Victoria Barge Canal Railroad Bridge Concept Study

Texas Department of Transportation | 2023

Victoria Barge Canal Railroad Bridge

Concept Study

Developed by TranSystems

These documents are preliminary and subject to change. They are not intended for construction or permit purposes. They were prepared by, or under the supervision of:

Gary J. Law, P.E.# 66550 11-01-2023

TranSystems - F3557

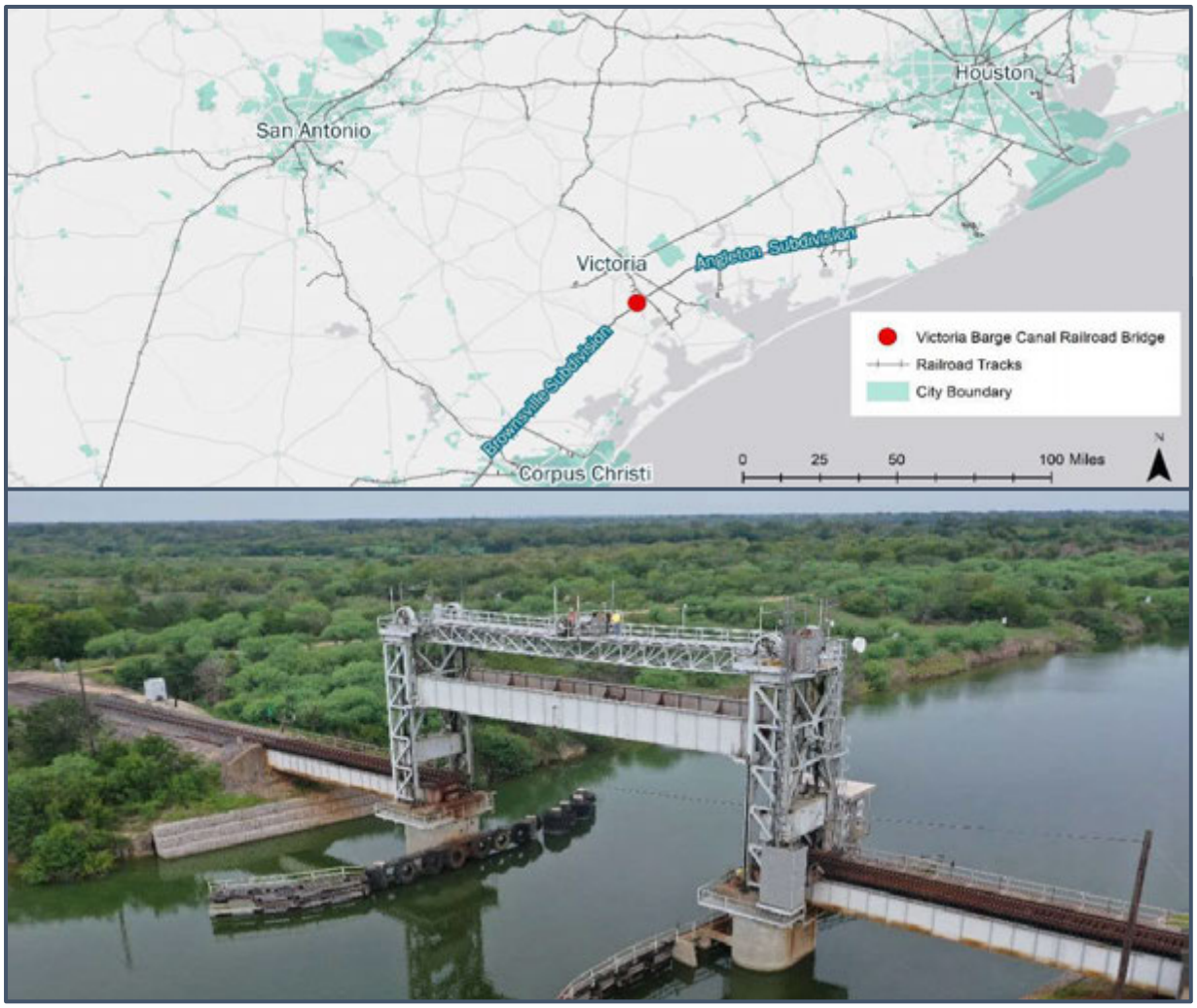
Table of Contents

Introduction

Texas Department of Transportation (TxDOT) and the Port of Victoria (the Port) have a shared interest to improve efficiency of waterway and rail freight movement. The goal of this project is to identify a conceptual layout that satisfies the future needs of all interested parties.

The Victoria Barge Canal Railroad Bridge is a unique situation where a public entity, the Port, owns and maintains the bridge. The bridge is nearing the end of its useful life and major repairs or replacement is outside the financial capacity of the Port. A goal of TxDOT is to facilitate the movement of freight and international trade, foster economic competitiveness, and improve the reliability of the state transportation system. If the bridge were to fall out of service, the impacts to freight movement would be experienced statewide.

This document summarizes work performed by TranSystems in providing professional services for an assessment of modifying vertical clearance at the Victoria Barge Canal Railroad Bridge. TranSystems completed conceptual engineering, preparation of cost estimates, funding analysis, and engagement of local officials and community leaders to advance planning on concepts to improve efficiency of waterway and rail freight movement.



Background

Geographically positioned along the mid-coast of Texas, the Port is a two-hour drive away from major cities like Houston, Austin, San Antonio, and Corpus Christi. With its connection to the Gulf Intracoastal Waterway (GIWW) through the Victoria Barge Canal, the Port has access to the Mississippi River, Ohio River, and their connecting canals and river basins. Construction of the GIWW was formally completed in 1949 with a ribbon cutting for the section between Corpus Christi and Brownsville. Construction of the barge canal began in 1951 with its completion in 1965. The current lift bridge is original to the project. In 2002, the widening and deepening of the Victoria Barge Canal was completed. Since then, the lift bridge has been a constricting point along the canal, limiting the freight capabilities of the Port.

The GIWW is a major backbone of the Texas economy, approximately 75 million tons of goods moved on the Texas portion of the GIWW in 2020.[1] Given the projected 45 percent growth in both the Texas population and national freight by 2045, the significance of the GIWW will continue to grow.[2] Multimodal port facilities such as the Port of Victoria will enable Texas to capture the benefits of growing demand.

Maritime

The criticality of the barge canal is still being realized. The Port has capacity for significantly more tenants. Still, with as many as 10 barge trips daily, maritime traffic has a considerable impact on rail operations. Legally, barge traffic has priority over rail traffic so that when a vessel approaches the bridge. The lift must be opened as soon as possible to accommodate an approaching vessel.

33 CFR § 117.991 Victoria Barge Canal

The draw of the Victoria Barge Canal Railroad Bridge across Victoria Barge Canal, mile 29.4, at the Bloomington, Victoria County, Texas, shall operate as follows:

(a) The draw shall be unmanned and when a vessel with AIS equipment onboard approaches the two-mile post, the dispatcher will receive a prompt to open the bridge, if required, because a vessel is approaching. The vessel may continue to transit the waterway, but must tune their radiotelephone to VHF–FM channel 13 and receive passing instructions from the railroad dispatcher. The dispatcher must contact the vessel promptly to provide passing instruction to insure the continued safe transit of the vessel. Vessels without AIS equipment or vessels with AIS who would prefer to call via telephone, may call the railroad dispatcher at 800–262–4691 to arrange passing instructions.
(b) When any vessel approaches the one-mile post, the railroad dispatcher should have either cleared the vessel through the bridge or given an indication that a train is in the block and the vessel will be cleared as soon as practicable. If the vessel has not yet spoken with the railroad dispatcher, the vessel should immediately call the railroad dispatcher via telephone at 800–262–4691.
(c) If any vessel reaches the one-half mile post and has not communicated with the railroad dispatcher nor been cleared to proceed, the vessel should stop and contact either the railroad dispatcher at 800–262–4691 or the Port of Victoria emergency contact at 361–570–8855.

[USCG–2014–0952, 80 FR 39686, July 10, 2015]

[1] 2022 Gulf Intracoastal Waterway Legislative Report – 88th Texas Legislature
[2] IBID

Rail

The Port is situated adjacent to two rail lines: the Brownsville Subdivision (mainline) and the Victoria Industrial Lead. The Brownsville Subdivision, with the Angleton Subdivision north of the project area, is the primary rail corridor along the gulf coast between Mexico and Houston. This critical rail corridor is utilized by three Class 1 railroads: Union Pacific Railroad (UP), BNSF Railway (BNSF), and Canadian Pacific Kansas City Limited (CPKC). According to the Federal Railroad Administration (FRA), there are approximately 18 trains crossing the bridge daily.[3] The Port is in the process of completing a 10-year rail expansion effort which will connect the Port facilities to the Brownsville Subdivision and features enough capacity to work over 1,000 rail cars. The expansion would allow Port tenants to access UP and BNSF railroads and enhance freight rail services throughout the region.

The importance of this rail corridor to the Texas economy can be recognized through port access, border-crossing access, rural economic development, and quality job creation.

One pivotal facet of this corridor's importance is its role in providing access to ports. These ports serve as critical gateways for the exchange of goods, both domestically and internationally. The corridor's connectivity to these ports is indispensable for efficient import and export operations, making it a linchpin for businesses engaged in global trade. In 2016, the Panama Canal Authority officially opened a larger, third set of locks on the canal. The canal capacity for container vessels, previously limited to 4,500 Twenty-foot Equivalent Units (TEU) ships, are increasing to container vessels of 12,500 TEU capacity.[4] This expansion project creates an opportunity for the ports in the eastern and southern U.S. to capture additional ocean trade with Asia and the West Coast of South American countries – traffic that, until recently, had avoided Atlantic ports and traveled instead to ports on the West Coast before traveling to eastern and southern regions by rail or truck.

Cross-border trade with Mexico stands as another driving force behind the corridor's economic significance. The corridor serves as a conduit for the flow of goods between the United States and Mexico. Trade agreements, such as the United States-Mexico-Canada Agreement, have further enhanced this cross-border commerce, bolstering the economic competitiveness of the region.

Regional economic development is another facet of this corridor's influence. As it traverses through rural areas, the corridor stimulates economic activity in these regions. An extended period of disruption would impact economic conditions on a regional scale. It attracts businesses, fosters job creation, and encourages investments that strengthen the fabric of rural economies. The corridor's impact extends to the realm of job creation, not just in terms of quantity but also in the creation of quality jobs. These jobs represent a variety of skills and sectors, ranging from logistics and transportation to maintenance and operations.

[3] U.S. DOT Crossing Inventory Form, 2021
[4] Texas Rail Plan

Existing Conditions

At the time of this report (2023) the lift bridge is in working condition but approaching a period needing significant investment for major rehabilitation reconstruction. The canal was dredged this year by the U.S. Army Corps of Engineers (USACE). A copy of the most recent hydrological study completed by the Corps can be found in **Appendix A**.

Maritime Infrastructure

Construction began on the canal in 1951 and it was completed in 1965, which included the lift bridge in operation today. Original plans for the bridge are included as **Appendix B**. Thirty (30) years later, construction began to widen and deepen the channel. In 2002, widening and deepening of the canal was completed. The canal is maintained by the USACE who routinely dredge the majority of the canal to a depth of 14 feet and width of 125 feet. There are three locations along the canal where the width is restricted to 75 feet: Dupont Road (existing plans for removal from channel), State Highway 35 (existing plans for removal from channel), and the Victoria Barge Canal lift bridge. Soon, the bridge will be the sole constriction point in the channel.

Rail Infrastructure

The Victoria Barge Canal Railroad Bridge is nearing 60 years in operation and will soon require significant investments to maintain operability and serviceability. Without significant investments, the rail corridor is at risk of extended mobility disruptions as the lift bridge ages. The bridge features a single line of track with a maximum speed of 50 mph. The bridge sees an average of 18 trains daily, nearly one train per hour, with nine during the day and nine during the night. Since 2011, lift bridge expenses totaled approximately $3,967,000. As rail and maritime traffic continues to increase, concerns regarding reliable operation of the bridge will continue to demand investment.

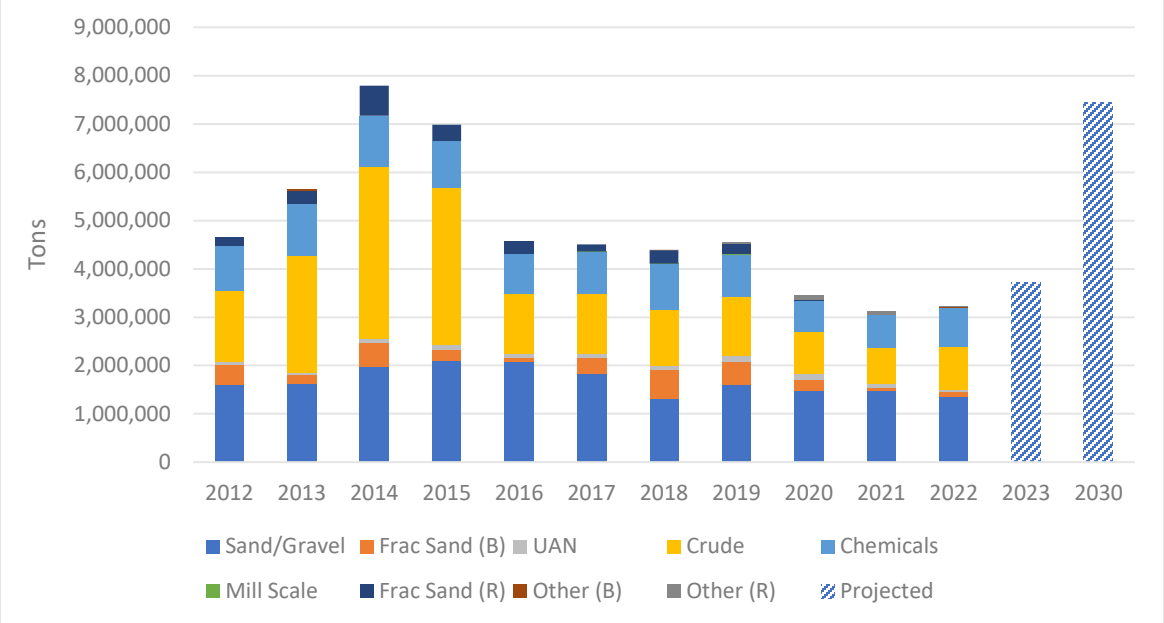
Marine and Rail Traffic

An increase of either mode of freight transportation traffic, maritime or rail, means more interruptions to the other.

