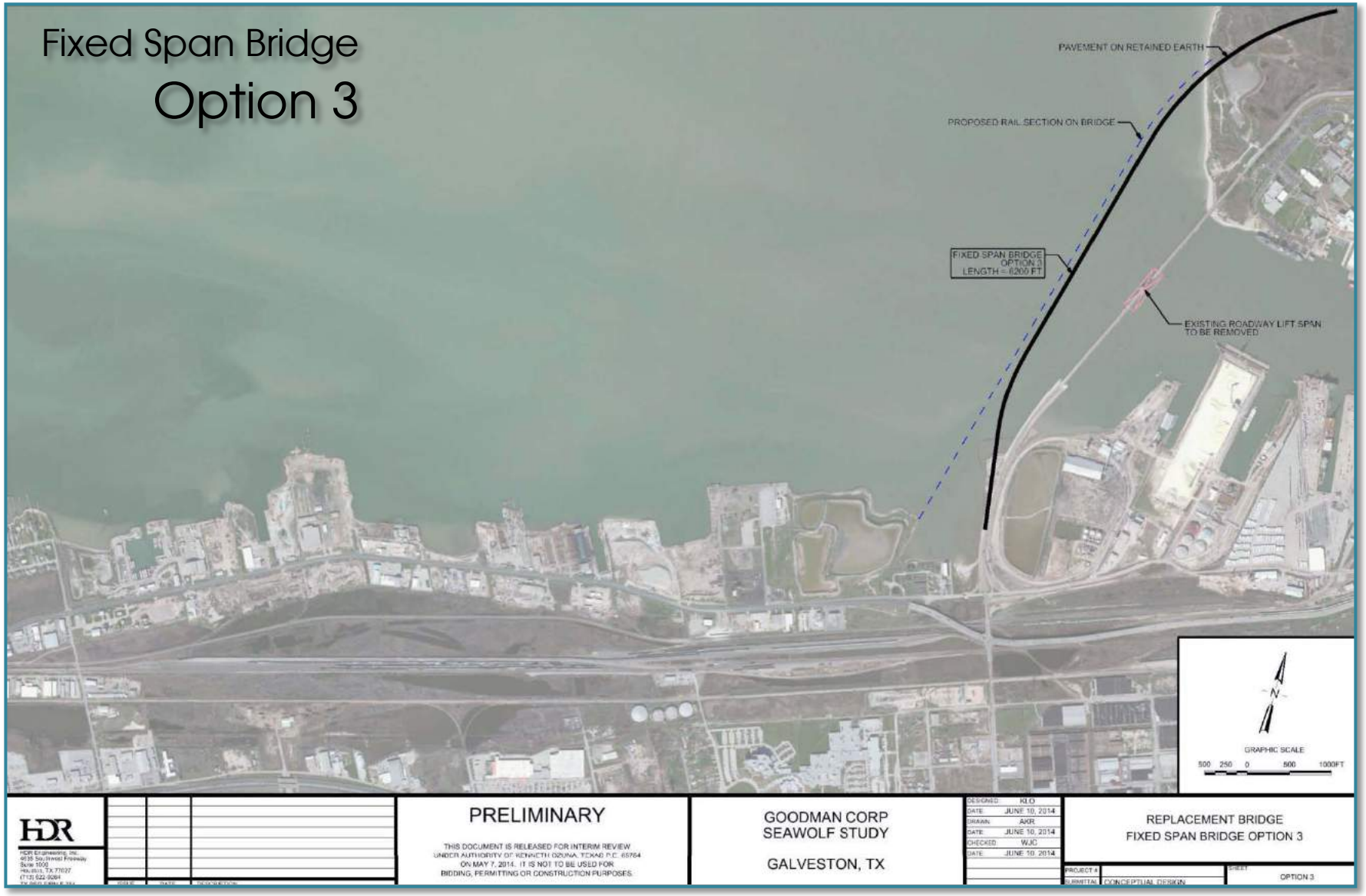


Figure 3.5 – Fixed Span Bridge Option 3



FHWA AND TxDOT COORDINATION

This bridge is not located on the State highway system, is designated as a "local road," and classified as an "off-system bridge." It is, therefore, eligible for rehabilitation or replacement under the federally funded BRRP. Projects eligible for inclusion in this program are selected according to criteria requirements specified by FHWA and prioritized on a statewide basis by TxDOT. The primary eligibility requirement is the structure must be inspected by an independent professional engineer who rates the bridge as being deficient. A deficient rating can indicate the structure has either load carrying flaws or geometric flaws that make it eligible for federal funding to correct those flaws. This bridge currently is rated Deficient and is federally eligible for replacement. Funding share responsibility for off-system bridge replacement projects is typically an 80/10/10% federal/state/local funding match, with the local match fund participation requirement based on the estimated project cost made at the time of agreement execution between TxDOT and the local government sponsor. The 10% participation of the local government may be adjusted when the project is located within a county meeting the statutory definition of being an Economically Disadvantaged County (EDC). At this time, however, Galveston County has not been deemed an EDC by the State.

The local match fund requirement on federal off-system bridge projects may be waived. For a waiver to be considered, the local government must agree to use local funds to perform structural or other safety improvement work on other load-carrying deficient bridges or cross-drainage structures (culverts) in its jurisdiction in lieu of a cash match and the work must have a dollar value at least equal to the required local match outlined in the bridge replacement agreement.

This bridge is owned/operated by GCND. It is the only facility owned by this local government and is ineligible for a waiver of this type. GCND is a taxing entity that has a very limited tax base income and cannot afford to rebuild this structure without significant federal financial aid. Securing the monies for its 10% funding share places an extreme financial burden on GCND. Without repairs and in its present condition, the State can perform load rating calculations, based on assumed section losses, to reduce the live-load carrying capacity of the bridge and post the bridge as being load zoned. If the State calculates a load rating that is below the axle weights of a typical tractor-trailer unit, the industry on Pelican Island will be prohibited from using the bridge commercially. When a bridge on a key route becomes load posted so low that normal vehicular traffic cannot safely cross the bridge, the State has the authority to bar any traffic on the structure. These actions are extreme and do not occur under normal operational use. Bridge closures usually are required after extreme weather-related events.

SUMMARY OF COSTS

Cost estimates for the four proposed vehicular alignment and bridge-type options are presented in *Tables 3.3 to 3.6*. *Table 3.7* presents a summary of these cost estimates. These estimates have been prepared at 2014 unit costs, are inclusive of all developmental and constructions costs, and contain a 25% contingency factor. YOE costs can be extrapolated using any number of years and inflation values based on alternative development scenarios.

Movable Span Bridge

Table 3.3 – Movable Span Bridge Cost Estimate

Description	*Quantity*	*Unit*	*Cost/Unit*	*Total*
Mobilization	1.00	LS	$375,000	$375,000
Roadway Approaches				
Clearing	5	AC	$10,000	$50,000
Embankment	12,000	CY	$4	$48,000
6" Lime treated Subgrade	22,000	SY	$14	$308,000
12" Concrete Pavement	20,000	SY	$55	$1,100,000
Roadway Approaches Subtotal				$1,506,000
Bridges				
Galveston Approach	80,000	SF	$175	$14,000,000
Pelican Island Approach	90,000	SF	$175	$15,750,000
Bascule Movable Span (300' x 72')	21,600	SF	$2,000	$43,200,000
Bridges Subtotal				$72,950,000
Retaining Walls				
Concrete Sheet Pile Wall to Replace Existing at Galv. Approach	45,000	SF	$45	$2,025,000
Retaining Walls Subtotal				$2,025,000
Miscellaneous				
Safety Lighting	1	LS	$60,000	$60,000
Demolish Existing Bridge	1	LS	$2,000,000	$2,000,000
Traffic Control	1	LS	$75,000	$75,000
Striping	1	LS	$35,000	$35,000
Miscellaneous Subtotal				$2,170,000
Subtotal I				$79,026,000
ROW Acquisition	5	Acres	$100,000	$500,000
Utility Relocation Expenses	1.00	LS	$200,000	$200,000
Subtotal II				$700,000
Design Engineering		% of I	8%	$6,322,080
Environmental Mitigation		% of II	15%	$105,000
Subtotal III				$6,427,080
Contingency	% of Subtotals I, II, & III		25%	$21,538,270
Total Cost				$107,691,350

Fixed Span Bridge Option 1

Table 3.4 – Fixed Span Bridge Option 1 Cost Estimate

Description	*Quantity*	*Unit*	*Cost/Unit*	*Total*
Mobilization	1.00	LS	$375,000	$375,000
Roadway Approaches				
Clearing	5	AC	$10,000	$50,000
Embankment	12,000	CY	$4	$48,000
6" Lime treated Subgrade	22,000	SY	$14	$308,000
12" Concrete Pavement	20,000	SY	$55	$1,100,000
Roadway Approaches Subtotal				$1,506,000
Bridges				
Galveston Approach	81,367	SF	$175	$14,239,225
Pelican Island Approach	101,425	SF	$175	$17,749,375
Bridges Subtotal				$31,988,600
Retaining Walls				
Concrete Sheet Pile Wall to Replace Existing at Galv. Approach	45,000	SF	$45	$2,025,000
Retaining Walls Subtotal				$2,025,000
Miscellaneous				
Safety Lighting	1	LS	$60,000	$60,000
Demolish Existing Bridge	1	LS	$2,000,000	$2,000,000
Traffic Control	1	LS	$300,000	$300,000
Striping	1	LS	$35,000	$35,000
Miscellaneous Subtotal				$2,395,000
Subtotal I				$38,289,600
ROW Acquisition	5	Acres	$100,000	$500,000
Utility Relocation Expenses	1.00	LS	$200,000	$200,000
Subtotal II				$700,000
Design Engineering		% of I	8%	$3,063,168
Environmental Mitigation		% of II	15%	$105,000
Subtotal III				$3,168,168
Contingency	% of Subtotals I, II & III		25%	$10,539,442
Option 1 Total Cost				$52,697,210

Fixed Span Bridge Option 2

Table 3.5 – Fixed Span Bridge Option 2 Cost Estimate

Description	*Quantity*	*Unit*	*Cost/Unit*	*Total*
Mobilization	1.00	LS	$375,000	$375,000
Roadway Approaches				
Clearing	5	AC	$10,000	$50,000
Embankment	12,000	CY	$4	$48,000
6" Lime treated Subgrade	22,000	SY	$14	$308,000
12" Concrete Pavement	20,000	SY	$55	$1,100,000
Roadway Approaches Subtotal				$1,506,000
Bridges				
Galveston Approach	84,644	SF	$175	$14,812,700
Pelican Island Approach	223,360	SF	$175	$39,088,000
Bridges Subtotal				$53,900,700
Retaining Walls				
Concrete Sheet Pile Wall to Replace Existing at Galv. Approach	45,000	SF	$45	$2,025,000
Retaining Walls Subtotal				$2,025,000
Miscellaneous				
Safety Lighting	1	LS	$60,000	$60,000
Demolish Existing Bridge	1	LS	$2,000,000	$2,000,000
Traffic Control	1	LS	$300,000	$300,000
Striping	1	LS	$45,000	$45,000
Miscellaneous Subtotal				$2,405,000
Subtotal I				$60,211,700
ROW Acquisition	5	Acres	$100,000	$500,000
Utility Relocation Expenses	1.00	LS	$200,000	$200,000
Subtotal II				$700,000
Design Engineering		% of I	8%	$4,816,936
Environmental Mitigation		% of II	15%	$105,000
Subtotal III				$4,921,936
Contingency	% of Subtotals I, II & III		25%	$16,458,409
Option 2 Total Cost				$82,292,045

Fixed Span Bridge Option 3

Table 3.6 – Fixed Span Bridge Option 3 Cost Estimate

Description	*Quantity*	*Unit*	*Cost/Unit*	*Total*
Mobilization	1.00	LS	$375,000	$375,000
Roadway Approaches				
Clearing	5	AC	$10,000	$50,000
Embankment	12,000	CY	$4	$48,000
6" Lime-treated Subgrade	22,000	SY	$14	$308,000
12" Concrete Pavement	20,000	SY	$55	$1,100,000
Roadway Approaches Subtotal				$1,506,000
Bridge				
Galveston Approach	259,000	SF	$175	$45,325,000
Pelican Island Approach	88,500	SF	$175	$15,487,500
Bridges Subtotal				$60,812,500
Retaining Walls				
Retaining Walls on Galv. Approach	45,000	SF	$45	$2,025,000
Retaining Walls Subtotal				$2,025,000
Miscellaneous				
Roadway on Pelican Island	1	LS	$6,000,000	$6,000,000
Safety Lighting	1	LS	$60,000	$60,000
Demolish Existing Bridge	1	LS	$2,000,000	$2,000,000
Traffic Control	1	LS	$300,000	$300,000
Striping	1	LS	$45,000	$45,000
Miscellaneous Subtotal				$8,405,000
Subtotal I				$73,123,500
ROW Acquisition	14	Acres	$100,000	$1,400,000
Utility Relocation Expenses	1.00	LS	$600,000	$600,000
Subtotal II				$2,000,000
Design Engineering		% of I	8%	$5,849,880
Environmental Mitigation		% of II	15%	$300,000
Subtotal III				$6,149,880
Contingency	% of Subtotals I, II & III		25%	$20,318,345
Option 3 Total Cost				$101,591,725

SUMMARY AND RECOMMENDATIONS

After consultation with various stakeholders concerning the options shown on *Table 3.7*, it is recommended that a new location fixed span bridge be constructed over open water with an alignment aimed toward PHA property on the north boundary of the TAMUG campus, known as Option 3. Option 3 is less expensive than a new movable span bridge and is the preferred alternative of Pelican Island stakeholders, most notably TAMUG. Option 3 accomplishes two goals: *first*, it accesses undeveloped PHA property making it more attractive to development and, *second*, it eliminates any industrial through-traffic within the TAMUG campus by creating a bypass.

Table 3.7 – Cost Summary of Vehicular Bridge Replacement Options

Bridge Option	*Total Cost*
Movable Span	$108 million
Fixed Span Option 1	$53 million
Fixed Span Option 2	$82 million
Fixed Span Option 3	$102 million

If Option 3 were to be selected, multiple funding partners would be required. In the existing bridge's current configuration, it is owned, maintained, and operated by GCND. GCND derives its operations and maintenance funding from a very limited ad valorem tax source that currently nets approximately $1.0 million to $1.3 million annually, of which approximately half is expended on bascule operations. The remainder of the fund is dedicated to routine maintenance and emergency repairs. If GCND were to pursue replacement funding on its own, it would most likely pursue Option 1, which is the least expensive and utilizes existing submerged ROW.

Option 1 fully accomplishes GCND's primary mission of conveying vehicular traffic over a navigable waterway connecting Pelican Island with Galveston Island.

If Option 2 were to be pursued, the additional expense to elevate and grade separate industrial through-traffic from TAMUG at-grade campus traffic would be of benefit to the university and, therefore, would be an expense that should be borne by the state and not GCND.

Option 3 is the preferred alternative and, if it were to be built, the cost delta between Option 1 and Option 3 logically should be absorbed by other interested parties, not GCND.

Note: If a new location vehicular bridge option were pursued, in accordance with Title 33 Code of Federal Regulations (CFR), Part 116, Alteration of Unreasonably Obstructive Bridges, the existing bascule bridge could be determined by the USCG Chief, Office of Bridge Administration (BA) to be an obstruction to navigation. Upon this determination public hearings would commence to decide if the bascule bridge should be removed. Additional detail about this process is included in Chapter 4 – Navigation.

Chapter 4 – ENVIRONMENTAL REGULATORY REVIEW

4

This chapter presents an environmental and regulatory review for the Pelican Island feasibility study. This review is based on information readily available from public sources (wetland delineations prepared by others, FEMA maps, and the most current federal and state regulations), and HDR cumulative environmental experience with other projects with similar environmental impacts in the area.

All of the comments are based on the experience of HDR Engineering staff and, therefore, are subject to change with variations in the informal practices of the agencies, as well as changes in regulations, statutes, or court decisions. The following environmental and regulatory issues were reviewed for the rail feasibility study:

- Navigation
- Water Quality
- Wetlands
- Endangered Species
- Essential Fish Habitat (EFH)
- Cultural Resources
- Shoreline Erosion / Texas General Land Office (GLO) Leasing
- Migratory Birds
- Flood Plain

REGULATORY PROGRAMS AND RECOMMENDATIONS ON HOW TO PROCEED

This chapter presents the applicable regulatory programs that could potentially impact the proposed project, describes how each program may impact the property based on available information, identifies potential major obstacles, and identifies which compliance could possibly be required in order to proceed. Recommendations on how to proceed are shown.

NAVIGATION

This analysis addresses the potential regulatory impacts related to the introduction of new rail and vehicular access between Pelican Island and Galveston Island that are proposed to cross the federal navigation channel between the two islands. The proposed project is to construct a railroad structure consisting of an elevated causeway and vertical lift span at the channel that would provide a 150-foot horizontal and 73-foot vertical MHT navigation window. The proposed project also includes construction of a new vehicular structure consisting of an elevated causeway and clear span at the channel that will provide an identical navigation window as the rail structure.

USCG Bridge Permitting Program

USCG approves, under the General Bridge Act of 1946 and Section 9 of the Rivers and Harbors Act of 1899, the location and plans of bridges and causeways and imposes any necessary conditions relating to the construction, maintenance, and operation of these bridges in the interest of public navigation.

Section 9 of the Rivers and Harbors Act of 1899 and General Bridge Act of 1946

The purpose of these Acts is to preserve the public right of navigation and to prevent interference with interstate and foreign commerce. The General Bridge Act of 1946, as amended, the Rivers and Harbors Act of 1899, as amended, require the location and plans of bridges and causeways across the navigable waters of the United States be submitted to and approved by the Secretary of Homeland Security prior to construction. The General Bridge Act of 1946 is cited as the legislative authority for bridge construction in most cases.

USCG Permitting Process

- ***Pre-application Consultation.*** A Joint Evaluation Meeting (JEM) typically involves one or several meetings between an applicant, USCG's BA, and interested resource agencies (federal or state). The purpose of such meetings is to provide an outlet for informal discussions regarding the pros and cons of a proposed project before an applicant makes irreversible commitments of resources (funds, detailed designs, etc.). The process is intended to provide the applicant with an assessment of the viability of some of the more obvious alternatives available to accomplish the project purpose, to discuss measures for reducing impacts of the project, and to inform them of the factors the USCG must consider in its decision-making process.
- ***Formal Review Process.*** This process begins once a completed application is submitted to the BA. The BA undertakes a rigorous independent investigation to determine the possible impacts of the proposed project on navigation and the human environment. As part of the District Commander's independent investigation, scoping/coordination meetings and consultation may be required to determine the level of environmental documentation.
- ***Environmental Review.*** A project review with federal agencies that may have jurisdictional aspects of the project will be initiated once the BA has determined the level of environmental documentation. These federal agencies include the USACE, U.S. Fish and Wildlife Service (USFWS), FEMA, and the National Oceanic and Atmospheric Administration (NOAA), among others. If federal funds are acquired for construction of the project, FHWA and/or FRA may serve as the lead federal agency in the preparation of the project's environmental review.
- ***Public Notice*** (PN) is made requesting public comment from all interested individuals, adjacent property owners, expertise groups, Non-Governmental Organizations (NGO), and government agencies, in addition to the environmental review with federal agencies. The Coast Guard District bridge program staff receives, evaluates, and acts upon the responses to a PN. The applicant will be furnished any substantive comments received in response to the PN to resolve or dispute the issues that are raised. The public comment period is typically 30 days. Once comments are received and reviewed, USCG may decide that a public meeting, to address issues with the proposed project, is warranted.

- ***Coast Guard Bridge Permit.*** This permit is either issued or denied by the BA. The Bridge Program policy requires more complex permit applications, such as those that are highly controversial or require an environmental assessment of an Environmental Impact Statement (EIS), which are issued by the USCG Headquarters.

  Note: USCG strives to issue this type of permit in six to nine months. Longer time may be required to evaluate this project and issue the permit after reviewing any comments that are submitted during the public comment period for the permit. Review of this project and/or the development of an EIS could take up to two years or more if major environmental or socioeconomic impacts are discovered during the evaluation of this project.

The following is the current contact information for the BA for this region:

Mr. David Frank
Commander, Eighth Coast Guard District (dpb)
Hale Boggs Federal Building, 500 Poydras Street
New Orleans, Louisiana 70130-3310
504.671.2128 / David.M.Frank@uscg.mil

The review of mitigation options can begin once a final project layout is selected and an estimate of impacts to U.S. waters is determined. Possible mitigation requirements and costs cannot be determined at this time. Avoidance and minimization of impacts can help reduce mitigation requirements and costs associated with the project. The ability for the impacts to be mitigated on-site, compared to another location or in a mitigation bank, will largely affect mitigation costs.

How to Proceed

- Prepare bridge construction application for submittal to BA;
- Attend any application meetings to discuss project with BA or other USCG bridge program staff; and
- Respond to any comments received from issued project PN or federal agency coordination.

WATER QUALITY

The proposed construction of rail over land and water and an increased capacity vehicular bridge between Galveston Island and Pelican Island will introduce additional storm water runoff pollutants affecting water quality.

Texas Commission on Environmental Quality (TCEQ) Regulatory Program

The USACE Section 404 permit process triggers the State water quality certification process. Section 401 water quality certifications are required by TCEQ for all Section 404 permits. TCEQ has developed a tiered system of review for all individual Section 404 permit applications based on project size and the amount of state water affected. The extent of Section 401 certification review varies between the different tiers, as well as the type of wetland affected. TCEQ has 10 days from USACE's Section 404 permit issuance date to issue a state water quality certification. TCEQ can request an extension of time for water quality certification review and issuance, if necessary.

- ***Tier I*** – For small projects that affect less than three acres of state waters, TCEQ has determined that incorporating certain Best Management Practices (BMP) and other requirements into the project will sufficiently address the likelihood that water quality will remain at the desired level. For those projects, no further Section 401 certification reviews will be necessary if the applicant agrees to include those BMPs in its project.
- ***Tier II*** – Any project that does not qualify for a Tier I review, or for which the applicant elects not to incorporate Tier I criteria or prefers to use alternatives to BMPs, will be considered a Tier II project. Tier II projects are subject to an individual certification review by TCEQ. This review will be performed consistent with streamlining practices developed by TCEQ and USACE. A Tier II Section 401 Water Quality Certification Questionnaire and Alternatives Analysis Checklist are required for submittal to TCEQ for approval in order to receive a Section 401 water quality certification.

How to Proceed

Whether construction at the project site would require a Tier I or Tier II certification depends on the amount of jurisdictional wetlands to be filled. To determine the amount of fill, a development plan for the site would be overlain onto an exhibit showing the verified jurisdictional wetlands boundary. If fill impacts are less than three acres, the project is considered Tier I. If fill impacts are more than three acres, the project is considered Tier II.

WETLANDS

This section describes the proposed railroad footprint necessary to accomplish rail connections at the UPRR and BNSF switching yards *(Figure 2.1)* located on Galveston Island and the proposed connection points located on Pelican Island. No definitive rail routes have been proposed for the interior of Pelican Island. Those routes once established will be comprehensively investigated in a future environmental review process.

USACE Regulatory Program

USACE is authorized to issue permits for work in U.S. waters and associated jurisdictional wetlands under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act, as follows:

- ***Section 10 of the Rivers and Harbors Act of 1899*** – Permits obtained under this Act authorize the construction, excavation, or deposition of materials in, over, or under navigable waters, or any work which would affect the course, location or capacity of those waters. The geographic jurisdiction of the Rivers and Harbors Act includes all navigable waters of the U.S. that are defined as "those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce." Section 10 permits include structures (e.g., piers, wharfs, breakwaters, bulkheads, jetties, weirs, transmission lines) and work such as dredging or disposal of dredged material, or excavation, filling, or other modifications to any navigable U.S. waters.
- ***Section 404 of the Clean Water Act*** – Permits obtained under this Act authorize the discharge of dredged or fill material into U.S. waters, including jurisdictional wetlands. The Section 404 jurisdiction is defined as encompassing Section 10 waters plus their tributaries and adjacent wetlands. Activities requiring Section 404 permits are limited to discharges of dredged or fill materials into U.S. waters. These discharges include generally any fill material (e.g., rock, sand, dirt) used to prepare land for site development, roadways, erosion protection, etc.

Figure 4.1 – TAMUG Wetlands Mitigation Bank Pelican Island Aerial

Figure 4.2 – TAMUG Infrared Wetlands Map Pelican Island

USACE Permitting Process

The basic form of authorization for this type of project is the Individual Permit (IP). IPs can be processed under Section 10 or Section 404, as previously described. Processing such permits involves evaluation of individual project-specific applications in three steps: pre-application consultation (for major projects), submittal of application and formal review process, and evaluation of impacts through a Statement of Findings/Decision document.

- ***Pre-application Consultation*** (JEM) typically involves one or several meetings between an applicant, USACE district staff, and interested resource agencies (federal or state). The purpose is to provide an outlet for informal discussions regarding the pros and cons of a proposed project before an applicant makes irreversible commitments of resources (funds, detailed designs). The process is intended to provide the applicant with an assessment of the viability of the more obvious alternatives available to accomplish the project purpose, to discuss measures for reducing impacts of the project, and to inform the applicant of the factors USACE must consider in its decision-making process.
- ***Formal Review Process*** begins once a completed application has been submitted. USACE districts operate under a project manager system, where one individual is responsible for handling an application from receipt to final decision. The USACE project manager prepares a PN that is published for 30 days. During this 30-day period, resource agencies, interested parties, and the general public may provide comments to USACE regarding the project. If comments are received during this period, the USACE project manager will provide these to the applicant and its agent within 15 days of the last day the PN is published for review. The applicant and agent then have 30 days to provide USACE with a response to agency and public comments. The USACE project manager then evaluates the impacts of the project, including comments received from resource agencies and the public, and negotiates necessary modifications to the project, if required.
- ***Evaluation of the Impacts*** of the proposed project are conducted when the USACE project manager has received the required information and comments received, any negotiated necessary modifications to the project if required are documented, and then drafts a Statement of Findings. The Statement of Findings is a "permit decision" document that includes the environmental impacts of the project, findings of the public interest review process, and alternatives analysis. The Statement of Findings is reviewed by USACE management and, if approved, a permit is issued.

Note: USACE strives to issue this type of permit in four to six months. Extended time may be required to evaluate the proposed project and issue the permit after reviewing any comments that are submitted during the public comment period for the permit. Review of the project and/or development of an EIS could take up to two years or more if major environmental or socioeconomic impacts are discovered during the evaluation of the project.

How to Proceed

- Determine wetlands jurisdictional boundary for the project site;
- Initiate Section 10/404 permit process (submit application, etc.);
- Attend JEM;
- Conduct Alternatives Analysis (AA);
- Prepare Draft Mitigation Plan; and
- Coordinate PN.

ENDANGERED SPECIES

Proposed rail over land and water can impact certain species in the area that occupy habitat that has been dedicated for the construction of the proposed project.

Regulatory Program

- USCG and USACE initiate informal consultation with the USFWS under Section 7 of the Endangered Species Act (ESA). Under Section 7, federal agencies must consult with the USFWS when any action the agency carries out, funds, or authorizes (i.e., Section 404 permit) may affect a listed endangered or threatened species or may adversely modify or degrade designated critical habitat. The majority of all Section 7 consultations between the federal agencies are informal consultations, with the proposed action resulting in a "not likely to adversely affect determination." Consultation with USFWS is triggered by the proposed degradation of designated critical habitat, such as critical habitat designated for the endangered and federally listed species in the area.
- If it is determined that the proposed action is likely to adversely affect a threatened or endangered species, a formal consultation is triggered and can last up to 150 days, resulting in a Biological Opinion (BO). When USFWS makes a determination, it also provides reasonable and prudent alternative actions. In case USFWS makes a determination that the action may adversely affect a species, but not jeopardize its continued existence, USFWS will prepare an incidental "take" statement provision that allows the applicant to proceed under the protection of the ESA. Typically, a consultant may draft the BO for USFWS.

The threatened or endangered species listed on the USFWS webpage for Galveston County, Texas, include:

- Attwater Prairie Chicken
- Eskimo curlew
- Piping Plover
- West Indian Manatee
- Hawksbill Sea Turtle
- Leatherback Sea Turtle
- Kemp's Ridley Sea Turtle
- Green Sea Turtle

In addition, the following threatened or endangered species are also listed for Galveston County on the Texas Parks and Wildlife Department (TPWD) website.

- White-tailed Hawk
- Reddish Egret
- Peregrine Falcon
- Whooping Crane
- Bald Eagle
- Wood Stork
- White-faced Ibis
- Smalltooth Sawfish
- Red Wolf
- Louisiana Black Bear
- Loggerhead Sea Turtle
- Alligator Snapping Turtle
- Timber Rattlesnake
- Texas Horned Lizard

Not all of these species are located in the proposed project area. It is also possible that none of the species listed above will be impacted by the proposed project. If a listed species is located in the proposed project area, any possible adverse impacts to that species will need to be coordinated through the USFWS and TPWD to minimize or eliminate the impact.

How to Proceed

- Submit USCG, USACE, and TPWD permit applications;
- Begin informal consultation with USFWS and TPWD;
- Draft biological assessment for USCG, USACE, and TPWD, if required; and
- Draft BO for USFWS and TPWD, if required.

ESSENTIAL FISH HABITAT

Construction of a water crossing on rail will introduce impacts during the construction phase and in the post-construction operational lifespan of the facility and will require a comprehensive analysis.

Regulatory Program

- The Magnuson-Stevens Fishery Conservation and Management Act of 1996 defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Federal agencies must provide a detailed response to National Marine Fisheries Service (NMFS) that includes proposed measures for avoidance, mitigation, or offsetting the impact of the proposed activity.
- NMFS has identified and described EFH for each managed species using the best available science. This process consists of identifying specific areas and the habitat features within them that provide essential functions to a particular species for each of its life stages. NMFS has assessed fishing practices in their regions to determine if the resulting impacts on habitat are more than minimal or not temporary in nature.

How to Proceed

- Submit USCG and USACE permit applications; and
- Attend joint evaluation meeting.

CULTURAL RESOURCES

Construction of a rail facility may introduce impacts during the construction phase and will necessitate investigative efforts to research the possibility of the existence of significant cultural resources.

The existing Pelican Island Causeway vehicular bridge is considered historic. Historic bridges are defined as bridges listed or eligible to be listed on the NRHP.

A bridge that is rare in type, unusual from an engineering perspective, or historically significant because of its location or association with an important event or person may be deemed an historic bridge. This determination is made by the TxDOT Environmental Affairs Division (ENV), in consultation with the State Historic Preservation Officer (SHPO).

Regulatory Program

- Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their activities on historic properties and provide the National Historic Council a reasonable opportunity to comment on such undertakings. Applicants are usually required to hire a professional archeologist to conduct a cultural resources survey of the project site. The archeologist then submits a draft report of its findings to USCG, USACE, and THC for approval. Depending on the findings of the cultural resources survey, the applicant may be required to conduct additional testing and surveys of the site or alter project configuration to satisfy archeological requirements.
- Historic bridge rehabilitation projects are required to meet the standards outlined in *Secretary of the Interior's Standards for Historic Preservation Project* (36 CFR Chapter 1 Part 67).
- Section 106 regulations (36 CFR 800) ensure that the effects to historic properties, such as bridges, are appropriately considered during the project planning process. This includes an adequate public involvement process with consultation with SHPO and other consulting parties, such as county historical commissions.
- Section 4(f) regulations (23 CFR 774) ensure the project planning process considers feasible and prudent avoidance alternatives to the demolition of historic bridges.

How to Proceed

- Initiate Archaeological Recon-Level assessment; and
- Initiate TxDOT Historic Bridge Programmatic Section 4(f) Evaluation Process.

TEXAS GLO COORDINATION

The proposed construction of freight rail over water outside the confines of the existing ROW at Seawolf Parkway will necessitate investigative efforts to determine public and private deed, title, and ownership of all submerged lands.

Regulatory Program

- According to the Texas Open Beaches Act, any land located seaward of the MHT line is owned by the State of Texas, whereas any area landward of the MHT line is owned by the private individual or entity holding title to that land. MHT is defined as the average of highest daily water computed over or corrected to the regular tidal cycle of 18.6 years.
- The rolling easement doctrine is part of the Texas Open Beaches Act. The rolling easement doctrine allows for a public easement, defined by the MHT line, to shift with the changing shoreline; because the easement shifts involuntarily, the amount of property owned by the state and private individual or entity can increase or decrease depending on the amount of shoreline erosion or accretion.
- In accordance with Section 33. 135 of the Texas Natural Resources Code, title policies in Texas have always included the following exceptions as notice to coastal buyers:
  - The real property described in and subject to this contract adjoins and shares a common boundary with the tidally influenced submerged lands of the state. The boundary is subject to change and can be determined accurately only by a survey on the ground made by a Texas Registered Professional Land Surveyor (RPLS) in accordance with the original grant from the sovereign. The owner of the property described in the contract may gain or lose portions of the tract because of changes in the boundary.
  - The seller, transferor, or grantor has no knowledge of any fill as it is related to the property described in and subject to the contract.
- State law prohibits the use, encumbrance, construction, or placing of any structure in, on, or over state-owned submerged lands below the applicable MHT line without permission.

How to Proceed

- Conduct RPLS survey; and
- File application for Texas GLO lease.

Information regarding the location of the MHT line to the subject property can be obtained from the surveying division of the Texas GLO in Austin.

MIGRATORY BIRDS

Construction of a freight rail on land will introduce impacts during the construction phase and in the post-construction operational lifespan of the facility and will require a comprehensive analysis.

Regulatory Program

- The Migratory Bird Treaty Act prohibits the take of any migratory bird or any part, nest, or eggs of any such bird. Under the act, "take" is defined as pursuing, hunting, shooting, capturing, collecting, or killing, or attempting to do so. In addition, Executive Order (EO) 13186 (January 11, 2001) requires that any project with federal involvement address impacts of federal actions on migratory birds with the purpose of promoting conservation of migratory bird populations. Migratory bird nesting season in Texas is from February 14 through August 31. Any clearing of areas deemed to be migratory bird nesting habitat is discouraged during this time period.
- As a result of the 30-day USACE Permit PN period, resource agencies can request that a nesting survey be conducted to determine if migratory birds are utilizing portions of the proposed project site. In addition, resource agencies can request that any clearing of the property deemed as "migratory bird nesting habitat" be conducted outside of nesting season which usually occurs from February 14 through August 31. It is left to the discretion of the USACE Project Manager on whether to include restrictions regarding the migratory bird habitat within the USACE permit conditions.

How to Proceed

- Contact USFWS Region 2 office at permitsR2MB@fws.gov to schedule a nesting survey of the proposed project site.

FLOOD PLAIN MANAGEMENT

Any construction of ballasted rail in the flood plain will require an investigation to analyze and document any potential negative impacts to storm water runoff.

Regulatory Program

- National Flood Insurance Program (NFIP), administered locally by the city, is the primary basis.
- Approximately 20,000 communities across the U.S. and its territories participate in the NFIP by adopting and enforcing flood plain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in these communities. Note: Community participation in the NFIP is voluntary.
- Flood insurance is designed to provide an alternative to disaster assistance to reduce the escalating costs of repairing damage to buildings and their contents caused by floods.
- NFIP identifies and maps the nation's flood plains in addition to providing flood insurance and reducing flood damages through flood plain management regulations. Mapping flood hazards creates broad-based awareness of these hazards and provides the data needed for flood plain management programs and to actuarially rate new construction for flood insurance. Flood zones are geographic areas that FEMA has defined according to varying levels of flood risk. These zones are depicted on a community's Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map. Each zone reflects the severity or type of flooding in the area.

How to Proceed

- Contact Galveston County Engineer (Flood Plain Administrator); and
- Follow Galveston County Flood Plain Management Regulations.

TRAFFIC

Increased vehicular bridge capacity and new rail bridge capacity will spur development on Pelican Island resulting in increased industrial, employment, and university related traffic; however, an added capacity bridge would absorb increased volumes of traffic for the foreseeable future.

PARKING

Port-related surface cargo storage, truck parking, railroad sidings, industrial employee and student-related parking capacity would result in increased storm water runoff, coupled with vehicle-related contaminants. Oil and water separator units would be required.

ENERGY REQUIREMENTS AND POTENTIAL FOR CONSERVATION

Increased industrial capacity will drive the need for additional electric power substations and power delivery devices.

HISTORIC PROPERTIES AND PARKLANDS

Regulatory Program

Under the provisions of Sections 106 and 110b of the amended National Historic Preservation Act of 1966, federal agencies must produce documentation to Heritage Documentation Program (HDP) standards for buildings that are listed, or are eligible for listing, in the NRHP, to mitigate the adverse effects of federal actions such as demolition or substantial alteration. National Park Service regional offices oversee this aspect of HDP documentation, which is submitted to the Washington, D.C., office for final review and inclusion in the collections. HDP administers the Historic American Building Survey (HABS), the Federal Government's oldest preservation program, and its companion programs: the Historic American Engineering Record (HAER) and the Historic American Landscape Survey (HALS). Documentation produced through these programs constitutes the

nation's largest archive of historic architectural, engineering, and landscape documentation. The HABS/HAER/HALS Collection is housed at the Library of Congress.

From the earliest recorded history of this region, Galveston has been recognized as the "Gateway to Texas." Due to poor inland road conditions coupled with countless river and stream crossings, or the absence of roads altogether, made travel to Texas by water a safer and more efficient method of travel for people and goods. In the early 19th Century, Galveston had been designated by Congress as a designated regional import-export harbor. Galveston, at the time, was a sister city to New Orleans, which increased its global reach and prominence as a port. In the heyday of cotton exports, Galveston was the export destination of schooner lines that had ports of call along the eastern seaboard, Mexico, the Caribbean, and European ports-of-call from Copenhagen to Venice. These schooner lines were linked with eight railroads that fanned out across Texas and the southern and Midwest United States. Greater Galveston was known as "Where Rail and Water Lines Meet."

With this prominence as a global port, immigration followed, leading to the necessity of construction of a Quarantine and Immigration Station on Pelican Island to prevent the spread of any infectious diseases being carried by those on board. The vast majority of these immigrants chose Texas as their final destination and the current-day German, Czech, and Italian communities, among others, are the result of this migration.

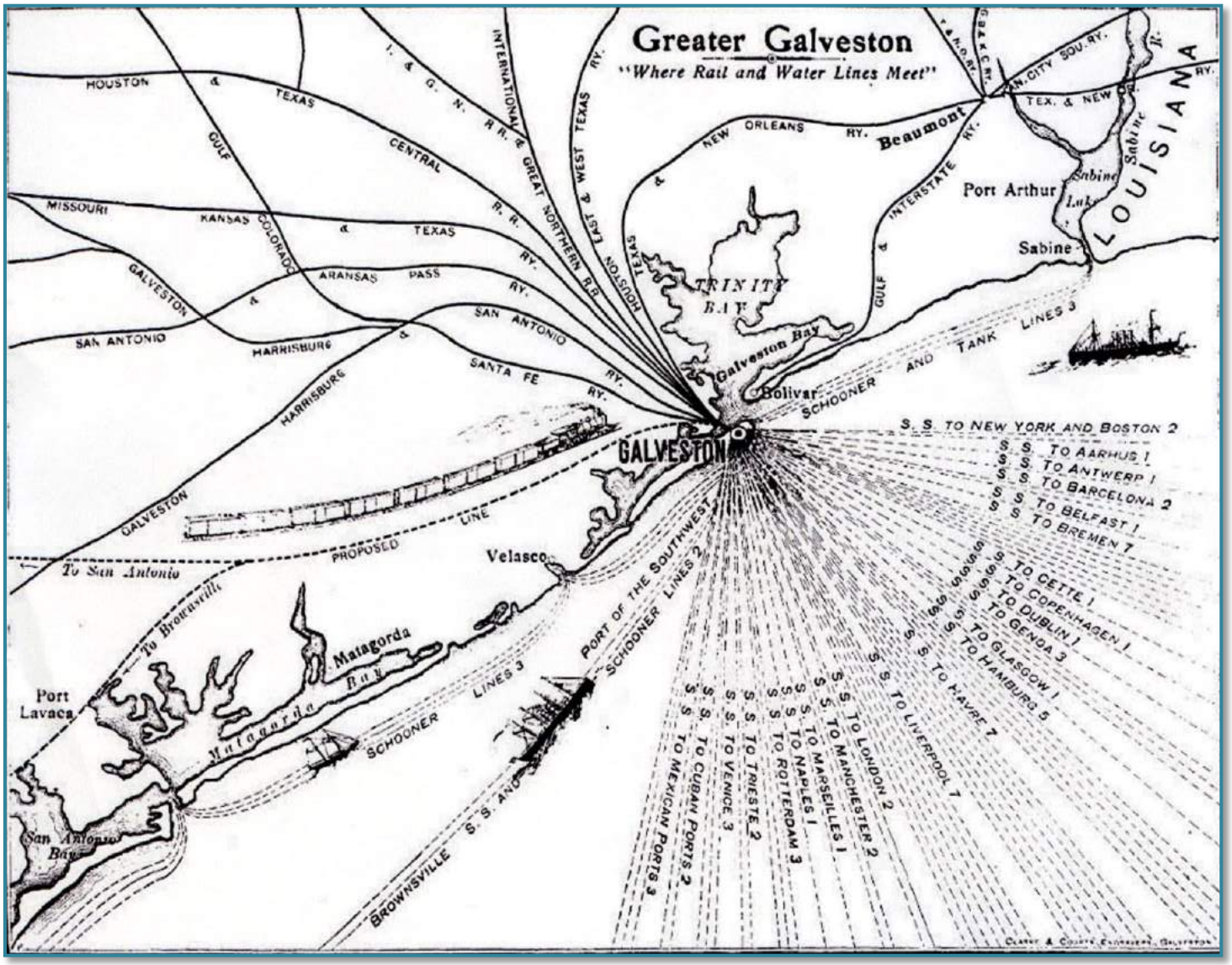
How to Proceed

- The only structure in the Pelican Island area eligible for listing in the NRHP is the Pelican Island Causeway bascule bridge presented in Chapter 3. This bridge is a Scherzer single-leaf rolling lift bascule main span and is the only remaining example of this type in Texas. If this bridge is slated for demolition, extensive HAER documentation will be required. This formal documentation, including all available schematics, detailed design plans (plan views, profiles, and cross sections), and extensive high-definition photography, articles, and other archival data about the bridge, must be compiled prior to demolition.

Pelican Island is also where Confederate artillery was placed during the Civil War on Pelican Spit. The site was named Fort Jefferson and was placed across the Galveston Ship Channel from Fort Point on the northern tip of Galveston Island. These two placements of guns ensured cross fire to any Union ships approaching the port and the city during the duration of the war.

Pelican Island is currently home to Seawolf Park, named as a memorial to the USS *Seawolf* (SS-197), a U.S. Navy Sargo-class submarine believed sunk by friendly fire during World War II. Within the park there is a U.S. Navy Gato-class submarine, USS *Cavalla* (SS-244) and the Edsall-class destroyer escort USS *Stewart* (DE-238), and the offshore remains of the USS *Selma*, a World War I tanker that is the largest concrete hulled ship ever constructed. Steel shortages during World War I led the U.S. to build experimental concrete ships. The ship was damaged by striking a jetty in Tampico, Mexico. The ship was sailed to Galveston for repair. When the repairs proved unsuccessful, a channel was dredged to the northern shore of Pelican Island and the ship was intentionally scuttled.

Figure 4.3 – Port of Galveston 1903



AESTHETICS

Any resultant development on Pelican Island associated with the introduction of freight rail would be port-industry related and would not be considered aesthetically pleasing in nature. However, rail and vehicular bridges could be designed as modern structures with clean lines and aesthetically pleasing to fit into the industrial nature of the surrounding area.

COMMUNITY DISRUPTION

The primary residential community on Pelican Island includes students, faculty, and staff of TAMUG. Initial construction of supporting infrastructure (in particular, the vehicular bridge), depending on the chosen route, could possibly disrupt the activities of the campus during the construction phase.

Mitigation measures could be taken to ease long-range vehicular impacts, especially those associated with industrial traffic on Seawolf Parkway. If through-traffic were to remain at-grade, noise abatement barriers could be constructed along the roadway through the campus. Any construction would be located away from neighborhoods, thereby minimizing disruption.

SAFETY AND SECURITY

With the development of rail and vehicular service to and from Pelican Island in support of future port development, industrial traffic on rail and roads will increase. This increase in freight-related volumes will cause an increased risk of accidents. The time of project development for vehicular traffic through TAMUG would be the most opportune time to consider introducing safety mitigation factors, such as improved area illumination and roadway geometry improvements (i.e., grade separation for industrial through-traffic).

SECONDARY DEVELOPMENT

The increase in the availability of reliable rail and vehicular access eventually will evolve into peripheral properties not dedicated to port use. These properties could be developed for port industrial support functions, such as suppliers and drayage agents. There also would be an opportunity for additional residential housing and light retail. Secondary development is a desirable economic development result from these improvements.

HAZARDOUS MATERIALS

With any port industrial development within PHA, the Port of Texas City (POTC), and the POG channel corridors, there is certainty that a significant amount of rail, roadway, and waterborne freight traffic will be petroleum related. Workers in the region possess the knowledge, skills, and abilities to handle these materials in a safe and responsible manner and, in the event of any hazardous materials release, have the ability to quickly mount an effective response using practiced coordination with government agencies and the private sector. However, no hazardous materials are expected to be encountered.

CONSISTENCY WITH LOCAL PLANS

This section presents the goals and objectives of state and local entities within the study area. Port industrial development is and has been included in POG's respective long-range development strategy for Pelican Island by both the PHA and the POG. The PHA currently is advertising on its website the lease of over 1,100 acres of land on Pelican Island available for development.

TxDOT has approved $10 million for FY2021 for replacement of the existing vehicular bridge to Pelican Island under CSJ 0912-73-204. Based on findings in Chapter 3 of this report, this funding amount is inadequate to replace a bridge of this magnitude. TAMUG issued a *Campus Master Plan* in 2009 *(Figure 4.4)* and is currently constructing additional student housing on Pelican Island in accordance with the plan. These bridge projects would be coordinated with PHA, POG, TxDOT, TAMUG and the City in order to be consistent with their respective Capital Improvement Plans and also with the City's Thoroughfare Plan and Comprehensive Plan on file at Houston-Galveston Area Council (H-GAC) for regional planning purposes.

Figure 4.4 – TAMUG Campus Master Plan Map

SEISMIC HAZARD

The U.S. Geologic Survey (USGS) Earthquake Hazard Program Maps and Data indicate that there are no known seismic hazard zones within the study area.

ENVIRONMENTAL JUSTICE

Environmental Justice is the fair treatment and meaningful involvement of all peoples regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Adverse human health or environmental effects on these populations as a result of future Pelican Island development are not anticipated. Any future industrial or port-related development would be remotely located away from these populations, but would provide jobs.

NON-GOVERNMENTAL ORGANIZATIONS

As part of the public involvement phase of any significant project, outreach and communication with any affected NGO is required. The following NGOs are active in the local area of the proposed project and may be commenters for any public notice issued for the proposed project.

- Galveston Bay Foundation
- Sierra Club
- Houston Wilderness
- The Nature Conservancy
- Audubon Society

How to Proceed

- Involve NGOs in planning phase of project;
- Ask NGOs for recommendations for areas of concern;
- Address any concerns raised by NGOs during the public comment period; and
- Correspond with commenting NGOs after final design is selected and permits are issued.

LAND USE AND ZONING

- Largest land use is currently dredge disposal settlement areas controlled by federal government.
- Active and potential port-related industry makes up the second largest land use.
- Non-industrial use includes TAMUG and peripheral housing and recreational public park use at Seawolf Park.

AIR QUALITY

- Introduction of freight rail service to new port facilities would result in increased diesel-electric train emissions.
- Introduction of new port facilities on Pelican Island would result in increased waterborne freight activity and, therefore, additional ship-exhaust emissions and truck-borne cargo.
- Introduction of increased import/export cargo capabilities on Pelican Island would result in increased employment activity and additional shift worker vehicles.
- Replacement of bascule with a fixed span bridge would result in reduced vehicle idling emissions that occur during bridge opening for marine traffic.

NOISE

- Introduction of vehicular, rail, and ship traffic to and from Pelican Island would result in increased noise levels from those sources.
- Ship cargo loading and unloading activities would result in increased industrial noise sources.
- Initial construction of infrastructure that supports port-related activities would result in increased noise levels.
- Noise analysis would be required during the project development phase.

Chapter 5 – ROW ACQUISITION AND UTILITY EASEMENT ANALYSIS

5

If either, or both, of the railroad and vehicular bridge proposals on the new alignment are pursued, acquisition of ROW and/or obtaining easements to access the properties shown on *Figure 5.1* will be a certainty. It has been established in prior chapters of this report that the alignment of the existing bridge is not the most conducive to industrial development or providing a safer university campus environment. For industry and academia to coexist on Pelican Island, a new bridge alignment for both the railroad and vehicular options must be further explored.

The study corridor contains a mix of property owners and easement holders. This mix is comprised of Class 1 railroads, state and local governments, utility companies, as well as publicly and privately held submerged lands. The two affected Class 1 railroads are UPRR and BNSF. According to property tax records obtained from Galveston Central Appraisal District (GCAD), UPRR has 62 property tax records throughout Galveston County and BNSF has 42 property tax records throughout Galveston County. These property records cover land, buildings, and rolling stock. The portions of the UPRR and BNSF corridors included in this study within Galveston County are shown on sheets 356-A and 356-B in the GCAD map files. Required at-grade and aerial easements will need to be obtained from both railroads within the boundary of the Galveston Island switching yards south of Harborside Drive (SH 275) between 51st Street and 77th Street.

ROW acquisition, with some displacements and railroad aerial easements, will be needed from the City of Galveston in order to connect the land-locked railroad switching yards with the northern shoreline of Galveston Island at Galveston Bay, if the recommendations in this study are implemented. A railroad aerial easement at SH 275 also will need to be obtained from the surface owner (TxDOT). The City-owned affected properties have been identified as GCAD Account Numbers 0628-0154-0000-000 (5202 Old Port Industrial), 3505-0711-0000-000 (5115 Harborside), and 0628-0019-0000-000 (No address). Public ROW, such as SH 275, is not identified on GCAD databases.

ROW ACQUISITION

In initiating a ROW project, a federal program approval establishes the eligibility for federal participation but does not qualify the project for actual reimbursement. Since the state expects to obtain full federal participation, program eligibility requirements must be met before the project is released and any ROW expense is incurred or obligated.

TxDOT programs and schedules ROW and construction projects separately and assigns each separate project tracking numbers.

When a project involving ROW is approved by the Texas Transportation Commission (TTC) and is submitted to FHWA or FRA to be included in the Statewide Transportation Improvement Program (STIP), the approved limits for ROW acquisition established in the TTC program approval will not be altered.

ROW projects may cover any number of construction projects as conditions dictate. However, ROW and advanced planning projects should be programmed over the same limits and should be as close as possible to the actual proposed construction project limits. Sharing the same limits facilitates more precise project development and program procedures.

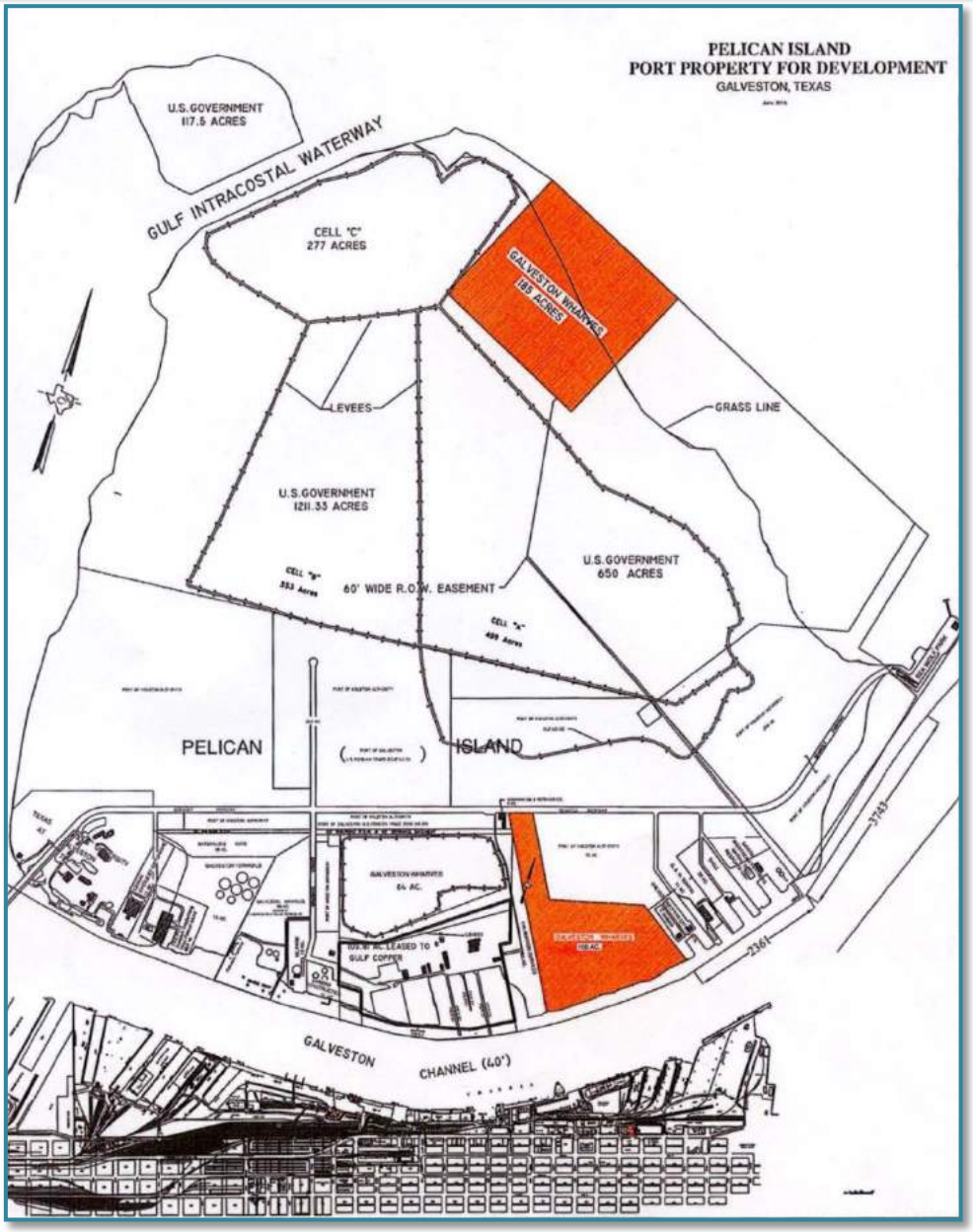


Figure 5.1 – Port Development Property on Pelican Island

Procedures

Projects approved in the STIP by FHWA or FRA may be released by the TxDOT ROW Division for ROW acquisition only after these agencies issue a Federal Project Authorization Agreement (FPAA). The ROW release request can be made only after schematics and environmental documents have been approved by FHWA or FRA.

TxDOT must submit the following information in order to obtain an FPAA:

- Construction project number as shown in the STIP;
- Project schematic layout;
- Project environmental clearance;
- Estimate of total ROW related costs and TxDOT Form ROW-RM-CSJTPC (ROW Control-Section-Job Request for Total Project Cost); and
- Other information as required by FHWA.

Schematic Layouts for Transportation Projects

Before release, a project's schematic layout must be approved by the TxDOT Design Division and by FHWA. The Design Division notifies the ROW Division of schematic approvals. Verification of ROW to be acquired, including control of access, agrees with the approved design necessary for further project development is highly advised. The only deviation allowed from the requirement of prior approval of the schematic is for "early acquisitions" or "protective purchases." These types of acquisitions are used when contiguous development is imminent and the purchase of the ROW will secure the property at a reasonable price.

Environmental Clearance

Before release, the project must have environmental clearance by approval of a Final Environmental Impact Statement (FEIS); Environmental Assessment (EA); Categorical Exclusion (CE); Finding of No Significant Impact (FONSI); Record of Decision (ROD); or concurrence that it is a non-major action project. These clearances also include Public Involvement and may require Public Hearings before FHWA will grant environmental approval. This final clearance is obtained through the TxDOT Environment Affairs Division.

EASEMENT ANALYSIS

In addition to fee title ROW acquisition, some alignments may be granted access through easements. Miscellaneous Easements (ME) usually are obtained on state-owned lands through the Texas GLO. MEs are issued on both coastal submerged lands and state-owned uplands for projects which require ROW on, across, under, or over state-owned lands, pursuant to the Texas Natural Resources Code (TNRC), subsection 51.291. Most fees are based on a published rate schedule and calculated based on the length of ROW, the region of the state, and the outer diameter of the pipeline (if applicable). ME contracts cover activities such as oil and gas pipelines, communication lines, subsurface easements, water lines, power lines, roads, and certain structures, including bridges.

Failure to obtain an easement from the GLO prior to beginning construction, violation of contract terms, failure to pay required fees, or failure to provide information required by the GLO may result in penalties and/or termination of the easement and removal of the structures at the expense of the property owner. It should be noted that a USACE permit alone does not authorize an applicant to begin a project on state-owned submerged land without prior GLO approval. Unauthorized uses such as placement of structures on coastal public land without proper authorization from the GLO may result in civil penalties of up to $1,000 per day for each violation. Mitigation costs also may be assessed to compensate for damage to natural resources.

The ME application process with the GLO is relatively straightforward. The GLO is committed to prompt processing of these applications and its goal is to provide an executed contract within 90 days following the receipt of a *complete* application package. If a USACE permit is also required for the project, applicants may avoid processing delays by filing a GLO application concurrently with a USACE permit application. The State of Texas GLO Application for State Land Use Lease-ME/ROW form is included in *Appendix A* and instructions for preparing the exhibits are included in *Appendix B*.

A fee for the use of the ME is normally assessed either by fee schedule or negotiation for inclusion in the ME contract terms. However, political subdivisions of the state, as a general rule, are exempted from ME contract leasing fees. A lease period also will be negotiated and established. If, after the lease expires and the original use of the lease is still ongoing, an extension to the lease agreement will be granted by the GLO. Only after the original lease purpose has ended will the lease be revoked[1].

[1] If the original intended public use of the lease continues, GLO can extend the lease period.

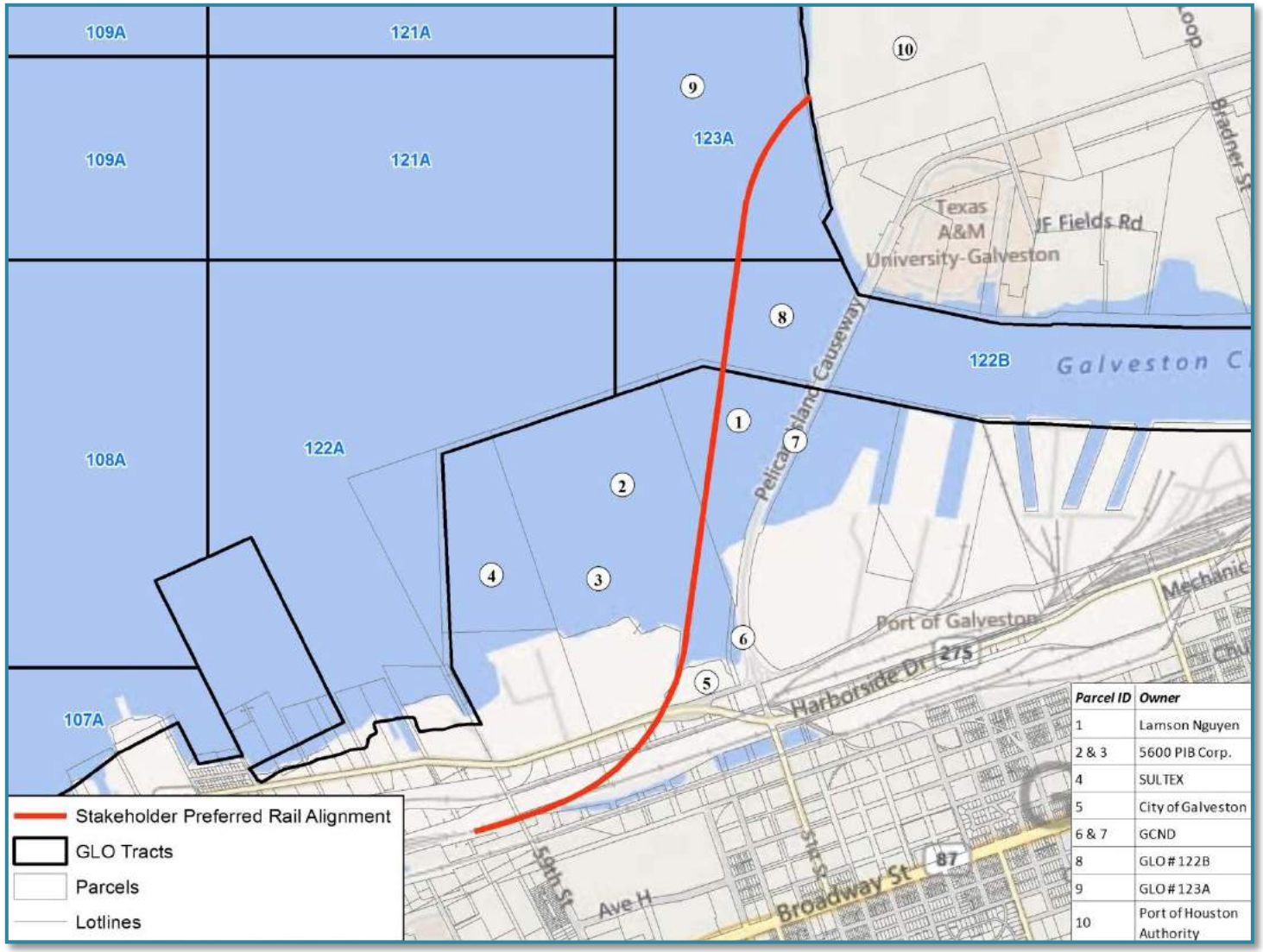
If the lease is for a privately operated facility, the GLO may invoke a lease fee schedule. The GLO leasing and easement guidelines are included in *Appendix C*.

The Galveston County Engineer initiated a title search for study-affected, privately owned submerged land. The identified private submerged tracts are located between the north shoreline of Galveston Island and extend north to the southern boundary of the Federal navigation channel. The title search identified seven tracts, listed below. Owner and Galveston County Clerk record location are listed. Deeds and metes and bounds surveys are included in *Appendix D*.

- **Tract 1**, Lamson Nguyen, File No. 2006047170 (GCAD Account # 0628-0140-0000-000)
- **Tracts 2 and 3**, 5600 PIB Corp., a Texas corporation, File No. 2006009940 (GCAD Account # 0628-0154-0001-000)
- **Tract 4**, SULTEX, a Texas limited partnership, File No. 9815690 (it was later determined that this tract is located outside of the study area and can be disregarded)
- **Tract 5**, City of Galveston, Volume 1013, Page 60
- **Tracts 6 and 7**, GCND, Volume 1117, Page 338 and Volume 1111, Page 564, respectively

These tracts are shown on *Figure 5.2*.

Figure 5.2 – Property Tracts along Stakeholder Preferred Rail Alignment



Parcel ID	Owner
1	Lamson Nguyen
2 & 3	5600 PIB Corp.
4	SULTEX
5	City of Galveston
6 & 7	GCND
8	GLO # 122B
9	GLO # 123A
10	Port of Houston Authority

Chapter 6 – REGIONAL DEEP WATER PORT MARKET ANALYSIS

6

The proposed expansion of the Panama Canal will have significant impacts on Texas ports along with the highways and rail lines that serve them. The expansion of the canal scheduled for 2015-2016 will greatly impact the Texas intermodal transportation network and will accelerate development at all of the state's seaports, most notably those with deep-draft capabilities. Deep-draft ports accommodate large ocean-going vessels and are the main conduit of international trade in terms of tonnage hauled. In Texas over 565 million tons of cargo move through its ports, generating over 112,100 jobs directly related to these marine cargo activities. The movement of that cargo results in a total of $277.6 billion in economic activity to the State of Texas. As a result, Texas port activities represent approximately 25% of the state's total Gross Domestic Product (GDP).

The predominant cargo type that will benefit the most from the Panama Canal expansion will be containers. The container segment of cargo moving through the canal accounted for 95 million tons in 2005. After the canal expansion, container traffic moving through the canal is projected to be 296 million tons by 2025. In the short term, these cargo impacts will be felt most heavily on and around PHA, the state's largest container port and a key trading partner for goods shipped via the Panama Canal.

PHA currently controls approximately 70% of the container trade among U.S. Gulf ports and 91% in Texas. PHA owns and operates the Barbours Cut and Bayport container terminals and also leases space at Barbours Cut to A.P. Moller-Maersk. These three facilities face no measurable competition in the greater Houston area.

This report focused on the deep-draft (deep water) ports in Texas *(Figure 6.1)*, by geographic proximity and the relatively small number of vessel types making calls to these facilities, as follows:

- **Beaumont/Port Arthur (BPA)** – includes Nederland, Orange, Port Neches, Sabine Pass)
- **Brownsville (BRN)** – includes Port Isabel
- **Calhoun Port Authority (CPA)** – includes Port Lavaca, Port Comfort
- **Corpus Christi (CC)** – includes Ingleside
- **Freeport (FP)**
- **Galveston (POG)**
- **Houston (PHA)** – includes Barbours Cut, Bayport, Pasadena
- **Texas City (POTC)**

Figure 6.1 – Texas Deep Water Sea Ports

Table 6.1 delineates the ports and vessel calls by type in 2012 as recorded by the U.S. Department of Transportation's (DOT) Maritime Administration (MARAD). As expected, PHA is the dominate player in all types of vessel calls. Tankers, such as PHA, POG, BPA, and POTC, dominate the vessel calls by type. *Table 6.2* delineates predominate import/export products by the respective deep-draft Texas port in this study.