Maritime Traffic

Traffic along the canal has varied over the last 10 years, experiencing a peak in 2014.[5] Since the COVID-19 pandemic, freight tonnage has increased each year. The projected tonnage by 2030 is double the expected tonnage of 2023. The increasing amount of maritime traffic will result in more bridge movements. The Port does not track the number of bridge movements annually, however, operations may be similar to 2014, the last year freight tonnage surpassed 7,000,000.

[5] Port of Victoria Freight Volume by Tonnage, 2012-2022



Source: Port of Victoria, 2023

Rail Traffic

Rail traffic on the UP Brownsville Subdivision is expected to increase. The demand for rail capacity continues to grow as markets in Texas expand including grain, power equipment (e.g., large wind turbine components), petroleum coke exports to Mexico, and bulk fertilizer shipments destined for the Midwest.[6] Approximately 60 percent of the rail traffic along this corridor is CPKS. The remaining 40 percent of rail traffic is divided between UP and BNSF. As maritime traffic increases, the interruptions to rail service would be experienced by all three Class 1 railroads.

[6] South Texas Rail Capacity Project

Improvement Alternatives

With the goal to increase the efficiency of freight movement for barge and rail traffic, three alternatives were identified. Alternatives take into consideration future capacity needs for rail traffic as well as increased horizontal and vertical clearances for canal traffic. Therefore, all three alternatives feature the possible expansion of capacity for double tracks, an air-draft clearance of at least 73 feet, and a clear width of 85 feet to 125 feet.

Alternative 1: In-line Mechanical Structure

The first alternative identified is replacement of the existing mechanical lift structure with a new mechanized bridge. An in-line mechanized structure would not require additional ROW or carry the high up-front costs of a flyover. However, removing the existing bridge and installing a new one along the existing alignment would result in significantly higher immediate impacts to rail operations than other alternatives. Beyond construction impacts, commissioning the in-line bridge would result in additional downtime for rail operations.

A bascule bridge could be an option for an in-line replacement of the existing bridge if approved by the United States Coast Guard (USCG). An advantage of a bascule bridge is the mechanical components could be located on only one side of the canal, as opposed to a lift bridge which requires components on both sides of the canal. Another benefit to a bascule bridge would be reduced maintenance costs. On average, bascule bridges have a lower annual maintenance cost due to the nature of gears versus pullies found on a lift bridge. A disadvantage of a bascule bridge is communications will require a submarine cable or an adjacent aerial span. Another disadvantage is the USCG is responsible for regulating bridges and for this portion of the GIWW, mechanical lift bridges and fixed bridges are the official recommendation. While a bascule bridge may still get permitted, additional coordination with authorizing agencies would be required. With this alternative, interruptions to maritime and rail operations would persist, and extensive interruptions related to construction make this alternative less desirable than others.

Alternative 2: Off-Alignment Mechanical Structure

The second alternative identified is replacement of the existing mechanical lift structure with a new mechanized bridge. An off-alignment mechanized structure may require additional ROW but would not carry the high up-front costs of a flyover. Impacts to rail and maritime operations would be less significant for this alternative compared to an in-line replacement.

The new bridge could be constructed south of the existing alignment which would allow for oversized components to be delivered by barge, lessening impacts to rail operations. To accommodate future rail capacity needs, the combination of a new off-alignment single-track bridge could be combined with an in-line single-track replacement bridge. Together, the two bridges would provide double track capacity while creating minimal impact to operations.

Alternative 3: Off-Alignment Flyover

The final alternative identified is a flyover concept. Starting at milepost 214 headed north and milepost 218 headed south, track grade would increase at a one percent incline to achieve an air-draft clearance of 73 feet over the canal. A minimum horizontal clearance of 125 feet would accommodate

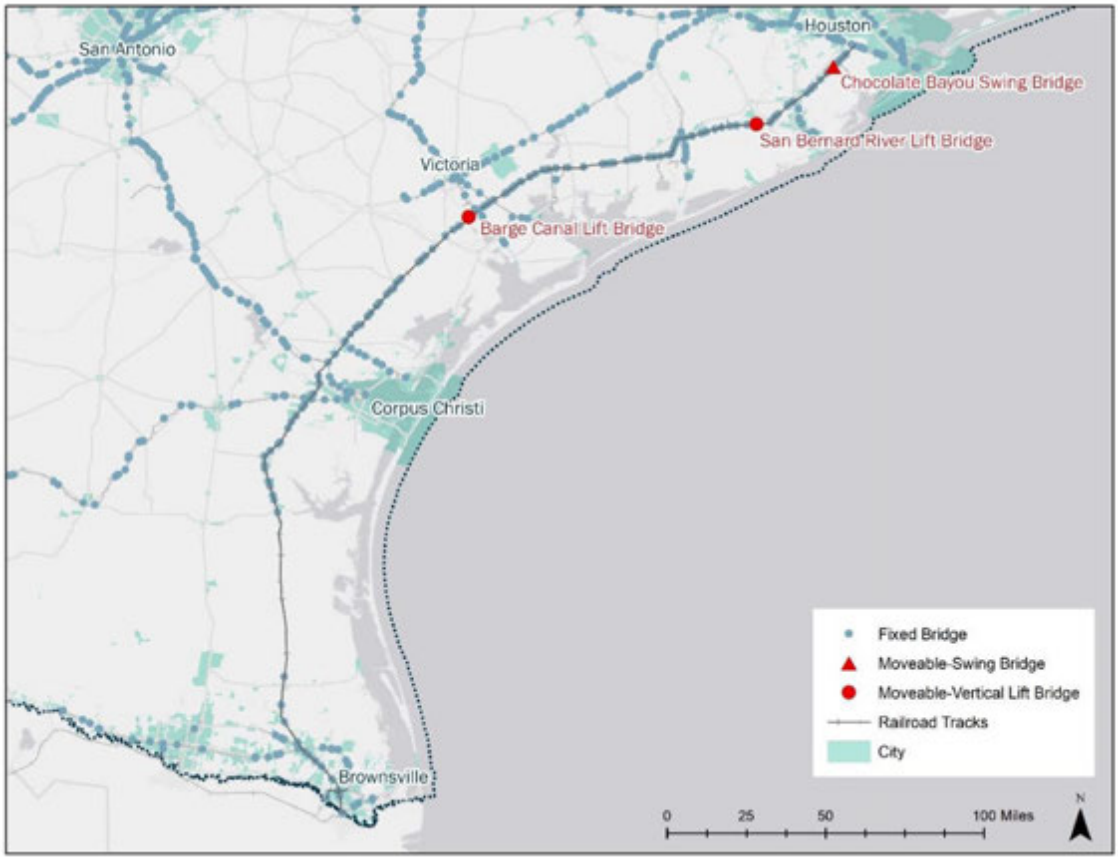
side-by-side barges. Because the tie-ins to the existing alignment would occur near milepost 214 and milepost 218, the reconstruction of the industrial spurs from the port to the Brownsville mainline would be required. This alternative may limit the port's rail access to only the Victoria Industrial Lead and could require the acquisition of significantly more ROW for construction.

The removal of mechanical components from the proposed bridge would offer substantial enhancements in the reliability of freight movement, benefiting both rail and barge traffic. As this concept is further developed, it is conceivable that UP might be more open to the prospect of taking ownership of the new bridge, particularly when compared to alternatives featuring mechanical structures.

It is important to underscore the removal of this lift bridge should not be perceived as an endeavor to altogether remove mechanical bridges along the rail corridor stretching from Brownsville to Houston. North of the Port, in Brazoria County, two mechanical bridges exist on the Angleton Subdivision, both of which are owned by UP: a vertical lift bridge spanning the San Bernard River and a swing bridge over the Chocolate Bayou.

To attain the dual objectives of improved reliability and heightened capacity, it may be appropriate to adopt a corridor-based approach for infrastructure enhancements. Such an approach would ensure that the broader network within this region is resilient, responsive, and well-equipped to meet the growing demands of freight movement.

Existing Mechanical Structures Along the Corridor



Concept Alternatives Matrix

The following matrix identifies strengths and weaknesses of each alternative. The matrix is not meant to be a comprehensive alternative analysis but represents the narrow focus of this report on improved functionality of freight movement. Improved barge capacity includes increased width and clearance while improved rail capacity is a measure of reduced disruptions. Negative temporary impacts to rail and maritime operations includes disruptions due to traffic and construction activities. Other considerations include right of way acquisitions, compatibility with the Port's infrastructure (namely the Texas Logistics Center), and bridge cost.

Red = No Improvement, Amber = Slight Improvement, Green = Improvement

	No Build	In-line Mechanical Structure	Off-Alignment Mechanical Structure	Off-Alignment Flyover
Improved Barge Capacity				
Improved Rail Capacity				See Note*
Negative Temporary Impact to Rail Operations				
Negative Temporary Impact to Barge Operations				
New ROW Acquisitions				
Compatibility with Texas Logistics Center				
Bridge Costs				
Overall				

* Do not achieve improved rail capacity until all moveable bridges on corridor are replaced with fixed bridges.

Based on the table above, the likely concept to move forward is the off-alignment mechanical structure. The off-alignment mechanical structure results in the fewest negative impacts to rail and maritime operations while still meeting the desired capacity and reliability goals. While the off-alignment mechanical structure still poses temporary impacts to barge and rail operations, the disruption would be measured in days compared to an in-line replacement where disruptions would be measured in months. If a corridor-based approach is undertaken, a flyover may be more prudent for improved reliability.

Engagement of Local Officials

On September 25th, 2023, a meeting was convened to introduce local officials and community leaders to this study. A total of 13 individuals from the Victoria County Navigation District, Port of Victoria, Victoria County, Victoria Economic Development Corporation, and TxDOT attended. During the meeting, the study team presented three concepts, fostering a group discussion into the strengths and drawbacks of each option. The concepts consisted of two flyover concepts (one with standard earthwork, another utilizing retaining walls to reduce ROW requirements) and an off-alignment mechanical structure. Meeting exhibits are included in **Appendix C.**

The group acknowledged the merits of the flyover concepts, appreciating their potential benefits. However, concerns were raised regarding the associated reinvestment costs to reconnect the Texas Logistics Center with the Brownsville Subdivision Main. Given that the Port is presently in the process of securing state funding for on-site rail enhancements, including connectivity to the Brownsville Subdivision, concerns were expressed about the compatibility of these improvements with a flyover structure.

Conversely, when the lift bridge concept was under consideration, attendees conveyed a more optimistic outlook, primarily influenced by the potential for reduced costs and its alignment with ongoing port infrastructure enhancements. During the discussion, attendees addressed the complex question of bridge ownership. This included reflecting upon the positives and negatives of the Port retaining ownership, recognizing the private interests of UP, a for-profit enterprise. These discussions resulted in a division of opinions regarding the tradeoffs associated with maintaining ownership of a lift bridge versus transferring ownership of a fixed-bridge solution.

This meeting was a successful forum for sharing insights and perspectives, allowing for a comprehensive examination of the alternatives under consideration. It provided a valuable platform for attendees to voice their concerns, interests, and considerations, thus informing the decision-making process related to this critical piece of infrastructure.

Bridge Costs

Construction costs can be highly volatile due to fluctuations in the prices of raw materials like steel and shifts in labor costs influenced by market demand. This volatility can result in substantial project cost variations, making accurate budgeting and cost estimation a challenging aspect of construction planning. Estimates to replace the existing bridge, contained in **Appendix D**, include the following costs:

- Planning Study (5 percent of estimated construction cost): $600,000
- Final Design and Construction Activities: $102,223,160
    - Final Design (7 percent of estimate construction cost): $714,000
    - Existing Bridge Demolition: $4,000,000
    - New Bridge Construction: $51,500,000
    - Railroad Realignment: $46,723,160

Implementation Strategies

This study serves as a starting point for continued multimodal coordination, collaborative planning, and design of a barge canal rail bridge replacement. Concepts presented here should be further developed following stakeholder and community input. A follow-up study to develop preliminary plans could determine concept feasibility, expected environmental impacts, and/or ROW requirements. Multiple options for funding future studies may be available, including the following:

The Rebuilding American Infrastructure with Sustainability and Equity (RAISE)

- Provides funding directly to *any* public entity, including municipalities, counties, port authorities, tribal governments, or Metropolitan Planning Organizations (MPOs).
- Program does NOT require a 20% local match
- Application window has previously occurred in early winter.

Consolidated Rail Infrastructure and Safety Improvements (CRISI)

- Provides funding to states, political subdivision of a state, MPOs, rail service provider, tribal governments, or a rail-related transportation research institution.
- Program requires a 20% local match
- Application window has previously occurred in spring or summer.

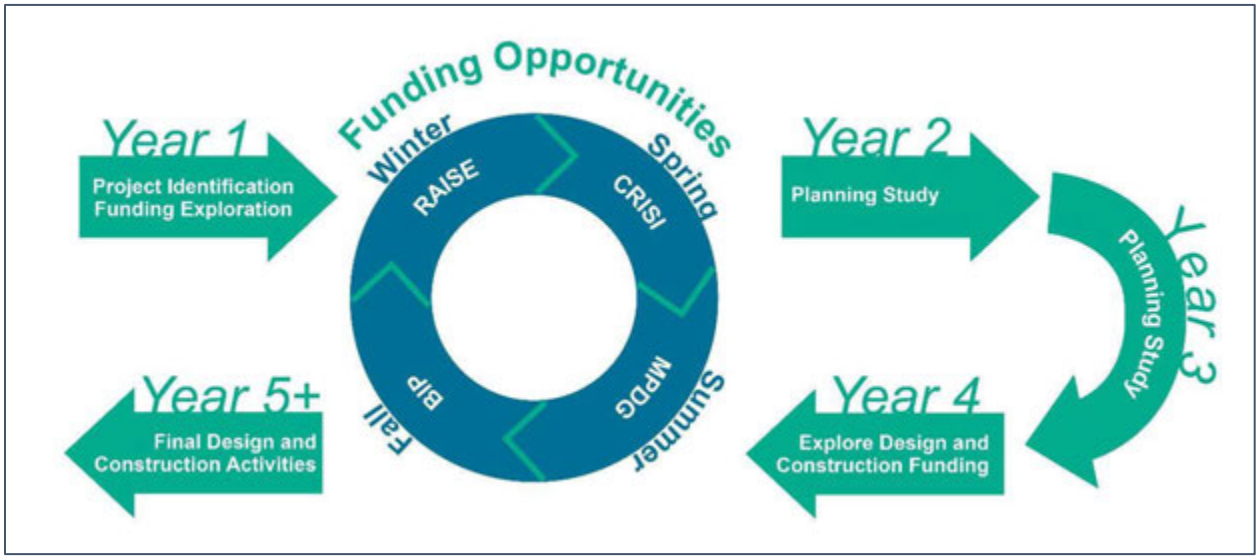
Multimodal Project Discretionary Grant (MPDG)

- Provides funding to states, political subdivisions of the state, MPOs, port authorities, local governments, tribal governments, and groups of eligible entities.
- Program requires a 20% local match
- Application window usually occurs in summer

Bridge Investment Program (BIP)

- Provides funding to state, county, or city governments, as well as tribal governments and special government districts.
- Program requires a 20% local match
- Application window has previously occurred in the fall.

The following graphic illustrates potential funding opportunities throughout the funding cycle. Application windows for federal funding, shown on the wheel, can fluctuate.



The planning study, years two through four, would focus on consensus building around preliminary concepts, alternative analysis, and environmental investigations to conform with the National Environmental Policy Act (NEPA).

NEPA requires a consideration of environmental impacts for federally funded projects that significantly impact the environment. This required environmental review can be satisfied in three ways depending on the scope of a project. These three methods are: categorical exclusions (CE), which are categories of projects that have been predetermined to have only minimal environmental impacts; environmental assessments (EAs) that result in a finding of no significant impact; and environmental impact statements (EIS) for projects that are expected to have a significant impact. It is anticipated that a Federal Railroad Administration NEPA review will confirm that the project is eligible for a Categorical Exclusion allowing it to move quickly to construction.

Year 5 and beyond, design and construction phase activities begin. These activities include final design, ROW acquisition, relocation activities (in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act), utility adjustments, and finally construction.

Recommendations

The likely concept to move forward is the off-alignment mechanical structure, included in **Appendix E**. The structure should be constructed on the gulf-side of the existing alignment to allow for maritime delivery of oversized bridge elements. The lift span would be wide enough to span the entire dredged channel and provide the vertical clearance required for maritime freight on the GIWW to use this corridor. The concept minimizes interruptions to rail traffic and minimizes additional ROW acquisition.

A broader feasibility study with consideration of the entire corridor could determine the appropriate replacement for this bridge. If all mechanical structures could be replaced to optimize freight

movement through the corridor, it could change which type of bridge is recommended as a replacement for the existing Victoria Barge Canal Railroad Bridge.

References

Federal Railroad Administration. (2021). *U.S. DOT Crossing Inventory Form.*

Port of Victoria. (2023). *Freight Volume by Tonnage, 2012-2022.*

Texas Department of Transportation. (2010). *Rail Capacity Expansion for the South Texas Region.*

Texas Department of Transportation. (2019). *Texas Rail Plan.*

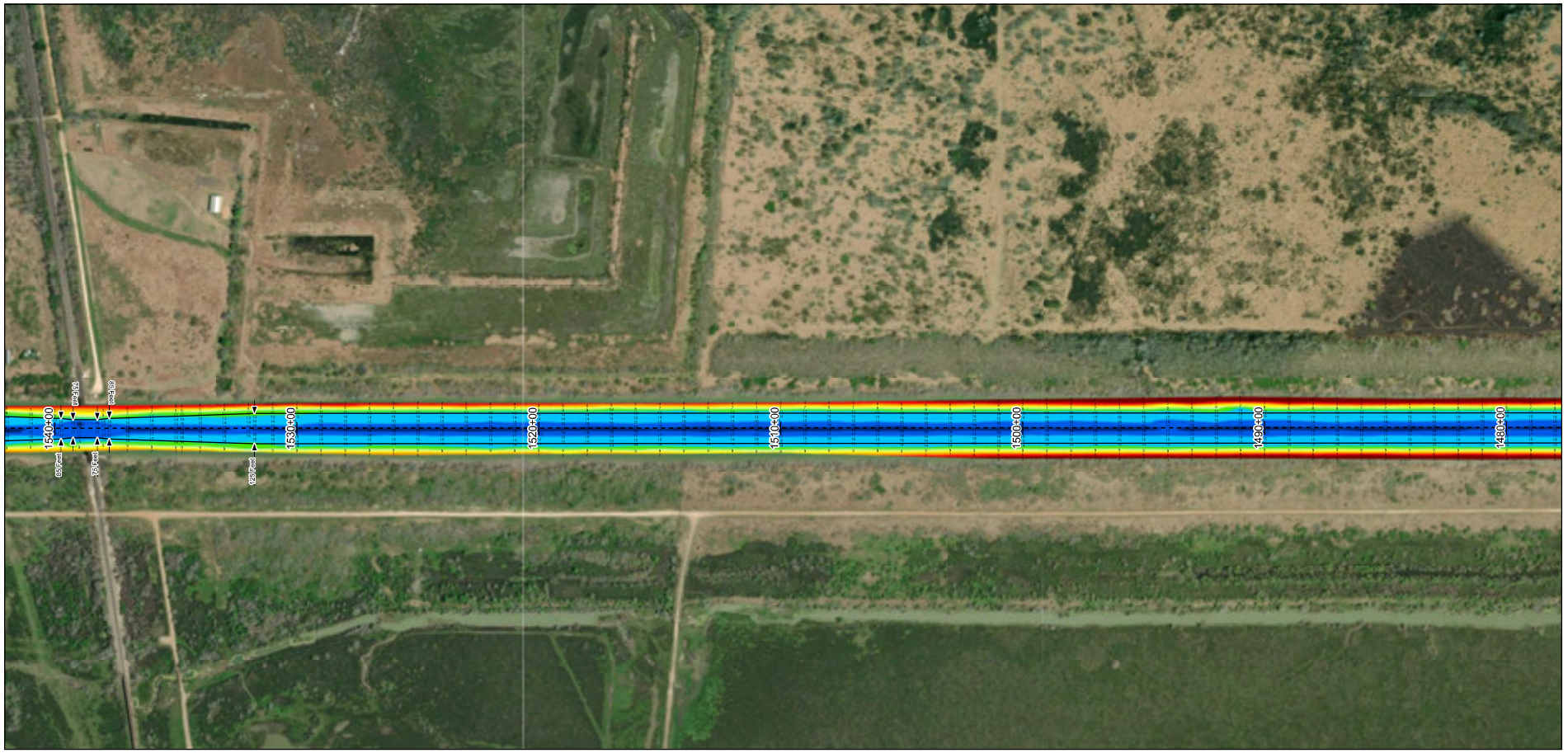
Texas Department of Transportation. (2022). *Gulf Intracoastal Waterway Legislative Report - 88th Texas Legislature.*

Appendix A

USACE Hydrographic Survey

Channel to Victoria: Mile 14 to Mile 29

U.S. Army Corps of Engineers
Galveston District



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Website Index Number: 30
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Scale: 1:2,400
PDF Print Date: 5/15/2023
Mapped by: M3AOXPAC
Additional Imagery info:

Channel Features
- Channel Center Line
- Channel Toe
- Channel Station Lines
- Channel Dimensions

Aids to Navigation
- Green Side Aids
- Red Side Aids
- Lights

MLLW
0 - 4 | 4 - 6 | 6 - 8 | 8 - 10 | 10 - 12 | 12 - 14 | 14 - 16 | 16 - 18 | < 18

NOTES:
1. Horizontal coordinates are referenced to texas state plane coordinate system, south central zone nad83 us survey feet.
2. Elevations are referenced to mean lower low tide (MLLW) datum.
3. This project was designed by the galveston district of the u.s. army corps of engineers. The initials and signatures and registration designations of individuals appear on these project documents within the scope of their employment as required by er1110-1-8152.
4. The information depicted on this survey map represents the results of surveys made on the dates indicated and can only be considered as indicating the general conditions existing at that time. These conditions are subject to rapid change due to shoaling events. A prudent mariner should not rely exclusively on the information provided here. Required by 33 cfr 209.325
5. For the most up to date information please check our website at: http://www.swg.usace.army.mil/Missions/Navigation/HydrographicSurveys/

Service Layer Credits: World Topographic Map: Texas Parks & Wildlife, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, NGA, EPA, USDA
World Ocean Base: Esri, GEBCO, DeLorme, NaturalVue
World_Imagery: Maxar, Microsoft
World_Imagery: Maxar

Additional Combined Survey Dates and Stationing:
COMB_SURV_INFO_HERE

Coordinate System: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet
Projection: Lambert Conformal Conic

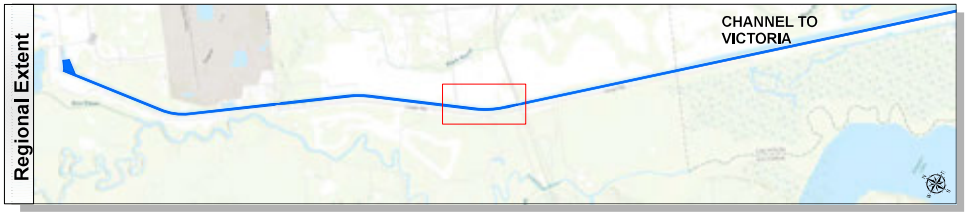
Dredging Reach Extent
0 0.25 0.5 1 Miles

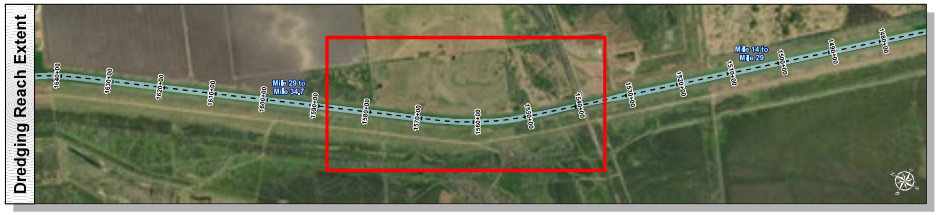
Hydrographic Survey Extent
0 205 410 820 Feet

HYDROGRAPHIC SURVEY
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
GALVESTON, TEXAS

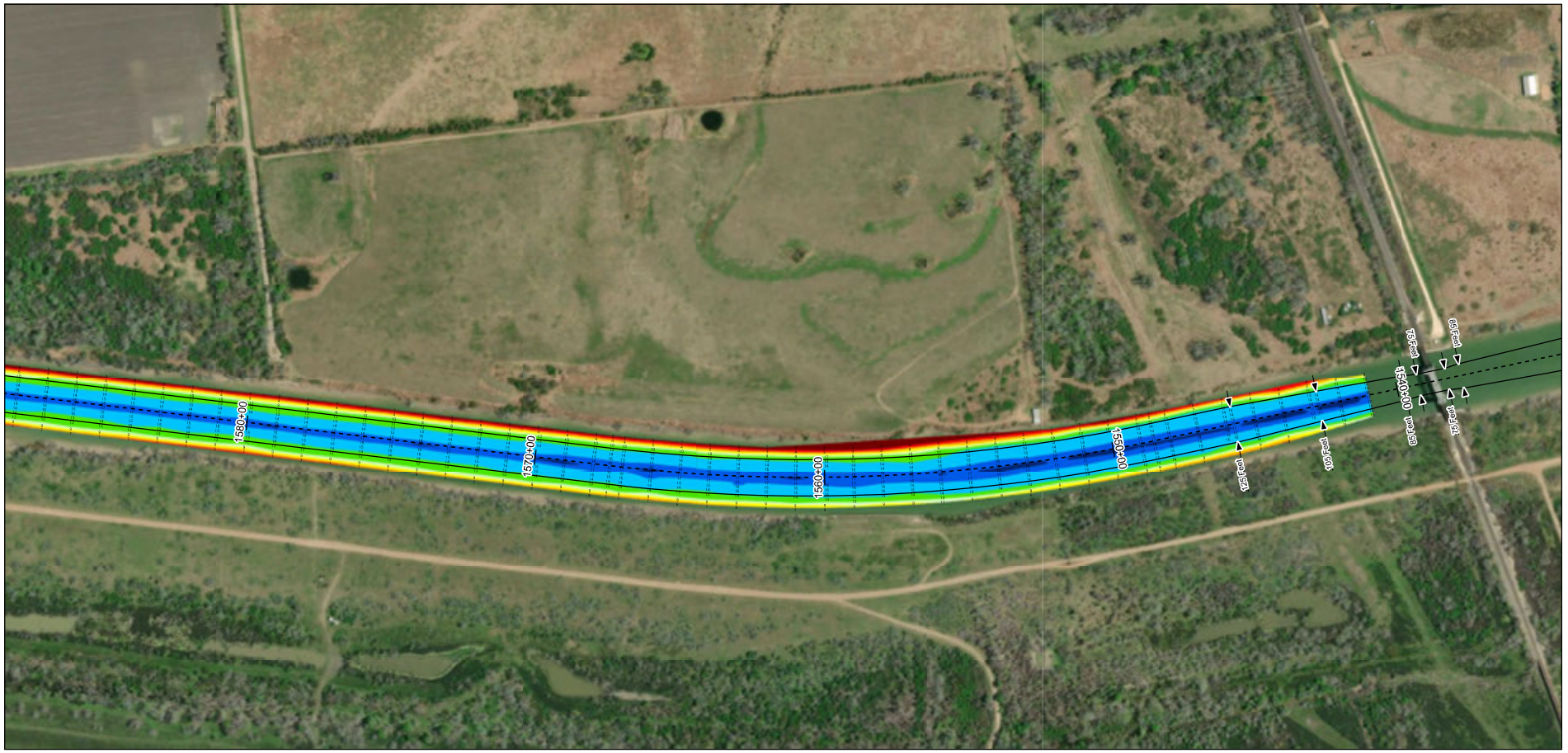
Station: 740+00 to 1540+00
CHANNEL TO VICTORIA
Mile 14 to Mile 29