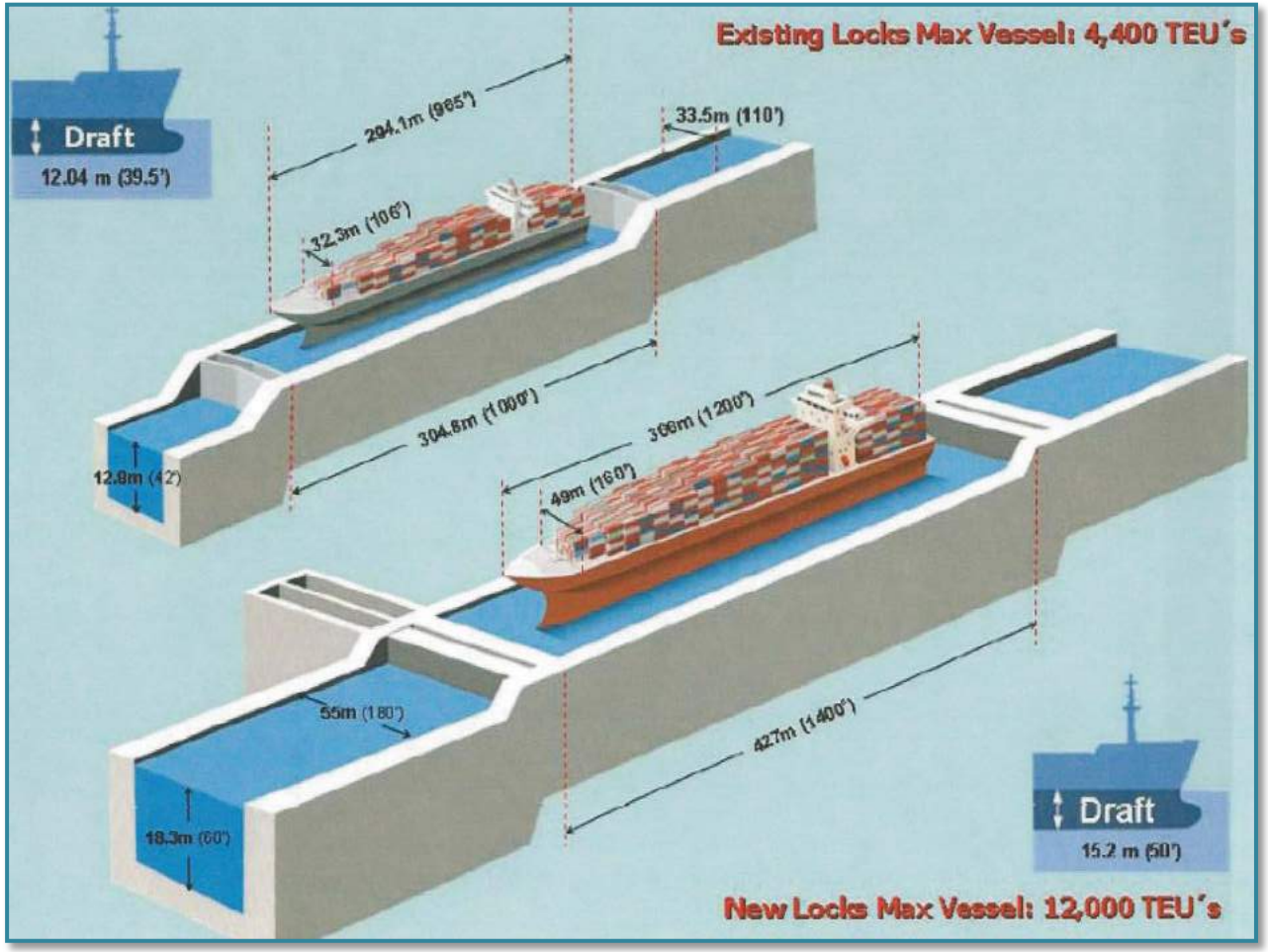
Table 6.1 – Ports and Vessel Calls 2012

Port	*Number of Tankers*	*Container*	*Dry Bulk*	*Ro-Ro*	*Gas Carrier*	*General Cargo*	*Total by Port*	*Rank by Port*
PHA	5,555	1,008	887	223	575	1,040	9,288	1
BPA*	1,802	0	301	57	80	152	2,392	2
POG*	1,320	1	123	168	8	165	1,785	3
CC*	834	0	247	4	116	94	1,295	4
POTC	1,045	1	27	0	0	4	1,077	5
FP*	444	106	13	3	49	62	677	6
CPA	142	0	106	0	40	4	292	7
BRN	72	0	88	1	0	28	189	8
Total by Type	**11,214**	**1,116**	**1,792**	**456**	**868**	**1,549**	**16,995**	
Rank by Type	**1**	**4**	**2**	**6**	**5**	**3**		

* Includes tanker lightering area vessel calls credited to that port
Source: U.S. DOT MARAD

In anticipation of the deepening and widening of the Panama Canal locks and the arrival of Post-Panamax containerized cargo ships shown in *Figure 6.2*, PHA is spending over $700 million modernizing its Barbours Cut terminal and dredging deeper and wider channels to the Barbours Cut and Bayport terminals to accommodate the expected increase in traffic and size of these ships.

Figure 6.2 – Post-Panamax Canal Locks and Ships



Part of the modernization includes the May 2015 delivery to PHA of four of the largest ship-to-shore containerized cargo cranes in the world *(Figure 6.3)*. These cranes have the capacity to handle cargo ships of Post-Panamax magnitude and the capability to load and unload ships twice as fast as the existing container cranes.

Figure 6.3 – Ship-to-Shore Containerized Cargo Cranes

Table 6.2 identifies which commodities have the most competition among these ports. [Note: POTC should be disregarded for comparison due to the port being privately held with most cargos dedicated to port shareholders making these cargos relatively immune to open market competition.]

Table 6.2 – Predominate Import/Export Cargos by Port

Cargo	*PHA*	*BPA*	*POG*	*CC*	*POTC*	*FP*	*CPA*	*BRN*
Petroleum-related								
Crude/refined petroleum	X	X	X	X	X	X		X
Liquid gas	X	X	X	X		X	X	
Chemicals	X				X	X		X
Plastics	X					X		
Fertilizer	X		X		X			
Dry Bulk								
Wood	X	X	X					
Non-metallic minerals/aggregate	X	X		X		X	X	X
Grain	X	X	X	X		X		
Metallic ores	X			X				X
Containers	X		X			X		
General								
Steel	X							X
Cotton	X					X		
Paper	X		X			X		
Machinery	X		X			X		
Livestock			X					
Military		X		X				
Project	X	X	X					
Wind generators	X		X			X		
Roll-on/Roll-off	X		X			X		
Refrigerated	X		X	X		X		

Source: U.S. DOT MARAD

Table 6.3 presents the results of the Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis inclusive of the PHA, POG, BPA, and FP market areas.

Table 6.3 – Regional Port Market SWOT Analysis

Port	*Strengths*	*Weaknesses*	*Opportunities*	*Threats*
PHA	• Cargo handling diversity & capacity • Ready access to IH system • Ready access to rail system • Ready access to pipeline network • Large tracts of land on Pelican Island	• Distance from deep water • Lack of access to developable land on Pelican Island • Cruise operator abandonment • Continuous channel maintenance expense	• Large developable acreage close to deep water on Pelican Island • Short-term expansion at Bayport	• Hurricanes/storm surge • Security • Environmental • Insufficient federal funds for channel maintenance • Post-Panamax port diversions
BPA	• Ready access to IH system • Close proximity to lumber producers • Close proximity to petroleum refining • - DOD port	• Dependence on shrinking military cargoes	• Cheniere LNG	• Hurricanes/storm surge • Security • Environmental • Insufficient federal funds for channel maintenance • Post-Panamax port diversions
POG	• Close proximity to deep water • Ready access to IH system • Ready access to rail system • Ready access to pipeline network • Large tracts of undeveloped land on Pelican Island	• Limited diversity of cargo handling • Cruise operator abandonment	• Increase cruise capacity at Terminal 2 • Transort desalination and co-generation facility on Pelican Island with improved vehicular bridge & rail bridge • Gulf Copper lease continuance • Vehicle processing center • Phoenix Port Partners – West End	• Hurricanes/storm surge • Security • Environmental • Insufficient federal funds for channel maintenance • Post-Panamax port diversions
FP	• Close proximity to deep water • Close proximity to rail system • Close proximity to pipeline system	• Limited access to IH system	• Expandable land & berthing capabilities • SH 36 capacity increase • SH 332 grade separations • Quintana bridge & tank farm • Planned expansion of rail network in Brazoria and Fort Bend Counties	• Hurricanes/storm surge • Security • Environmental • Insufficient federal funds for channel maintenance • Post-Panamax port diversions

The SWOT analysis revealed that potential port and industrial development on Pelican Island has many Strengths. Any Pelican Island development would benefit from its close proximity to deep water navigation and approximately 1,665 acres of undeveloped land that could be configured for any type of port use for the PHA and the POG.

Chapter 7 – FINANACIAL ANALYSIS

One dilemma facing governments is the commitment of funding to capital improvement projects that will successfully attain the desired goals while utilizing limited taxpayer funds to the most effective result. This measured and deliberate funding commitment process begins with a financial analysis that identifies and examines the best use of available funding. A financial analysis of proposed projects is essential in determining project viability and includes a Life-Cycle Cost Analysis (LCCA), a Benefit/Cost Analysis (BCA), and a Risk Analysis.

LIFE-CYCLE COST ANALYSIS

A project generates costs and benefits over its entire service life-cycle. A project generates mostly costs during construction. Once in service, a project generates mostly benefits, although some costs continue due to maintenance, periodic rehabilitation, and operational activities. Comparison of benefits to costs over a project's life-cycle would be a simple issue except that the value of money fluctuates over time. Two separate and distinct factors, inflation and the time value of resources, are the reasons why money diminishes over time. Inflation in the economy is typically caused when the demand for goods and services is greater than the supply of those goods and services at current prices.

The Consumer Price Index (inflation index) indicates past and current pricing trends for goods and services. *Engineering News Record* publishes a Construction Cost Index and a Building Cost Index, widely used in the construction industry. Other indices include the Turner Construction Company Composite Index and the R.S. Means Heavy Construction Cost Index.

Funding from which the inflation component has been removed is called "real" or "base-year" dollars. Funding that includes the effects of inflation is called "nominal" or YOE dollars. Inflation should be adjusted in instances such as a public agency financial analysis of investments when a project's life-cycle costs/benefits would be forecast without inflation due to the difficulty in predicting inflation. The best time to adjust for inflation is after an economic analysis indicates the project is economically viable and the project's budget is being prepared.

In the financial analysis of proposed projects, the time value of resources also is referred to as the "time value of money" or the "opportunity cost" of resources. This means that there is a cost associated with diverting the resources needed for an investment from other productive uses. The time value of resources is measured by an annual percentage factor known as the "discount rate."

The LCCA is a method for assessing the total cost of facility ownership. It has many applications of interest to government agencies exploring capital investments, such as selecting, designing, and documenting the most affordable means of accomplishing a project. In LCCA the discount rate is applied to the costs from each year of a project's life-cycle. This yields the present value of a project's cost stream. Because the costs of competing alternatives can be compared fairly only if the alternatives yield the same benefits, the LCCA must compare the project's alternatives over the same operational time period. The LCCA time period should be long enough to incorporate all, or at least a significant portion, of each alternative's life-cycle, including at least one major rehabilitation activity for each identical alternative (typically 30-50 years for rail bridges and some port facilities).

In some cases alternative facilities being considered by an agency are not designed to generate identical benefits. The appropriate analysis tool in these cases is the BCA, which considers life-cycle benefits as well as life-cycle costs.

BENEFIT/COST ANALYSIS

The BCA considers the changes in benefits and costs that would be caused by a potential improvement to the existing facility. The BCA may be used to determine the following:

- Should the project be undertaken – build or no build?
- When should the project be undertaken – economically viable now or 10 years from now due to projected growth in demand?
- Which competing capital infrastructure alternatives should be funded on a limited budget?

The major steps in the BCA process include the following:

- Establish clear objectives to reduce the number of alternatives being considered;
- Identify constraints (policy, legal, natural) on potential agency options and specify assumptions about the future (expected regional cargo growth over the projected life of the improvement);
- Develop a full set of reasonable improvement alternatives to meet the stated objectives beginning with development of a "do-nothing" option known as the "base case," which represents the continued operation of the existing facility under BMPs without major investment;
- Select an analysis period that is long enough to include at least one major rehabilitation activity for each alternative;
- Define the level of effort allocated to quantifying benefits and costs proportional to the project's expense, complexity, and controversy;
- Analyze increased maritime cargo effects on the alternatives being considered;
- Estimate benefits and costs relative to the base case;
- Evaluate risk associated with alternative project selection and funding (agency funding versus Public/Private Partnership [P3] funding);
- Compare net benefits and rank alternatives where the value of discounted benefits exceeds the value of discounted costs that would make the project worth pursuing; and
- Recommend a plan of action from an economic standpoint, based on the results of the BCA and associated risk analysis, for the preferred alternative.

OTHER FACTORS TO BE CONSIDERED

- Identify benefits categories, such as internal economic benefits (increased revenue), economies of scale, and employee productivity savings.
- Analyze external economic factors, such as customer savings over comparable service offerings as a result of regional competition.
- Examine other qualitative benefits, such as strategic partnerships, environmental mitigation efforts, and stakeholder buy-in.
- Identify cost categorization and examine each to associate costs relevant to those activities, such as operating costs that include administrative and management, personnel and staff, facilities and operating and management, and marketing.

Other major categories of costs are associated with capital costs, such as business planning costs (placement and size of asset), cost of the asset itself (engineering and construction), other asset costs (procurement, assembly of equipment, and training of staff on equipment), financing costs, consulting fees, and other unknown costs.

Texas A&M Transportation Institute (TTI) developed the following modal comparison[1] for TxDOT and FHWA which can be used to compare benefits and costs from a transportation modal comparison perspective *(Table 7.1)*.

Table 7.1 – Modal Comparison

Barge	Rail	Truck
Units to Carry 27,500 Barrels of Liquid Cargo		
1	46	144
Units to Carry 1,750 Short Tons of Dry Cargo		
1	16	70
Ton-Miles Traveled per Gallon of Fuel		
616	478	150
Rate of Spills in Gallons per Million Ton-Miles		
2.59	4.89	10.41
Rate of Injuries per Million Ton-Miles		
1.0	95.3	1,609.6

Source: TTI

TTI also performed a modal comparison matrix for emissions for Hydrocarbons (HC), Nitrogen Oxides (NOx), Volatile Organic Compounds (VOC), and Carbon Monoxide (CO), Particulate Matter (PM-10), and Carbon Dioxide (CO_2) *(Table 7.2)*.

Table 7.2 – Emissions (grams per ton-mile)

Mode	HC & VOC (truck)	CO	NOx	PM-10	CO_2
Barge	0.014123	0.0432	0.27435	0.007955	16.41
Rail	0.018201	0.0556	0.3536	0.010251	21.14
Truck	0.10	0.37	1.45	0.06	171.83

Source: TTI

[1] *Texas Gulf Intracoastal Waterway Master Plan*, August 2014.

As a comparison between rail and a rail bridge versus trucks (vehicular) as shown in *Tables 7.1* and *7.2*, rail is a superior form of cargo transportation over trucking in terms of performance, efficiency, energy consumption, safety, and pollution reduction. The estimated capital and development costs of the various railroad and vehicular bridges considered in this report are presented in *Table 7.3*.

Table 7.3 – Estimated Capital and Development Cost Summary (Range for all Options)

Facility	*Capital Cost (millions)*	*Development Cost (millions)*	*25% Contingency (millions)*	*Total Estimated Cost (millions)*
Rail Bridge	$194 - $227	$19 - $23	$49 - $56	$262 - $306
Vehicular Bridge	$38 - $73	$4 - $8	$11 - $21	$53 - $102
Port Facility	TBD	TBD	TBD	TBD
Internal Railroad Network	TBD	TBD	TBD	TBD
Total	*$232 - $300*	*$23 - $31*	*$60 - $77*	*$315 - $408*

RISK ANALYSIS

Project risk must be identified, evaluated, and managed throughout a project's life for the project to be successful. Management of risks requires a public agency to proactively address potential obstacles that may hinder project success. P3s are considered to be a form of risk management because public and private sector parties seek to achieve optimal risk allocation to minimize overall project risks.

Project management is an iterative process that begins in the early phases of a project and is conducted throughout the project's life cycle. Risk management follows a clearly identified process, which includes:

- Risk identification;
- Risk evaluation;
- Risk response planning (including transfer of risks to private sector); and
- Risk monitoring, controlling, and reporting.

Major risk factors for railroad/port projects include:

- Requiring major political involvement due to sheer scale of undertaking;
- Requiring coalition-building and strategic partnerships to accomplish a project that has regional significance;
- Securing capital funds through various sources such as federal and state programs and grants, bonds, and P3s;
- Managing project budget overruns that occur with projects that have long development timelines;
- Project completion time (construction delays) and associated delay of revenue streams;
- Failing to achieve anticipated benefits after project completion;
- Cruise ship boycotts/cancellations;
- Natural disasters;
- Security concerns;
- Strict resource agency permitting requirements and their associated development timeline impacts;
- Significant environmental mitigation and associated costs; and
- Possible litigation (injunctions, judgments, and associated legal costs) and impact on project development timeline.

SWOT ANALYSIS FOR PELICAN ISLAND

A SWOT analysis is a valuable tool in evaluating the merits and risks involved in any project undertaking. It is also a valuable tool in the constant reevaluation of changing conditions and existing assets during their useful life.

Table 7.4 – Pelican Island SWOT Analysis

Strengths	*Weaknesses*
• Proximity to deep open water	• No rail access
• Proximity to Houston and Galveston channels	• Limited capacity two-lane vehicular bridge
• Large developable acreage	• No funding partnership capable of initiating port projects of regional significance exists at this time
• Location eliminates interface with Galveston Intracoastal Waterway barge traffic and large ships	• No local infrastructure supply chain for large port facility exists
Opportunities	*Threats*
• Strong regional economy	• Resistance to industrial development by special interest groups
• Post-Panamax market growth serving Texas and Midwest	• Strong regional port market share competition
• Future ability to connect with two existing Class I railroads located on Galveston Island	• Post-Panamax cargo diversion to East Coast deep water ports

PURSUIT OF FUNDING

The following lists potential infrastructure and operational funding sources that can be used for industrial rail bridges, public vehicular bridges, and port facilities.

FEDERAL SOURCES

Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant

TIGER provides a unique opportunity for the U.S. DOT to invest in road, rail, transit, and port projects that promise to achieve critical national objectives. Congress has dedicated more than $4.1 billion since 2009 for six rounds to fund projects that have a significant impact on the nation, a region, or a metropolitan area.

The competitive structure of the TIGER Grant Program[2] allows project sponsors at the state and local level to avoid narrow, formula-based categories, and fund multimodal, multi-jurisdictional projects not eligible for funding through traditional DOT programs. TIGER can fund port and freight rail projects which play a critical role in the country's ability to move freight. TIGER can provide capital funding to any public entity, including municipalities, counties, and port authorities.

Grant applications must contain a BCA that takes into account local leverage funding as part of the selection criteria.

[2] BCA requirements at TIGERgrants@dot.gov.

Transportation Infrastructure Finance and Innovation Act (TIFIA) Credit Program

TIFIA[3] provides credit assistance for qualified projects of regional and national significance. Many large-scale, surface transportation projects (highway, transit, railroad, intermodal freight, and port access) are eligible for assistance. Eligible applicants include state and local governments, transit agencies, railroad companies, special authorities, special districts, and private entities. Applicants to this program must submit a Letter of Interest to the FHWA Office of Innovative Program Delivery. Eligible costs using TIFIA credit instruments include the following:

- ***Development phase activities*** such as planning, feasibility analysis, revenue forecasting, environmental review, permitting, preliminary engineering and design, and other pre-construction phase activities.
- ***Construction and acquisition of real property*** (including land related to the project), environmental mitigation, construction contingencies, among others.
- ***Payment of capitalized interest*** necessary to meet market requirements, reasonably required reserve funds, capital issuance expenses, and other carrying costs during construction.

[3] TIFIACredit@dot.gov.

Water Resources Reform and Development Act (WRRDA) of 2014

Through WRRDA, Congress authorizes the key missions of USACE, including developing, maintaining, and supporting the nation's economically vital water infrastructure and supporting effective and targeted flood protection and environmental restoration needs. Highlights of WRRDA[4] include the following:

- ***Reforms*** bureaucracy, accelerates project delivery, and streamlines environmental reviews
- ***De-authorizes*** $18 billion of old, inactive projects that offset funding for new authorizations
- ***Maximizes*** the ability of non-federal interests to contribute funds to move projects forward and to expedite environmental reviews and permits

[4] WRRDA at transportation.house.gov/uploadedfiles/wrrdabookletpostconflowres.pdf.

Federal Railroad Administration (FRA) Grants and Loans

FRA supports passenger and freight railroading through a variety of competitive grant, dedicated grant, and loan programs to develop safety improvements, relieve congestion, and encourage the expansion and upgrade of passenger and rail infrastructure and services. FRA also provides training and technical assistance to grantees and stakeholders. The Railroad Rehabilitation and Improvement Financing (RRIF) Program was established by the Transportation Equity Act for the 21st Century (TEA-21) and amended by the Safe Accountable Flexible and Efficient Transportation Equity Act: a Legacy for Users (SAFETEA-LU) and the Rail Safety Improvement Act of 2008. Under this program FRA is authorized to provide direct loans and loan guarantees up to $35 billion to finance the development of railroad infrastructure. Up to $7 billion is reserved for projects benefiting freight railroads other than Class I carriers. Direct loans can fund up to 100% of a railroad project with repayment periods of up to 35 years and interest rates equal to the cost of borrowing to the government. However, FRA prefers applicants to provide equity to the project.

FRA gives priority to projects that provide public benefits, including benefits to public safety, the environment, economic development, and rail-related intermodal service. The following describes the FRA seven-step loan application and evaluation process:

- ***Information Session*** - Required for new applicants to fully understand the RRIF process.
- ***Draft Application Submittal*** – Includes project scope, financial and legal records, environment and safety (if applicable) documents. Applicants encouraged to seek FRA guidance throughout this step.
- ***Draft Application Review Meeting*** – Required to provide FRA feedback on draft application and discuss missing information or areas of concern. FRA will notify applicant of any deficiencies and corrections needed.
- ***Final Application Submittal*** – Should be consistent with draft and address all FRA concerns.
- ***Final Application Acceptance for Review*** – FRA notifies applicant if application is accepted for review or requires additional information. Application acceptance does not guarantee approval.
- ***Final Application Review and Approval*** – Includes financial analysis by independent financial analyst, legal review, project scope review, and reviews/approvals by DOT's Credit Council, FRA leadership, and Office of Management and Budget (OMB). Applicant must pay a fee to FRA (not more than 0.5% of loan amount) for legal/financial reviews, even if the loan is denied.
- ***Loan Closing*** – Negotiate final terms/conditions and parties execute financing agreement and close transaction.

Eligible applicants include railroads, state and local governments, government-sponsored authorities and corporations, joint ventures that include at least one railroad and limited option freight shippers who intend to construct a new rail connection.

FRA gives priority to projects that provide public benefits, including benefits to public safety, the environment, economic development, and rail-related intermodal service. The following describes the FRA loan application and evaluation process:

FHWA Highway Bridge Replacement and Rehabilitation Program (HBRRP)

FHWA's HBRRP was established in 1978 to provide financial assistance to states and local governments to replace or rehabilitate bridges on and off the federal-aid system. This program is fiscally constrained with $230 million is available annually of which $60 million of this total is available for off system bridges. FHWA provides an 80% funding match toward eligible projects with 20% funding coming from the state or local sponsor. In 1995, TTC acted to provide 10% of the local match of eligible off-system projects with state funds thereby creating an 80/10/10% federal/state/local funding match.

If a local sponsor has an eligible project but does not have the ability to fund their share of the matching requirement that entity can apply to TxDOT for a State Infrastructure Bank (SIB) loan. The SIB is a revolving account in the State Highway Fund from which loans may be made to local governments for funding critical projects such as bridges.

All publicly accessible bridges in the country are inspected every two years and their individual condition is scored numerically on a 0-to-100 scale on worst to best condition basis respectively. If a bridge is considered "Structurally Deficient" (in poor condition) and has a score of 0-to-49, it is deemed eligible for replacement or rehabilitation. If the bridge score has a score of 50 to 80, it is deemed "Functionally Obsolete" (poor configuration and/or design) and is eligible for rehabilitation only. With limited funding availability, TxDOT compiles these scores statewide and endeavors to replace and rehabilitate bridges that are in the most critical condition that could pose a safety hazard to the travelling public.

Private Activity Bonds (PAB)

PABs are debt instruments issued by state or local governments whose proceeds are used to construct projects with significant private involvement, such as the following:

- ***FHWA Revenue Bonds PAB.*** A concessionaire can use revenue bonds to finance a project. One type of revenue bond commonly used is PABs issued by a public sector conduit. PAB allocations are made by the Secretary of the DOT and allow state and local governments to issue tax-exempt bonds on behalf of P3 infrastructure projects.

  Prior to the 2007-2008 financial crisis, financial guarantees, sometimes called monoline insurance, could be purchased to make the issuance of project revenue bonds more attractive to buyers and to borrowers. Collapse of the bond insurance market made it more difficult to finance projects through project revenue bonds.
- ***FHWA Section 129 Loans.*** Section 129 loans allow states to use regular federal-aid highway apportionments to fund loans to projects, which can be repaid with dedicated revenue streams.

STATE SOURCES

- ***TxDOT SIB.*** TxDOT is authorized under federal law that enables states to use its federal-aid apportionments to establish a revolving fund that offers low-cost loans and other credit assistance to help finance projects, including P3 projects. TTC is currently considering making the SIB multimodal, including rail and ports.
- ***TxDOT Texas Ports Capital Program.*** An unfunded account has been established in the General Revenue Fund that has the legislative capability to fund port development activities, subject to a 50% local sponsor fund match in accordance with the Texas Transportation Code, Title 4 Navigation, Subtitle A Waterways and Ports, Chapter 55, Funding of Port Security, Projects and Studies, Section 55.992, Port Development Funding.
- ***TxDOT Transportation Reinvestment Zone (TRZ).*** The demand for transportation infrastructure has far outpaced the resources of federal, state, and local governments. The Texas Legislature has established innovative methods of developing and financing transportation projects, such as the TRZ, a tool used by local entities to advance transportation projects. The local governing body designates a zone in which it will promote a transportation project. Once the zone is created, a base year is established and the incremental increase in property tax revenue collected inside the zone is used to finance a project in the zone.

LOCAL SOURCES

- ***Municipal Bonds.*** There are many different kinds of municipal bonds that can be issued to help finance transportation projects, including general obligation bonds, revenue bonds, and grant anticipation notes. With federal Grant Anticipation Revenue Vehicles (GARVEE) bonds, future federal funds are used to repay the debt and related financing costs under the provisions of Section 122 of Title 23, U.S. Code. A GARVEE can be issued by a state, a political subdivision of a state, or a public authority.

PUBLIC PRIVATE PARTNERSHIPS (P3)

Innovative financing tools need to be explored due to a large and growing gap between government infrastructure needs and the inability to pay for those needs using traditional financing methods.

One of the fastest growing innovative financing tools being utilized in the U.S. is known as Design-Build contracting. This approach has a long history in Europe and is beginning to emerge in the United States. Design-Build contracting, in the form of P3, gives private firms the authority and ability to finance and build public infrastructure projects.

P3s are based on the idea that the government can maximize the value of the public's assets by taking advantage of the private sector's profit motive and market discipline. P3s can also be an excellent project delivery method that shifts sufficient amounts of risk to the private sector. A well-designed P3 balances public and private sector risk, capabilities, and interests. P3s are complex transactions, and determining that a P3 is likely to provide a better result than a conventional approach is not a simple task when considering long-term costs, many uncertainties, present and future risks, and complicated funding and financing approaches.

FINANCIAL MODELING

Bidders, lenders, and public agencies use financial models to determine a project's financial feasibility from their perspectives, as presented next.

Model Inputs and Outputs

Financial models are built using a standard spreadsheet program and are usually comprised of separate sheets for a user guide, inputs, calculations, and outputs. All calculations involve estimates of future cash flows; therefore, the reliability of the results depends on the validity of the data and assumptions used as input. *Table 7.5* presents a description of the model inputs.

Model outputs are summarized and include the financial metrics needed by public agencies, lenders, and equity investors, and annual projections of the following:

- Capital expenditures
- Drawdown of equity and debt
- Availability of payments or revenues
- Other operating revenues
- Operating expenditures
- Taxes
- Debt repayments
- Profit and loss account (income statement)
- Balance sheet
- Cash flow (source and use of funds)

Table 7.5 – Model Inputs

Input	*Key Elements*
Economic data	Inflation rate and tax rate
Capital expenditure data	Bidding and development costs, construction costs and schedule, interest during construction, reserve accounts, and contingency amounts
Sources of funds and amounts	Equity, loans, bonds, and public subsidies
Financial data	Characteristics of the loans and bonds, that involve interest rate, term, and covenants
Operations data	Operation and maintenance costs, renewal and replacement costs, user forecasts, and facility revenue

Financial Metrics Used by Public Agencies

Public agencies need methods of comparing bids with one another. There are various approaches for comparing bids involving different measures derived as outputs from the financial model. Some of these require converting future cash flows (i.e., expenditures and income, or costs and revenues) to present values.

Comparison of P3 bids requires converting future revenues or future payments to be made by the public agency to present values. Future cash flows are converted to present values by using a calculation based on a selected discount rate, known as *discounting*. The discount rate is effectively a percentage by which a cash flow element in the future (i.e., project costs and revenues) is reduced for each year that cash flow is expected to occur. The discount rate is based on the "time value" of money, that is, it is the rate of return one would expect in exchange for receiving a future payback of dollars invested or lent today.

A Discounted Cash Flow (DCF) analysis allows the calculation of a present value for revenues and costs (i.e., income and expenditures) that are not expected to occur until far into the future.

Financial Metrics Used by Equity Investors

The P3 consortium that bids on the project and its investors expect to receive returns on the equity invested in the project, and lenders expect to receive interest on the money lent to the concessionaire's shareholders. Each party may have its own specific tools to analyze the project and decide on the best way of structuring the financing.

In corporate finance, Weighted Average Cost of Capital (WACC) is used by companies (e.g., members of a P3 consortium) to determine the feasibility of investment opportunities. The WACC calculates a firm's cost of capital, which is equal to the average return expected from all sources of financing. Each category of capital is proportionately weighted. All capital sources—common stock, preferred stock, bonds, and any other long-term debt—are included in the calculation.

The project equity Internal Rate of Return (IRR) represents the yield of the project for the stakeholders through the reimbursement of their investment with dividends. The equity IRR is commonly used as a "hurdle rate" for investments. For an investment to be justified, the equity IRR must be above the hurdle rate. The standard approach used by bidders for pricing P3 projects is to determine the leverage and cost of debt and then to apply the required equity return to the balance of funding needed. The required equity IRR may be used by P3 bidders to calculate the required annual

availability payment. It may also be used to calculate refinancing gains (when refinancing gains are to be shared with the public agency) or for compensation for contractual changes required by the public agency during the life of the P3 contract.

Financial Metrics Used by Lenders

There are three metrics used by lenders to check project capacity to repay debt, as follows:

- Annual Debt Service Coverage Ratio (ADSCR)
- Loan Life Coverage Ratio (LLCR)
- Project Life Coverage Ratio (PLCR)

ADSCR represents, for any operating year, the ability for the net project revenue to cover the debt. The higher the ADSCR, the more attractive the project will be to lenders. Any ADSCR above 1.0 provides a cushion for adverse circumstances that may occur during the project's life.

LLCR indicates the capacity for the concessionaire to bear an occasional shortfall of cash due to a change in circumstances in the model while maintaining its debt service through the end of the term of the debt. The project is considered viable for the lenders when the LLCR exceeds the principal amount of debt outstanding for every year of the project life. This means that the concessionaire should be able to maintain its debt repayments if there is a period of cash shortfall. The higher the LLCR, the more attractive the project is to lenders.

PLCR is another check made by lenders concerning whether the concessionaire has the capacity to make repayments after the original final maturity of the debt.

In conclusion, this chapter covered the various capital improvement funding mechanisms available for rail and vehicular bridges and also for port development. Some of these funding mechanisms are grants and, in other instances, they are debt instruments that must be repaid. The next chapter addresses conceptual revenue streams that could be tapped for the purpose of debt service. Examples of these revenue sources include ad valorem taxes to port and industrial-related improvements, port tariffs and fees, short-line rail fees, and increased jobs and sales resulting in further "trickle-down" tax revenues.

Chapter 8 – ECONOMIC IMPACT ANALYSIS

8

As part of a larger and more comprehensive economic impact analysis of the State of Texas Port and Maritime Transportation System, *Local and Regional Economic Impacts of Marine Cargo and Passenger Cruise Activity at the Port of Galveston*[1] was prepared for the Board of Trustees of the Galveston Wharves in October 2012. The report summarized the local economic impacts of marine cargo and cruise vessel calls at the port for 2011 and presented economic impact models for marine cargo and passenger cruise vessel activities that measured the impacts from those activities at all public and private terminals.

In this feasibility study, only the economic impacts of marine cargo were analyzed and cruise vessel impacts were omitted. To ensure accuracy and defensibility, the baseline impact data were collected from interviews with maritime firms in the Galveston maritime community, as well as additional interviews with firms included in the statewide economic impact analysis of which a total of 2,307 interviews were conducted for the statewide analysis. These firms represent greater than 98% coverage of all firms identified in the seaport community. These firms represent the universe of firms providing services at the POG's public and private maritime terminals located at the POG and along the Galveston Ship Channel, as identified by the following sources:

- *The Journal of Commerce,* Transportation Telephone Tickler;
- *Statewide Economic Impact Analysis Directory*;
- POG's *Port Directory*; and
- POG's internal customer and tenant lists.

The marine cargo-related economic impacts were identified and measured using four types of economic activity generated, as follows:

- Jobs
  - Direct jobs
  - Induced jobs
  - Indirect jobs
  - Related jobs
- Personal Income Earnings
- Revenue
- Local Purchases
- State and Local Tax Impacts

[1] *The Local and Regional Economic Impacts of Marine Cargo and Passenger Cruise Activity at the Port of Galveston, 2011,* October 3, 2012, Martin Associates

JOBS

Direct Jobs. *Jobs with marine cargo-related firms whose existence depends on marine cargo activity.* These firms would suffer immediate negative impacts if port activity were reduced. Marine cargo direct jobs include those with trucking companies and railroads moving cargo to and from the port; longshoremen and stevedores loading and unloading cargo; freight forwarders; steamship agents; chandlers; ship repair companies; and terminal and warehouse operators, among others.

Induced Jobs. *Jobs created locally and regionally due to the purchase of goods and services by those with direct jobs.* A re-spending impact is created throughout the economy by local purchases made by individuals and firms with induced jobs. In economic terminology, this is known as an Income Multiplier. The re-spending impact from marine cargo activity creates jobs in the induced jobs sector. These jobs include miscellaneous retail, the local construction industry, healthcare, and State and local government agencies that provide public services and professional and business services for individuals and companies in the direct job sector. To estimate induced jobs, a regional personal earnings multiplier for the marine cargo sector in Galveston County was developed from data provided by the U.S. Bureau of Economic Analysis (BEA), Regional Income Multiplier System (RIMS II). A portion of the total personal earnings impact is allocated to specific local purchases (determined from consumption data for Galveston-area residents developed from the U.S. Bureau of Labor Statistics, Consumer Expenditure Survey).

Indirect Jobs. *Jobs created locally by the purchase of goods and services of commercial interest, not individuals.* Jobs in this sector include office supplies, parts and equipment suppliers, office and warehouse space; and maintenance and repair. Special care was taken to avoid double counting, since the current study counts certain jobs as direct that often are classified as indirect by other approaches, notably the input-output model approach. The local purchases were combined with employment-to-sales ratios in local supplying industries, developed from the BEA Regional Input-Output Modeling System (RIOMS) for the Galveston region.