Channel to Victoria: Mile 29 to Mile 34.7





U.S. Army Corps of Engineers
Galveston District



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Scale: 1:2,000		PDF Print Date: 5/15/2023	
Mapped by: M3AOXPAC			
Additional Imagery info:			

Channel Features
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Aids to Navigation
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Service Layer Credits: World Topographic Map: Texas Parks & Wildlife, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, NGA, EPA, USDA
World Ocean Base: Esri, GEBCO, DeLorme, NaturalVue
World_Imagery: Maxar, Microsoft
World_Imagery: Maxar

Additional Combined Survey Dates and Stationing:
COMB_SURV_INFO_HERE

Coordinate System: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet
Projection: Lambert Conformal Conic

Dredging Reach Extent
0 0.2 0.4 0.8 Miles

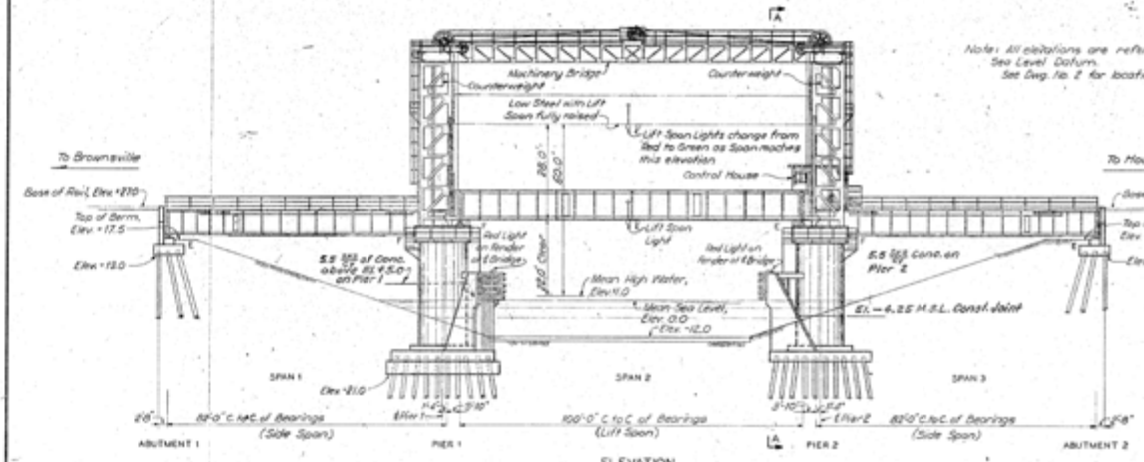
Hydrographic Survey Extent
0 170 340 680 Feet

HYDROGRAPHIC SURVEY
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
GALVESTON, TEXAS

Station: 1540+00 to 1837+46
CHANNEL TO VICTORIA
Mile 29 to Mile 34.7

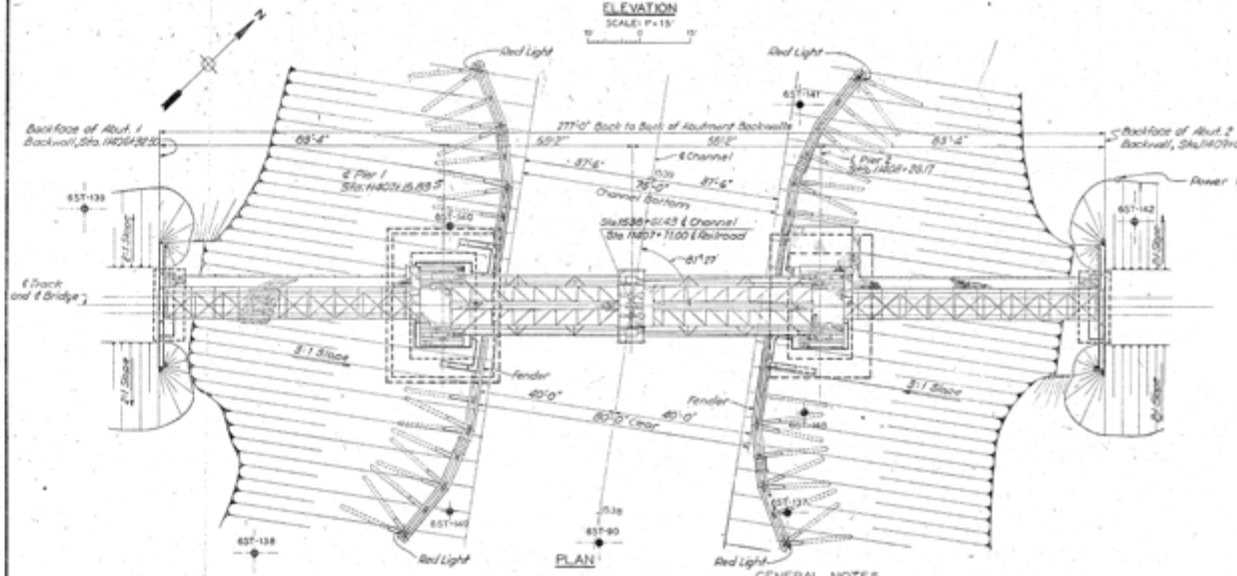
Appendix B

Original Lift Bridge Plans



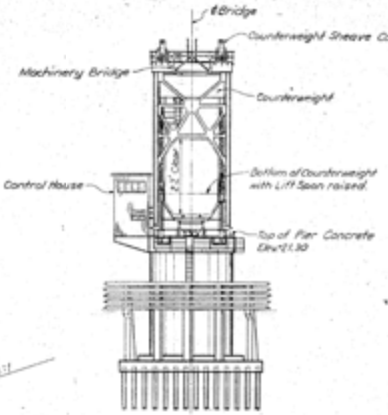
ELEVATION

SCALE: 1" = 15'



PLAN

CHANNEL SECTION



SECTION A-A

GENERAL NOTES

DESIGN SPECIFICATIONS: In accordance with the American Railway Engineering Association Manual for "Masonry," Chapter 8, 1963; "Specifications for Steel Railway Bridges for Fixed Spans Not Exceeding 400 Feet in Length," (1963 Edition), and "Specifications for Movable Railway Bridges" (1963 Edition).

LIVE LOAD: Cooper E72

WIND FORCE: As specified in the Design Specifications for moving span normally left in the closed position.

ALLOWABLE TIMBER PILE LOADS:

Abutments	-- any loading condition	30 Tons
Piers		
	Vertical forces only	20 Tons
	Vert plus lateral or longit. forces	25 Tons
	Vert plus lateral plus longit. forces	26.7 Tons

REINFORCING STEEL: All dimensions are to the center line of bars unless otherwise indicated. Bars shall be lapped a minimum of 24 diameters at splices.

CONCRETE: All concrete shall have a minimum ultimate compressive strength of 3,000 p.s.i. at 28 days except in counterweights where 2,500 p.s.i. concrete will be permitted.

BEVELED EDGES: All exposed edges of concrete shall be beveled 3/4" unless otherwise shown or noted.

CONSTRUCTION JOINTS: Construction joints shall be adequately keyed and made only at the locations shown on drawings, ~~except as otherwise approved by the Contracting Officer.~~

STRUCTURAL STEEL: All structural steel shall conform to A.S.T.M. Designation A36-63T, unless otherwise noted on the drawings.

STRUCTURAL STEEL DETAILS: All shop connections shall be riveted unless otherwise noted on the drawings. Where desired for convenience in erection, shop and field connections may be interchanged. Except where high-strength bolts are specified on the drawings, field connections may be made with either rivets or high-strength bolts, ~~at the option of the Contractor.~~

Turned bolts shall have a driving fit unless otherwise noted. Where finished surfaces are indicated on the drawings, the surface finishes shall conform to the American Standards Association surface roughness requirements as defined in A.S.A. B46.1-1962.

DECK AND TRACK MATERIAL: Treated timber, deck hardware and track expansion devices shall be furnished and installed by the Contractor. For furnishing and installing of track material, see Dwg. No. 12.

OPERATING TIME - NORMAL OPERATION: The time required to open the bridge for a normal lift of 28 feet, after the rail locks have been released and exclusive of time required to manipulate controls, will be approximately two (2) minutes for either main or auxiliary power.

TEMPERATURE: Span lengths, including the machinery bridge between towers, are those required for the final structure at 70° F.

1	Aug. 1967	Mainboard Number Dog Changed - Made	GAC
REVISION	DATE		BY

EVERDRUP & PARCEL AND ASSOCIATES, INC.
ENGINEERS — ARCHITECTS
ST. LOUIS, MO.

OFFICE OF THE DISTRICT ENGINEER
U. S. ARMY ENGINEER DISTRICT, GALVESTON
CORPS OF ENGINEERS
GALVESTON, TEXAS

DRAWN BY: H.E.R.
CHECKED BY: A.A.F.
SUBMITTED BY: [signature]
SUBMITTED BY: [signature]
APPROVED: [signature]
DATE: JUNE 1964

G. I. W. W. — CHANNEL TO VICTORIA, TEXAS
ALTERATION OF MISSOURI PACIFIC RAILROAD

LIFT BRIDGE
GENERAL PLAN AND ELEVATION

SCALE: 1" = 15'

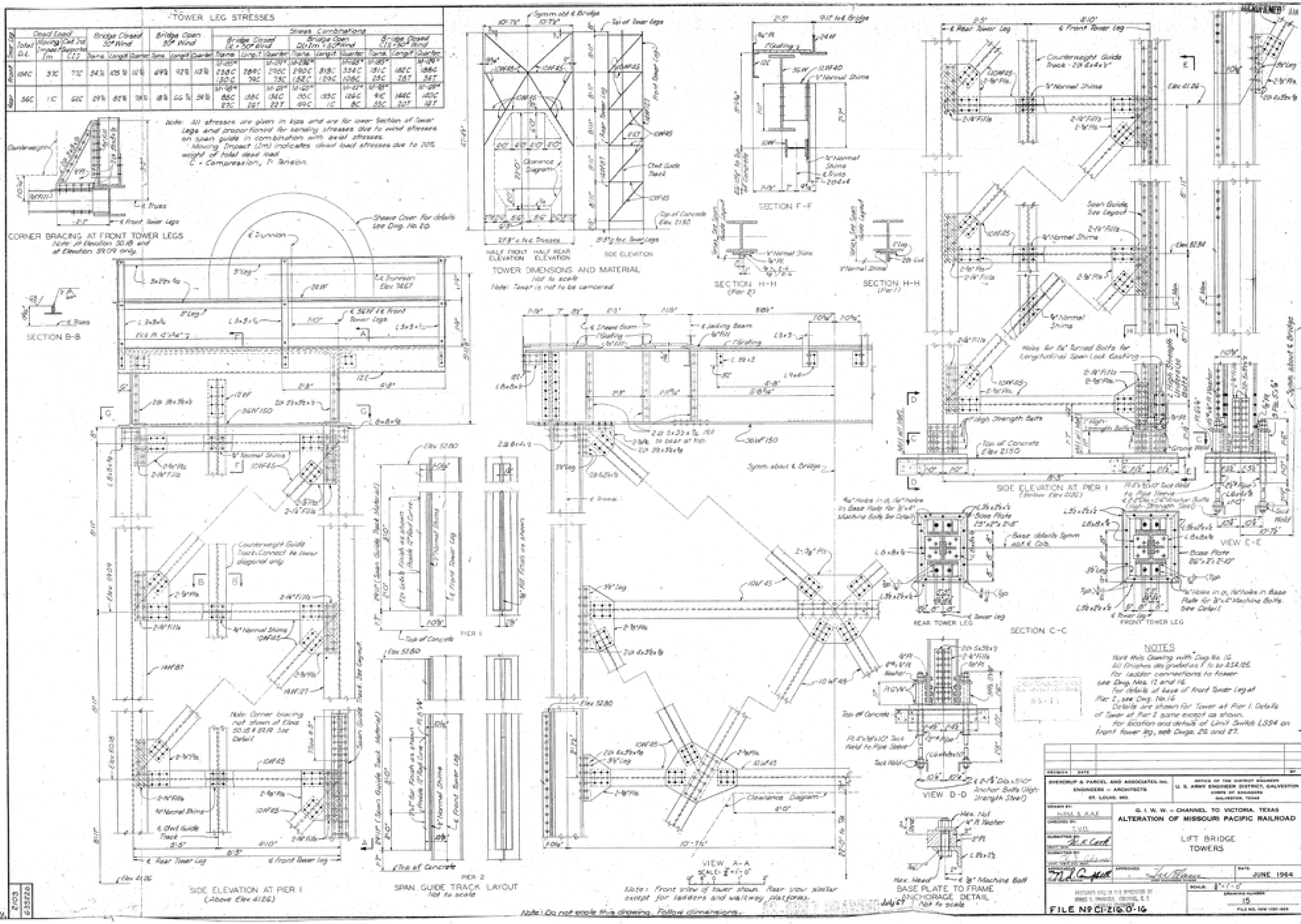
DRAWING NUMBER: 6

FILE NO. CI-216.0-7

AS-BUILT DRAWING
July 67

Note: Do not scale drawing. Follow dimensions.