These indirect jobs are estimated based on the value per ton of the commodities exported and imported via the POG and the associated jobs to value of output ratios for the respective producing and consuming industries located in the State. The value per ton of each of the key commodities moving via the POG was developed from DOT's MARAD.

Related Jobs. These are jobs with firms using the POG to send and receive cargo. These related jobs are far less influenced by the economic fluctuations of the POG. Regional alternatives exist in the form of competing ports, trucking companies, and rail lines that are able to absorb demand for their services.

PERSONAL INCOME EARNINGS

The income impact is estimated by multiplying the average annual earnings (excluding benefits) of each port participant (i.e., truckers, steamship agents, pilots, towing firm employees, longshoremen, chandlers) by the corresponding number of direct jobs in each category. The individual annual earnings in each category multiplied by the corresponding job impact resulted in $118.4 million in personal wage and salary earnings, for an average salary of $49,385.

The impact of the re-spending of the direct income for local purchases is estimated using a personal earnings multiplier. The personal earnings multiplier is based on data supplied by the BEA and estimates that for every dollar earned by direct employees generated by port activity, an additional $2.88 of personal income and consumption expenditures would be created as a result of re-spending for the purchases of goods and services produced and supplied locally.

Note that the re-spending impact of $340.9 million includes only the direct earnings received by the employees holding the induced jobs and is not a cumulative amount that includes the direct job holder personal income.

In addition to the direct and induced personal income and consumption impact, wages and salaries were received by the 3,042 indirect employees. Using wage and salary data for these indirect jobs as reported in RIMS, it was estimated that nearly $140.5 million of indirect wages and salaries were created by port activity. Therefore, in 2011, the maritime activity at the Port of Galveston created a total of $599.9 million of direct, induced and indirect wages and salaries.

REVENUE

The POG receives revenue from terminal leases and port charges according to the most recent POG tariff fee schedule. The revenue generated by port activity consists of many components. Only three of these components can be identified locally with any degree of accuracy. The components include personal income, payment of State and local taxes, and local purchases made by firms that are dependent on the maritime industry in the area.

As shown in *Table 8.1*, the direct revenue impact generated by cargo moving in and out of the public and private terminals at the POG totaled $616.1 million in 2011. This total was related to direct business revenue received by firms directly dependent on the POG by providing maritime services and inland transportation services for cargo handled at the public and private terminals.

Of the $616.1 million, $212.3 million was generated by rail. Another $365.4 million was generated primarily through barge/bunkers, maritime services and construction, and terminal fees. The remainder of the total direct revenue was attributed to tenant leases and POG tariff fees. These

amounts should not be confused with POG-only direct revenue which is included in the total direct revenue shown.

LOCAL PURCHASES

Each of the firms contacted and surveyed were asked to provide a breakdown of local expenditures for items such as equipment, parts, office supplies, business services, utilities, raw materials, maintenance and repair, and new construction. Based on the reported expenditures, it is estimated that $266.2 million of local purchases were made by the firms directly dependent on maritime cargo activity at the POG public and private marine terminals.

STATE AND LOCAL TAX IMPACTS

These tax impacts are based on State and local per capita income tax burdens developed by the Tax Foundation. The taxes include all State and local taxes collected divided by personal income in the State of Texas. By multiplying the tax/capita income burden to the total direct, induced, and indirect personal income impact, it is estimated that activity at the POG-owned marine terminals and the private terminals generated $47.4 million in State, County, and local taxes that remained in the region.

Collection of ad valorem taxes on Pelican Island real property and surface improvements is made by GCAD on behalf of the following entities using rates per $100 appraised value:

• Galveston ISD	$1.155
• City of Galveston	$0.53389
• Galveston County	$0.578844
• Galveston County Road & Flood	$0.005956
• Galveston College	$0.187
• Galveston County Navigation District	$0.046618
Total	$2.507308

These rates total $2.507308 per $100 appraised value. Although the value of land owned by PHA and POG is tax exempt, any privately held surface improvements and equipment are subject to tax. For every $1 million of non-exempt property and equipment improvements, annual tax income would be approximately $25,073.

Table 8.1 presents the existing conditions in 2011 for the POG-related facilities and the projected conditions if a containerized cargo terminal were to be constructed on Pelican Island. The economic models presented can be used to test economic impacts related to changes in labor for new marine facility development and expansion on Pelican Island. Using this methodology, projections were derived for locally induced and indirect jobs that could be created for a containerized cargo facility.

The "Projected Conditions" column in *Table 8.1* was modeled for a container terminal on Pelican Island only. Since this analysis, PHA has revised its Strategic Plan and has now shifted the focus and priority to expansion of facilities and operations at the Bayport and Barbour's Cut ports.

Table 8.1 – Economic Impact Analysis for Galveston 2011

Economic Impact	*2011 Existing Conditions (Marine Cargo Only)*	*Projected Conditions (Pelican Island Container Terminal Only)*	*Combined Conditions (Existing and Projected)*
Jobs			
Direct	2,397	5,408	7,805
Induced	2,957	4,009	6,966
Indirect	3,042	2,662	5,704
Related	3,029	N/A	3,029
Total	11,425	12,079	23,504
Personal Income	*(millions)*	*(millions)*	*(millions)*
Direct	$118.4	$213.8	$332.2
Induced	$340.9	$424.3	$765.2
Indirect	$140.5	$106.0	$246.5
Related	$310.1	N/A	$310.1
Total	$909.9	$744.1	$1,654.0
Revenue	*(millions)*	*(millions)*	*(millions)*
Direct	$616.1	$966.8	$1,582.9
Local Purchases	$266.2	$266.2	$532.4
Related Output	$1,841.9	N/A	$1,841.9
Total	$2,724.2	$1,232.9	$3,957.2
State/Local Taxes	*(millions)*	*(millions)*	*(millions)*
Direct	$9.4	N/A	N/A
Induced	$26.9	N/A	N/A
Indirect	$11.1	N/A	N/A
Related	$24.5	N/A	N/A
Total	$71.9	$69.9	$141.8

Source: Martin Associates

Table 8.2 – Summary of Impacts Generated by Port of Houston 2012			
Economic Impact	*PHA Facilities*	*Private Terminals*	*Total*
Jobs			
Direct	19,767	34,186	53,953
Induced	25,468	45,597	71,065
Indirect	13,548	36,287	49,835
Related Users	592,501	259,467	851,968
Total	651,284	375,537	1,026,821
Personal Income	*(millions)*	*(millions)*	*(millions)*
Direct	$1,054.4	$1,881.5	$2,935.9
Re-spending/Local Consumption	$3,104.0	$5,538.7	$8,642.7
Indirect	$547.6	$1,466.7	$2,014.3
Related User Income	$27,672.4	$15,257.9	$42,930.3
Total	$32,378.4	$24,144.8	$56,523.2
Revenue/Economic Output	*(millions)*	*(millions)*	*(millions)*
Direct Business Revenue	$3,627.7	$9,716.2	$13,343.9
Local Purchases	$1,236.1	$3,310.7	$4,546.8
Related User Output	$110,571.4	$50,042.6	$160,614.0
Total	$115,435.2	$63,069.5	$178,504.7
State/Local Taxes	*(millions)*	*(millions)*	*(millions)*
Direct	$83.3	$148.6	$231.9
Re-spending/Local Consumption	$245.2	$437.6	$682.8
Indirect	$43.3	$115.9	$159.2
Related User Taxes	$2,186.1	$1,205.4	$3,391.5
Total	$2,557.9	$1,907.5	$4,465.4
Source: Martin Associates			

An Economic Impact Analysis was developed in May 2012 for PHA using the same data sources and methodologies used in the POG analysis, to produce a matrix of existing jobs and revenues for these facilities *(Table 8.2)*.

The related impacts for the PHA Personal Income Multiplier factors for direct and induced income were comparable to the POG factors. However, the PHA direct and induced Revenue Output Multiplier factor compared to total output was much higher than that of the POG. This phenomenon is probably attributable to the added commercial value to goods that passed through PHA, economies of scale in containerized cargo tonnage, and the superior regional surface transportation connection network compared to that available to the POG.

In addition to measuring economic impacts for 2011, these models can be used to estimate annual updates and also to test the sensitivity of impacts to changes in such factors as marine cargo type; tonnage levels; labor productivity; development and expansion of new marine facilities; and other areas of marine-borne vessel activity.

This feasibility study utilized the labor productivity and new marine facilities development and expansion portions of the Martin Associates 2012 report to project the levels of economic impact resulting from possible port expansion and development associated with construction of new rail access and improved vehicular access onto Pelican Island.

Chapter 9 – NEXT STEPS

To move both the rail and vehicular bridge projects forward, a series of steps will be required to further develop the physical characteristics of the bridges (including alignments), refine costs, examine potential environmental issues, begin the permitting process, pursuit of funding, and maintaining stakeholder consensus. The chief permitting officer at the USACE Galveston district office recommends that the rail and vehicular bridges have independent schematic development and environmental permitting activities and timelines. This approach will ensure that unforeseen circumstances of one project will not hamper development of the other project or cause it to restart the permitting process as an independent project if they were combined in the beginning. Since the rail and vehicular facilities are not recommended to be located on a common structure or developed on a common timetable, separate pursuit makes sense. However, various environmental factors may be common to both.

Two MOUs are being developed concurrently, one between the PHA and the primary project sponsor, Galveston County, and a second one between the City of Galveston and Galveston County, with the expressed intent of achieving the following objectives:

- Enhance the economic viability of Pelican Island stakeholders;
- In the near term, add new vehicular bridge capacity between Galveston Island and Pelican Island;
- Obtain resource agency approval for new vehicular and rail bridge alignments that will allow access to PHA property and a TAMUG campus bypass on Pelican Island;
- Develop alignment for future rail connectivity that accommodates existing Class I rail interests and enables planning for a future competitive rail interface to serve existing and any proposed port and industrial development on Pelican Island; and
- Maximize the safety impact of an added-capacity vehicular bridge and new rail bridge alignments on the existing and future TAMUG campus.

A key action for consideration and demonstration of local solidarity should be the formation of a Stakeholder Working Group (SWG). SWG membership could be comprised of public and private entities that would potentially be affected by development of the bridge projects that include entities such as Galveston County, the City of Galveston, PHA, POG, GCRRTD, GCND No. 1, TxDOT, BNSF, UPRR, PIO, and HMD. The purpose of this stakeholder group is to provide input and feedback on the preferred bridge project alignment and scope to the primary project sponsor and to advocate for project funding from various resources. Stakeholder input will be needed and considered for all aspects of the projects.

After reaching consensus on each project's alignment and scope, the primary project sponsor can request a permit pre-application screening with the USACE Galveston district office for each bridge. This office has established new electronic procedures which allow potential applicants to contact a member of the regulatory staff to request electronic pre-application consultation. After the request is submitted electronically, a member of the staff will conduct a brief but comprehensive review of the proposed projects and provide helpful information necessary to pursue a permit application. Staff will provide the applicant with a summary of information that USACE must consider in its permit decision-making process, review the application information for completeness, and may schedule a JEM to present the projects to other affected state and federal agencies. Submission of an electronic request can be sent to preapplication_swg@usace.army.mil. It will be critical to obtain this guidance before pursuit of professional schematic design and environmental study services and associated capital expenditures have commenced. However, a small "pre-application screening" contract for professional services could be issued through a Request for Qualifications (RFQ) to guide and assist the primary project sponsor through this process.

If the outcome of the project JEM determines that no fatal flaws are detected on one or both projects, formal environmental and permitting coordination with the responsible resource agencies and interests could begin. This would address potential downstream impacts coming from the development of new rail and vehicular bridges. The downstream affected public agencies include TxDOT, PHA, POG, TAMUG, City of Galveston, and Galveston County. Other affected private interests include BNSF, UPRR, businesses on Pelican Island, and businesses along Harborside Drive (SH 275).

During the project development process, identification of lands impacted by the project(s) must be coordinated with city, state, railroads, and private landowners for rights of entry and access easements and should be pursued and implemented according to the appropriate timetable for each project. As the project development activities are

progressing, a comprehensive market study of the resultant industrial and port-related development induced by the bridge projects could be performed by an independent consultant. Part of this market study could include the evaluation of conceivable port types and their related commercial rail needs. The market study also would need to be prepared to the requirements of potential public or private equity sources for their internal project selection and funding evaluation processes.

Concurrent to the project development process, application procedures to the Surface Transportation Board (STB) to establish or expand a Small Railroad for Class III Carriers must be followed. To qualify for STB approval the applicant must be a non-carrier or a pre-existing Class III Carrier with annual operating revenues of less than $20 million.

The STB application must include the following:

- Full name and address of the applicant;
- Name, address and telephone number of the applicant representative;
- Details about when an agreement will be reached with UPRR and BNSF RR for switching yard connections;
- Name of the short-line rail operator;
- Brief summary of the proposed project, including the proposed time schedule for development and operations commencement and total route miles being acquired;
- Map clearly indicating the area to be served including origins, termini, stations, cities, counties, and states; and
- Certification that the applicant's projected annual revenues do not exceed those of a Class III carrier.

There is currently one Class III carrier in Galveston. Its STB reporting mark is GVSR. The railroad was formed in 1900 and in May 2005 was purchased by Genesee and Wyoming (GWI) Railroad Company. GWI operates east of 51st street serving the Galveston Wharves and operates outside of the area studied for Pelican Island rail access.

If pledges of developmental and capital (construction) funding were to be obtained, the issuance of RFQs for professional engineering, planning, and environmental permitting services for the rail and vehicular bridges could commence.

After professional service contracts have been awarded and Preliminary Engineering (PE), schematic design, and environmental permit activities have commenced, the programmatic activity to have the projects included in the Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP) could be conducted concurrently. Inclusion in the TIP requires documentation and demonstration of the successful pursuit of the aforementioned activities described in this feasibility study.

FUNDING AND IMPLEMENTATION

This report provides an analysis of the present need for the replacement of the existing Pelican Island vehicular bridge, and the future potential need for a rail bridge connection between Galveston Island and Pelican Island. Replacement and increased capacity of the existing vehicular bridge from a two-lane to a four-lane facility can be justified today, however, the need will become even more pressing as TAMUG, industry, and recreation continue to grow on Pelican Island. The future rail bridge will become necessary if and when port and industry market and other conditions on Pelican Island warrant the types of port cargoes that are more cost effectively transported to and from the Port by rail. In any event, identification of an alignment across the channel that is satisfactory to all stakeholders and which can accommodate existing and future bridge needs is critical.

The strategy for funding and implementing both the vehicular and rail bridges will take different paths. Replacement of the Pelican Island Vehicular Bridge is currently needed and the federal and state resources to implement this project could become available, if preliminary environmental and development activities are completed locally. The need and timing of a rail bridge will be market driven and rely more on public/private sector initiatives, as well as, long-term federal and state mobility loans and grant resources.

It is important to note that different funding resources at the state and federal level will be available and pursued for the respective vehicular and rail bridges. The rail bridge development offers the incentive of revenue generation related to freight movement. Therefore, the public-private partnership between the RRTD and a future third party qualifies for rail-project federal and state long-term, low-interest loan financing (currently 35 years and 3%+ interest), which also may include "capitalized interest." Federal and state grants are also available to support rail infrastructure and Intermodal Terminal development on Pelican Island.

VEHICULAR BRIDGE REPLACEMENT

Funding currently exists at the federal and state level for the replacement of aging bridges. In fact, national infrastructure strategies continually emphasize port and bridge infrastructure as being a priority for funding; especially for projects which are at an advanced development stage. TxDOT also continues to support funding for the off-system bridge replacement program. H-GAC programs significant amounts of federal and state funding periodically for mobility infrastructure including bridge replacement. Project selection for the Pelican Island Bridge replacement would rank high based on existing bridge condition, safety, and traffic volume factors.

The implementation strategy for the vehicular bridge is based on the following key elements:

- *Bridge Condition* – As previously and extensively documented, the existing Pelican Island Vehicular Bridge is old and needs replacement. The bridge has been repaired several times, most recently from Hurricane Ike damage. Additional maintenance expenditures will only slightly extend the life of the existing bridge. Since the capacity of the two existing lanes is being overtaken by demand, replacement with a higher capacity vehicular bridge is the only long-term practical solution.
- *Consensus of Local Stakeholders* – Galveston County and the City of Galveston are negotiating an MOU regarding the ROW on Galveston Island owned by the City, which will be integral to provide a linkage to the existing roadway network using the most desirable roadway alignment option shown in *Figure 3.5*. A similar agreement is being negotiated between Galveston County and PHA for Port ROW integral to a landing point for a new vehicular bridge, and potential future rail bridge onto Pelican Island. The stakeholder preferred rail bridge alignment is shown in *Figure 2.6*. It should be re-emphasized that TAMUG, a major stakeholder on Pelican Island, has concurred with these proposed preferred alignments.
- *Funding Ready Status* – During the last ten years, stakeholders seeking federal and state funding to support construction of mobility infrastructure have been successful by advancing proposed projects through preliminary development steps so that they can be moved to construction very quickly. In the case of a new vehicular bridge, detailed PE and environmental studies must be completed, detailed cost estimates completed, underlying rights to land secured, and appropriate permits obtained to qualify for design and construction funding. The estimated cost to accomplish these tasks is $2 million to $2.5 million. Galveston County has taken the lead by a significant financial commitment toward these activities contingent upon the County's ability to secure bridge take-off and landing points with the COG and PHA. An estimated 18 to 24 months will be required to complete pre-development activities for a new vehicular bridge alignment.
- *Pursuit of Funding* – There will be multiple opportunities to secure funding for design and construction of a new vehicular bridge, subject to a local commitment to fund the next phase of PE and EA studies. Once this work is underway, programming and pursuit of funding for design and construction can proceed successfully.

VEHICULAR BRIDGE FUNDING

Federal funding is available annually through FHWA's STP to support roadway, bridge, and other highway related infrastructure. This funding has annually been allocated to the states on a formula basis, which is then sub-allocated to Texas MPOs for distribution in large urban areas. H-GAC currently is programming federal and state mobility funding for the FY2015 to FY2018 timeframe. The Pelican Island Vehicular Bridge project, while generally recognized as critical for future vehicular transport, was not submitted for ranking but has received a $10 million budgetary placeholder allocation in TxDOT's future Off-System Bridge Replacement and Rehabilitation Program.

Federal discretionary STP funding is also available through congressional action on projects of major significance. The reauthorization of MAP-21 will offer Galveston an opportunity to receive authorization for funding the Pelican Island vehicular bridge replacement if local partners have made significant progress on project development.

STATE OF TEXAS MOBILITY FUNDING

Cities in Texas and Galveston can benefit greatly from the recent commitment of the state legislature to increasing the level of state funding for roadway and mobility projects. Proposition 1 which was approved by the voters in 2013 will be entering into the second year of funding supported by the state "Rainy Day Fund." In addition, the Texas Legislature recently passed SJR 5 which, if approved by the voters in November, dedicates certain existing sales, use, and motor vehicle taxes to fund highway improvements in the state, after certain other funding priority thresholds are met. It is estimated that the new highway funding measure will generate approximately $2.5 billion in additional roadway funding by 2018. This funding is available for any publicly accessible road project. The Pelican Island Vehicular Bridge would qualify for this funding, if substantial progress is made on PE and environmental work related to the project. In 2011, the Texas Legislature created the TxDOT-managed Port Mobility Fund. TxDOT now has a funding mechanism to support port-related infrastructure projects. To date, however, this fund has not been capitalized.

VEHICULAR BRIDGE LOCAL SHARE

H-GAC recently adopted a policy on the approval of TDCs which highly favors transportation projects of regional significance. TDCs are awarded to replace what, otherwise would be, local cash match. This is significant for the Pelican Island Vehicular Bridge replacement objective since additional local cash resources, beyond those necessary to advance the project's readiness, may not be readily available. Otherwise, the estimated cost of the preferred

alignment shown on *Figure 3.5* will cost $102 million for design and construction of a new Pelican Island Vehicular Bridge and will require $60 million in local cash match.

RAIL BRIDGE FUNDING

The federal Railroad Rehabilitation and Improvement Financing Program has $35 billion available to finance 100% of project costs (including capitalized interest) up to 35 years with current interest rates less than 4%.

The federal TIFIA loans funds for up to finance up to 1/3rd of total project costs for large scale railroad, intermodal freight, and port access projects. TIFIA funding offers repayment terms up to 35 years after substantial completion of the project. Repayment can be deferred up to five years to allow for construction and ramp up of revenue –producing activity. Approximately $2 Billion was authorized in TIFIA funding for DOT for FY2013 and FY2014. The Copper River Bridge Replacement Project, initiated with TIFIA funding in 2000, is an example of how TIFIA can play a strategic role in infrastructure project financing.

The TIGER discretionary grant program, is the USDOT's annual call for projects that includes the development of freight railroad and port infrastructure projects. The next round of TIGER funding is anticipated to be announced in spring 2016. This program generally requires a substantial local share to be competitive. Thus far, approximately $400 million has been approved for railroad projects. The FY2015 TIGER program required a minimum request of $20 million for urban area projects and $1 million for rural infrastructure projects. Local share generally must be 30 to 40% to be competitive for TIGER funding.

Economic Stimulus infrastructure Funding – Some in Congress are beginning to discuss the merits of a new economic stimulus program which will accelerate the US economic recovery and help to repair and replace the nation's aging mobility infrastructure. The Obama administration has proposed several new infrastructure oriented economic stimulus programs funded through changes in the existing corporate tax structure. However, Congress is unlikely to consider any infrastructure funding measure which negatively impacts corporations. The timing is most likely to be after the 2016 elections and will be highly dependent upon who is elected.

U.S. CONGRESS NEW AUTHORIZATION OF TRANSPORTATION FUNDING

It is important to note that passage of the last two transportation authorizing bills (SAFETEA-LU and MAP-21) were substantially delayed due to national politics, and a lack of congressional consensus on methods to raise revenue resources such as an increase in the federal gasoline sales tax.

In July 2015, the House of Representatives extended the MAP-21 authorizing legislation through December 18, 2015, to be funded through changes in tax compliance laws, the closing of tax loopholes, and other short term actions which will enable the transfer of $8.1 billion from the general fund to keep the Highway Trust Fund solvent. The House action is pending a similar action in the Senate and signing by the President prior to the August 2015 recess.

The existing Transportation Authorization, pursuant to MAP-21, has been previously extended several times, at current funding levels. Congress is out of session for five weeks beginning in August so final action to maintain solvency of the nation's mobility program is critical.

With the politics surrounding the 2016 presidential election in full swing, and with a Congress that is more polarized than ever, it is likely that Congress will pass a short-term transportation authorization measure and "kick the can down the road" on a long-term transportation authorization bill. However, eventually there will be a new Transportation Authorizing Bill which will afford an additional opportunity for funding a new Pelican Island Vehicular Bridge.

SUMMARY

The pursuit of a new rail connection to Pelican Island and a replacement vehicular bridge are critical to the future economic development of Pelican Island, Galveston County, and the region. The rail infrastructure, including Intermodal Terminal facilities, will rely on public-private partnerships to attract low-interest federal and state funding for design and construction (some components will be eligible for grants). The vehicular replacement bridge will be eligible for federal and state grants which ordinarily would require a 20% local share. However, all or part of the local share can be satisfied with Texas TDCs, potentially reducing or eliminating the need for cash match. In order to preserve independent utility, the pursuit of funding to finance the design and construction of the rail and vehicular bridges will be from separate non-competing resources.

APPENDICES

A – GLO Application for State Land Use Lease

B – GLO Instructions for Preparing Exhibits for Applications

C – GLO Leasing and Easement Guidelines

D – Title Search

Appendix A – GLO Application for State Land Use Lease

State of Texas
Texas General Land Office
Application for State Land Use Lease
Miscellaneous Easement/Right-of-Way - New

General Information:

This application form is to be used to request a right-of-way across state-owned land under the management authority of the General Land Office (Section 51.291, T.N.R.C.), or under the management authority of another state agency on whose behalf the General Land Office (GLO) will issue a land-use agreement. Types of actions covered by this application include, but are not limited to, the following: pipelines, electric power lines, communication lines, sub-surface easements, roads, canals, etc. If you are unsure if this application form is appropriate for your project, please contact the GLO.

Instructions:

The GLO is committed to prompt processing of this application. Our goal is to provide you with an executed contract within 90-days of the date a COMPLETE application is received. To minimize the length of time required to process this application, please note the following:

A. If obtaining a permit from the U.S. Army Corps of Engineers (COE) is required for this project, it DOES NOT authorize construction on state land. You may avoid processing delays by filing your state application CONCURRENTLY with a COE application.

B. **Submitting this application to the GLO does not authorize work on state land. You are not authorized to use state land prior to receipt of a contract executed by the Commissioner of the General Land Office. Placement or maintenance of structures on State Land without proper authorization from the GLO may result in civil penalties (V.C.T.A. Natural Resources Code, Section 51.302). In addition, the Commissioner may have unauthorized structures removed from Coastal Public Land and seek restitution for costs incurred from the responsible party (V.C.T.A. Natural Resources Code, Section 51.3021). Mitigation costs may also be assessed when necessary to compensate for damage to natural resources (31 TAC, Section 155.3(g)(1)).**

C. Receipt of an application form does not begin the GLO 90-day processing timeline. The 90-day GLO processing timeline does not begin until the application has been reviewed and found to be complete, containing all information necessary for processing. This includes: the application form with all sections properly completed; and all exhibits required in the "Instructions for Preparation of ME Exhibits." Additional information may be required on a case-by-case basis to ensure a full evaluation of impacts to state resources and protection of the public's interest in state lands. Failure to provide information requested by the GLO may result in cancellation of the application and forfeiture of the application fee.

D. Please type or print information requested.

E. Letters of No Objection: This is mainly for pipeline easements, but we reserve the right to require letters of no objection as needed. If your project is being installed across a state mineral lease tract that is held by someone other than the easement applicant, a letter of consent is required from the current leaseholder giving their consent to the location of this project. If this project crosses another pipeline that is not owned by the easement applicant, a letter of consent as to the location of the crossover is also required.

Consent letters must be addressed to the General Land Office, Asset Inspection Division, as well as to the lease holder and must specifically reference this application and specifically identify the subject project. In the consent letter, give the current leaseholder a 30-day deadline to respond to your request for consent. **Also state that if they do not respond within 30 days that will be construed as their acceptance of the proposed project.** In the event the applicant is unable to obtain a letter of consent, the GLO reserves the right to permit the project or require that the proposed location of the project be repositioned to avoid unreasonable interference with mineral lease development or any existing pipelines.

F. **NOTE:** By signing and/or dating this application, the applicant certifies that all information contained herein is true and correct. Providing false or incomplete information may result in contract termination, forfeiture of all rights granted on the basis of this application, and the assessment of penalties, if appropriate.

G. If you need assistance in completing any portion of this application, please contact the General Land Office at:

Asset Inspection, Stephen F. Austin Bldg., Room 110
1700 North Congress Ave., Austin, Texas 78701-1495
Glenn Rosenbaum: (512) 463-8180 or Glenn.Rosenbaum@glo.texas.gov

State of Texas
Texas General Land Office
Application for State Land Use Lease
Miscellaneous Easement/Right-of-Way - New

Easement No.

Grantee/Official Company Name/Applicant

Company, Partnership, Individual or Trust Name

Street Address

City State Zip Code

Work # Fax #

Country Website

Email

☐ **Authorized Agent** ☐ **Company Contact**

Individual, Company, or Consultant Information

Agent/Company Contact
(Title, First Name, Last Name, Salutation)

☐ Send contracts to Agent/ Company Contact

Work # Mobile #

Street Address

City State Zip Code

Country Email

Type of Business and State of Incorporation of Grantee

Type of Business

State of Incorporation

Tax Id #

If LP, Name Of GP

COE # if known Date

Location of Right-of-Way for tidally influenced projects

County(ies):

Waterbody(ies)	State Tract No.(s)

Water Depth

For ROW crossing State-owned Uplands

County Abstract #

Survey/Section # Block # Town. #

Survey Name

State-owned Uplands

County Abstract #

Survey/Section # Block # Town. #

Survey Name

State-owned Riverbed/Navigable Stream NOT tidally influenced

River or Navigable Stream crossed by proposed line

County Abstract #

Survey/Section # Block # Town. #

Survey Name

River or Navigable Stream crossed by proposed line

County Abstract #

Survey/Section # Block # Town. #

Survey Name

River or Navigable Stream crossed by proposed line

County Abstract #

Survey/Section # Block # Town. #

Survey Name

If the pipeline route will cross a state-owned tract held by a state Mineral Lease or covered by a Pooling Agreement, please fill out the information below:

Tract #	Mineral Lease #	Lease Holder	Held by Lease?	Held by Pooling?

****** Please note: For Oil and Gas-related Pipelines ONLY there is the option for a 10 year or 20 year term*****

Select Term: ☐ **10 Year Term** ☐ **20 Year Term**

Pipeline Information

Company's name for this pipeline

RRC T-4 Permit No. if known

Pipe outside diameter (in.)

Easement length of pipeline on state land (rods)

Permanent ROW width in feet - Normally 30 ft

Name of product being transported

Method of burial and equipment to be used
(dredging, jetting, plowing, backhoe, trenching machine, directional drill, etc.)

Transmission Line Information

Company's name for this transmission line

If electric power, provide KV rating

If communication line, designate type:

Copper Cable | Other (explain)

If above ground installation, give description

If below ground installation (minimum 24"):

Burial Depth | Cable Diameter | Casing Diameter

Method of burial and equipment to be used:
(dredging, jetting, plowing, backhoe, trenching machine, directional drill, etc.)

Easement length of line on state land (rods)

Permanent ROW width in feet

Anticipated Start Date

Expected Completion Date

☐ By clicking this box, I verify that I have read the General Information and Instructions included in this application.

Signature of Applicant/Agent

Name (please print or type)

Title

Date

Easement No.

Sub-Surface Easement Information

For the purpose of this application, a "sub-surface easement" is defined as a directionally drilled well bore for the exploration and production of crude oil, natural gas, and/or other mineral products.

Company's name for this well bore

Total length of well bore on state land (rods)

Outside diameter of drill casing (in.)

Exterior Casing | Interior Casing (if applicable)

Name of product being transported

If the applicant's surface location is in a state tract that is not currently leased by the sub-surface easement applicant, a letter of consent, issued by the easement applicant, is required from the current leaseholder giving their consent to the location of the project.

Consent letters must be addressed to the General Land Office, Asset Inspection Division, as well as to the applicant and must specifically reference this application and specifically identify the subject property. In the consent letter, give the current leaseholder a 30-day deadline to respond to your request for consent. **Also, please state that if they do not respond within 30 days, that will be construed as their acceptance to the proposed project.**

In the event the applicant is unable to obtain a letter of consent, the GLO reserves the right to require that the proposed location of the project be repositioned to avoid unreasonable interference with the mineral lease development.

Other Activities or Notes: If this is for a project other than those listed above, such as water lines, fiber-optic lines, roads, etc., fill in the boxes below. Also, please use this section for additional notes if needed.

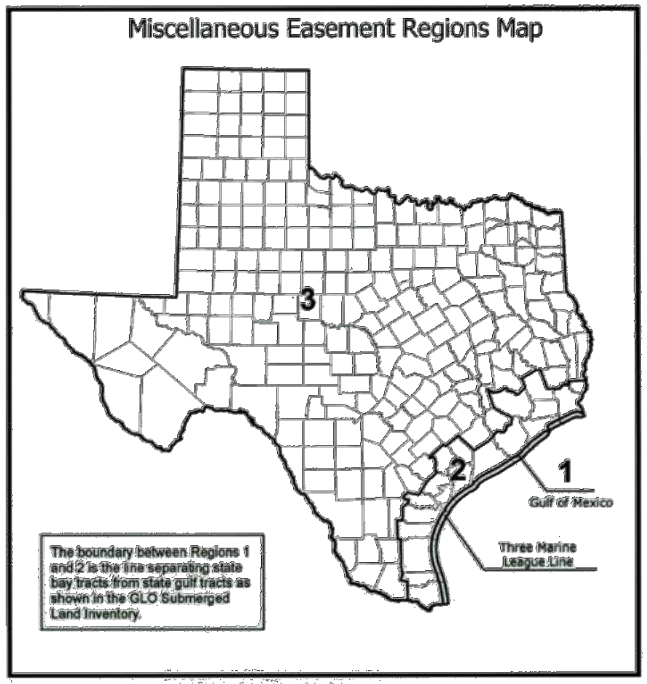
Activity Description
Explain briefly what work you propose to conduct on state land

Technical Specifications
Describe technical aspects of the proposed activity (width, length, depth, etc.)

Construction Details
Describe methods, equipment, and timing for project completion

Information collected by electronic mail and by web form is subject to the Public Information Act, Chapter 552, Government Code.

Submit by Email



General Land Office Rates for Oil & Gas Related Pipelines All rates based on price per rod (1 rod = 16.5 feet)					
10-Year Term					
Size	Region 1	Region 2	Region 3	Damages	Non-State Oil & Gas
Up to 13"	$15	$27	$22	$20	$139
>13"	$40	$65	$53	$26	$139
20-Year Term					
Up to 13"	$21	$37	$30	$20	$189
>13"	$55	$88	$71	$26	$189

Minimum amount for a 10-year pipeline contract is $737. See notes below.
Minimum amount for a 20-year pipeline contract is $1474. See notes below.
Fees are $350 per event of application, renewal, or amendment.
Assignment fees are $350 per easement.

PLEASE NOTE:

1. All charges are per line, per crossing.
2. Rates for PSF acquired properties and properties within a municipality or its extraterritorial jurisdiction (ETJ) are negotiated.
3. Damages are charged per rod and are applied to new easements only.
4. Damages will not be assessed for lines that are directionally drilled/bored under State riverbeds, creeks, etc.
5. Base rate may increase annually (but not decrease) September 1 of each year by the Consumer Price Index for all Urban Consumers (CPI-U).

General Land Office Rates for Electric Power Lines All rates based on price per rod (1 rod = 16.5 feet)				
10-Year Term				
	Base Rate (per rod)			
Power Line Capacity	Region 1	Region 2	Region 3	Damages (per rod)
<69 KV	$17	$28	$22	$11
69-137 KV	$28	$39	$33	$17
138 KV	$50	$61	$55	$19
>138 KV	$72	$83	$77	$22

Minimum of $1106 consideration per line, per crossing, per 10-year contract term.
Fees are $350 per event of application, renewal, or amendment.
Assignment fees are $350 per easement.

PLEASE NOTE:

1 Rates for ROW easements over, across or under properties acquired by the PSF and properties within a municipality or its ETJ are negotiated.
2. Damages apply to new easements only.
3. Damages will not be assessed for lines that are directionally drilled/bored under State riverbeds, creeks, etc.
4. Base rate may increase annually (but not decrease) September 1 of each year by the CPI-U.

Appendix B – GLO Instructions for Preparing Exhibits for GLO ME Sub-Surface Easements Application

B

Instructions for Preparing Exhibits For The Following General Land Office Applications:

Miscellaneous Easements (Rights-of-Way)
Sub-Surface Easements

Maps (or plats) showing the location of proposed and as-built projects on state-owned lands are required as part of the General Land Office (GLO) application process. The following instructions are to be followed when applying for new work (proposed project), or for reporting as-built conditions for a previously approved project, when the activity is a **Miscellaneous Easement (Right-of-way/ROW), Surface Lease, or Sub-Surface Easement** on state land.

The information specified below represents **minimum** requirements of the GLO and additional information may be requested on a project-by-project basis to facilitate a full evaluation of the proposed activity.

The information should be submitted along with the required application form and processing fees. Each map or plat must conform to the specifications contained herein. An application is not considered complete, and processing of the application will not be initiated, until all information requested has been submitted and GLO staff has determined that it is adequate.

NOTE: Surveys and survey plats required by other entities, Federal, State, County and/or City, are PERMISSIBLE and USABLE for GLO applications provided they meet the following requirements.

IF SUBMITTING SURVEY PLATS DIGITALLY, PLEASE PROVIDE THE INFORMATION IN ONE OF THE FOLLOWING FORMATS:

1. In an ESRI format (i.e. Shape file, E00, or Geodatabase)
2. AutoDesk Map 6 or earlier version in a DWG format.
3. **And Projection Information of the data set submitted.**

A. GENERAL INSTRUCTIONS for ALL APPLICATIONS:

1. Each map or plat should be 8-1/2" x 11".

2. A one-inch margin should be left at the top edge of each sheet for binding purposes.

3. Any shading used to identify specific areas must be reproducible by ordinary copy machines.

4. Each map or plat submitted must have a title block identifying, at a minimum: (a) applicant name; (b) applicant address; (c) project name; (d) date of preparation; (e) name of preparer, and (f) project location as follows:

   (1) if on state-owned uplands, then provide county, survey name (original grantee) and, as applicable, survey or section number, block number, township number, subdivision name, lot or tract number, and abstract number;

   (2) if on submerged land, then provide county name, waterbody name, and state tract number;.

5. The scale for each map or plat must be clearly indicated both digitally and by graphic scale.

6. Vicinity Maps -- Exhibit A for each project application must be a Vicinity Map showing the general location of the proposed work. The Vicinity Map must be produced using a U.S.G.S. 7.5 minute Topographic Map, a Texas Department of Transportation County Road Map, or navigation chart as its base layer. A prominent arrow on the map should indicate the project location. An 8 1/2" x 11" Xerox copy from the original Topo, county map, or navigation chart showing the project location is sufficient. It is not necessary to submit the entire Topo or county map, so long as the map is appropriately identified as to the origin of the base information (e.g., name, and date of base map information used). This is most easily accomplished by copying the legend of the base map and making it part of the Vicinity Map.

1

7. Project Site Map -- Exhibit B for each project application should be a Project Site Map (in Survey Plat format), which provides specific project location information. The Project Site Map should be produced at sufficient scale and detail to enable field inspectors to locate the project on the ground with minimal difficulty. Demographic features such as road numbers, stream names, railroad crossings, corporate city limits, and other prominent locative features should be included on the Project Site Map. A prominent arrow on the map should indicate the project location and a North arrow must be provided. Annotation may be included on the map regarding distance of the project from known points (e.g., highway intersections, road stream crossings, etc.). **Additional guidance for preparing Project Site Maps is provided in Section B of this document.**

8. Detailed Project Plan -- Exhibit C for each project application should be a Detailed Project Plan, consisting of an aerial plan-view drawing and a cross-sectional drawing of all proposed or existing structures on state-owned lands at the project site.

Page 1 of the Detailed Project Plan should contain, at a minimum:

a. Location of the shoreline or banks if the project is on or adjacent to tidally influenced waters or crosses a state-owned river, stream, creek, or bayou.
b. The direction of ebb and flow if in or adjacent to tidal waters, or the direction of water flow if the project crosses a river, creek, stream, or bayou.
c. A North arrow.
d. The location of state tract lines (on tidally influenced lands), survey lines, or property lines, as applicable.
e. The location of any marshes, submerged grass flats, oyster reefs, mud or sand flats, or other sensitive natural/cultural resources known to exist in the project area.
f. The lines of mean high water and mean low water when applicable.
g. Dimensions of all structures (existing and proposed) that will encumber state-owned lands at the project site.
h. The registration, easement, or lease numbers for any structures at the site previously authorized by the GLO (available from GLO field offices upon request).
i. Any applicable Corps of Engineers application numbers covering the proposed work, as soon as that application number is available, but, in any event, prior to issuance of the easement.

Page 2 of the Detailed Project Plan should contain, as applicable, an explanation of construction methodology, techniques, and equipment that will be used at the site.

9. As-Built Survey -- A survey showing the depth of burial must be furnished for all projects on state-owned tidally influenced lands (Gulf of Mexico, bays, estuaries, etc.), crossings of state-owned rivers/streams/creeks/bayous. The survey shall show plan view only for projects on state-owned upland tracts. Failure to provide this information is, by terms of the state contract, grounds for termination of the easement and removal of the structure from state-owned land.

New Installations: Each application for installation of a **new** power transmission line or communication line must include with the application a profile drawing showing the **proposed** depth of burial at not less than 36" below the surface.

GLO will issue an easement using the **proposed** ROW and depth of burial information. Following installation of the line, however, the applicant is required by terms of the GLO contract to provide a survey of actual burial depth measurements for that portion of the ROW length occupying state-owned land. The spacing between depth-of-burial measurement points is a function of the length of ROW. If the easement length is less than 500 feet, the depth of cover of the structure and waterway bottom elevation shall be determined at intervals not to exceed 50 feet. If the easement length is greater than 500 feet but less than 5,000 feet the interval between measurement points shall be 100 feet. Easements greater than 5,000 feet in length shall be surveyed at 250-foot intervals.

All work shall be performed under the supervision of and sealed by a registered public land surveyor. All submitted drawings must be sealed by the supervising registered public land surveyor. All elevations must be referenced to a common datum (Mean Sea Level, National Geodetic Vertical Datum, Mean Low Water, etc.) and grid coordinates must reference Texas State Plane coordinate System of 1927 or 1983. The accuracy of the waterway bottom and installation elevations shall be +/- one-half (.5') foot for the waterway bottom and +/- one-half (0.5') foot for depth of burial less than or equal to 10 feet and +/- fifteen (15%) percent for depth of burial greater than ten (10) feet. Manual probing and electronic means (both active and passive) of survey type shall be acceptable for depth of burial determinations.

Existing Installations: At time of renewal of an easement for an existing underground power transmission line or communication line, provide the data as required under Section 3.02.(iv) of this easement contract.

2

CERTIFICATION BY A TEXAS REGISTERED PUBLIC LAND SURVEYOR IS REQUIRED ON ALL OF THE FOLLOWING WITH THE EXCEPTION OF DIRECTIONALLY DRILLED WELL BORE LOGS IN ITEM B1C.

B. SPECIFIC INSTRUCTIONS:

Maps or Survey Plats to be submitted as the Project Site Map and/or the Detailed Project Plan (see A7 and 8 above) must contain the information described below.

Upland survey data should be reported to normal boundary land surveying minimum standards. Offshore or submerged sites shall be located to a specified accuracy of +/- 5 feet of any reported location.

1. Projects located on Tidally Influenced State-owned lands (Including the Gulf of Mexico, bay tracts, and the tidally influenced portions of rivers, creeks, streams, and bayous):

a. Rights-of-Way (e.g., Miscellaneous Easements for transmission lines, roads, etc.)

Coordinates must be provided at the beginning and ending points of the ROW's centerline, or on the principal point or points of tracts described by other means (directional well bores, etc.). These coordinates must be based on the Texas State Plane Coordinate System of 1927 or 1983. Courses and distances must be specified as either grid or geodetic for all centerlines and perimeter lines, and ties must be made from specific improvements (e.g., well heads, platforms, pilings, etc.) to a corner or corners of the lease or easement tract. All submerged state land tracts crossed by any part of the ROW must be shown and identified, and the points of each ROW crossing of a state-tract boundary identified in the Texas State Plane Coordinate System of 1927 or 1983. The distance between crossings of a state-tract boundary must be indicated in both feet and rods on the plat.

As-built plats (and confirmation surveys at time of renewal) must give bearing and distance between angle points along the easement route. In the event no angle points exist along the course of the ROW, the plat shall provide a minimum of one identified point for each 1,000 feet of ROW length. A ROW less than 1,000 feet long but greater than 500 feet in length requires one mid-point to be identified on the survey plat.

b. Surface Leases (e.g., well platforms on un-leased tracts, etc.)

A metes and bounds description (or other valid description) must be provided for the area encumbered by a surface lease. This description must be in increments of not less than one acre for the area surrounding a platform or structure, with the point of beginning, well location, and other structures on the leased site identified and properly located by coordinates. The point of reference from either the center or the corner of a platform or structure must be specified, with coordinates given at one or more points on the Texas State Plane Coordinate System of 1927 or 1983.

c. Sub-Surface Easements (e.g., directionally drilled well bores, etc.)

Sub-surface easements for directionally drilled well bores shall consist of a corridor having a ten (10) foot radius around the directionally drilled well bores as it is shown by an as-built directional well survey. Directional well surveys shall show the following information: surface location (as described in item B.1.b., above), sub-surface elevation of each angle point, and the bottom hole location as shown on well bore log. These items shall be identified by a value given at not less than one point on any locative document, referenced to the Texas State Plane Coordinate System of 1927 or 1983.

2. Projects Across (Rights-of-Way) State-owned Upland Property, or the state-owned portion of a river, creek, stream, or bayou above the limit of tidal influence:

a. Upland Tract (State Fee Lands):

For new project applications, information provided for projects on state-owned upland tracts shall include the beginning and end points of the easement centerline, identified by coordinates on the Texas State Plane Coordinate System of 1927 or 1983, and shall include course and distance of all segments of the proposed easement centerline. Course and distance from one end of the easement to the nearest survey corner or subdivision survey corner shall be included, along with the survey name (original grantee), and as applicable, survey or section number, block number, township number, subdivision name, lot or tract number, and abstract number of all surveys abutting the ROW easement.

3

At completion of construction, or at time of renewal, an as-built plat or confirmation survey (which ever is applicable) must be submitted. This plat must give bearing and distance between angle points along the easement route. In the event no angle points exist along the course of the ROW, the plat shall provide a minimum of one identified point for each 1,000 feet of ROW length. ROWs, less than 1,000 feet long but greater than 500 feet long, require one mid-point to be identified on the survey plat.

b. Crossing the State-owned portion of a river, creek, stream, or bayou above the limit of tidal influence.

Information provided for projects crossing non-tidal state-owned rivers, creeks, streams, or bayous shall include an identification of the stream or water body by local and any other names known (historic, from topographic or other maps, etc.). In addition, the beginning and end points of the easement centerline, identified by coordinates on the Texas State Plane Coordinate System of 1927 or 1983, and shall include course and distance of all segments of the easement centerline. Course and distance from one end of the easement to the nearest survey corner or subdivision survey corner shall be included, along with a cross section or profile of the crossing between the top of the high banks, survey name (original grantee), and as applicable, survey or section number, block number, township number, subdivision name, lot or tract number, and abstract number of all surveys abutting the ROW easement.

4

Appendix C – GLO Leasing and Easement Guidelines

C

Texas General Land Office
Leasing and Easement Guidelines

1. To determine if a proposed project requires a General Land Office lease, applicants are advised to discuss their project plans with the appropriate Land Office field office before submitting a formal application.

2. If a Land Office lease is required, an application packet will be sent to you, or you may download an application and mail it to the field office nearest you. Land Office staff members at the Corpus Christi and La Porte field offices are available if you need assistance completing your application.

NOTICE
A U.S. Army Corps of Engineers permit alone does not authorize an applicant to begin a project on state-owned submerged land. Authorization from the Texas General Land Office is also required for the use of these lands.
UNAUTHORIZED USES
Placement or maintenance of structures on coastal public land without proper authorization from the Land Office may result in civil penalties of up to $1,000 per day for each day of violation. The Commissioner of the Texas General Land Office may have unauthorized structures removed from coastal public land and seek restitution for costs incurred from the responsible party. Mitigation costs may also be assessed to compensate for damage to natural resources.

3. Most coastal easements and structure registrations are issued from the field offices. Submitted applications should be accompanied by:
    a. A diagram of the project showing all structures and dimensions
    b. A copy of a tax statement as proof of ownership of littoral property
    c. A vicinity map showing project location
    d. An application fee (as explained in cover letter in the application packet).

The Land Office headquarters in Austin issues cabin permits, coastal leases, miscellaneous easements, surface leases and commercial leases. Additional information that may be required includes survey plats, habitat surveys, mitigation plans, proof of insurance and engineering drawings.

Last updated 2/17/2010

Texas General Land Office
Leasing and Easement Guidelines (continued)

4. When the completed application form, fees and required attachments are received in the appropriate office at the Land Office: The application is reviewed for completeness, an on-site inspection of the project site is conducted, and fees and special contract requirements are determined. The applicant will be notified of the date and time of a public meeting if the project requires approval by the School Land Board (*applicant is not required to attend*).

5. If the project is approved: Two originals of the contract will be mailed to the applicant for review and signature. These should be returned to the Land Office along with any fees due. Upon execution, the Land Office will return one of the original contracts to the applicant. The other contract is kept on file with the Land Office. The applicant is responsible for making required payments as outlined in the contract. Failure to pay required fees or meet any other terms of the contract may result in the termination of the contract and require the lessee to remove the structure.

Last updated 2/17/2010

Appendix D – Title Search

TITLE REPORT

FILE NO.: 1416743782

PRIOR FILE: N/A

EFFECTIVE DATE: September 24, 2014 @ 8:00 A.M.

CLOSER: Don Lera

EXAMINER: Quinn Tuma

ARB NO.: 15-17, 149, 150/*; A-628;

APPLICANT: County of Galveston, Texas

Examination from: Records of Stewart Title Company

Subject to: Claims of present occupants; discrepancies in area and boundaries; unpaid bills for labor or material in connection with repairs or new improvements; unpaid taxes.

OWNER OF RECORD APPEARS TO BE:

Lamson Nguyen (As to Tract 1)

5600 PIE CORP., a Texas corporation (As to Tracts 2 & 3)

SULTEX, LTD., a Texas limited partnership (As to Tract 4)

City of Galveston (As to Tract 5)

Galveston County Navigation District No. 1 (As to Tracts 6 & 7)

TITLE BY VIRTUE OF

by virtue of Deed recorded in/under County Clerk's File No. 2006047170 of the Official Public Records of Real Property of Galveston County, Texas. (As to Tract 1);

by virtue of Deed recorded in/under County Clerk's File No. 2006009940 of the Official Public Records of Real Property of Galveston County, Texas. (As to Tracts 2 & 3);

by virtue of Deed recorded in/under County Clerk's File No. 9815690 of the Official Public Records of Real Property of Galveston County, Texas. (As to Tract 4);

by virtue of Deed recorded in/under Volume 1013, Page 60 in the Office of the County Clerk of Galveston County, Texas (As to Tract 5);

by virtue of Deed recorded in/under Volume 1117, Page 338 in the Office of the County Clerk of Galveston County, Texas (As to Tract 6); and

by virtue of Deed recorded in/under Volume 1111, Page 564 in the Office of the County Clerk of Galveston County, Texas. (As to Tract 7)

ESTATE OR INTEREST:

Fee Simple

CORRECT DESCRIPTION OF PROPERTY:

TRACT 1:

All that certain tract or parcel of land lying and being situated in the City of and County of Galveston, Texas, and being a portion of that certain tract conveyed to Southern Pacific Terminal Company by Arabella D. Huntington, et al, by deed dated July 10,1901, and recorded in Volume 186, Page 53, et seq., in the office of the County Clerk of Galveston County, Texas, as more fully described by metes and bounds as follows:

COMMENCING at the intersection of the northerly prolongation of the east line of 51st Street and the north line of what formerly was Avenue A, said intersection being N 16° 38' W, three hundred and thirty feet (330.0 feet) from the southwest corner of Block 710;

Thence North 16° 43' West a distance of 983.5 feet to the Point of Beginning,

Thence from said point of beginning continuing North 16° 43' West a distance of 3,194.8 feet;

Thence North 73° 17' East a distance of 567.4 feet,

Thence South 76° 19' East a distance of 1520.36 feet more or less to the northwesterly line of the Pelican Island Causeway;

Thence South 27° 34' West along said northwest line a distance of 1633.3 feet to a point on a curve to the left,

Thence continuing along said northwest line southerly along said curve with a radius 3,093.0 feet an arc distance of 585.4 feet;

Thence continuing along said northwest line North 73° 05' East a distance of 27.7 feet;

Thence continuing along said northwest line southerly along a curve to the left with a radius 3,070 feet an arc distance of 866.8 feet;

Thence South 73° 22' West a distance of 31.4 feet more or less to the Point of Beginning.

Contains 66.03 Acres, more or less.

TRACT 2:

A METES AND BOUNDS DESCRIPTION OF A 35.9075 (CALLED 36.5060) ACRE TRACT BEING THAT SAME TRACT DESCRIBED IN DEED TO 5600 PIB CORP. RECORDED UNDER FILM CODE No. 009-46-2038 OF THE GALVESTON COUNTY DEED RECORDS, LOCATED IN THE M.B. MENARD SURVEY, GALVESTON ISLAND, GALVESTON COUNTY, TEXAS, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS WITH ALL BEARINGS BEING BASED IN THE CENTERLINE OF 45TH STREET;

COMMENCING at the Northwest corner of Block 716, City of Galveston, according to the Map or Plat of said City now in common use, said point lying in the Southerly right of way line of Avenue "A", (Harborside Drive Right-of-Way varies);

THENCE N 16°43' W, across Avenue "A", along the Northerly projection of the Westerly line of said Block 716, a distance of 70.0 feet to a 1/2 inch iron rod with cap stamped "COASTAL SURVEYING" set for the POINT OF BEGINNING of the herein described tract;

THENCE N 16°43'00" W, continuing along the Northerly projection of the Westerly line of said Block 716, a distance of 1402.64 to a point for corner in the Mean High Tide Meanders of Galveston Bay as described in said 5600 PIB CORP. tract;

THENCE in an Easterly direction, along the Mean High Tide Meanders of Galveston Bay as described in said 5600 PIB CORP. tract the following 10 courses and distances:

1.) S 43°30'24" E, a distance of 117.24 feet

2.) N 74°23'38" E, a distance of 389.26 feet

3.) N 77°30'37" E, a distance of 232.07 feet

4.) N 62°39'52" E, a distance of 202.84 feet

5.) S 86°53'49" E, a distance of 62.23 feet

6.) S 34°33'37" E, a distance of 273.82 feet

7.) N 71°05'04" E, a distance of 325.53 feet

8.) S 66°26'25" E, a distance of 221.48 feet

9) S 8°16'42" W, a distance of 278.62 feet

10.) S 10°11'15" W, a distance of 262.09 feet to a point for corner;

THENCE S 3°16'25" W, a distance of 101.80 (call 124.02) feet to a point for corner on the Northerly fence line for the City of Galveston Waste Water Treatment Plant;

THENCE S 70°32'23"W, along said fence line a distance of 48.66 feet to a fence corner;

THENCE S 43°04'18" W, continuing along said fence line a distance of 166.93 feet to a point for corner;

THENCE S 17°11'00" E, a distance of 207.73 feet to a 1/2 inch iron rod with cap stamped "COASTAL SURVEYING" set in the Northerly right of way line of said Avenue "A", (Harborside Drive Right-of-Way varies) located on the arc of a curve to the left said curve being the Northerly line of a called 0.495 acre tract as shown on acquisition map for Port Industrial right-of-way found in the Galveston County Engineers office (no deed found of record);

THENCE along the Northerly line of said 0.495 acre tract being the Northerly right of way line of said Avenue "A", (Harborside Drive Right-of-Way varies) and said curve to the left having a radius of 3085.77 feet, a central angle of 04° 34'39", an arc length of 246.53 feet and a chord bearing of S 74°08'25" W, a distance of 246.47 feet to a 1/2 inch iron rod with cap stamped "COASTAL SURVEYING" set;

THENCE S 71°51'05" W, continuing along the Northerly line of said 0.495 acre tract being the Northerly right of way line of said Avenue "A", (Harborside Drive Right-of-Way varies), a distance of 600.19 feet to a 1/2 inch iron rod with cap stamped "COASTAL SURVEYING" set;

THENCE S 70°08'54" W, continuing along the Northerly line of said 0.495 acre tract being the Northerly right of way line of said Avenue "A" (Harborside Drive Right-of-Way varies), a distance of 201.10 feet to the POINT OF BEGINNING and containing 35.9075 acres, more or less.

TRACT 3:

A 185 acre tract of submerged land lying in Galveston Bay along the north shoreline of Tract 1 being the 36.5060 acre tract, and said 185 acre tract being more particularly described by metes and bounds as follows:

DESCRIPTION OF A TRACT OF LAND OUT OF THE MICHAEL B. MENARD SURVEY, ABSTRACT NO. 628, GALVESTON COUNTY, TEXAS, BEING A PART OF THAT CERTAIN TRACT CONVEYED FROM J. B. ANGELL AND ADA MAY ANGELL TO THE CITY OF GALVESTON BY DEED DATED NOVEMBER 19, 1952, AND RECORDED IN VOLUME 1013, PAGES 60 THROUGH 62 IN THE OFFICE OF THE COUNTY CLERK OF GALVESTON COUNTY, TEXAS

COMMENCING at the Northwest corner of Block 716 in the City of Galveston, said point being in the South right of way line of Avenue "A", 70 foot right of way, said point being the Southwest corner of a tract recorded in Volume 1013, Pages

60 through 62;

THENCE N16°43'W, along the Northerly projection of the West line of Block 716 and along the West line of said tract recorded in Volume 1013, Pages 60 through 62, a distance of 1472.64 feet to the place of beginning of the tract hereinafter described, said point being the Northwest corner of a 36.5060 acre tract and said point lying in the mean high tide meanders of the Southerly shore line of Galveston West Bay;

THENCE from said beginning point continuing N16°43'W, along the said Northerly projection of the West line of Block 716 and along the West line of said tract recorded in Volume 1013, Pages 60 through 62, a distance of 2757.09 feet to a point for corner in the Galveston Channel South Harbor line established in 1897, said point being the Northwest corner of said tract recorded in Volume 1013, Pages 60 through 62;

THENCE N73°14'06"E, along the Galveston Channel South Harbor line established in 1897, and along the North line of said tract recorded in Volume 1013, Pages 60 through 62, a distance of 2280.00 feet to a point for corner in the Northerly projection of the West line of Block 710 in the City of Galveston, said point being the Northeast corner of said tract recorded in Volume 1013, Pages 60 through 62;

THENCE S16°43'E, along the said Northerly projection of the West line of Block 710, and along the East line of said tract recorded in Volume 1013, Pages 60 through 62, a distance of 3030.59 feet to a point for corner being the Northwest corner of a 1.82 acre tract conveyed from the City of Galveston to Southern Pacific Terminal Company by deed dated September 15, 1955 and recorded in Volume 1121, Page 79 in the Office of the County Clerk of Galveston County, Texas;

THENCE S7°17'W, along the Westerly line of said 1.82 acre tract, a distance of 676.22 feet, called 578.43 feet to the P.C. of a curve;

THENCE in a Southerly direction, continuing along the Westerly line of said 1.82 acre tract, around a curve to the left whose radius is 520.00 feet, whose chord bears S4°43'E, 216.23 feet, a distance of 217.82 feet, called 217.32 feet, to the P.T. of said curve;

THENCE S16°43'E, continuing along the Westerly line of said 1.82 acre tract, a distance of 164.28 feet to a point for corner in the mean sea level meanders of the Southerly shore line of Galveston West Bay;

THENCE in a Westerly direction along the mean sea level meanders of the Southerly shore line of Galveston West Bay as follows:

N48°21'55"W, 34.89 feet
N59°35'46"W, 48.57 feet
N19°15'41"W, 58.58 feet
N07°22'48"W, 55.33 feet
N66°33'39"W, 21.43 feet
N25°12'51"W, 61.39 feet
S81°57'11"W, 174.44 feet
S71°14'41"W, 196.37 feet
N22°53'09"W, 0.84 feet
N81°52'01"W, 5.76 feet
S64°26'57"W, 100.06 feet
S23°07'53"W, 72.32 feet
N60°25'09"W, 61.80 feet, said point lying in the Easterly line of said 36.5060 acre tract;

THENCE continuing in a Westerly direction along the mean sea level meanders of the Southerly shore line of Galveston West Bay and the Northerly line of said 36.5060 acre tract as follows:

N10°11'15"E, 262.09 feet
N08°16'42"E, 278.62 feet
N66°26'25"W, 221.48 feet
S71°05'04"W, 325.53 feet
N34°33'37"W, 273.82 feet

N86°53'49"W, 62.23 feet
S62°39'52"W, 202.84 feet
S77°30'37"W, 232.07 feet
S74°23'38"W, 389.26 feet and
N43°30'24"W, 117.24 feet to the place of beginning.

TRACT 4:

Part of the M. B. Menard Grant lying and being situated in the City and County of Galveston, Texas, and being a portion of that certain tract conveyed to Southern Pacific Terminal Company by Arabella D. Huntington et al by deed dated July 10, 1901, and recorded in Volume 186, Page 53, et seq., in the Office of the County Clerk of Galveston County, Texas, as more fully described by metes and bounds as follows:

COMMENCING at the intersection of the Northerly projection of the East right of way line of 51st Street, 80 foot right of way, and the North right of way line of what formerly was Avenue A, 70 foot right of way, said intersection being North 16° 38' West, a distance of 330.00 feet from the Southwest corner of Block 710;

THENCE North 73° 22' East, along what was formerly the North right of way line of Avenue A, a distance of 301.30 feet;

THENCE North 59° 50' West, a distance of 9.41 feet to the PLACE OF BEGINNING of the tract hereinafter described, said point being in the Easterly line of that certain 15.76 acre tract of land described in that certain deed dated August 12, 1955, to Galveston County Navigation District No. 1, said point also being at a corner in the Northerly line of that certain street easement described as "First" in instrument dated April 26, 1965, to the City of Galveston, Texas;

THENCE from said Beginning Corner in a Northwesterly direction along the Easterly line of said 15.76 acre tract with a line curving to the right having a radius of 428.34 feet (called 428.00 feet) and a long chord of 200.28 feet (called 202.20 feet) which bears North 53° 52' 40" West, (called North 54° 01' 25" West) an arc distance of 202.15 feet (called 204.13 feet) to end of curve;

THENCE North 40° 21' 28" West continuing along the Easterly line of said 15.76 acre tract, a distance of 177.73 feet to a point of curve;

THENCE in a Northwesterly direction continuing along the Easterly line of said 15.76 acre tract with a line curving to the right having a radius of 360.28 feet and a long chord of 204.65 feet, which bears North 23° 51' 28" West, an arc distance of 207.51 feet to end of curve;

THENCE in a Northerly direction continuing along the Easterly line of said 15.76 acre tract with a line curving to the right, having a radius of 2927.00 feet and a long chord of 1349.52 feet (called 1330.44 feet) which bears North 05° 28' 14" East, (called North 05° 46' 43" East) a distance of 1361.77 feet (called 1361.66 feet);

THENCE North 73° 05' 21" East, continuing along the Easterly line of said 15.76 acre tract a distance of 42.07 feet;

THENCE in a Northeasterly direction, continuing along the Easterly line of said 15.76 acre tract with a line curving to the right having a radius of 2893.00 feet and a long chord of 412.30 feet which bears North 23° 29' 20" East, a distance of 412.65 feet to end of curve;

THENCE North 27° 34' 30" East, a distance of 1682.84 feet to point for a corner on the South line of Harbor established in 1897;

THENCE South 76° 33' 06" East (called South 76° 18' East), along said Harbor line a distance of 934.71 feet the Northerly end of a "Boundary Line Agreement" recorded under Film Code No. 005-41-1579 in the Office of the County Clerk of Galveston County, Texas;

THENCE South 13° 53' 50" West (called South 11° 45' 28" West), and along the centerline of Slip "B", 300 foot easement and along the Westerly line of said "Boundary Line Agreement", a distance of 1430.93 feet to the Southerly end of Slip "B", 300 foot easement;

THENCE South 22° 17' 17" West (called South 20° 08' 55" West), continuing along the said "Boundary Line Agreement" line, a distance of 8.30 feet;

THENCE South 26° 38' 17" East (called South 35° 09' 30" East), continuing along the said "Boundary Line Agreement" line, a distance of 26.74 feet (called 24.76 feet) to a 4" pipe fence post for called corner;

THENCE South 13° 55' 01" West (called South 11° 45' 28" East), continuing along the said "Boundary Line Agreement" line, a distance of 813.82 feet (called 814.11 feet) to a 4" pipe fence lost for called corner;

THENCE South 76° 09' 25" East (called South 78° 07' 37" East) continuing along the said "Boundary Line Agreement" line, a distance of 606.61 feet (called 607.20 feet) to a 4" pipe fence post for called corner;

THENCE South 13° 43' 02" West (called South 11° 45' 28" West), continuing along the said "Boundary Line Agreement", a distance of 351.95 feet to a point in the Northerly line of said Street Easement to the City of Galveston, said point being a 4" pipe fence post for called corner and said point being North 13° 53' 0" East, a distance of 2.30 feet from the most Southerly end of said "Boundary Line Agreement" line marked by a 1/2" iron pipe;

THENCE in a Northeasterly direction, continuing along the Easterly line of said 15.76 acre tract with a line curving to the right having a radius of 2893.00 feet and a long chord of bears South 68° 10' 31" West, a distance of 240.14 feet to end of curve;

THENCE South 55° 13' 20" West, continuing along the Northerly line of said Street Easement a distance of 140.70 feet to the beginning of a curve to the right;

THENCE in a Southwesterly direction continuing along the Northerly line of said Street Easement with said curve to the right having a radius of 2251.83 feet and a long chord of 417.64 feet which bears South 60° 32' 35" West, a distance of 418.24 feet (called 418.56 feet) to end of curve;

THENCE South 65° 51' 50" West, continuing along the Northerly line of said Street Easement a distance of 565.57 feet to the beginning of a curve to the right;

THENCE in a Southwesterly direction, continuing along the Northerly line of said Street Easement with said curve to the right having a radius of 2251.83 feet and a long chord of 294.66 feet (called 294.55 feet) which bears South 69° 36' 55" West, a distance of 294.8 feet to end of curve;

THENCE South 73° 22' 00" West continuing along the Northerly line of said Street Easement a distance of 150.35 feet to the PLACE OF BEGINNING.

TRACT 5:

Commencing at the intersection of the north right of way line of Avenue "A" and the extension of the east right of way line of Fifty-First Street;

Thence, along said north right of way line of Avenue "A" on a bearing of S. 73°22'00" W, a distance of two hundred sixty feet (260.00') to the point of beginning of the land herein described;

Thence, continuing along said north right of way line on a bearing of S. 73°22'00" W, a distance of thirty three and eight one hundredths (33.08') feet;

Thence in a southwesterly direction on a line curving to the right having a radius of four hundred eighty nine and 96/100 feet (489.96') and a long chord of three hundred thirty four and 28/100 feet (334.28') which bears S. 24°29'15" W, a distance of three hundred forty and ninety-three hundredths (340.93') feet;

Thence S. 44°26'00" W, along southwesterly tangent to said curve, a distance of one hundred twenty and fifty nine one hundredths (120.50') feet to a point on the north line of a twenty foot (20') strip of land owned by the C.R.I. & P. Railroad Company;

Thence along the north line of said strip on a bearing of S. 73°22'00" W, at twenty five and 84/1000 feet (25.84') pass the center line of the existing railroad siding serving City of Galveston sewage disposal plant and in all a distance of fifty one and 68/100 feet (51.68');

Thence, on a bearing of N 44°26'00" E, a distance of one hundred sixty five and eighty-one/hundredths (165.81') feet;

Thence in a northeasterly direction on a line curving to the left, having a radius of four hundred sixty four and 96/1000 feet (464.96') and a long chord of three hundred eight and 05/100 feet (308.05') which bears N. 25°05'13" East, a distance of three hundred thirteen and 89/100 feet (313.89'); to a point on the north right of way line of Avenue "A";

Thence N. 16°38'00" W, a distance of three hundred one and seventy nine one hundredths (301.79') feet;

Thence, on a line in a northeasterly direction curving to the right, having a radius of five hundred twenty feet (520') and a long chord of two hundred sixteen and 23/100 feet (216.23') which bears N. 04°38'00" W, a distance of two hundred seventeen and seventy two one hundredths (217.72') feet;

Thence N. 07°22'00" E, along northeasterly tangent to said curve a distance of five hundred seventy eight and forty three one hundredths (578.43') feet;

Thence in a northerly direction along a line curving to the left, having a radius of four hundred sixty feet (460') and a long chord of one hundred ninety one and 28/100 feet (191.28'), which bears N. 04°38'00" W, a distance of one hundred ninety two and 59/100 feet (192.59') to the west line of Grantee's property;

Thence S. 16°38'00" E, along said west line a distance of two hundred forty five and twenty nine one hundredths (245.29') feet; and forty four one hundredths (541.44') feet;

Thence S. 07°22'00" W, a distance of five hundred forty one and forty four one hundredths (541.44') feet;

Thence along a line curving to the left having a radius of four hundred sixty feet (460.0') and a long chord of one hundred ninety one and 28/100 feet (191.28') which bears S 04°38'00" E, a distance of one hundred ninety two and 59/100 feet (192.59');

Thence S. 16°38' 00" E, along southeasterly tangent to said curve, a distance of three hundred one and seventy-nine one hundredths (301.79') feet to the point of beginning and containing one and eighty two one hundredths (1.82) acres more or less.