2063
6.F.5.700



TOWER LEG STRESSES

Tower Leg	Dead Load: Total D.L.	Dead Load: Moving Impact Im	Dead Load: Cwt 3rd Supports CTS	Bridge Closed 50# Wind: Trans.	Bridge Closed 50# Wind: Long'l	Bridge Closed 50# Wind: Quarter	Bridge Open 30# Wind: Trans.	Bridge Open 30# Wind: Long'l	Bridge Open 30# Wind: Quarter	Stress Combinations – Bridge Closed DL + 50# Wind: Trans.	Bridge Closed DL + 50# Wind: Long'l	Bridge Closed DL + 50# Wind: Quarter	Bridge Open DL+Im + 30# Wind: Trans.	Bridge Open DL+Im + 30# Wind: Long'l	Bridge Open DL+Im + 30# Wind: Quarter	Bridge Closed CTS + 50# Wind: Trans.	Bridge Closed CTS + 50# Wind: Long'l	Bridge Closed CTS + 50# Wind: Quarter
Front	104C	35C	7?C	54%	105%	111%	69%	92%	113%	51-20* 238C 130C	284C 79C	51-09* 290C 73C	51-23* 290C 158C	818C 129C	51-03* 334C 108C	51-05* 151C 25C	182C 28T	51-29* 188C 36T
Rear	56C	1C	60C	29%	82%	78%	18%	66%	54%	51-18* 86C 27C	138C 26T	51-09* 136C 22T	51-02* 135C 49C	135C 1C	51-07* 126C 8C	51-18* 41C 35C	166C 20T	51-29* 180C 18T

Note: All stresses are given in kips and are for lower Section of Tower Legs and proportioned for sending stresses due to wind stresses on span guide in combination with axial stresses.
* Moving Impact (Im) indicates dead load stresses due to 20% weight of total dead load.
C = Compression, T = Tension.

NOTES

Work this Drawing with Dwg. No. 16.
All finishes designated f to be ASA/26.
For ladder connections to tower see Dwg. Nos. 12 and 16.
For details of base of Front Tower Leg at Pier 2, see Dwg. No. 16.
Details are shown for Tower at Pier 1. Details of Tower at Pier 2 same except as shown.
For location and details of Limit Switch LS94 on front tower leg, see Dwgs. 26 and 27.

SVERDRUP & PARCEL AND ASSOCIATES, INC. ENGINEERS — ARCHITECTS ST. LOUIS, MO.	OFFICE OF THE DISTRICT ENGINEER U. S. ARMY ENGINEER DISTRICT, GALVESTON CORPS OF ENGINEERS GALVESTON, TEXAS

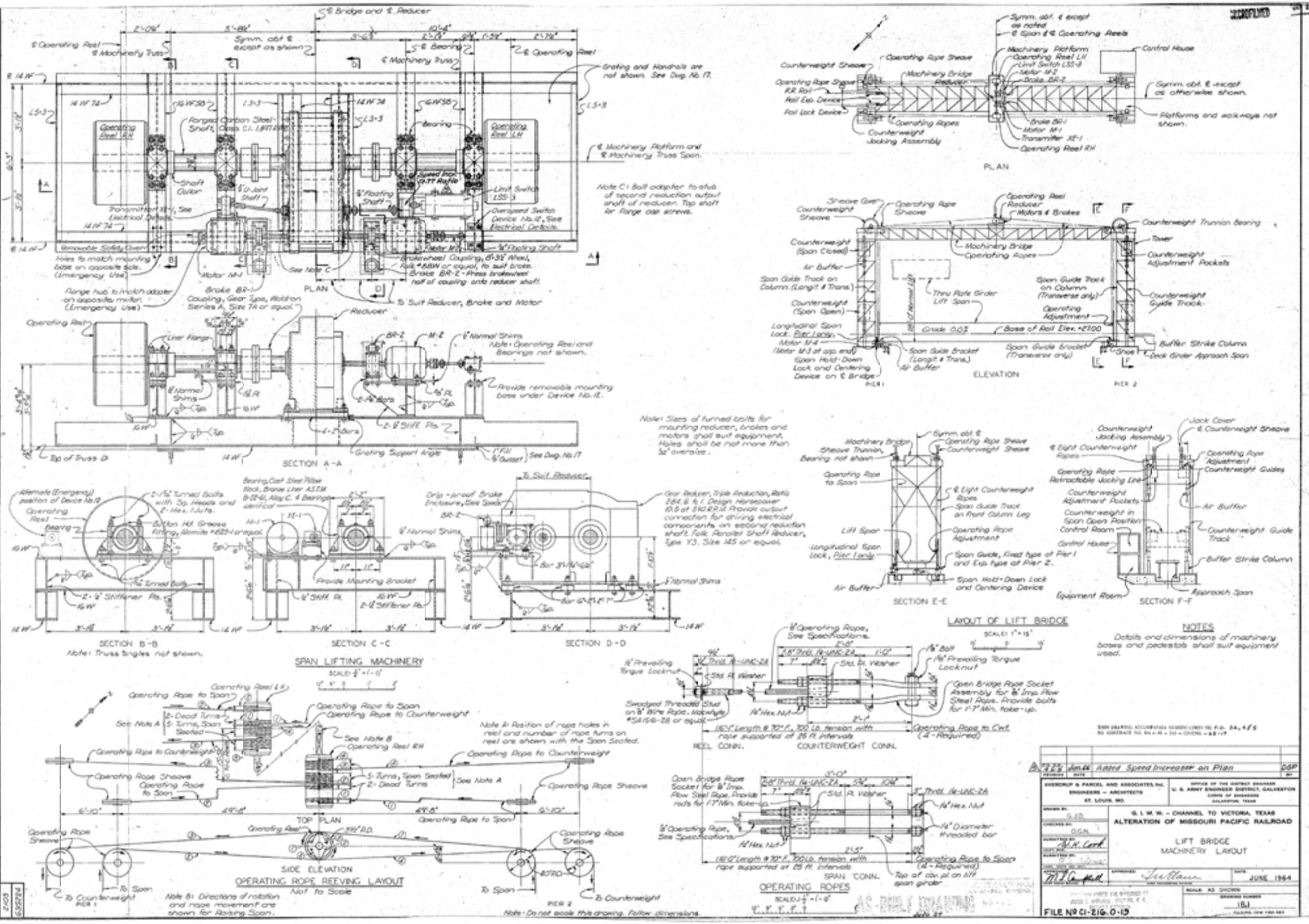
Drawn by: H.R.M. & A.A.E.
Checked by: T.V.D.

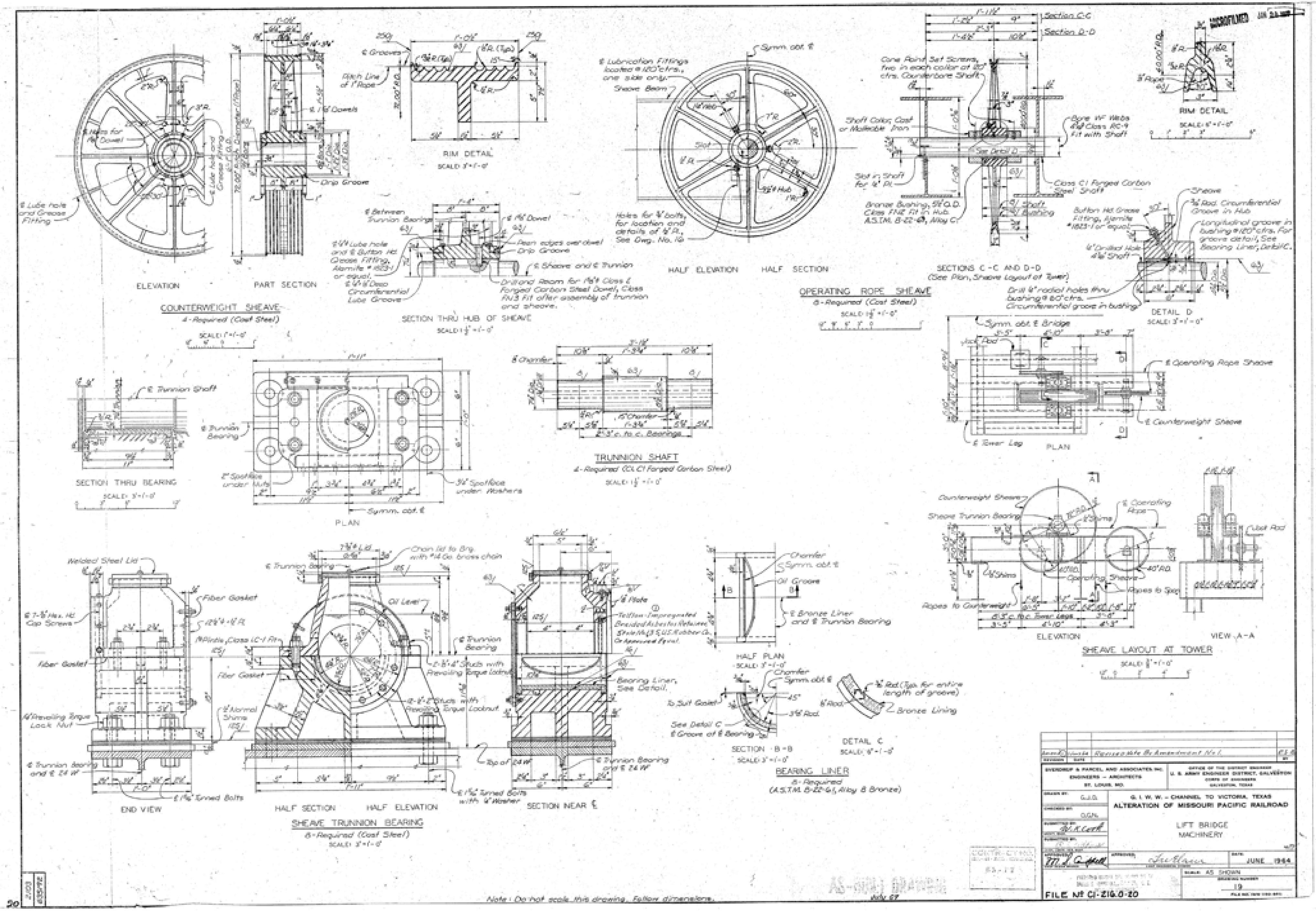
G. I. W. W. — CHANNEL TO VICTORIA, TEXAS
ALTERATION OF MISSOURI PACIFIC RAILROAD

LIFT BRIDGE
TOWERS

Date: JUNE 1964
Scale: $\frac{1}{2}$" = 1'-0"
Drawing Number: 15

FILE Nº C1-216.0-16


PLAN
ELEVATION
SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D
SECTION E-E
SECTION F-F
SPAN LIFTING MACHINERY
SCALE: 3/4" = 1'-0"
TOP PLAN
SIDE ELEVATION
OPERATING ROPE REEVING LAYOUT
Not to Scale
LAYOUT OF LIFT BRIDGE
SCALE: 1" = 15'
REEL CONN.
COUNTERWEIGHT CONN.
SPAN CONN.
OPERATING ROPES
SCALE: 1/2" = 1'-0"
NOTES
Details and dimensions of machinery bases and pedestals shall suit equipment used.
Add Speed Increaser on Plan
EVERDUP & PARCEL AND ASSOCIATES, INC.
ENGINEERS — ARCHITECTS
ST. LOUIS, MO.
U. S. ARMY ENGINEER DISTRICT, GALVESTON
CORPS OF ENGINEERS
GALVESTON, TEXAS
G. I. W. W. - CHANNEL TO VICTORIA, TEXAS
ALTERATION OF MISSOURI PACIFIC RAILROAD
LIFT BRIDGE
MACHINERY LAYOUT
JUNE 1964
SCALE AS SHOWN
DRAWING NUMBER
161
FILE Nº CI-216.0-19



COUNTERWEIGHT SHEAVE
4-Required (Cast Steel)
ELEVATION
PART SECTION
RIM DETAIL
SECTION THRU HUB OF SHEAVE
OPERATING ROPE SHEAVE
8-Required (Cast Steel)
HALF ELEVATION
HALF SECTION
SECTIONS C-C AND D-D
(See Plan, Sheave Layout at Tower)
DETAIL D
TRUNNION SHAFT
4-Required (Cl. C1 Forged Carbon Steel)
SECTION THRU BEARING
PLAN
SHEAVE LAYOUT AT TOWER
ELEVATION
VIEW A-A
SHEAVE TRUNNION BEARING
8-Required (Cast Steel)
END VIEW
HALF SECTION
HALF ELEVATION
SECTION NEAR ℄
BEARING LINER
8-Required
(A.S.T.M. B-22-61, Alloy B Bronze)
HALF PLAN
SECTION B-B
DETAIL C
SVERDRUP & PARCEL AND ASSOCIATES INC.
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ST. LOUIS, MO.
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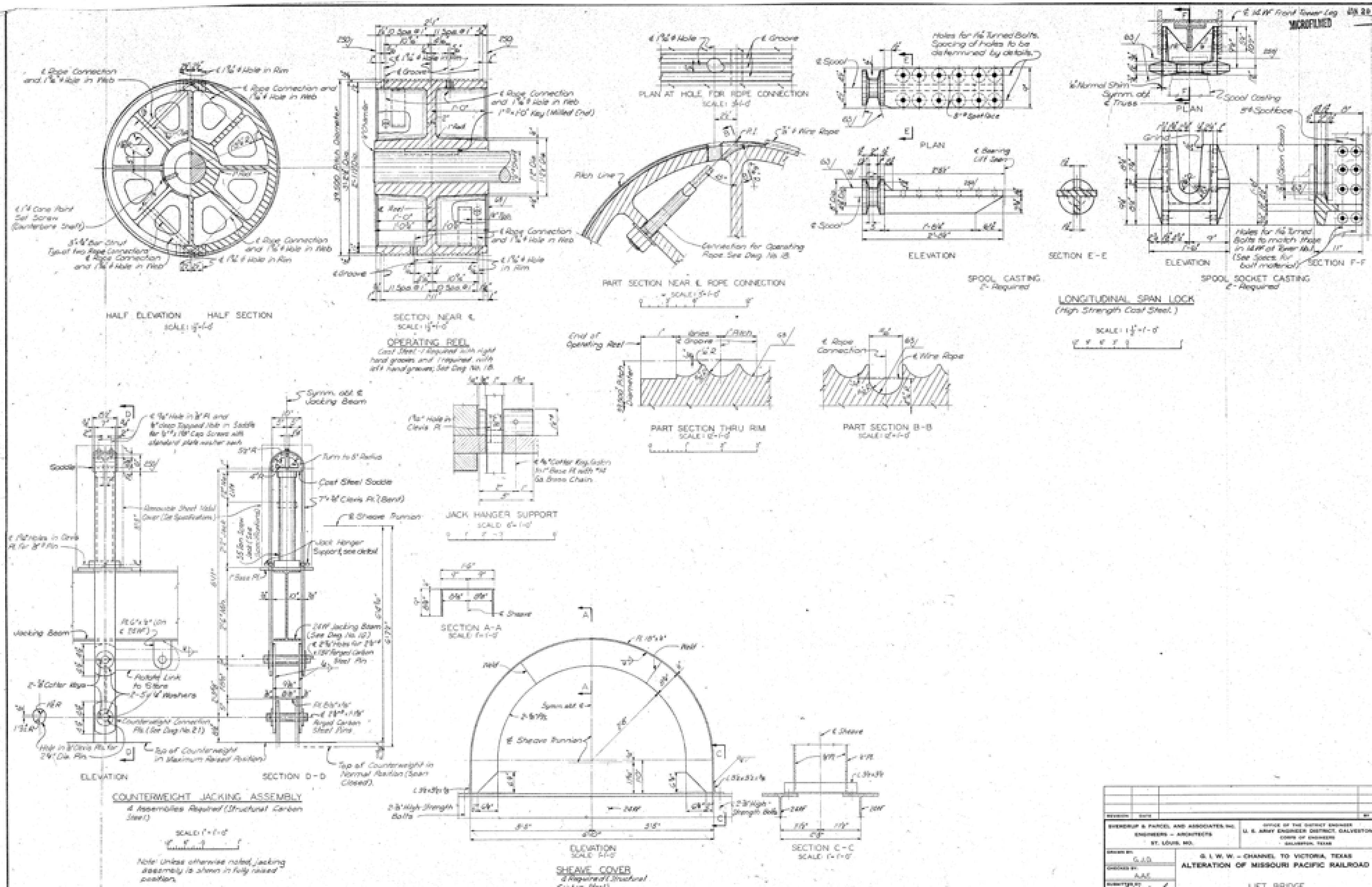
CORPS OF ENGINEERS
GALVESTON, TEXAS
G. I. W. W. – CHANNEL TO VICTORIA, TEXAS
ALTERATION OF MISSOURI PACIFIC RAILROAD
LIFT BRIDGE
MACHINERY
JUNE 1964
SCALE: AS SHOWN
19
FILE Nº CI-219.0-20
Note: Do not scale this drawing. Follow dimensions.
AS-BUILT DRAWING



REVISION	DATE		BY

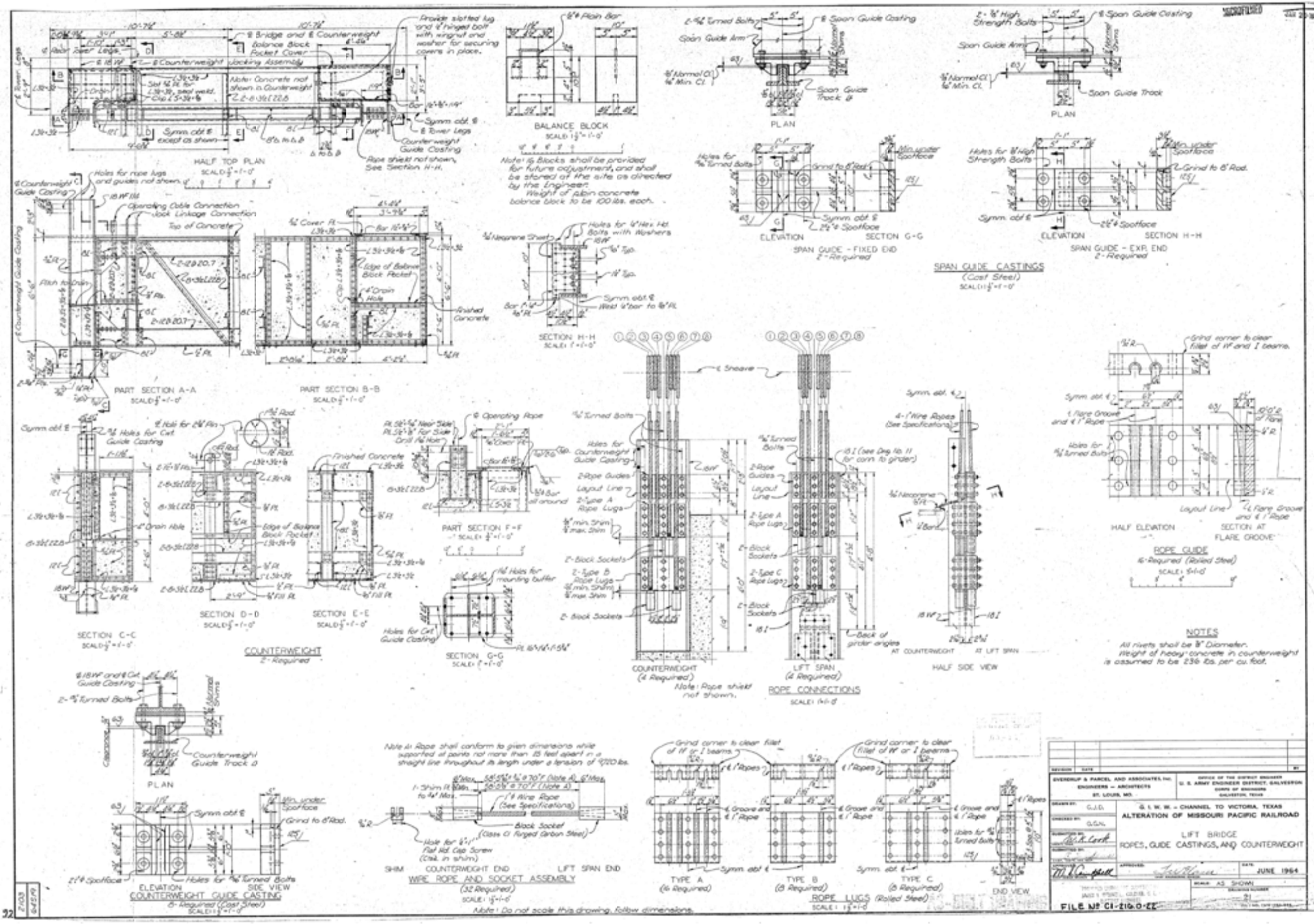
SVERDRUP & PARCEL AND ASSOCIATES, Inc.
ENGINEERS – ARCHITECTS
ST. LOUIS, MO.

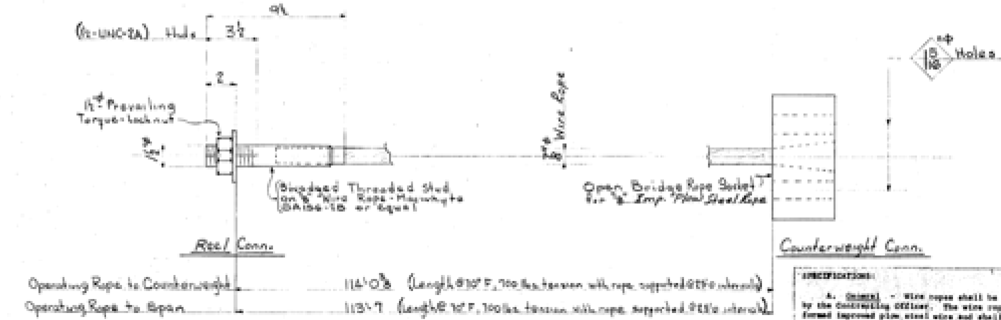
OFFICE OF THE DISTRICT ENGINEER
U. S. ARMY ENGINEER DISTRICT, GALVESTON
CORPS OF ENGINEERS
GALVESTON, TEXAS

G. I. W. W. – CHANNEL TO VICTORIA, TEXAS
ALTERATION OF MISSOURI PACIFIC RAILROAD

LIFT BRIDGE
MACHINERY

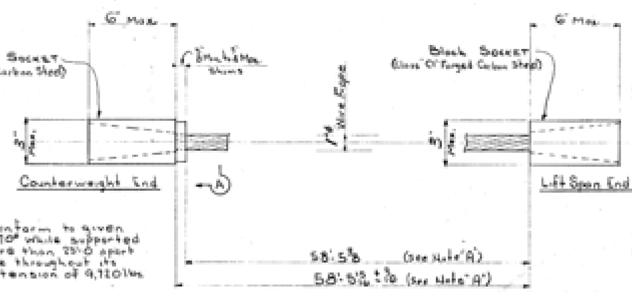
DRAWN BY: G.J.D.
CHECKED BY: A.A.E.
SUBMITTED BY: W. R. Cook
APPROVED: M. L. Campbell
DATE: JUNE 1964
SCALE: AS SHOWN
DRAWING NUMBER 20
FILE Nº C1-219.0-21


HALF TOP PLAN
BALANCE BLOCK
PLAN
ELEVATION
SECTION G-G
SPAN GUIDE - FIXED END
2 - Required
SPAN GUIDE CASTINGS
(Cast Steel)
ELEVATION
SECTION H-H
SPAN GUIDE - EXP. END
2 - Required
PART SECTION A-A
PART SECTION B-B
SECTION H-H
SECTION C-C
SECTION D-D
SECTION E-E
PART SECTION F-F
SECTION G-G
COUNTERWEIGHT
2 - Required
COUNTERWEIGHT
(4 Required)
LIFT SPAN
(4 Required)
ROPE CONNECTIONS
HALF SIDE VIEW
HALF ELEVATION
SECTION AT
FLARE GROOVE
ROPE GUIDE
16 - Required (Rolled Steel)
NOTES
All rivets shall be 7/8" Diameter.
Weight of heavy concrete in counterweight
is assumed to be 256 lbs. per cu. foot.
PLAN
ELEVATION
SIDE VIEW
COUNTERWEIGHT GUIDE CASTING
8 - Required (Cast Steel)
SHIM
COUNTERWEIGHT END
LIFT SPAN END
WIRE ROPE AND SOCKET ASSEMBLY
(32 Required)
TYPE A
(16 Required)
TYPE B
(8 Required)
TYPE C
(8 Required)
ROPE LUGS (Rolled Steel)
END VIEW
Note 1: Do not scale this drawing. Follow dimensions.
G. I. W. W. - CHANNEL TO VICTORIA, TEXAS
ALTERATION OF MISSOURI PACIFIC RAILROAD
LIFT BRIDGE
ROPES, GUIDE CASTINGS, AND COUNTERWEIGHT
JUNE 1964
FILE No. CI-216.0-22



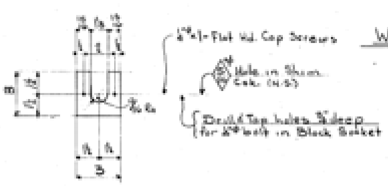
OPERATING ROPE TO COUNTERWEIGHT
(4-REQ'D)

OPERATING ROPE TO SPAN
(4-REQ'D)



NOTE "A" ???
Rope shall conform to given dimensions @ 70° while supported at points not more than 25'-0 apart in a straight line throughout its length under a tension of 9,720 lbs.

WIRE ROPE AND SOCKET ASSEMBLY
(32-REQ'D)



SECTION "A"

SPECIFICATIONS:

A. General - Wire ropes shall be made by a manufacturer whose facilities and experiences are approved by the Contracting Officer. The wire ropes for suspending the span and counterweights shall be made of preformed improved plow steel wire and shall be of 6 x 25 filler wire construction with hard fiber core. Each strand shall consist of 19 main wires and 6 filler wires, fabricated in one operation with all wires interlocking. There shall be four sizes of wire in each strand: 12 outer wires of one size, 6 filler wires of one size, 6 inner wires of one size and a core wire. Ropes shall be right regular lay, and the maximum length of rope lay shall be 7 1/2 times the nominal rope diameter. The lay of the wires in the strands shall be such as to make the wires approximately parallel to the axis of the wire rope where they would come in contact with a right circular cylinder circumscribed on the wire rope.

B. Cores - All hard fiber cores shall be prelubricated by the manufacturer. All component parts of the ropes--fiber cores, wires and strands--shall be lubricated during fabrication with a special corrosion-resisting lubricant approved by the contracting officer.

C. Splicing - No splicing of the wire ropes or individual strands will be permitted. Wire joints shall be electrically butt-welded, and no two joints in any one strand shall be closer than 25 feet apart, except for filler wires. Every effort shall be made to fabricate wire ropes of uniform physical properties and all counterweight ropes for any one sheave shall be cut from one continuous manufactured length.