TRACT 6:

Commencing at the intersection of Avenue "A" in said City of Galveston, Texas and the extension of the East right-of-way line of Fifty-first street in said City of Galveston, Texas, which is the point of beginning;

Thence, along the said extension of the East right-of-way line of Fifty-first Street on a bearing of S. 16°38'00" E, for a distance of twenty (20) feet;

Thence, along a line parallel to the aforesaid north right-of-way line of Avenue "A" on a bearing S. 73° 22' 00" W. for a distance of one hundred twenty (120) feet;

Thence, on a bearing of N. 16° 38' 00" W. for a distance of twenty (20) feet to a point on the aforesaid north right-of-way line of Avenue "A";

Thence, along said north right-of-way line on a bearing of S. 73° 22' 00" W. for a distance of one hundred forty (140) feet;

Thence, on a bearing of N. 16° 38' 00" W. for a distance of three hundred one and seventy-nine hundredths (301.79) feet;

Thence, on a line curving to the right for a distance of one hundred ninety-two and fifty-nine hundredths (192.59) feet, the chord of said curved line bearing N. 04° 38' 00" W. for a distance of one hundred ninety-one and twenty-eight hundredths (191.28) feet;

Thence, on a bearing of N. 07° 22' 00" E. for a distance of five hundred, forty-one and forty-four hundredths (541.44) feet to a point on the existing north-south seawall, which is the extension of the aforesaid east right-of-way line of Fifty-first Street;

Thence, along said north-south seawall on a bearing of S. 16° 38' 00" E. for a distance of nine hundred eighty-three and fifty-four hundredths (983.54) feet to the point of beginning and containing four and fifteen hundredths (4.15) acres, more or less.

TRACT 7:

Commencing at the intersection of the northerly prolongation of the east line of 51st Street and the north line of what formerly was Avenue "A", said intersection being on the west line of Grantor's property and is N. 16°38' W, three hundred thirty feet (330') from the southwest corner of Block 710, which is also the southwest corner of Grantor's property;

Thence N. 16°38' W, along Grantor's west property line, a distance of nine hundred eighty three and 54/100 feet (983.54') to corner;

Thence N. 73° 22' E, a distance of thirty one and 44/100 feet (31.44') to corner;

Thence in a northeasterly direction along a line curving to the right having a radius of three thousand seventy feet (3070') and a long chord of eight hundred sixty four and 48/100 feet (864.48') which bears N. 08°55'07" E, a distance of eight hundred sixty six and 75/100 feet (866.75') to an intersection with the center line of Grantor's east-west bulkhead for corner;

Thence S. 73°05'20" W, along the center line of said bulkhead, a distance of twenty seven and 67/100 feet (27.67') to corner to the right having a radius of three thousand ninety three feet (3093') and a long chord of five hundred eighty four and 84/100 feet (584.84') which bears N. 22°09' E, a distance of five hundred eighty five and 42/100 feet (585.42') to end of curve;

Thence N. 27°34.30" E, a distance of one thousand six hundred thirty three and 26/100 feet (1633.26') to corner on the south United States Harbor line as established in 1897;

Thence S. 76° 19' 34" E, along said Harbor line, a distance of two hundred six and 03/100 feet (206.03') to corner;

Thence S. 27°34'30" W, a distance of one thousand six hundred eighty two and 84/100 feet (1682.84') to corner;

Thence in a southwesterly direction along a line curving to the left having a radius of two thousand eight hundred ninety three feet (2893') and a long chord of four hundred twelve and 30/100 feet (412.30') which bears S. 23°29'20" W, a distance of four hundred twelve and 43/100 feet (412.43') to corner on the center line of Grantor's said east-west bulkhead;

Thence S. 73°05'20" W, along said center line, a distance of forty two and 7/100 feet (42.07') to corner;

Thence in a southwesterly direction along a line curving to the left having a radius of two thousand nine hundred twenty seven feet (2927') and a long chord of one thousand three hundred thirty and 44/100 feet (1330.44') which bears S. 05° 46' 43" W, a distance of one thousand three hundred forty one and 49/100 feet (1341.49') to end of curve;

Thence in a southeasterly direction along a line curving to the left having a radius of three hundred sixty and 28/100 feet (360.28') and a long chord of two hundred four and 65/100 feet (204.65), which bears S. 23°51'28" E, a distance of two hundred seven and 40/100 feet (207.40') to end of curve;

Thence S. 40°21'28" E, along the southeasterly tangent of preceding curve, a distance of one hundred seventy seven and 73/100 feet (177.73') to corner;

Thence in a southeasterly direction along a line curving to the left having a radius of four hundred twenty eight and 34/100 feet (428.34') and a long chord of two hundred fourteen and 50/100 feet (214.50') which bears S. 54°51'28" East, a

distance of two hundred sixteen and 69/100 feet (216.69') to corner on the north line of former Avenue "A", which was closed and abandoned by Ordinance adopted by the City Council of the City of Galveston, Texas, on February 04, 1899;

Thence S. 73°22' W, along the north line of former Avenue "A", a distance of two hundred sixty one and 25/100 feet (261.25') to corner;

Thence S. 16°38' E, a distance of twenty feet (20') to corner;

Thence S. 73°22' W, parallel with the north line of former Avenue "A", a distance of forty feet (40') to corner on Grantor's said west property line;

Thence N. 16°38' W, along Grantor's said west property line being also the east line of 51st Street, a distance of twenty feet (20') to the place of beginning and containing fifteen and seventy six one hundredths (15.76) acres more or less, of which 9.83 acres, more or less, are submerged.

SCHEDULE B

RESTRICTIONS (Change smart tag to NO if no restrictions apply)

The following restrictive covenants of record itemized below (We must either insert specific recording data or delete this exception):

Those recorded in/under Volume 1117, Page 338 (Tract 6) and Volume 1121, Page 79 (Tract 5) in the Office of the County Clerk and County Clerk's File No. 2006047170 (Tract 1) of the Official Public Records of Real Property of Galveston County, Texas; but omitting any covenants, condition, or restriction, if any, based on race, color, religion, sex, handicap, familial status or national origin unless and to the extent that the covenant, condition or restriction (a) is exempt under Title 42 of the United States Code or (b) relates to handicap, but does not discriminate against handicapped persons.

EASEMENTS, MINERALS & OTHER EXCEPTIONS

B. An easement 10 feet wide and an aerial easement 20 feet wide from a plane 20 feet above the ground upward, located adjacent thereto for the use of public utilities granted to Houston Lighting and Power Company, as recorded in/under Volume 1017, Page 317 and Volume 1019, Page 243 in the Office of the County Clerk of Galveston County, Texas. (As to Tracts 2, 3 & 5)

C. A perpetual easement or right-of-way for railroad, and/or vehicular roadway purposes located on subject property granted to Southern Pacific Terminal Company, as recorded in/under Volume 1121, Page 79 in the Office of the County Clerk of Galveston County, Texas; as affected by instrument recorded in/under Volume 1513, Page 5 in the Office of the County Clerk of Galveston County, Texas. (As to Tract 5)

D. An easement to Slip B located on subject property granted to Continental Grain Company by instrument recorded in/under Volume 1251, Page 646 in the Office of the County Clerk; and further described in deed recorded in/under Volume 2157, Page 675 of the Deed Records of Galveston County, Texas. (As to Tract 4)

E. A right-of-way easement, 10 feet wide, for purposes of distribution lines located on subject property granted to Houston Lighting & Power Company by instrument recorded in/under Volume 1375, Page 434 in the Office of the County Clerk of Galveston County, Texas. (As to Tracts 2, 3, 5, & 6)

F. A utility easement, 20 feet wide, located on subject property granted to Houston Pipe Line Company by instrument recorded in/under Volume 1635, Page 541 in the Office of the County Clerk of Galveston County, Texas. (As to Tracts 2, 3, 5 & 6)

G. An easement located on subject property granted to Duval Corporation by instrument recorded in/under Volume 2157, Page 670 of the Deed Records of Galveston County, Texas. (As to Tract 4)

H. Easements and agreements relating to the relocation of such easements, and rights of ingress and egress to such easements, reserved and described in deed dated January 13, 1971, and recorded in/under Volume 2157, Page

675 of the Deed Records of Galveston County, Texas. (As to Tract 4)

I. A right-of-way easement, 10 feet wide, for electric distribution and communication lines located on subject property granted to Houston Lighting & Power Company by instrument recorded in/under Volume 2403, Page 389 in the Deed Records of Galveston County, Texas. (As to Tract 2)

J. An unobstructed aerial easement twenty-three (23) feet wide from a plane twenty (20) feet above the ground upward, the locate of the center line of which is more particularly described by sketch attached to instrument recorded in/under Volume 2825, Page 75 of the Deed Records of Galveston County, Texas. (As to Tracts 5 & 6)

K. A subsurface right-of-way and easement located on subject property granted to Mitchell Energy Offshore Corporation by instrument recorded in/under Volume 3291, Page 129 in the Deed Records of Galveston County, Texas. (As to Tracts 2, 3, 5, & 6)

L. A right-of-way easement, 30 feet wide, for electric distribution facilities located on subject property granted to Houston Lighting & Power Company by instrument recorded in/under Volume 3297, Page 684 in the Deed Records of Galveston County, Texas. (As to Tracts 2, 5, & 6)

M. Easements, 3 feet wide, for electric distribution facilities located on subject property granted to Houston Lighting & Power Company by instrument recorded in/under County Clerk's File No. 8130752 of the Official Public Records of Real Property of Galveston County, Texas. (As to Tracts 2, 5, 6, & 7)

N. A perpetual non-exclusive easement over and across all lands and submerged areas for the purpose of dredging for navigational purposes to maintain deep water across from the deep water channel of the Galveston Ship Channel to the seaboard, or northern boundary of land as set forth and more particularly described in Final Judgment under Cause No. 113,630 in the 122nd Judicial District Court of Galveston County, Texas.

O. An easement 10 feet wide and an aerial easement 10 feet wide from a plane 16 feet above the ground upward, located adjacent thereto for the use of public utilities granted to Houston Lighting & Power Company, as recorded in/under County Clerk's File No. 9036134 of the Official Public Records of Real Property of Galveston County, Texas. (As to Tract 4)

P. A pipe line right-of-way easement located on subject property granted to S.G.T.C., Inc., a Texas corporation by instrument recorded in/under County Clerk's File No. 9245063 of the Official Public Records of Real Property of Galveston County, Texas; and assigned to Gerald A. Sullivan by instrument recorded in/under County Clerk's File No. 9309044 of the Official Public Records of Real Property of Galveston County, Texas. (As to Tract 4)

Q. An easement 10 feet wide and an aerial easement 10 feet wide from a plane 16 feet above the ground upward, located adjacent thereto for the use of public utilities granted to CenterPoint Energy Houston Electric, LLC, as recorded in/under County Clerk's File No. 2007073749 of the Official Public Records of Galveston County, Texas. (As to Tract 4)

R. An easement 10 feet wide and an aerial easement 10 feet wide from a plane 16 feet above the ground upward, located adjacent thereto for the use of public utilities granted to CenterPoint Energy Houston Electric, LLC, as recorded in/under County Clerk's File No. 2011036945 of the Official Public Records of Galveston County, Texas. (As to Tract 4)

S. An easement for electric distribution facilities located on subject property granted to CenterPoint Energy Houston Electric, LLC by instrument recorded in/under County Clerk's File No. 2014014622 of the Official Public Records of Galveston County, Texas. (As to Tracts 2, 3, 5 & 6)

T. A 1/8th royalty interest in and to all oil, gas and other minerals on, in, under or that may be produced from the subject property is excepted herefrom as the same is set forth in instrument recorded in/under Volume 1013, Page 60 in the Office of the County Clerk of Galveston County, Texas. The Company makes no representation as to the present ownership of any such interests. There may be leases, grants, exceptions or reservations of interests that are not listed. (As to Tracts 2, 5, 6 & 7)

U. All the oil, gas and other minerals, the royalties, bonuses, rentals and all other rights in connection with same all of

which are expressly conveyed in instrument recorded in/under Volume 1013, Page 221 in the Office of the County Clerk of Galveston County, Texas. The Company makes no representation as to the present ownership of any such interests. There may be leases, grants, exceptions or reservations of interests that are not listed. (As to Tract 2)

V. All the oil, gas and other minerals, the royalties, bonuses, rentals and all other rights in connection with same all of which are expressly excepted herefrom and not insured hereunder, as same are set forth in instrument recorded in/under Volume 1111, Page 564 in the Office of the County Clerk of Galveston County, Texas. The Company makes no representation as to the present ownership of any such interests. There may be leases, grants, exceptions or reservations of interests that are not listed. Surface rights waived therein. (As to Tract 7)

W. Oil, gas and mineral lease dated November 07, 1967, recorded in/under Volume 1917, Page 60 in the Office of the County Clerk of Galveston County, Texas in favor of Mitchell & Mitchell Properties, Inc., a Texas corporation; as amended by instrument recorded in/under Volume 1928, Page 850 in the Office of the County Clerk; as amended by Reformation or Amendment as set forth and more particularly described in Final Judgment under Cause No. 113,630 in the 122nd Judicial District Court and recorded in/under County Clerk's File Nos. 8628808 and 8628809 of the Official Public Records of Real Property of Galveston County, Texas and as affected by Affidavit of Non-Production recorded in/under County Clerk's File No. 9749880 of the Official Public Records of Real Property of Galveston County, Texas. (Title to said lease not checked subsequent to its date of execution.) (As to Tract 4)

X. Oil, gas and mineral lease dated March 08, 1968, recorded in/under Volume 1928, Page 829 in the Office of the County Clerk of Galveston County, Texas in favor of Mitchell & Mitchell Properties, Inc.; as amended by Reformation or Amendment as set forth and more particularly described in Final Judgment under Cause No. 113,630 in the 122nd Judicial District Court and recorded in/under County Clerk's File Nos. 8628808 and 8628809 of the Official Public Records of Real Property of Galveston County, Texas. (Title to said lease not checked subsequent to its date of execution.) (As to Tracts 2, 5 & 6)

Y. All the oil, gas and other minerals, the royalties, bonuses, rentals and all other rights in connection with same all of which are expressly excepted herefrom and not insured hereunder, as same are set forth in instrument recorded in/under County Clerk's File No. 8458045 of the Official Public Records of Real Property of Galveston County, Texas. The Company makes no representation as to the present ownership of any such interests. There may be leases, grants, exceptions or reservations of interests that are not listed. (As to Tract 4)

Z. All the oil, gas and other minerals, the royalties, bonuses, rentals and all other rights in connection with same all of which are expressly conveyed in instrument recorded in/under County Clerk's File No. 9815689 of the Official Public Records of Real Property of Galveston County, Texas. The Company makes no representation as to the present ownership of any such interests. There may be leases, grants, exceptions or reservations of interests that are not listed. (As to Tracts 2 & 3)

AA. All the oil, gas and other minerals, the royalties, bonuses, rentals and all other rights in connection with same all of which are expressly excepted herefrom and not insured hereunder, as same are set forth in instrument recorded in/under County Clerk's File No. 2006047170 of the Official Public Records of Real Property of Galveston County, Texas. The Company makes no representation as to the present ownership of any such interests. There may be leases, grants, exceptions or reservations of interests that are not listed. Surface rights waived therein. (As to Tract 1)

AB. All leases, grants, exceptions or reservations of coal, lignite, oil, gas and other minerals, together with all rights, privileges, and immunities relating thereto, appearing in the Public Records whether listed in Schedule B or not. There may be leases, grants, exceptions or reservations of mineral interests that are not listed.

AC. All terms, conditions, and provisions of that certain Reverter Clause as set forth in Deed recorded in/under Volume 1117, Page 338 in the Office of the County Clerk of Galveston County, Texas. (As to Tract 6)

AD. All terms, conditions, and provisions set forth in Deed recorded in/under Volume 1251, Page 646 in the Office of the County Clerk of Galveston County, Texas. (As to Tract 4)

AE. All terms, conditions, and provisions of that certain Resolution by the City of Galveston to obtain certain easement

rights covering the Industrial By-Pass Route across portions of the Southern Pacific Company's property, recorded in/under Volume 1875, Page 575 in the Office of the County Clerk of Galveston County, Texas. (As to Tract 4)

AF. All terms, conditions, and provisions of that certain Boundary Line Agreement by and between John L. Sullivan, Gerald A. Sullivan and Sullivan Enterprises, Inc. AND Pennzoil Sulphur Company, a Nevada corporation, recorded in/under County Clerk's File No. 8731498 of the Official Public Records of Real Property of Galveston County, Texas. (As to Tract 4)

AG. Affidavit to the Public recorded in/under County Clerk's File No. 8919727 of the Official Public Records of Real Property of Galveston County, Texas giving notice of an on-site solid waste and sludge disposal site located on the subject property and that owner or user of this site must consult with the Texas Department of Health prior to planning or initiating any activity involving the disturbance of the landfill cover or monitoring system. (As to Tracts 2 & 3)

AH. All terms, conditions, and provisions of that certain Ordinance No. 91-9 for a 3" inch natural gas line within the City's right-of-way, recorded in/under County Clerk's File No. 9246129 of the Official Public Records of Real Property of Galveston County, Texas. (As to Tract 2)

AI. All terms, conditions, and provisions including a Right of First Refusal as set out in that certain Memorandum of Lease Agreement by and between Gerald A. Sullivan, as Lessor and Applied Industrial Materials Corporation, as Lessee, recorded in/under County Clerk's File No. 9749877 of the Official Public Records of Real Property of Galveston County, Texas; said Lessor's interest being assigned to Sultex, Ltd., a Texas limited partnership in instrument recorded in/under County Clerk's File No. 9815691 of the Official Public Records of Real Property of Galveston County, Texas. (As to Tract 4)

AJ. Affidavit to the Public recorded in/under County Clerk's File No. 2006061442 of the Official Public Records of Real Property of Galveston County, Texas giving notice of an on-site surface application system located on the subject property and that a contract with an approved maintenance company is required for use of the system. (As to Tract 4)

AK. This Company shall have no liability for, nor any responsibility to defend, any portion of the property described herein against any right, title, interest, or claim (valid or invalid) of any character had or asserted by the State of Texas or by any governmental authority or by the public generally, (1) in and to portions of the above described property that may be within the bed, shore, or banks of a perennial stream or lake, whether navigable in fact or law; or within the bed or shore or the beach adjacent thereto of a body of water affected by the ebb and flow of the tide; and (2) in and to portions of the above described property which may be between the water's edge and a line of vegetation on the upland or for any claim or right for ingress and egress thereto.

AL. Rights of tenants, and assigns, as tenants only, under currently effective lease agreements.

AM. Subject to any easements, rights-of-way, roadways, encroachments, etc., which a survey or physical inspection of the premises might disclose.

AN. Lack of a right of access to and from the Land. Covered Risk number 4 is hereby deleted. (As to Tracts 1 & 3) (Applies to Owner's Policy (T-1) only.)

AO. Lack of a right of access to and from the Land. Covered Risk number 4 is hereby deleted. (As to Tracts 1 & 3) (Applies to Loan Policy (T-2) only.)

SCHEDULE C

PAYOFF LIENS & MISC REQUIREMENTS

6. NOTE: We find no outstanding liens of record affecting the subject property. Inquiry should be made concerning the existence of any unrecorded lien or other indebtedness which could give rise to any security interest claim in the subject property.

7. We are to be furnished with release(s) or an affidavit to the effect that SULTEX, LTD., the record owner, is not the same as mentioned in the following:

   Abstract of Judgment in favor of Consolidated Electrical Distributors, Inc., against Sultex, Ltd., filed September 27, 2010, in the amount of $18,152.95 plus cost and interest, recorded in/under County Clerk's File No. 2010047693 of the Official Public Records of Galveston County, Texas.

   (Note: Where applicable, a properly noticed and recorded Affidavit as Release of Judgment Lien Against Homestead pursuant to Section 52.0012 of the Texas Property Code serves as a release of a judgment lien filed after September 1, 2007. If the subject property is not the owner's homestead, this option is not available.)
   (As to Tract 4)

8. We are to be furnished with release(s) or an affidavit to the effect that Lamson Nguyen, the record owner, is not the same as mentioned in the following:

   Federal Lien against Lamson V. Nguyen, a Partnership/Lamson Construction, filed May 06, 2013, in the amount of $376.83 recorded in/under County Clerk's File No. 2013027749 of the Official Public Records of Galveston County, Texas.

   (Note: Where applicable, a properly noticed and recorded Affidavit as Release of Judgment Lien Against Homestead pursuant to Section 52.0012 of the Texas Property Code serves as a release of a judgment lien filed after September 1, 2007. If the subject property is not the owner's homestead, this option is not available.)
   (As to Tract 1)

9. We must be furnished the marital status of Lamson Nguyen, the record owner, from July 07, 2006, the date of acquisition to the present time. If the record owner is married, we require either (i) the joinder of the spouse; or (ii) an affidavit from the spouse of the owner disclaiming the property as part of any homestead and stating that the property is under the sole management and control of the record owner. (As to Tract 1)

10. The Company requires for its review a copy of the articles of incorporation, a satisfactory corporate resolution of the Board of Directors from 5600 PIE CORP, a Texas corporation, authorizing the proposed transaction, Shareholders Resolution where applicable, and satisfactory evidence that the corporation is in good standing in the state of its incorporation. At the time the Company is furnished these items, the Company may make additional requirement or exceptions. (As to Tracts 2 & 3)

11. We require a copy of the limited partnership agreement from SULTEX, LTD., a Texas limited partnership, and all amendments thereto, in order to determine who is authorized to execute documents in connection with the closing of this transaction. We require satisfactory evidence that said limited partnership is registered with the Secretary of State and is in good standing. The Company requires the joinder of all general partners and evidence of the consent of all of the limited partners to the closing of this transaction, where appropriate. (As to Tract 4)

24-MONTH CHAIN OF TITLE (Flows to #2 of the T-53)

NOTES TO CLOSER:

GAC 2006047170 7 pgs

LAMSON NGUYEN
1011 - 61ST
GALVESTON TX 77551

Space Above for Recorder's Use Only

2355-94

DEED WITHOUT WARRANTY

STATE OF TEXAS)
) KNOW ALL MEN BY THESE PRESENTS
COUNTY OF GALVESTON)

UNION PACIFIC RAILROAD COMPANY, a Delaware corporation, Grantor, (formerly known as Southern Pacific Transportation Company, a Delaware corporation) for and in consideration of Ten Dollars ($10.00) and other good and valuable consideration, to it in hand paid by LAMSON NGUYEN, Grantee, to be addressed at 1011 – 61ST Street, Galveston, Texas 77551, the receipt of which is hereby acknowledged, has granted, sold and conveyed, and by these presents does grant, sell and convey to Grantee, the strip or tract of land (hereinafter the "Property") lying in the County of Galveston, State of Texas, described in **Exhibit A**, hereto attached and hereby made a part hereof

EXCEPTING from this conveyance and RESERVING unto Grantor, its successors and assigns, forever, all minerals and all mineral rights of every kind and character now known to exist or hereafter discovered underlying the Property, including without limiting the generality of the foregoing, oil and gas and rights thereto, together with the sole, exclusive and perpetual rights to explore for, remove and dispose of said minerals by any means or methods suitable to the Grantor, its successors and assigns, but without entering upon or using the surface of the Property, and in such manner as not to damage the surface of the Property, or to interfere with the use thereof by the Grantee, his heirs and assigns

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Grantee acknowledges that the Property is landlocked and has no access to a public roadway Grantee further acknowledges that Grantor does not convey any express or implied easement to Grantee for access across any lands or rights of way of Grantor "Grantor's Property"). Any access to the Property must be secured by Grantee across lands or rights of way owned by persons or entities other than Grantor. Accordingly, Grantor hereby declares that the Property is subject to the following covenant and restriction

> Grantee, its successors or assigns, shall not seek or claim any access to the Property across Grantor's Property from Grantor, its successors and assigns, or from any state or federal entity or body or court that may have jurisdiction. This restriction and covenant will run with the land and bind Grantee, its successors and assigns, and benefit Grantor, its successors and assigns. Grantor is entitled to initiate proceedings at law or in equity against any person(s) who breaches this restriction and covenant, and to collect from the breaching party damages, attorney fees and costs

This conveyance is made without any warranty, express or implied, including, without limitation, any warranty or covenant implied under the provisions of Section 5.023 of the Texas Property Code, which provisions are hereby expressly waived by [Grantee] [Grantees] even as to the return of the purchase price.

IN WITNESS WHEREOF, Grantor has duly executed this instrument this 7th day of July, 2006.

Attest

Assistant Secretary

(Seal)

UNION PACIFIC RAILROAD COMPANY

By Tony K Love

Title: Assistant Vice President – Real Estate

Grantee hereby accepts this Deed and agrees for himself, his successors and assigns, to be bound by the covenants set forth herein

Dated this 3 day of July, 2006.

Lamson Nguyen

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15

ACKNOWLEDGMENTS

STATE OF NEBRASKA)
) ss.
COUNTY OF DOUGLAS)

On July 7, 2006, before me, James E. Matza, Notary Public in and for said County and State, personally appeared TONY K. LOVE Assistant Vice President – Real Estate and M.E. Heenan who are the and the Assistant Secretary, respectively, of Union Pacific Railroad Company, a Delaware corporation, and who are personally known to me (or proved to me on the basis of satisfactory evidence) to be the persons whose names are subscribed to in the within instrument, and acknowledged to me that they executed the same in their authorized capacities, and that by their signatures on the instrument the persons, or the entity upon behalf of which the persons acted, executed the instrument.

WITNESS my hand and official seal

GENERAL NOTARY - State of Nebraska
JAMES E. MATZA
My Comm. Exp. Dec. 20, 2008

(Seal)

James E Matza
Notary Public

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16

STATE OF TEXAS)
) ss.
COUNTY OF GALVESTON)

On July 3, 2006, before me, a Notary Public in and for said County and State, personally appeared Lamson Nguyen, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument, and acknowledged to me that he executed the same

WITNESS my hand and official seal.

RICHARD A. SOURER
MY COMMISSION EXPIRES
February 11, 2010

Notary Public

(SEAL)

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17

UNION PACIFIC RAILROAD COMPANY
Galveston, Galveston County, Texas
EXHIBIT "A"

All that certain tract or parcel of land lying and being situated in the City of and County of Galveston, Texas, and being a portion of that certain tract conveyed to Southern Pacific Terminal Company by Arabella D. Huntington, et al, by deed dated July 10,1901, and recorded in Volume 186, Page 53, et seq., in the office of the County Clerk of Galveston County, Texas, as more fully described by metes and bounds as follows

COMMENCING at the intersection of the northerly prolongation of the east line of 51st Street and the north line of what formerly was Avenue A, said intersection being N 16° 38' W, three hundred and thirty feet (330 0 feet) from the southwest corner of Block 710;

Thence North 16° 43' West a distance of 983.5 feet to the Point of Beginning,

Thence from said point of beginning continuing North 16° 43' West a distance of 3194 8 feet;

Thence North 73° 17' East a distance of 567 4 feet,

Thence South 76° 19' East a distance of 1520.36 feet more or less to the northwesterly line of the Pelican Island Causeway;

Thence South 27° 34' West along said northwest line a distance of 1633 3 feet to a point on a curve to the left,

Thence continuing along said northwest line southerly along said curve with a radius 3093 0 feet an arc distance of 585.4 feet;

Thence continuing along said northwest line North 73° 05' East a distance of 27.7 feet;

Thence continuing along said northwest line southerly along a curve to the left with a radius 3070 feet an arc distance of 866.8 feet;

Thence South 73° 22' West a distance of 31 4 feet more or less to the Point of Beginning

Contains 66.03 Acres more or less

OFFICE OF REAL ESTATE
OMAHA, NEBRASKA
WRITTEN BY. JCO
June 14, 2006
235594.leg

18

CERTIFICATION OF NON-FOREIGN STATUS

Under Section 1445(e) of the Internal Revenue Code, a corporation, partnership, trust, or estate must withhold tax with respect to certain transfers of property if a holder of an interest in the entity is a foreign person To inform the transferee, LAMSON NGUYEN, that no withholding is required with respect to the transfer of a U.S. real property interest by UNION PACIFIC RAILROAD COMPANY, the undersigned hereby certifies the following on behalf of UNION PACIFIC RAILROAD COMPANY·

1. UNION PACIFIC RAILROAD COMPANY is not a foreign corporation, foreign partnership, foreign trust, or foreign estate (as those terms are defined in the Internal Revenue Code and Income Tax Regulations);

2. UNION PACIFIC RAILROAD COMPANY is not a disregarded entity as defined in Section 1 445 2(b)(2)(iii) of the Internal Revenue Code;

3 UNION PACIFIC RAILROAD COMPANY'S U.S employer identification number is 94-6001323; and

4 UNION PACIFIC RAILROAD COMPANY'S office address is 1400 Douglas Street, Omaha, Nebraska 68179, and place of incorporation is Delaware.

UNION PACIFIC RAILROAD COMPANY agrees to inform the transferee if it becomes a foreign person at any time during the three year period immediately following the date of this notice.

UNION PACIFIC RAILROAD COMPANY understands that this certification may be disclosed to the Internal Revenue Service by the transferee and that any false statement contained herein could be punished by fine, imprisonment, or both

Under penalties of perjury I declare that I have examined this Certification and to the best of my knowledge and belief it is true, correct and complete, and I further declare that I have authority to sign this document on behalf of UNION PACIFIC RAILROAD COMPANY

UNION PACIFIC RAILROAD COMPANY,
a Delaware corporation

By· Tony K Lee
Title Assistant Vice President – Real Estate
Date July 7, 2006

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19

FILED AND RECORDED
OFFICIAL PUBLIC RECORDS OF REAL PROPERTY

Mary Ann Daigle

2006 JUL 14 04:57 PM 2006047170
MLEE $36.00
Mary Ann Daigle ,COUNTY CLERK
GALVESTON, TEXAS

RAILROAD ORIGINAL

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GAC 2006009940 12 pgs

CORRECTION DEED§
DEED WITHOUT WARRANTY

THE STATE OF TEXAS §
§ KNOWN ALL MEN BY THESE PRESENTS
COUNTY OF GALVESTON §

The CITY OF GALVESTON, TEXAS, 823 Rosenberg, Galveston, Texas 77550, a home-rule municipality, ("Grantor"), of the County of Galveston, and State of Texas for an in consideration of the sum of Two Hundred Ten Thousand Five Hundred and No/100 ($210,500 00) Dollars and other valuable consideration to the undersigned paid by the Grantee herein named, the receipt and sufficiency of which is hereby acknowledged, have GRANTED, SOLD and CONVEYED and by these presents does GRANT, SELL and CONVEY unto 5600 PIE CORP , A Texas corporation, ("Grantee"), whose address is P O Box 3307, Galveston, Texas 77550, the following described real property, to-wit.