D. Diameter - The nominal diameter of the counterweight ropes shall be 1 inch, and of the operating ropes shall be 7/8 inch.

(1) The actual diameter of the wire ropes (the diameter of the circumscribed circle) shall be measured when the rope is unstressed. The actual diameter shall be not less than the nominal diameter and not more than 3/64 inch in excess of the nominal diameter.

E. Individual Wires - Filler wires may conform to the manufacturer's standard specifications. Other wires shall have the following physical properties before fabrication:

Diam. Wires Inch	Tensile Strengths Minimum	Lb. per Sq. In. Maximum
0.038 - 0.060	238,000	268,000
0.061 - 0.100	230,000	260,000
0.101 - 0.140	225,000	255,000
0.141 - 0.190	218,000	248,000

(1) The total ultimate elongation of the wires measured on a 10 inch gage length, at the breaking strength of the wire, shall be not less than the following:

Diam-Wires Inch	Elongation Percent
0.038 - 0.060	1-1/2
0.061 - 0.100	1-3/4
0.101 - 0.140	2
0.141 - 0.190	2-1/2

(2) Tensile test specimens of the wire shall be at least 15 inches long and free from bends and kinks.

(3) The number of complete successive turns of 360 degrees in one direction through which an 8-inch length of wire can be twisted about its longitudinal axis without breaking or showing any signs of splitting or other defects shall be not less than the following:

Diam. of Wire - Inch.	Number of Turns
0.038 - 0.060	2.3 divided by diam. of wire in inches
0.061 - 0.100	2.2 divided by diam. of wire in inches
0.101 - 0.140	2.1 divided by diam. of wire in inches
0.141 - 0.190	2.0 divided by diam. of wire in inches

(4) In this torsion test, one end of the wire is to be rotated with respect to the other end of the wire at continuous uniform speed until breakage occurs. During the test the applied tension shall not exceed five percent of the breaking strength as measured in the tensile test. The speed of rotation shall not exceed 60 twists per minute. Such tests shall be carried out by a mechanically driven device, such as a motor or belt drive, in order to ensure operation at constant uniform speed.

(5) All tests shall be made upon fair samples which may be taken from either end of any coil of wire, and such samples shall be taken from not less than 10 percent of the total number of coils.

(6) The tolerance limits of like positioned wires in the strands of the wire rope shall not exceed the following values.

Diam of Wire Inch	Total Variation Inch
0.038 - 0.060	0.0020
0.060 - 0.100	0.0025
0.101 - 0.140	0.0030
0.141 - 0.190	0.0035

F. Ultimate Strength Requirements - In order to test the strength of the rope and fastenings, a number of test pieces not more than 12 feet long, but with a length of at least 25 rope diameters between the sockets, with sockets (selected at random from those which are to be used in filling the order) attached to each end, shall be stressed to destruction in a suitable testing machine. The sockets used for these tests shall not be used in the structure.

(1) The test pieces shall be taken from each original length of rope from which the finished lengths of rope are fabricated, with at least four specimens of the counterweight ropes and two of the operating ropes being subjected to testing. The test specimens shall be taken from each end of the set as manufactured. A small wire collar shall be cast around the wire rope against the end of the socket so that any movement of the latter can be readily detected. Under this test the counterweight ropes shall develop an ultimate strength of not less than 81,000 pounds, and the operating ropes shall develop an ultimate strength of not less than 63,000 pounds.

G. Rejection - If the physical properties of the rope or its individual wires fall below those specified in paragraph 11-07g and 11-07j, the entire length from which the test specimens were taken shall be replaced by the Contractor with a new length meeting the specified requirements.

H. Prestressing - Each finished counterweight rope shall be prestressed to 28,350 pounds and each finished operating rope shall be prestressed to 22,050 pounds. This load shall be applied one time only, and shall be held for a period of not less than four hours.

I. Sockets - All sockets used in connection with wire ropes shall be of forged carbon steel, Class C1, forged without welds from solid steel. Socket pins shall be of Class C1 forged carbon steel. In every case the dimensions shall be such that no part under tension shall be stressed higher than 48,000 psi., when the wire rope is stressed to its specified ultimate strength. The sockets for the counterweight ropes shall be attached to the wire rope by approved methods using zinc of a quality not less than that defined for Intermediate/Grade in ASTM Designation B6-62T, "Slab Zinc (Spelter)". The zinc filling must entirely fill the baskets to their extreme ends and in a manner to prevent any backward slipping of the ropes. The slipping of sockets under load shall not exceed 1/6 of the nominal rope diameter when stressed to 80% of the ultimate rope strength.

(1) The sockets for the operating ropes shall be attached to the wire rope by cold swaging in such a manner that there is no slipping when stressed to 100% of the ultimate rope strength.

(2) If a socket should break or otherwise fail during the testing of ropes to destruction, two other sockets shall be selected and attached to another piece of rope and then the test repeated. This process shall be continued until the Contracting Officer is satisfied that all sockets are reliable. If 10 percent or more of the sockets tested break at a load less than the specified minimum ultimate strength of the rope, the entire lot of sockets shall be rejected.

J. Test Facilities - The Vendor shall provide the facilities for testing and shall make at his own expense all of the tests required. All tests shall be made in the presence of the Contracting Office or an Inspector representing the Contracting Officer.

K. Rope Length - The ropes shall be cut to the required length in the shop, the sockets attached, and shall then be measured while twisted to the correct lay and supported throughout its length at points not more than 25 feet apart. The counterweight ropes shall be measured while under a tension of 9720 pounds and the operating ropes while under a tension of 700 pounds. The lengths of each shall then be as tabulated on the plans. A stripe shall be painted along one side of each rope from end to end, to insure its erection with the correct twist of the lay. If any slipping of the sockets should occur during this measuring, the sockets shall be removed and resocketed.

L. Shipment - The ropes shall be shipped on reels the diameter of which shall be not less than 25 diameters of the rope. The ropes shall be removed by revolving the reels. The ropes shall be protected from the weather and kept clean during the shipment and storage, and shall be carefully handled at all times to avoid twists, bends and kinks. Sockets shall be painted in the shop and in the field as elsewhere specified for structural steel.

M. Lubrication of Ropes - After the lift span is in operating condition, the American Bridge Division shall properly clean all ropes of foreign material, and shall furnish and apply hot, in an approved manner, and when weather conditions are suitably dry and warm, one coat of an approved wire rope dressing that is compatible with the lubricant used in manufacture of the ropes. Vendor to furnish necessary field lubricant.

77-0-0017

Alteration of Missouri Pacific Railroad
Victoria County, Texas

American Bridge Division of (USS) United States Steel

Orange
Rennels
V.S. Scott

VENDOR NOTE

... purchase order number ... on all drawings and ... Bonds.

V9691 | SC1

FILE No. C1-E16.0-94

Appendix C

The Port and TxDOT Stakeholder Meeting Exhibits

Port of Victoria Barge Canal Lift Bridge Study

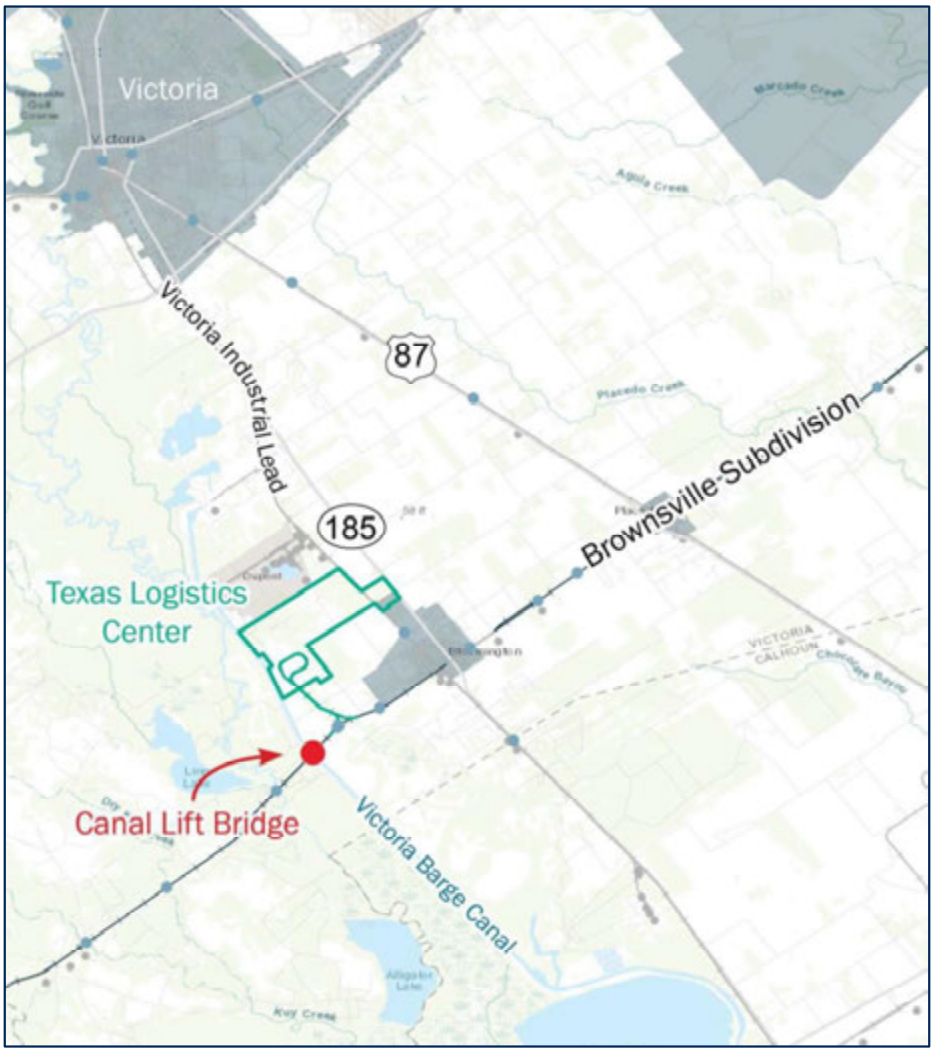
Victoria County

Texas Department of Transportation
Rail Division

Project Details:

TxDOT and the Port of Victoria (POV) have a shared interest to improve efficiency of waterway and rail freight movement. The project is described as a lift bridge replacement feasibility study. The study is a high-level, low-detail examination of alternatives for a future bridge replacement.

The current lift bridge is approaching 60 years in operation and will soon require additional investments to maintain serviceability. As rail and maritime traffic increases, reliable operation is critical for freight transportation through both corridors. Canal improvements over the years have resulted in the bridge site being a constriction point in the channel.



Project Location
The lift bridge is located on the Brownsville Subdivision, south of the port, near Bloomington.

The Existing Victoria Barge Canal Lift Bridge

At-A-Glance:

Cost Estimate	To be Determined
Status	Conceptual (Pre-Planning)
Scope	Identify a potential alternative to increase barge canal clearances under the railroad lift bridge and increase the efficiency of freight movement in Texas.
Schedule	Construction would begin after multiple years of planning

TRANSYSTEMS

Project Contact Information:
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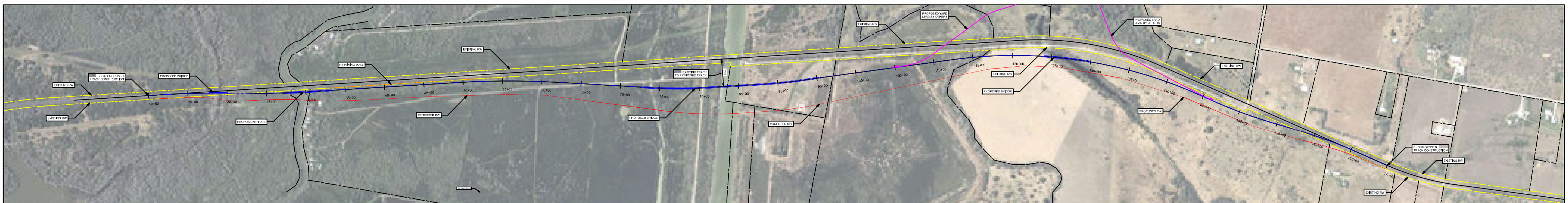
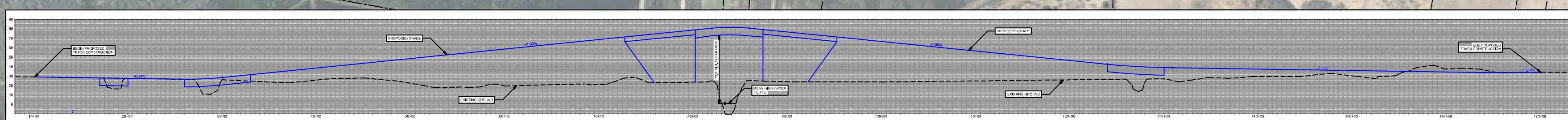
TranSystems Project Manager
gjlaw@transystems.com (512) 745-6136

Business with Port of Victoria:
Sean Stibich
Executive Director
sean@portofvictoria.com (361) 507-8854





LEGEND

black solid line	EXISTING RAIL
yellow dashed line	EXISTING R/W
black dash-dot line	EXISTING PROPERTY LINE
blue line	PROPOSED RAIL
magenta line	PROPOSED YARD LEAD (BY OTHERS)
orange line	PROPOSED RETAINING WALL
red line	PROPOSED RW

N

0 200 400 600
HORIZONTAL SCALE FEET
1" = 200'