TRACT 1 A 36.5060 acre tract of upland out of the M B. Menard Grant, Galveston Island, Galveston County, Texas, said tract being more fully described by metes and bounds found on the survey attached and marked Exhibit "A"

TRACT 2. A 185 acre tract of submerged land lying in Galveston Bay along the north shoreline of Tract 1 being the 36 5060 acre tract Exhibit "A-1"

SAVE AND EXCEPT any titles or rights asserted by anyone including, but not limited to, persons, corporations, governments or other entities to tideland or lands comprising the shores or beds of navigable or perennial rivers and streams, lakes, bays, gulfs or oceans, or to any lands beyond the line of the harbor or bulkhead lines as established or changed by any government, or to filled-in lands, or artificial islands, or to

riparian rights, or the rights of interests of the State of Texas or the public generally in the area extending from the line of low mean tide to the line of vegetation, or their right of access thereof, or rights of easement along and across the same; and all easements of record, or which a visual inspection of said property and every part thereof would reveal

GRANTOR excludes and excepts from this conveyance any warranties, express of implied, on the property, including, without limitation, any warranties arising by common law or Section 5 023 of the Property Code

GRANTOR conveys the property

a) "as is," "with all faults" and without any warranty as to condition or environmental hazard

b) subject to all restrictions, easements, rights-of-way leases, oil, gas and mineral leases, royalties, mineral conveyances, and mineral reservations of record, if any, in the office of the County Clerk of said County

c) subject to rights of parties in possession

GRANTOR disclaims any warranty, guaranty or representations, oral or written, on §

a) the nature and condition of the property or other items conveyed hereunder, including, without limitation, the water, soil and geology,

b) the suitability of the property conveyed hereunder for any and all activities and uses which GRANTEE may elect to conduct thereon,

c) the existence of any environmental hazards or conditions thereon (including but not limited to the presence of asbestos or other hazardous materials),

d) compliance with applicable environmental laws, rules or regulations, and

e) the compliance of the property with any laws, ordinances, or regulations of any governmental entity or body

By acceptance of this deed, GRANTEE acknowledges and agrees

a) GRANTEE has inspected the property and is relying solely on his own investigation of the same and not on any information provided or to be provided by on behalf of GRANTOR,

b) that any information provided with respect to the property was obtained from a variety of sources,

c) GRANTOR (i) has not made any independent investigation or verification of such information, and (ii) does not make any representations as to the accuracy or completeness of such information, and

d) that if there are any improvements on the property, GRANTOR shall not be responsible for or liable to GRANTEE for any construction defects, errors, omissions, of any other conditions affecting the property

GRANTEE or anyone claiming by, through or under GRANTEE, hereby fully releases GRANTOR, its officers, directors, representatives, attorneys and agents from any and all claims that it may now have or hereafter acquire against GRANTOR, its respective employees, officers, directors, representatives, attorneys and agents for any cost, loss, liability, damage, expense, demand, action or cause of action arising from or related to the conveyance of the premises herein, as well as any construction defects, errors, omissions, or other conditions affecting the property and other items conveyed hereunder GRANTEE further acknowledges and agrees that this release shall be given full force and effect according to each of its express terms and provisions, including, but not limited to, those relating to unknown and suspected claims, damages and causes of action. This covenant releasing GRANTOR shall be a covenant running with the property and shall be binding upon GRANTEE, their heirs, successors, beneficiaries and assigns GRANTOR hereby assigns without recourse or representation of any nature to GRANTEE, effective upon the execution and delivery hereof, any and all claims that GRANTOR May have for any such errors, omissions or defects in

the property and other items conveyed hereunder. As a material covenant and condition of this conveyance, GRANTEE agrees that in the event of any such construction defects, errors, omissions or on account of any other conditions affecting the property, GRANTEE shall look solely to GRANTOR'S predecessors or to such contractors and consultants as may have contracted work in connection with the property and other items conveyed hereunder for any redress or relief Upon the assignment by GRANTOR of its claims, GRANTEE released GRANTOR of all rights, express or implied, GRANTOR may have against GRANTOR arising out of or resulting from any errors, omission or defects in the property and other items conveyed hereunder. GRANTEE further understands that some of GRANTOR'S predecessors in interest may be or become insolvent, bankrupt, judgment-proof or otherwise incapable of responding in damages, and GRANTEE may have no remedy against such predecessors, contractors or consultants

TO HAVE AND TO HOLD the above-described premises, together with all and singular the rights and appurtenances thereto in any wise belonging unto GRANTEE, their heirs or assigns, forever

EXECUTED this the _____ day of _____, 2006

This deed is executed to correct and be effective from the same date as the deed dated January 20, 1994 from The City of Galveston as GRANTOR to 5600 PIE CORP and recorded as recording number 9402876, of the Deed Records of Galveston County, Texas, in which deed contained an erroneous metes and

bounds description attached thereto as Exhibit "A" and thus was incorrectly described

CITY OF GALVESTON, TEXAS

By _____
Steve LeBlanc
City Manager

Attest:

_____
Barbara Lawrence
City Secretary

THE STATE OF TEXAS §
COUNTY OF GALVESTON §

BEFORE ME, THE UNDERSIGNED, on this day personally appeared Steve LeBlanc, City Manager of the City of Galveston, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he executed the same for the purposes and consideration therein expressed, and in the capacity therein stated as the act and deed of the City

GIVEN UNDER MY HAND AND SEAL of office this 10th day of February, 2006

BETTY J SCHIEL
NOTARY PUBLIC
State of Texas
Comm Exp 10-30-2006
(personalized seal)

_____
Notary Public, State of Texas

Approved as to form

_____
Assistant City Attorney

25

Delivery received by 5600 PIE CORP

By: _____
Its Director

THE STATE OF TEXAS §
COUNTY OF GALVESTON §

BEFORE ME, THE UNDERSIGNED, on this day personally appeared Gerald A Sullivan, §§of 5600 PIE CORP, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he executed the same for the purposes and consideration therein expressed, and in the capacity therein stated as the act and deed of the City

GIVEN UNDER MY HAND AND SEAL of office this 10th day of February, 2006

BETTY J SCHIEL
NOTARY PUBLIC
State of Texas
Comm Exp 10-30-2006
(personalized seal)

_____
Notary Public, State of Texas

26

02/09/2006 09:10 4097400377 COASTAL SURVEYING PAGE 02

COASTAL SURVEYING OF TEXAS INC.
2011 HARBORSIDE DRIVE
GALVESTON TX 77554
PH (409) 740-1517
FAX (409) 740-0377
www.surveygalveston.com
"SERVING GALVESTON COUNTY OVER 50 YEARS"

EXHIBIT A

A METES AND BOUNDS DESCRIPTION OF A 35.9075 (CALLED 36.5060) ACRE TRACT BEING THAT SAME TRACT DESCRIBED IN DEED TO 5600 PIB CORP. RECORDED UNDER FILM CODE No. 009-46-2038 OF THE GALVESTON COUNTY DEED RECORDS, LOCATED IN THE M.B. MENARD SURVEY, GALVESTON ISLAND, GALVESTON COUNTY, TEXAS, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS WITH ALL BEARINGS BEING BASED IN THE CENTERLINE OF 45TH STREET;

COMMENCING at the Northwest corner of Block 716, City of Galveston, according to the Map or Plat of said City now in common use, said point lying in the Southerly right of way line of Avenue "A", (Harborside Drive Right-of-Way varies);

THENCE N 16°43 W, across Avenue "A", along the Northerly projection of the Westerly line of said Block 716, a distance of 70.0 feet to a 1/2 inch iron rod with cap stamped "COASTAL SURVEYING" set for the POINT OF BEGINNING of the herein described tract;

THENCE N 16°43'00" W, continuing along the Northerly projection of the Westerly line of said Block 716, a distance of 1402.64 to a point for corner in the Mean High Tide Meanders of Galveston Bay as described in said 5600 PIB CORP. tract;

THENCE in an Easterly direction, along the Mean High Tide Meanders of Galveston Bay as described in said 5600 PIB CORP. tract the following 10 courses and distances;

Page 1 of 3

02/09/2006 09:10 4097400377 COASTAL SURVEYING PAGE 03

1.) S 43°30'24" E, a distance of 117.24 feet

2.) N 74°23'38" E, a distance of 389.26 feet

3.) N 77°30'37" E, a distance of 232.07 feet

4) N 62°39'52" E, a distance of 202.84 feet

5.) S 86°53'49" E, a distance of 62.23 feet

6.) S 34°33'37" E, a distance of 273.82 feet

7.) N 71°05'04" E, a distance of 325.53 feet

8.) S 66°26'25" E, a distance of 221.48 feet

9) S 8°16'42" W, a distance of 278.62 feet

10.) S 10°11'15" W, a distance of 262.09 feet to a point for corner;

THENCE S 3°16'25" W, a distance of 101.80 (call 124.02) feet to a point for corner on the Northerly fence line for the City of Galveston Waste Water Treatment Plant;

THENCE S 70°32'23"W, along said fence line a distance of 48.68 feet to a fence corner;

THENCE S 43°04'18" W, continuing along said fence line a distance of 166.93 feet to a point for corner;

THENCE S 17°11'00" E, a distance of 207.73 feet to a 1/2 inch iron rod with cap stamped "COASTAL SURVEYING" set in the Northerly right of way line of said Avenue "A", (Harborside Drive Right-of-Way varies) located on the arc of a curve to the left said curve being the Northerly line of a called 0.495 acre tract as shown on acquisition map for Port Industrial right-of-way found in the Galveston County Engineers office (no deed found of record);

THENCE along the Northerly line of said 0.495 acre tract being the Northerly right of way line of said Avenue "A", (Harborside Drive Right-of-Way varies) and said curve to the left having a radius of 3085.77 feet, a central angle of 04°34'39", an arc length of 246.53 feet and a chord bearing of S 74°08'25" W, a distance of 246.47 feet to a 1/2 inch iron rod with cap stamped "COASTAL SURVEYING" set;

Page 2 of 3

02/09/2006 09:10 4097408377 COASTAL SURVEYING PAGE 04

THENCE S 71°51'05" W, continuing along the Northerly line of said 0.495 acre tract being the Northerly right of way line of said Avenue "A", (Harborside Drive Right-of-Way varies), a distance of 600.19 feet to a 1/2 inch iron rod with cap stamped "COASTAL SURVEYING" set;

THENCE S 70°08'54" W, continuing along the Northerly line of said 0.495 acre tract being the Northerly right of way line of said Avenue "A", (Harborside Drive Right-of-Way varies), a distance of 201.10 feet to the POINT OF BEGINNING and containing 35.9075 acres.

February 9, 2006

Patrick A. Jordan
Registered Professional Land Surveyor

STATE OF TEXAS REGISTERED PATRICK A. JORDAN 5525 PROFESSIONAL LAND SURVEYOR

05-0406

Page 3 of 3

29

02/09/2006 09:10 4097408377 COASTAL SURVEYING PAGE 11

Exhibit "A-1" 009-46-2044

January 17, 1994

DESCRIPTION OF A TRACT OF LAND OUT OF THE MICHAEL B. MORARD SURVEY, ABSTRACT NO. 428, GALVESTON COUNTY, TEXAS, BEING A PART OF THAT CERTAIN TRACT CONVEYED FROM J. E. ARNELL AND ANN MAY ARNELL TO THE CITY OF GALVESTON BY DEED DATED NOVEMBER 19, 1952, AND RECORDED IN VOLUME 1013, PAGES 48 THROUGH 52 IN THE OFFICE OF THE COUNTY CLERK OF GALVESTON COUNTY, TEXAS

COMMENCING at the Northwest corner of Block 716 in the City of Galveston, said point being in the South right of way line of Avenue "A", 70 feet right of way, said point being the Southwest corner of a tract recorded in Volume 1013, Pages 48 through 52;

THENCE S16°43'W, along the Northerly projection of the West line of Block 716 and along the West line of said tract recorded in Volume 1013, Pages 48 through 52, a distance of 1472.64 feet to the place of beginning of the tract hereinafter described, said point being the Northwest corner of a 36.5040 acre tract and said point lying in the mean high tide meandere of the Southerly shore line of Galveston West Bay;

THENCE from said beginning point continuing S16°43'W, along the said Northerly projection of the West line of Block 716 and along the West line of said tract recorded in Volume 1013, Pages 48 through 52, a distance of 1737.09 feet to a point for corner in the Galveston Channel South Harbor line established in 1897, said point being the Northwest corner of said tract recorded in Volume 1013, Pages 48 through 52;

THENCE S73°14'06"E, along the Galveston Channel South Harbor line established in 1897, and along the South line of said tract recorded in Volume 1013, Pages 48 through 52, a distance of 2280.90 feet to a point for corner in the Northerly projection of the East line of Block 710 in the City of Galveston, said point being the Northeast corner of said tract recorded in Volume 1013, Pages 48 through 52;

THENCE S16°43'E, along the said Northerly projection of the West line of Block 710, and along the East line of said tract recorded in Volume 1013, Pages 48 through 52, a distance of 3838.54 feet to a point for corner being the Northeast corner of a 1.82 acre tract conveyed from the City of Galveston to Southern Pacific Terminal Company by deed dated September 17, 1953 and recorded in Volume 1123, Page 78 in the Office of the County Clerk of Galveston County, Texas;

THENCE S7°13'W, along the Westerly line of said 1.82 acre tract, a distance of 676.22 feet, called 575.43 feet to the P.C. of a curve;

THENCE in a Southerly direction, continuing along the Westerly line of said 1.82 acre tract, around a curve to the left whose radius is 320.00 feet, whose chord bears S4°43'E, 218.23 feet, a distance of 217.82 feet, called 217.32 feet, to the P.T. of said curve;

THENCE S14°43'E, continuing along the Westerly line of said 1.82 acre tract, a distance of 164.26 feet to a point for corner in the mean sea level meandere of the Southerly shore line of Galveston West Bay;

THENCE in a Westerly direction along the mean sea level meandere of the Southerly shore line of Galveston West Bay as follows:

(Page 1 of 2)

2-117

JAMES W. GANTRELL, JR.

RECORDER'S MEMORANDUM
At the time of recordation, this instrument was found to be inadequate for the best photographic reproduction because of illegibility, carbon or photo copy, discolored paper, etc. All blackouts, additions and changes were present at the time the instrument was filed and recorded.

30

.02/09/2006 09:10 4897408377 COASTAL SURVEYING PAGE 12

009-46-2045

January 17, 1994

S48°21'55"W,	34.89 feet
N68°35'46"W,	49.87 feet
N19°13'41"W,	58.58 feet
N7°22'49"W,	35.33 feet
N64°22'38"W,	21.43 feet
N25°32'31"W,	61.39 feet
N81°57'11"W,	174.44 feet
S71°16'41"W,	196.37 feet
N22°53'09"W,	0.86 feet
N83°52'01"W,	68.74 feet
N64°26'57"W,	100.90 feet
N23°07'52"W,	73.35 feet
N68°25'09"W,	61.38 feet, said point lying in the

Easterly line of said 38.5060 acre tract;

THENCE continuing in a Westerly direction along the mean low level meandes of the Southerly shore line of Galveston West Bay and the Northerly line of said 38.5060 acre tract as follows:

N18°11'18"W,	261.09 feet
N8°18'43"W,	378.42 feet
N26°56'33"W,	224.49 feet
S72°35'04"W,	223.63 feet
N24°23'27"W,	572.92 feet
N86°32'49"W,	62.22 feet
N62°38'52"W,	202.84 feet
S77°20'37"W,	228.05 feet
N74°23'38"W,	289.24 feet and
N43°28'34"W,	117.24 feet to the place of beginning.

(Page 2 of 2) 3-117

JAMES W. GANTRELL, JR.

31

.02/09/2006 09:10 4897408377 COASTAL SURVEYING PAGE 13

009-46-2046

FILED FOR RECORD
94 JAN 21 AM 10:59

STATE OF TEXAS COUNTY OF GALVESTON
I hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the Official Public Records of Real Property of Galveston County Texas, on
JAN 21 1994
COUNTY CLERK
GALVESTON CO., TEXAS

Return to: 5600 PIB Corp.
P.O. Box 3287
Galveston, Texas 77552

RECORDER'S MEMORANDUM
At the time of recordation, this instrument was found to be inadequate for the best photographic reproduction because of illegibility, carbon or photo copy, discolored paper, etc. All blackouts additions and changes were present at the time the instrument was filed and recorded

FILED AND RECORDED
OFFICIAL PUBLIC RECORDS OF REAL PROPERTY

2006 FEB 16 11:04 AM 2006009940
TORRES,C $60.00
Mary Ann Daigle ,COUNTY CLERK
GALVESTON, TEXAS

City Secretary
City of Galveston
823 Rosenberg
Galveston, TX 77550

32

GAC 9815690 5 pgs

012-48-2081

SPECIAL WARRANTY DEED

The State of Texas §
§ **KNOW ALL MEN BY THESE PRESENTS:**
County of Galveston §

This Special Warranty Deed is made on this the 6th day of April, 1998, by **GERALD A. SULLIVAN** ("Grantor") to **SULTEX, LTD.**, a Texas limited partnership ("Grantee").

Grantor, in consideration of the sum of Ten and No/100 Dollars ($10.00), paid by Grantee to Grantor, the receipt of which is hereby acknowledged, does GRANT, SELL and CONVEY to Grantee and Grantee's successors and assigns forever all of the real property which is situated in the County of Galveston, Texas, and described on the atached Exhibit "A".

This conveyance is made and accepted subject to any and all restrictions, covenants, conditions, mineral reservations, mineral leases, rights of way and easements, relating to the property described on the attached Exhibit A, but only to the extent they are still in effect, and shown of record in the above-mentioned County and State, and to all zoning laws, regulations and ordinances of municipal and/or other governmental authorities.

Grantor warrants that Grantor will warrant and defend the property conveyed to Grantee and Grantee's successors and assigns against every person whomsoever lawfully claims the property conveyed or any part thereof, by, through or under Grantee but not otherwise, except as to the reservations from and exceptions to conveyance and warranty.

EXECUTED this the 6th day of April, 1998.

Gerald A. Sullivan
GERALD A. SULLIVAN

Terminal #60996

33

012-48-2082

STATE OF TEXAS §
§
COUNTY OF GALVESTON §

This instrument was acknowledged before me on the 6th of April, 1998, by GERALD A. Sullivan, as Grantor.

WITNESS my hand and official seal:

Bonnie Louvierre
Notary Public, State of Texas

BONNIE LOUVIERRE
MY COMMISSION EXPIRES
July 16, 2001

AFTER RECORDING RETURN TO:

Sultex, Ltd.
Attention: Mr. Gerald A. Sullivan
P.O. Box 3387
Galveston, TX 77552

Terminal #60996

34

012-48-2083

Part of the M. B. Menard Grant lying and being situated in the City and County of Galveston, Texas, and being a portion of that certain tract conveyed to Southern Pacific Terminal Company by Arabella D. Huntington et al by deed dated July 10, 1901, and recorded in Volume 186, Page 53, et seq., in the Office of the County Clerk of Galveston County, Texas, as more fully described by metes and bounds as follows:

COMMENCING at the intersection of the Northerly projection of the East right of way line of 51st Street, 80 foot right of way, and the North right of way line of what formerly was Avenue A, 70 foot right of way, said intersection being North 16° 38' West, a distance of 330.00 feet from the Southwest corner of Block 710;

THENCE North 73° 22' East, along what was formerly the North right of way line of Avenue A, a distance of 301.30 feet;

THENCE North 59° 50' West, a distance of 9.41 feet to the PLACE OF BEGINNING of the tract hereinafter described, said point being in the Easterly line of that certain 15.76 acre tract of land described in that certain deed dated August 12, 1955, to Galveston County Navigation District No. 1, said point also being at a corner in the Northerly line of that certain street easement described as "First" in instrument dated April 26, 1965, to the City of Galveston, Texas;

THENCE from said Beginning Corner in a Northwesterly direction along the Easterly line of said 15.76 acre tract with a line curving to the right having a radius of 428.34 feet (called 428.00 feet) and a long chord of 200.28 feet (called 202.20 feet) which bears North 53° 52' 40" West, (called North 54° 01' 25" West) an arc distance of 202.15 feet (called 204.13 feet) to end of curve;

THENCE North 40° 21' 28" West continuing along the Easterly line of said 15.76 acre tract, a distance of 177.73 feet to a point of curve;

THENCE in a Northwesterly direction continuing along the Easterly line of said 15.76 acre tract with a line curving to the right having a radius of 360.28 feet and a long chord of 204.65 feet, which bears North 23° 51' 28" West, an arc distance of 207.51 feet to end of curve;

THENCE in a Northerly direction continuing along the Easterly line of said 15.76 acre tract with a line curving to the right, having a radius of 2927.00 feet and a long chord of 1349.52 feet (called 1330.44 feet) which bears North 05° 28' 14" East, (called North 05° 46' 43" East) a distance of 1361.77 feet (called 1361.66 feet);

Exhibit A
page 1 of 3 pages

35

012-48-2084

THENCE North 73° 05' 21" East, continuing along the Easterly line of said 15.76 acre tract a distance of 42.07 feet;

THENCE in a Northeasterly direction, continuing along the Easterly line of said 15.76 acre tract with a line curving to the right having a radius of 2893.00 feet and a long chord of 412.30 feet which bears North 23° 29' 20" East, a distance of 412.65 feet to end of curve;

THENCE North 27° 34' 30" East, a distance of 1682.84 feet to point for a corner on the South line of Harbor established in 1897;

THENCE South 76° 33' 06" East (called South 76° 18' East), along said Harbor line a distance of 934.71 feet the Northerly end of a "Boundary Line Agreement" recorded under Film Code No. 005-41-1579 in the Office of the County Clerk of Galveston County, Texas;

THENCE South 13° 53' 50" West (called South 11° 45' 28" West), and along the centerline of Slip "B", 300 foot easement and along the Westerly line of said "Boundary Line Agreement", a distance of 1430.93 feet to the Southerly end of Slip "B", 300 foot easement;

THENCE South 22° 17' 17" West (called South 20° 08' 55" West), continuing along the said "Boundary Line Agreement" line, a distance of 8.30 feet;

THENCE South 26° 38' 17" East (called South 35° 09' 30" East), continuing along the said "Boundary Line Agreement" line, a distance of 26.74 feet (called 24.76 feet) to a 4" pipe fence post for called corner;

THENCE South 13° 55' 01" West (called South 11° 45' 28" East), continuing along the said "Boundary Line Agreement" line, a distance of 813.82 feet (called 814.11 feet) to a 4" pipe fence post for called corner;

THENCE South 76° 09' 25" East (called South 78° 07' 37" East) continuing along the said "Boundary Line Agreement" line, a distance of 606.61 feet (called 607.20 feet) to a 4" pipe fence post for called corner;

THENCE South 13° 43' 02" West (called South 11° 45' 28" West), continuing along the said "Boundary Line Agreement", a distance of 351.95 feet to a point in the Northerly line of said Street easement to the City of Galveston, said point being a 4" pipe fence post for called corner and said point being North 13° 53' 00" East, a distance of 2.30 feet from the most Southerly end of said "Boundary Line Agreement" line marked by a 1/2" iron pipe;

Exhibit A
page 2 of 3

36

012-48-2085

THENCE in a Northeasterly direction, continuing along the Easterly line of said 15.76 acre tract with a line curving to the right having a radius of 2893.00 feet and a long chord of bears South 68° 10' 31" West, a distance of 240.14 feet to end of curve;

THENCE South 55° 13' 20" West, continuing along the Northerly line of said Street Easement a distance of 140.70 feet to the beginning of a curve to the right;

THENCE in a Southwesterly direction continuing along the Northerly line of said Street Easement with said curve to the right having a radius of 2251.83 feet and a long chord of 417.64 feet which bears South 60° 32' 35" West, a distance of 418.24 feet (called 418.56 feet) to end of curve;

THENCE South 65° 51' 50" West, continuing along the Northerly line of said Street Easement a distance of 565.57 feet to the beginning of a curve to the right;

THENCE in a Southwesterly direction, continuing along the Northerly line of said Street Easement with said curve to the right having a radius of 2251.83 feet and a long chord of 294.66 feet (called 294.55 feet) which bears South 69° 36' 55" West, a distance of 294.8 feet to end of curve;

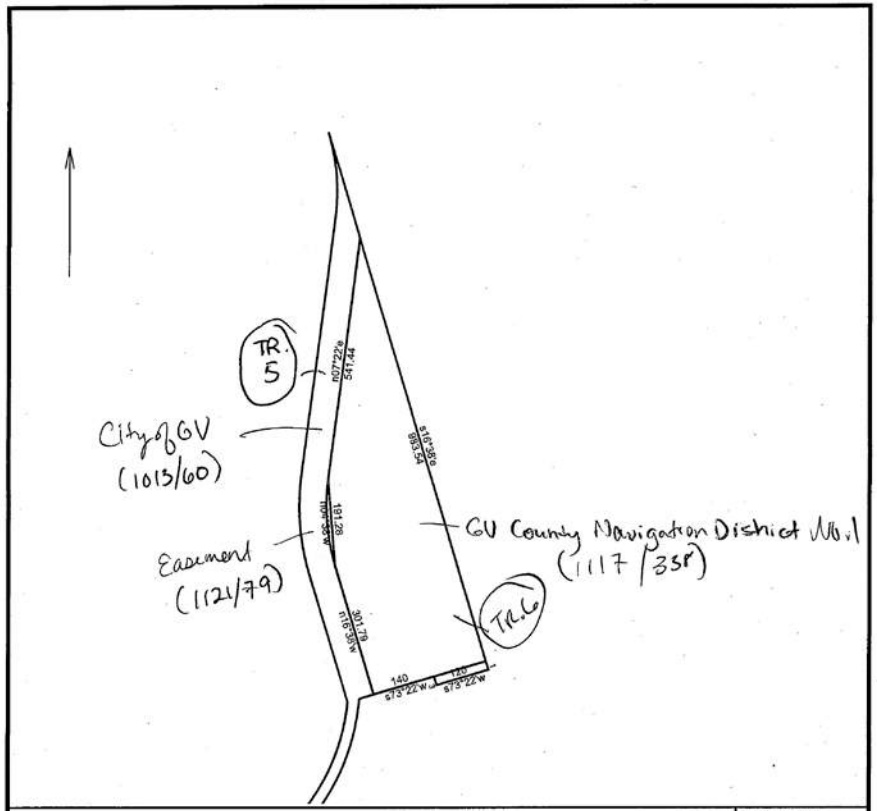
THENCE South 73° 22' 00" West continuing along the Northerly line of said Street Easement a distance of 150.35 feet to the PLACE OF BEGINNING.

MILLS, SHIRLEY, ECKEL & BASSETT, L.L.P.
P. O. BOX 1943
GALVESTON, TEXAS 77553

FILED AND RECORDED
OFFICIAL PUBLIC RECORDS OF REAL PROPERTY

4-9-98 01:47 PM 9815690
GULIS_M $17.00
Patricia Ritchie, County Clerk
GALVESTON COUNTY, TEXAS

Exhibit A
page 3 of 3



10/2/2014

Scale: 1 inch= 238 feet | File: DPMap - 4.15ac and 1.82acEA.ndp

Tract 1: 4.1381 Acres (180257 Sq. Feet), Closure: n03.1119e 0.02 ft. (1/109720), Perimeter=2318 ft.
Tract 2: 4.0256 Acres (175355 Sq. Feet), Closure: n73.3949e 259.68 ft. (1/15), Perimeter=3858 ft.

01 s16.38e 20
02 s73.22w 120
03 n16.38w 20
04 s73.22w 140
05 n16.38w 301.79
06 n04.38w 191.28
07 n07.22e 541.44
08 s16.38e 983.54
09 @1
10 s73.22w 260
11 s73.22w 33.08
12 Rt, r=489.96, arc=340.93, chord=s24.2915w 334.09
13 s44.26w 120.59
14 s73.22w 51.68
15 n44.26e 165.81
16 Lt, r=464.96, arc=313.89, chord=n25.0513e 307.96
17 n16.38w 301.79
18 Rt, r=520.00, arc=217.72, chord=n04.3800w 216.13
19 n07.22e 578.43
20 Lt, r=460.00, arc=192.59, chord=n04.3800w 192.59
21 s16.38e 245.29
22 s07.22w 541.44
23 Lt, r=460.00, arc=192.59, chord=s04.3800e 191.19
24 s16.38e 301.79

79

GIVEN under my hand and seal of office this the 23rd day of August, A. D., 1955.

(Doyle McDonald)
Notary Public in and for Galveston County, Texas.

THE STATE OF TEXAS, |
COUNTY OF GALVESTON. |

BEFORE ME, the undersigned, a Notary Public in and for said County and State, on this day personally appeared Helen Kirk Lauve, a feme sole, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that she executed the same for the purposes and consideration therein expressed.

GIVEN under my hand and seal of office this the 22nd day of August, A. D., 1955.

Notary Public in and for Galveston County, Texas.

Filed for Record September 23 ,1955 at 9:35 o'clock A. M. No. 140712.
Recorded September 24 ,1955 at 9:15 o'clock A. M.
JOHN R. PLATTE, County Clerk, By (Ethel Hanson) Deputy.

THE STATE OF TEXAS)
COUNTY OF GALVESTON)

WHEREAS, Southern Pacific Terminal Company and Galveston County Navigation District No. 1 have reached an agreement with respect to the right of way required for the construction of the said Navigation District's Galveston Island-Pelican Island Causeway across certain of said Terminal Company's property upon condition that the said Navigation District will acquire and convey, or cause to be conveyed to said Terminal Company without cost a perpetual right of way or easement for railroad and/or vehicular purposes upon and across the tract of land owned by the City of Galveston, lying west of and adjoining said Terminal Company's property so that the portions of said Terminal Company's property lying west of said Causeway may be reached and served by railroad trackage and roadways; and

WHEREAS, said Navigation District has requested the City of Galveston to grant and convey said perpetual easement or right of way unto said Terminal Company subject to the reservations herein set forth:

NOW THEREFORE, Know All Men By These Presents: That the City of Galveston, a municipal corporation of the State of Texas, acting herein by and through its Mayor, hereunto duly authorized by a resolution adopted by the Board of Commissioners of said City, a certified copy of which is hereto attached and made a part hereof, pursuant to the request of said Navigation District and for and in consideration of the benefits which the City of Galveston and its inhabitants expect to receive through

39

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the construction of the aforesaid Causeway and the sum of One and 00/100 Dollar ($1.00) to said City paid by said Navigation District, the receipt and sufficiency of which is hereby acknowledged, has granted, sold and conveyed and by these presents does Grant, sell and convey unto the said Southern Pacific Terminal Company a perpetual easement or right of way for railroad, and/or vehicular or roadway purposes, upon, along and across all that certain tract or parcel of land lying and being situated on Galveston Island in the City of Galveston, Texas, and being that portion of that certain tract or parcel of land which was conveyed by J. B. Angell and wife, to said City, by deed dated November 19, 1952, and recorded in Volume 1013, Pages 60, 61 and 62, of the Deed Records of Galveston County, Texas, particularly described as follows, to-wit:

Commencing at the intersection of the north right of way line of Avenue "A" and the extension of the east right of way line of Fifty-First Street;

Thence, along said north right of way line of Avenue "A", on a bearing of S. 73°22'00" W, a distance of two hundred sixty feet (260.00') to the point of beginning of the land herein described;

Thence, continuing along said north right of way line on a bearing of S. 73°22'00" W, a distance of thirty three and eight one hundredths (33.08') feet;

Thence in a southwesterly direction on a line curving to the right having a radius of four hundred eighty nine and 96/100 feet (489.96') and a long chord of three hundred thirty four and 38/100 feet (334.28') which bears S. 24°29'15" W, a distance of three hundred forty and ninety-three hundredths (340.93') feet;

Thence S. 44°26'00" W, along southwesterly tangent to said curve, a distance of one hundred twenty and fifty nine one hundredths (120.59') feet to a point on the north line of a twenty foot (20') strip of land owned by the C.R.I. & P. Railroad Company;

Thence along the north line of said strip on a bearing of S. 73°22'00" W, at twenty five and 84/100 feet (25.84') pass the center line of the existing railroad siding serving City of Galveston sewage disposal plant and in all a distance of fifty one and 68/100 feet (51.68');

Thence, on a bearing of N. 44°26'00" E, a distance of one hundred sixty five and eighty-one/hundredths (165.81') feet;

Thence in a northeasterly direction on a line curving to the left, having a radius of four hundred sixty four and 96/100 feet (464.96') and a long chord of three hundred eight and 05/100 feet (308.05') which bears N. 25°05'13" East, a distance of three hundred thirteen and 89/100 feet (313.89'); to a point on the north right of way line of Avenue "A";

Thence N. 16°38'00" W, a distance of three hundred one and seventy nine one hundredths (301.79') feet;

Thence, on a line in a northeasterly direction curving to the right, having a radius of five hundred twenty feet (520') and a long chord of two hundred sixteen and 23/100 feet (216.23') which bears N. 4°38'00" W, a distance of two hundred seventeen and seventy two one hundredths (217.72') feet;

Thence N. 7°22'00" E. along northeasterly tangent to said curve a distance of five hundred seventy eight and forty three one hundredths (578.43') feet;

Thence in a northerly direction along a line curving to the left, having a radius of four hundred sixty feet (460') and a long chord of one hundred ninety one and 28/100 feet (191.28'), which bears N. 4°38'00" W, a distance of one hundred ninety two and 59/100 feet (192.59') to the west line of Grantee's property;

Thence S. 16°38'00" E, along said west line a distance of two hundred forty five and twenty nine one hundredths (245.29') feet;

Thence S. 7°22'00" W, a distance of five hundred forty one and forty four one hundredths (541.44') feet;

Thence along a line curving to the left having a radius of four hundred sixty feet (460.0') and a long chord of one hundred ninety one and 28/100 feet (191.28') which bears S. 4°38'00" E, a distance of one hundred ninety two and 59/100 feet (192.59');

Thence S. 16°38'00" E, along southeasterly tangent to said curve, a distance of three hundred one and seventy nine one hundredths (301.79') feet to the point of beginning and containing one and eighty two one hundredths (1.82) acres more or less.

40

81

It is, however, understood and agreed that there is hereby excepted and reserved unto the City of Galveston, its successors or assigns:

(1) The right to maintain and operate its existing spur track serving its sewage disposal plant, which spur track is situated in part upon the land and premises hereinabove described.

(2) The right to construct, maintain and operate, repair, replace and remove any and all pipe lines, power lines, communication lines or other utilities and all appurtenances thereto, and roadways or streets across (on, over and under) the land and premises hereinabove described, in locations and in such manner as will not destroy or unreasonably interfere with the easement or right of way herein granted and conveyed unto said Terminal Company;

(3) The right to set aside, maintain and use for public street purposes all that part of the land and premises hereinabove described, lying north of the north right of way line of Avenue "A", save and except the westerly eighteen (18') feet thereof.

It is further understood and agreed that at no time will the drainage on, over, above or under said land and improvements be obstructed, impaired or changed, either by construction or destruction, save and except upon prior approval of the City of Galveston and/or its designated officers, agents, servants or employees.

TO HAVE AND TO HOLD, subject to the reservations and restrictions, herein contained, the easement or right of way upon and across the land herein described, together with all and singular the rights and appurtenances thereto in anywise belonging, unto said Southern Pacific Terminal Company, its successors and assigns forever.

IN WITNESS WHEREOF, the City of Galveston, has caused these presents to be executed by Geo. R. Clough, as Mayor-President of its Board of Commissioners duly authorized by Resolution this day adopted by the Board of Commissioners of the City of Galveston, a copy of which is hereto attached and attested by its Secretary with its seal affixed hereto at Galveston, Texas, this 15th day of September, A.D. 1955.

ATTEST:
Mildred N. Oser, Secretary
of the Board of Commissioners
of the City of Galveston.

CITY OF GALVESTON
By Geo. R. Clough
Geo. R. Clough, Mayor-President
of the Board of Commissioners
of the City of Galveston.

-3-

41

82

THE STATE OF TEXAS)
COUNTY OF GALVESTON)

BEFORE ME, the undersigned authority, a Notary Public in and for Galveston County, Texas, on this day personally appeared GEO. R. CLOUGH, Mayor-President of the Board of Commissioners of the City of Galveston, known to me to be the person and official whose name is subscribed to the foregoing instrument and acknowledged to me that the same was the act of the City of Galveston and that he executed the same as the act of such City for the purposes and consideration therein expressed and in the capacity therein stated.

GIVEN under my hand and seal of office this 15th day of September A.D. 1955.

NOTARY PUBLIC, in and for
Galveston County, Texas.

RESOLUTIONS

BE IT RESOLVED BY THE BOARD OF COMMISSIONERS OF THE CITY OF GALVESTON:

That, pursuant to Motion duly made, seconded and carried as appearing by the Minutes of the Meeting of the Board of Commissioners of the City of Galveston held on the 16th day of June, A. D. 1955, the City of Galveston grant a perpetual easement for railroad and vehicular purposes to the Southern Pacific Terminal Company over and upon that certain tract or parcel of land situated in Galveston, Galveston County, Texas, more particularly described as follows:

Commencing at the intersection of the north right of way line of Avenue "A" and the extension of the east right of way line of Fifty-First Street;

Thence, along said north right of way line of Avenue "A", on a bearing of S. 73°22'00" W. a distance of two hundred sixty feet (260.00') to the point of beginning of the land herein described;

Thence, continuing along said north right of way line on a bearing of S. 73°22'00" W, a distance of thirty three and eight one hundredths (33.08') feet;

Thence, in a southwesterly direction on a line curving to the right having a radius of four hundred eighty nine and 96/100 feet (489.96') and a long chord of three hundred thirty four and 28/100 feet (334.28') which bears S. 24°29'15" W, a distance of three hundred forty and ninety-three hundredths (340.93') feet;

Thence S. 44°26'00" W, along southwesterly tangent to said curve, a distance of one hundred twenty and fifty nine one hundredths (120.59') feet to a point on the north line of a twenty foot (20') strip of land owned by the C.R.I. & P. Railroad Company;

Thence along the north line of said strip on a bearing of S. 73°22'00" W, at twenty five and 84/100 feet (25.84') pass the center line of the existing railroad siding serving City of Galveston sewage disposal plant and in all a distance of fifty one and 68/100 feet (51.68');

Thence, on a bearing of N. 44°26'00" E, a distance of one hundred sixty five and eighty-one one hundredths (165.81') feet;

42

83

Thence in a northeasterly direction on a line curving to the left, having a radius of four hundred sixty four and 96/100 feet (464.96') and a long chord of three hundred eight and 05/100 feet (308.05') which bears N. 25°05'13" East, a distance of three hundred thirteen and 89/100 feet (313.89'); to a point on the north right of way line of Avenue "A";

Thence N. 16°38'00" W, a distance of three hundred one and seventy nine one hundredths (301.79') feet;

Thence, on a line in a northeasterly direction curving to the right, having a radius of five hundred twenty feet (520') and a long chord of two hundred sixteen and 23/100 feet (216.23') which bears N. 4°38'00" W, a distance of two hundred seventeen and seventy two one hundredths (217.72') feet;

Thence N. 7°22'00" E. along northeasterly tangent to said curve a distance of five hundred seventy eight and forty three one hundredths (578.43') feet;

Thence in a northerly direction along a line curving to the left, having a radius of four-hundred sixty feet (460') and a long chord of one hundred ninety one and 28/100 feet (191.28'), which bears N. 4°38' 00" W, a distance of one hundred ninety two and 59/100 feet (192.59') to the west line of Grantee's property;

Thence S. 16°38'00" E, along said west line a distance of two hundred forty five and twenty nine one hundredths (245.29') feet;

Thence S. 7°22'00" W, a distance of five hundred forty one and forty four one hundredths (541.44') feet;

Thence along a line curving to the left having a radius of four hundred sixty feet (460.0') and a long chord of one hundred ninety one and 28/100 feet (191.28') which bears S. 4°38'00" E, a distance of one hundred ninety two and 59/100 feet (192.59);

Thence S. 16°38'00" E, along southeasterly tangent to said curve, a distance of three hundred one and seventy nine one hundredths (301.79') feet to the point of beginning and containing one and eighty two one hundredths (1.82) acres more or less.

BE IT FURTHER RESOLVED BY THE BOARD OF COMMISSIONERS OF THE CITY OF GALVESTON:

That, Geo. R. Clough, Mayor-President of the Board of Commissioners of the City of Galveston is hereby authorized and empowered to execute and deliver to Southern Pacific Terminal Company a Deed conveying to the said Southern Pacific Terminal Company a perpetual easement or right of way for railroad and/or vehicular or roadway purposes over and on the above described real estate, and that the City Secretary is hereby authorized and empowered to attest and affix the official seal of the City of Galveston to said Deed

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I, Mildred M. Oser, Secretary of the Board of Commissioners of the City of Galveston, do hereby certify that the foregoing is a true and correct copy of Resolutions appearing in the Minutes of said City of

43

84

Galveston, which Resolutions were adopted by the Board of Commissioners of the City of Galveston, at a meeting held on the 15th day of September, A. D. 1955.

IN WITNESS WHEREOF, I hereto subscribe my name officially under the seal of the City of Galveston, this 15th day of September, A. D. 1955.

Mildred M. Oser
Secretary of the Board of Commissioners of the City of Galveston.

Filed for Record September 23, 1955 at 10:00 o'clock A. M. No. 140716
Recorded September 24, 1955 at 9:20 o'clock A. M.
JOHN R. PLATTE, County Clerk, By Ethel Hanson, Deputy.

THE STATE OF TEXAS |
COUNTY OF GALVESTON |
KNOW ALL MEN BY THESE PRESENTS:

THAT I, I. A. LERNER, of the County of Galveston, State of Texas, for and in consideration of the sum of Ten and No/100 ($10.00) Dollars cash, and other good and valuable consideration to me in hand paid by D. A. MACALUSO and wife FRANCES MACALUSO of the County of Galveston, State of Texas, the receipt of which is hereby acknowledged, have Granted, Sold and Conveyed, and by these presents do GRANT, SELL and CONVEY unto the said D. A. MACALUSO and wife FRANCES MACALUSO, all that certain tract or parcel of land lying and being situate in Galveston County, Texas, and being described as follows, to-wit:

The North 100 feet of Lot Forty-two (42), of LaMarque Heights, being a subdivision of a 38.08 acre tract out of the S. F. Austin League No. 4, Galveston County, Texas, according to the map or plat of the said LaMarque Heights of record in Volume 254-A, at page 60 in the office of the County Clerk of Galveston County, Texas.

This conveyance is made and accepted subject to the following:

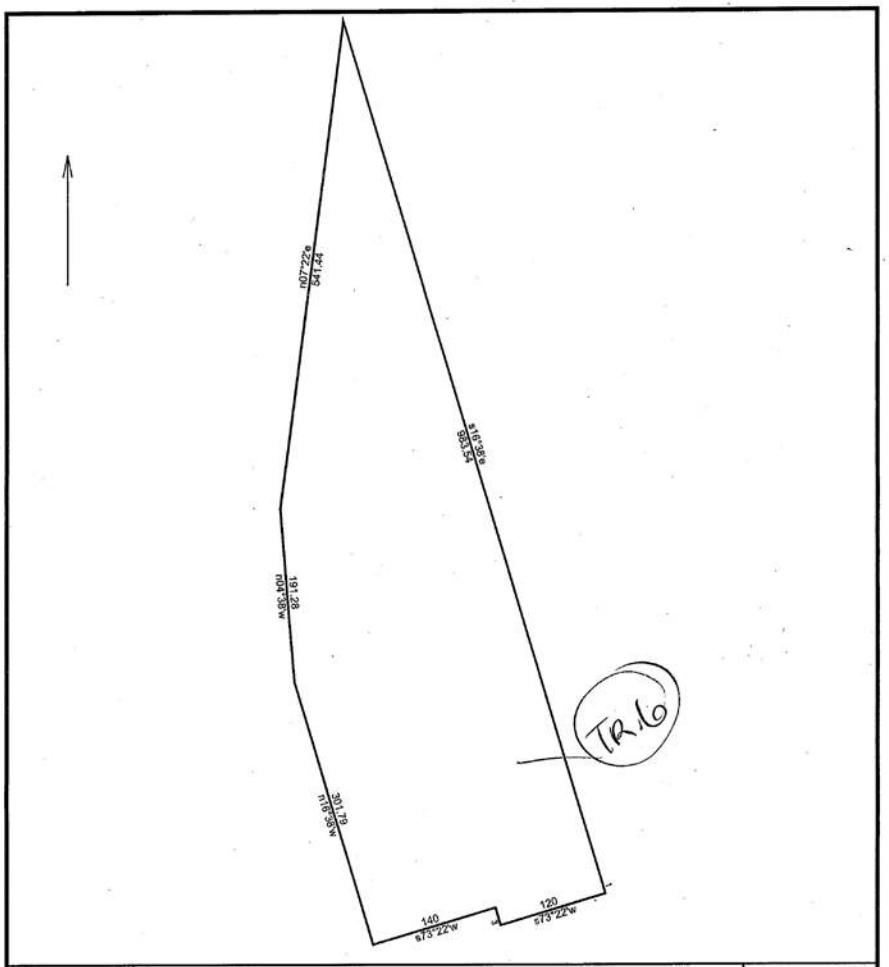
1) Mineral reservation contained in instrument of record in Volume 757 at page 49 in the office of the CountyClerk of Galveston County, Texas.

2) An oil, gas and mineral lease of record in Volume 829 at page 571, and one of record in Volume 814 at page 392, both in the office of the County Clerk of Galveston County, Texas.

3) Restrictions imposed on said property by instruments of record in Volume 834 at page 486, and in Volume 921 at page 579, both in the office of the County Clerk of Galveston County, Texas.

TO HAVE AND TO HOLD the above described premises, together with all and singular the rights and appurtenances thereto in anywise belonging unto the said D. A. MACALUSO and wife FRANCES MACALUSO, their heirs and assigns forever, and I do hereby bind myself, my heirs, executors and administrators to Warrant and Forever Defend all and singular

44



10/2/2014

Scale: 1 inch= 119 feet | File: DPMap - 4.15ac.ndp

Tract 1: 4.1381 Acres (180257 Sq. Feet), Closure: n03.1119e 0.02 ft. (1/109720), Perimeter=2318 ft.

01 s16.38e 20
02 s73.22w 120
03 n16.38w 20
04 s73.22w 140
05 n16.38w 301.79
06 n04.38w 191.28
07 n07.22e 541.44
08 s16.38e 983.54

45

100 ~~[illegible]~~ 1117/338

338

THE STATE OF TEXAS }
COUNTY OF GALVESTON } KNOW ALL MEN BY THESE PRESENTS:

That WHEREAS, Galveston County Navigation District No. 1, a body politic organized under the provisions of Article XVI, Section 59, of the Constitution of Texas, and Article 8263e, Vernon's Texas Civil Statutes (Chapter 27, Page 63, Acts of the 42nd Legislature, 3rd Called Session, 1932, as Amended) for all purposes (hereinafter referred to as Purposes) and endowed with all the powers provided for in said Statute, must acquire a certain tract or parcel of land situated in Galveston, Galveston County, Texas, said real estate being owned by the City of Galveston, a municipal corporation of the State of Texas; and

WHEREAS, said tract or parcel of land will be used by said Galveston County Navigation District No. 1 in connection with the Purposes and powers aforesaid, and said City of Galveston desires to convey said real estate to said Galveston County Navigation District No. 1 therefor:

NOW, THEREFORE, the City of Galveston, a municipal corporation of the State of Texas, acting herein by and through its Mayor-President, duly authorized by a Resolution adopted by the Board of Commissioners of the City of Galveston, a certified copy of which is hereto attached, marked Exhibit "A" and hereby made a part hereof for all purposes, (hereinafter called Grantor), for and in consideration of the sum of Ten Dollars ($10.00) to it in hand paid by Galveston County Navigation District No. 1, a body politic organized under the laws of the State of Texas, of Galveston, Texas, (hereinafter called Grantee), receipt of which is hereby acknowledged, and for other good and valuable considerations, has BARGAINED, GRANTED, SOLD and CONVEYED and does by these presents BARGAIN, GRANT, SELL and CONVEY unto the said Galveston County Navigation District No. 1 that certain tract or parcel of land situated in Galveston, Galveston County, Texas, more particularly described as follows:

Commencing at the intersection of Avenue "A" in said City of Galveston, Texas and the extension of the East right-of-way line of Fifty-first Street in said City of Galveston, Texas, which is the point of beginning; thence, along the said extension of the East right-of-way line of Fifty-first Street on a bearing of S. 16° 38' 00" E. for a distance of twenty (20) feet; thence, along a line parallel to the aforesaid north right-of-way line of Avenue "A" on a bearing S. 73° 22' 00" W. for a distance of one hundred twenty (120) feet; thence, on a bearing of N. 16° 38' 00" W. for a distance of twenty (20) feet to a

46

339

point on the aforesaid north right-of-way line of Avenue "A"; thence, along said north right-of-way line on a bearing of S. 73° 22' 00" W. for a distance of one hundred forty (140) feet; thence, on a bearing of N. 16° 38' 00" W. for a distance of three hundred one and seventy-nine hundredths (301.79) feet; thence, on a line curving to the right for a distance of one hundred ninety-two and fifty-nine hundredths (192.59) feet, the chord of said curved line bearing N. 40° 38' 00" W. for a distance of one hundred ninety-one and twenty-eight hundredths (191.28) feet; thence, on a bearing of N. 70 22' 00" E. for a distance of five hundred, forty-one and forty-four hundredths (541.44) feet to a point on the existing north-south seawall, which is the extension of the aforesaid east right-of-way line of Fifty-first Street; thence, along said north-south seawall on a bearing of S. 16° 38' 00" E. for a distance of nine hundred eighty-three and fifty-four hundredths (983.54) feet to the point of beginning and containing four and fifteen hundredths (4.15) acres, more or less, together with all improvements thereon;

said tract being shown and designated on plat hereto attached, marked Exhibit "B" and hereby made a part hereof for all purposes.

TO HAVE AND TO HOLD the above described premises together with all and singular the rights and appurtenances thereto in anywise belonging unto the said Galveston County Navigation District No. 1, its successors or assigns forever.

It is, however, understood, agreed and stipulated that in the event said Galveston County Navigation District No. 1 shall cease to use the above described premises for the Purposes aforesaid, then and thereupon this conveyance shall become null and void and the above described real estate and premises shall revert to Grantor, its successors, or assigns, provided that no temporary cessation of use shall effect or cause such reversion.

It is further understood, agreed and stipulated as follows:

47

340

(1) Said City of Galveston retains and shall retain the right and privilege, as to the real estate herein conveyed, to construct, maintain, operate, repair, replace and remove any and all utility installations and appurtenances thereto; and

(2) At no time will the surface drainage system of the above described real estate be obstructed, impaired or changed either by construction or destruction, save and except upon prior approval of Grantor;

it being the understanding and agreement of the parties hereto, and the intent hereof that the foregoing rights reserved and exceptions in favor of Grantor are and shall be subordinate and inferior to and shall not impair Grantee's use of the above described real estate for said Purposes or any of them.

EXECUTED this 8th day of September, 1955.

CITY OF GALVESTON

ATTEST:

Secretary.

By Geo. R. Clough
Mayor-President.

THE STATE OF TEXAS
COUNTY OF GALVESTON

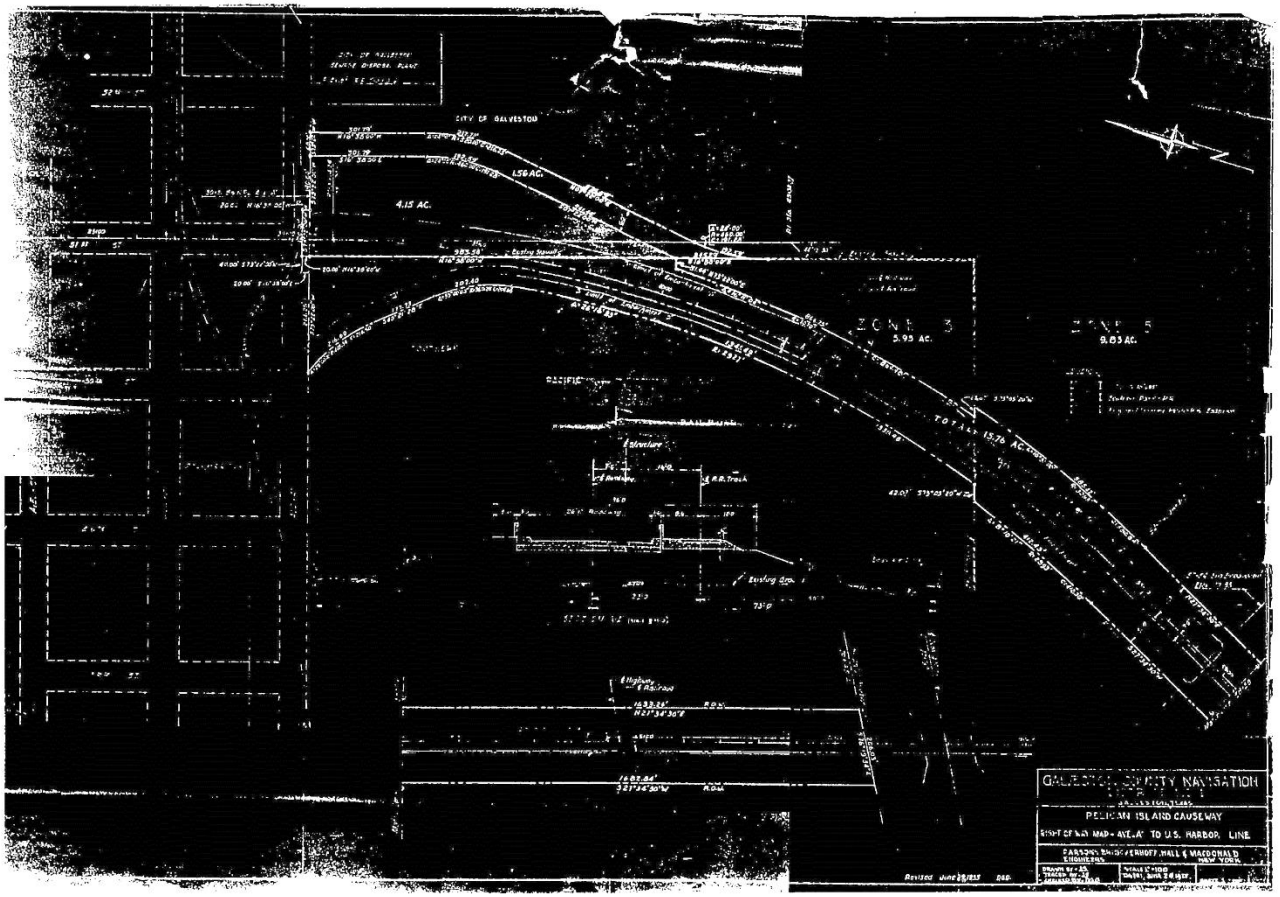
Before me, the undersigned authority, a Notary Public in and for Galveston County, Texas, on this day personally appeared Geo. R. Clough, Mayor-President of the Board of Commissioners of the City of Galveston, known to me to be the person and official whose name is subscribed to the foregoing instrument, and acknowledged to me that the same was the act of the City of Galveston and that he executed the same as the act of such City for the purposes and consideration therein expressed and in the capacity therein stated.

Given under my hand and seal of office this 9th day of September, 1955.

Notary Public in and for
Galveston County, Texas.

-3-

48


CITY OF GALVESTON
4.15 AC.
ZONE 3
5.95 AC.
ZONE 5
9.63 AC.
PELICAN ISLAND CAUSEWAY

342

RESOLUTIONS

BE IT RESOLVED BY THE BOARD OF COMMISSIONERS OF THE CITY OF GALVESTON:

That, pursuant to Motion duly made, seconded and carried as appearing by the Minutes of the Meeting of the Board of Commissioners of the City of Galveston, held on the 18th day of August, A. D. 1955, the City of Galveston convey by deed without warranty to Galveston County Navigation District No. 1 that certain tract or parcel of land situated in Galveston, Galveston County, Texas, more particularly described as follows:

"Commencing at the intersection of Avenue "A" in said City of Galveston, Texas and the extension of the East right-of-way line of Fifty-first Street in said City of Galveston, Texas, which is the point of beginning; thence along the said extension of the East right-of-way line of Fifty-first Street on a bearing of S. 16° 38' 00" E. for a distance of twenty (20) feet; thence, along a line parallel to the aforesaid north right-of-way line of Avenue "A" on a bearing S. 73° 22' 00" W. for a distance of one hundred twenty (120) feet; thence, on a bearing of N. 16° 38' 00" W. for a distance of twenty (20) feet to a point on the aforesaid north right-of-way line of Avenue "A"; thence, along said north right-of-way line on a bearing of S. 73° 22' 00" W. for a distance of one hundred forty (140) feet; thence on a bearing of N. 16° 38' 00" W. for a distance of three hundred one and seventy-nine hundredths (301.79) feet; thence, on a line curving to the right for a distance of one hundred ninety-two and fifty-nine hundredths (192.59) feet, the chord of said curved line bearing N. 40° 38' 00" W. for a distance of one hundred ninety-one and twenty-eight hundredths (191.28) feet; thence, on a bearing of N. 7° 22' 00" E. for a distance of five hundred forty-one and forty-four hundredths (541.44) feet to a point on the existing north-south seawall, which is the extension of the aforesaid east right-of-way line of Fifty-first Street; thence, along said north-south seawall on a bearing of S. 16° 38' 00" E. for a distance of nine hundred eighty-three and fifty-four hundredths (983.54) feet to the point of beginning and containing four and fifteen hundredths (4.15) acres, more or less, together with all improvements thereon.

EXHIBIT "A"
Page 1

50

343

BE IT FURTHER RESOLVED BY THE BOARD OF COMMISSIONERS OF THE CITY OF GALVESTON:

That Geo. R. Clough, Mayor-President of the Board of Commissioners of the City of Galveston is hereby authorized and empowered to execute and deliver to Galveston County Navigation District No. 1 a deed without warranty conveying the above described real estate to said Galveston County Navigation District No. 1 and that the City Secretary is hereby authorized and empowered to attest and affix the official seal of the City of Galveston to said deed.

I, Mildred M. Oser, Secretary of the Board of Commissioners of the City of Galveston, do hereby certify that the foregoing is a true and correct copy of Resolutions appearing in the Minutes of said City of Galveston, which Resolutions were adopted by the Board of Commissioners of the City of Galveston, at a meeting held on the 8th day of September, A. D. 1955.

IN WITNESS WHEREOF, I hereto subscribe my name officially under the seal of the City of Galveston, this 9th day of September, A. D. 1955.

Mildred M. Oser
Secretary of the Board
of Commissioners of the
City of Galveston.

EXHIBIT "A"
Page 2

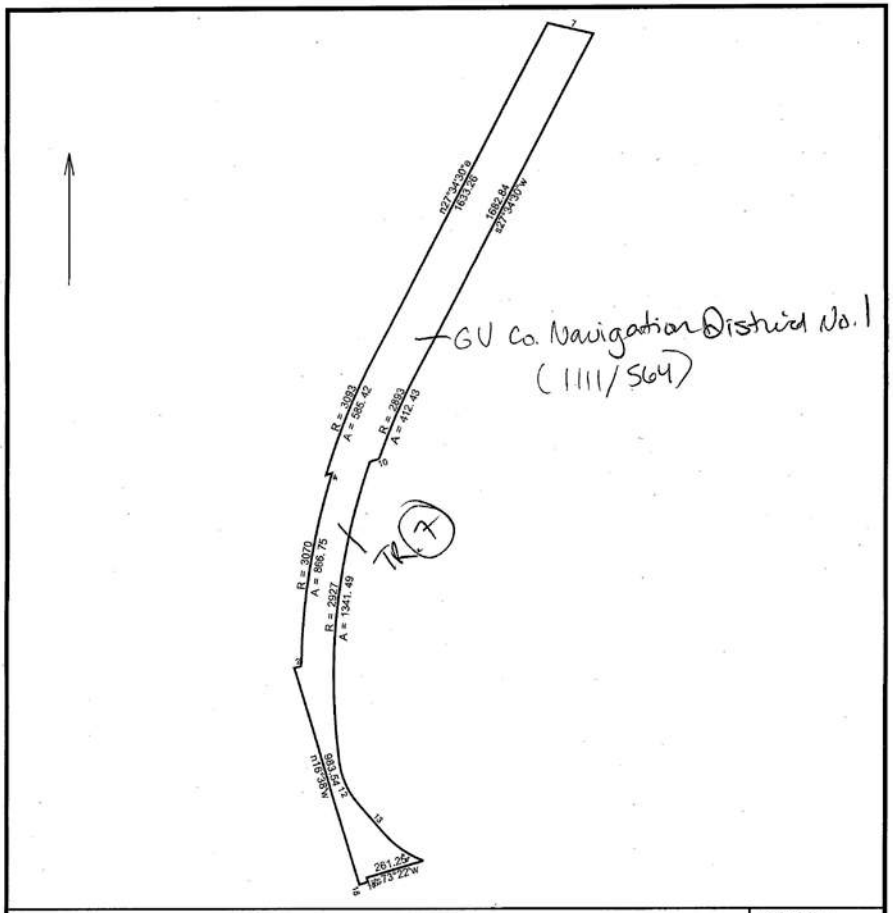
Filed for Record September 14, 1955 at 1:40 o'clock P. M. No. 141170
Recorded September 15, 1955 at 10:25 o'clock A. M.
JOHN R. PLATTE, County Clerk, By Lillian Meyer Deputy.

125-WARRANTY DEED — TEXAS STANDARD FORM

The State of Texas, County of GALVESTON } Know All Men by These Presents:

That Paul A. Milligan and wife, Jane S. Milligan of the County of Galveston State of Texas for and in consideration of the sum of ONE DOLLAR and other considerations DOLLARS to in hand paid by Frances M. Smithey as follows: have Granted, Sold and Conveyed, and by these presents do Grant, Sell and Convey, unto the said Frances M. Smithey

51



	10/6/2014
Scale: 1 inch= 482 feet	File: DPMap - 15.76ac.ndp

Tract 1: 15.7398 Acres, Closure: s49.1228e 0.29 ft. (1/30474), Perimeter=8756 ft.

01 n16.38w 983.54
02 n73.22e 31.44
03 Rt, r=3070.00, arc=866.75, chord=n08.5507e 863.87
04 s73.0520w 27.67
05 Rt, r=3093.00, arc=585.42, chord=n22.0900e 584.55
06 n27.3430e 1633.26
07 s76.1934e 206.03
08 s27.3430w 1682.84
09 Lt, r=2893.00, arc=412.43, chord=s23.2920w 412.08
10 s73.0520w 42.07
11 Lt, r=2927.00, arc=1341.49, chord=s05.4643w 1329.78
12 Lt, r=360.28, arc=207.40, chord=s23.5128e 204.55
13 s40.2128e 177.73
14 Lt, r=428.34, arc=216.69, chord=s54.5128e 214.39
15 s73.22w 261.25
16 s16.38e 20
17 s73.22w 40
18 n16.38w 20

52

1111/564

564

THE STATE OF TEXAS)
COUNTY OF GALVESTON) KNOW ALL MEN BY THESE PRESENTS:

THAT, Southern Pacific Terminal Company, a corporation organized and existing under and by virtue of the laws of the State of Texas, for and in consideration of the sum of Ten and 00/100 dollars ($10.00) and other valuable considerations, to it in hand paid by Galveston County Navigation District No.1, the receipt and sufficiency of which is hereby acknowledged, has granted, sold and conveyed, and by these presents does grant, sell and convey unto the said Galveston County Navigation District No. 1,

All that certain tract or parcel of land lying and being situated in the City of Galveston, Galveston County, Texas, and being a part of a tract of land which was conveyed to the Grantor herein by Arabella D. Huntington, et al, by deed dated July 10, 1901, recorded in Book 186, Pages 53 to 57, inclusive, of the Deed Records of Galveston County, Texas, more particularly described by metes and bounds as follows, to-wit:

Commencing at the intersection of the northerly prolongation of the east line of 51st Street and the north line of what formerly was Avenue "A", said intersection being on the west line of Grantor's property and is N. 16°38' W, three hundred thirty feet (330') from the southwest corner of Block 710, which is also the southwest corner of Grantor's property;

Thence N. 16°38'W, along Grantor's west property line, a distance of nine hundred eighty three and 54/100 feet (983.54') to corner;

Thence N. 73°22' E, a distance of thirty one and 44/100 feet (31.44') to corner;

Thence in a northeasterly direction along a line curving to the right having a radius of three thousand seventy feet (3070') and a long chord of eight hundred sixty four and 48/100 feet (864.48') which bears N. 8°55'07" E, a distance of eight hundred sixty six and 75/100 feet (866.75') to an intersection with the center line of Grantor's east-west bulkhead for corner;

Thence S. 73°05'20" W, along the center line of said bulkhead, a distance of twenty seven and 67/100 feet (27.67') to corner;

Thence in a northeasterly direction along a line curving to the right having a radius of three thousand ninety three feet (3093') and a long chord of five hundred eighty four and 84/100 feet (584.84') which bears N. 22°09' E, a distance of five hundred eighty five and 42/100 feet (585.42') to end of curve;

Thence N. 27°34'30" E, a distance of one thousand six hundred thirty three and 26/100 feet (1633.26') to corner on the south United States Harbor line as established in 1897;

Thence S. 76°19'34" E, along said Harbor line, a distance of two hundred six and 03/100 feet (206.03') to corner;

Thence S. 27°34'30" W, a distance of one thousand six hundred eighty two and 84/100 feet(1682.84') to corner;

Thence in a southwesterly direction along a line curving to the left having a radius of two thousand eight hundred ninety three feet (2893') and a long chord of four hundred twelve and 30/100 feet (412.30') which bears S. 23°29'20" W, a distance of

53

565

four hundred twelve and 43/100 feet (412.43') to corner on the center line of Grantor's said east-west bulkhead;

Thence S.73°05'20" W, along said center line, a distance of forty two and 7/100 feet (42.07') to corner;

Thence in a southwesterly direction along a line curving to the left having a radius of two thousand nine hundred twenty seven feet (2927') and a long chord of one thousand three hundred thirty and 44/100 feet (1330.44') which bears S. 5°46'43" W, a distance of one thousand three hundred forty one and 49/100 feet (1341.49') to end of curve;

Thence in a southeasterly direction along a line curving to the left having a radius of three hundred sixty and 28/100 feet (360.28') and a long chord of two hundred four and 65/100 feet (204.65'), which bears S. 23°51'28" E, a distance of two hundred seven and 40/100 feet (207.40') to end of curve;

Thence S. 40°21'28" E, along the southeasterly tangent of preceding curve, a distance of one hundred seventy seven and 73/100 feet (177.73') to corner;

Thence in a southeasterly direction along a line curving to the left having a radius of four hundred twenty eight and 34/100 feet (428.34') and a long chord of two hundred fourteen and 50/100 feet (214.50') which bears S. 54°51'28" East, a distance of two hundred sixteen and 69/100 feet (216.69') to corner on the north line of former Avenue "A", which was closed and abandoned by Ordinance adopted by the City Council of the City of Galveston, Texas, on February 4, 1899;

Thence S. 73°22' W, along the north line of former Avenue "A", a distance of two hundred sixty one and 25/100 feet (261.25') to corner;

Thence S. 16°38' E, a distance of twenty feet (20') to corner;

Thence S. 73°22' W, parallel with the north line of former Avenue "A", a distance of forty feet (40') to corner on Grantor's said west property line;

Thence N. 16°38' W, along Grantor's said west property line being also the east line of 51st Street, a distance of twenty feet (20') to the place of beginning and containing fifteen and seventy six one hundredths (15.76) acres, of which 9.83 acres, more or less, are submerged.

Southern Pacific Terminal Company, Grantor herein, excepts herefrom and reserves unto itself, its successors and assigns all of the oil, gas, sulphur and other minerals (whether similar or not to those named), in, on and underlying the property herein conveyed, without however, any right whatsoever to use the surface thereof for any purpose in connection therewith.

All ad valorem taxes lawfully assessed against the property herein described up to and including the year 1954 have been paid and the Grantor assumes and agrees to pay all ad valorem taxes lawfully assessed against said property for the year 1955, before same become delinquent.

This conveyance is made subject to all of the terms and conditions of that certain Act of the 26th Legislature of the State of Texas, known as Senate Bill No. 228, approved May 1, 1899, entitled:

"An Act ratifying and confirming an ordinance passed by the City Council of the City of Galveston the 4th day of February, 1899, entitled "An Ordinance abandoning, discontinuing and closing certain streets, avenues and alleys of the City of Galveston, and authorizing and empowering Collis P. Huntington, his heirs or assigns, perpetually to construct and maintain piers on the shore of Galveston Bay within the corporate limits of the City of Galveston upon certain specified conditions," and conditionally relinquishing any claim the State of Texas may have to part of the property therein described."

and being Chapter XCIV of the General Laws of Texas enacted by said 26th Legislature, to which reference is here made for all purposes

54

566

and which is hereby incorporated herein to the same extent as if said Act had been set forth herein.

TO HAVE AND TO HOLD the above described premises, together with all and singular the rights and appurtenances thereto in anywise belonging, unto the said Galveston County Navigation District No.1, its successors and assigns forever. And Southern Pacific Terminal Company does hereby bind itself, its successors and assigns, to warrant and forever defend, all and singular, the said premises unto the said Galveston County Navigation District No. 1, its successors and assigns, against every person whomsoever lawfully claiming or to claim the same, or any part thereof, by, through or under it but no further.

IN TESTIMONY WHEREOF, the Southern Pacific Terminal Company has caused these presents to be executed by its President, attested by its Secretary and its corporate seal to be hereunto affixed on this the 12 day of August A. D. 1955.

SOUTHERN PACIFIC TERMINAL COMPANY,

ATTEST: Secretary

BY President

THE STATE OF TEXAS)
COUNTY OF HARRIS)

BEFORE ME, the undersigned, a Notary Public in and for Harris County, Texas, on this day personally appeared B. F. BIAGGINI, JR., President of the Southern Pacific Terminal Company, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same in the capacity and for the purposes and considerations therein stated, and as the act and deed of said corporation.

Given under my hand and seal of office, this the 12 day of August, A. D. 1955.

M. L. Bush, Notary Public, in and for Harris County, Texas

Notary Public, in and for Harris County, Texas.

Filed for Record August 16, 1955 at 1:30 o'clock P. M. No. 138543
Recorded August 17, 1955 at 1:35 o'clock P. M.
JOHN R. PLATTE, County Clerk, By _____ Deputy.

55

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