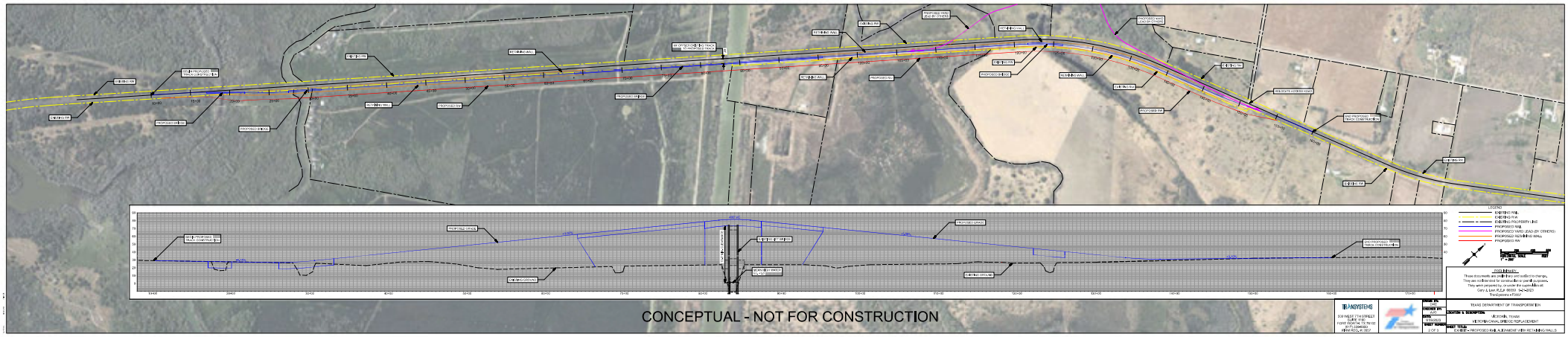
PRELIMINARY

These documents are preliminary and subject to change.
They are not intended for construction or permit purposes.
They were prepared by, or under the supervision of:
Gary J. Law, P.E.# 66550 9-21-2023
TranSystems - F3557

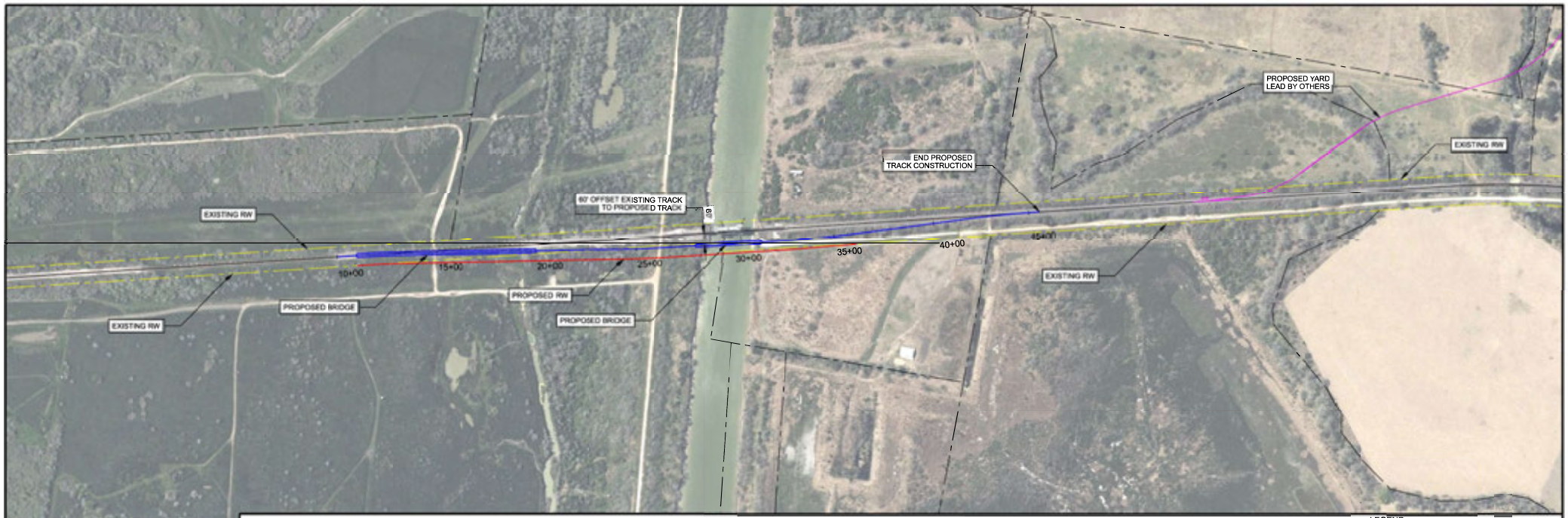
CONCEPTUAL - NOT FOR CONSTRUCTION

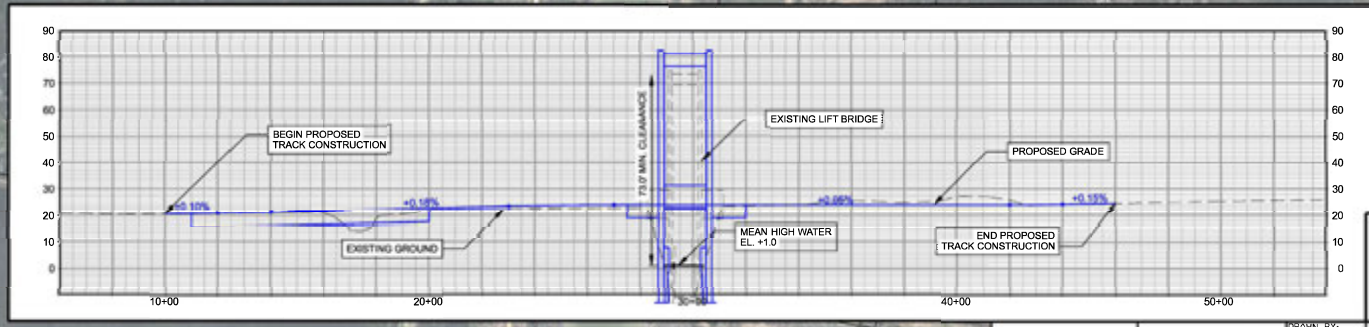
TRANSYSTEMS
500 WEST 7TH STREET
SUITE 1100
FORT WORTH, TX 76102
(817) 339-8950
FIRM REG. #: 3557

DRAWN BY: DRC	TEXAS DEPARTMENT OF TRANSPORTATION
CHECKED BY: AJG	LOCATION & DESCRIPTION: VICTORIA, TEXAS VICTORIA CANAL BRIDGE REPLACEMENT
DATE: 9/19/2023	
SHEET NUMBER: 1 OF 3	SHEET TITLE: EXHIBIT - PROPOSED RAILROAD NORMAL GRADING



CONCEPTUAL - NOT FOR CONSTRUCTION





LEGEND

- EXISTING RAIL
- EXISTING R/W
- EXISTING PROPERTY LINE
- PROPOSED RAIL
- PROPOSED YARD LEAD (BY OTHERS)
- PROPOSED RETAINING WALL
- PROPOSED RW

200 400 600
HORIZONTAL SCALE FEET
1" = 200'

PRELIMINARY

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They are not intended for construction or permit purposes.
They were prepared by, or under the supervision of:
Gary J. Law, P.E.# 66550 9-21-2023
TranSystems - F3557

CONCEPTUAL - NOT FOR CONSTRUCTION

TRANSYSTEMS
500 WEST 7TH STREET
SUITE 1100
FORT WORTH, TX 76102
(817) 339-8950
FIRM REG. #: 3557

Texas Department of Transportation

DRAWN BY: DRC
CHECKED BY: AJG
DATE: 9/19/2023
SHEET NUMBER: 3 OF 3

TEXAS DEPARTMENT OF TRANSPORTATION

LOCATION & DESCRIPTION:
VICTORIA, TEXAS
VICTORIA CANAL BRIDGE REPLACEMENT

SHEET TITLE:
EXHIBIT - PROPOSED RAIL ALIGNMENT AT-GRADE PROFILE

Appendix D

Cost Estimates

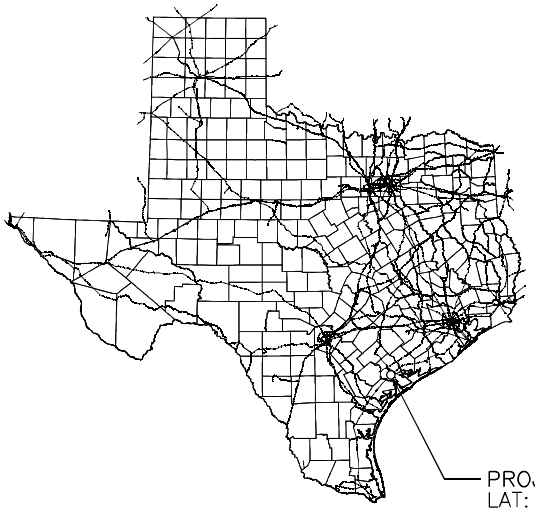
BNSF Ash Fork Siding Ext
MP 1.1 to MP 2.6
Bid Form

Estimate of Cost					
Item No.	**Description**	**Quantity**	**Units**	**Unit Price**	**Amount**
	General Items				
1	Mobilization	1	LS	$ 4,000,000.00	$ 4,000,000.00
2	Clearing and Grubbing	11.0	AC	$ 4,800.00	$ 52,800.00
3	Topsoil Placement (6" Thick)	8,600	CY	$ 6.00	$ 51,600.00
4	Embankment	30,000	CY	$ 24.00	$ 720,000.00
5	Excavation	1,500	CY	$ 34.00	$ 51,000.00
6	6" Road Base	1,800	SY	$ 50.00	$ 90,000.00
7	Silt Fence	5,000	LF	$ 7.00	$ 35,000.00
8	Erosion Control Management and Maintenance	1	LS	$ 50,000.00	$ 50,000.00
9	Subballast	2,480	CY	$ 150.00	$ 372,000.00
10	Seeding	10.0	AC	$ 1,500.00	$ 15,000.00
11	Install New 5 Wired Barbed Wire Right-Of-Way Fence	6,700	LF	$ 36.00	$ 241,200.00
12	Orange Construction Fence	400	LF	$ 5.00	$ 2,000.00
13	Remove Existing Track	2,633	TF	$ 50.00	$ 131,650.00
14	Proposed Track Shift	910	TF	$ 125.00	$ 113,750.00
15	Install Track All-in Incl. Ballast	2,640	TF	$ 230.00	$ 607,200.00
16	Proposed Lift Bridge	1	LS	$ 50,000,000.00	$ 50,000,000.00
17	Proposed Bridge - Lift Bridge Approaches	1	LS	$ 1,500,000.00	$ 1,500,000.00
18	Proposed Bridge Over Wetlands/Access Road	900	TF	$ 18,000.00	$ 16,200,000.00
19	Demolition Existing Lift Bridge Structure	1	EA	$ 4,000,000.00	$ 4,000,000.00
20	Demolition of Non-Channel Structure	1	EA	$ 400,000.00	$ 400,000.00
	GENERAL SUBTOTAL				***$ 78,633,200.00***
	CONTINGENCY	**30%**			***$ 23,589,960.00***
GENERAL TOTAL				***$***	***102,223,160.00***

Appendix E

Victoria Barge Canal Railroad Bridge Concepts

VICTORIA BARGE CANAL RAIL BRIDGE
CONCEPTUAL STUDY



PROJECT LOCATION
LAT: 28°37'07"
LONG: 96°56'06"

NTS

State of Texas

Project Location Map

TRANSYSTEMS
2777 ALLEN PARKWAY
SUITE 500
HOUSTON, TEXAS 77019
PHONE: (713) 807-0600
WWW.TRANSYSTEMS.COM

CONCEPTUAL
These documents are preliminary and subject to change.
They are not intended for construction or permit purposes.
They were prepared by, or under the supervision of:
Gary J. Law, P.E.# 66550 10-19-2023
TranSystems - F3557

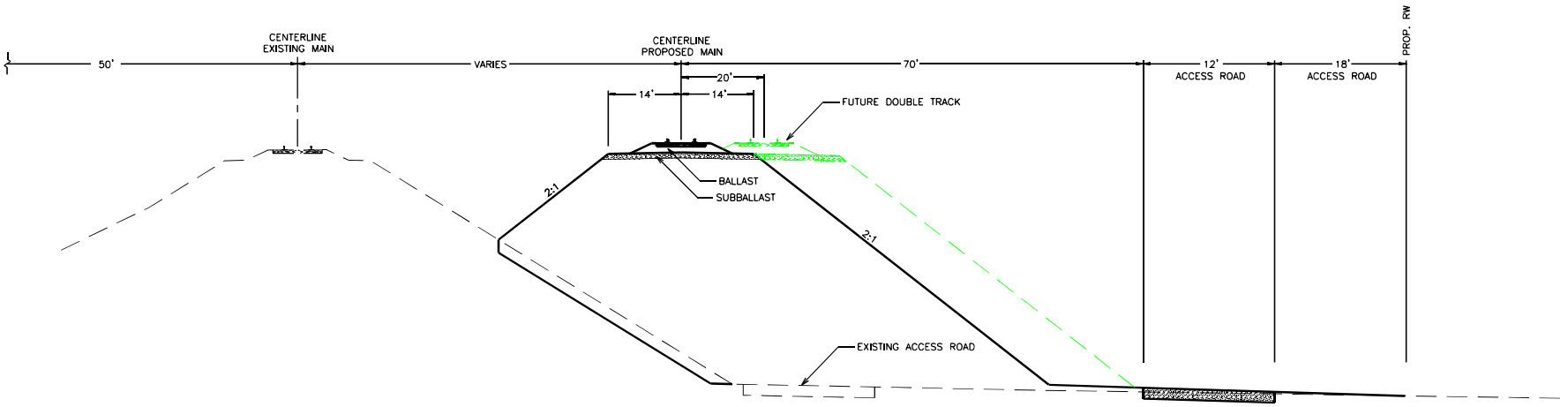
TEXAS DEPARTMENT OF TRANSPORTATION
VICTORIA, TX
VICTORIA CANAL BRIDGE REPLACEMENT

CONCEPTUAL PLANS

NOT FOR CONSTRUCTION

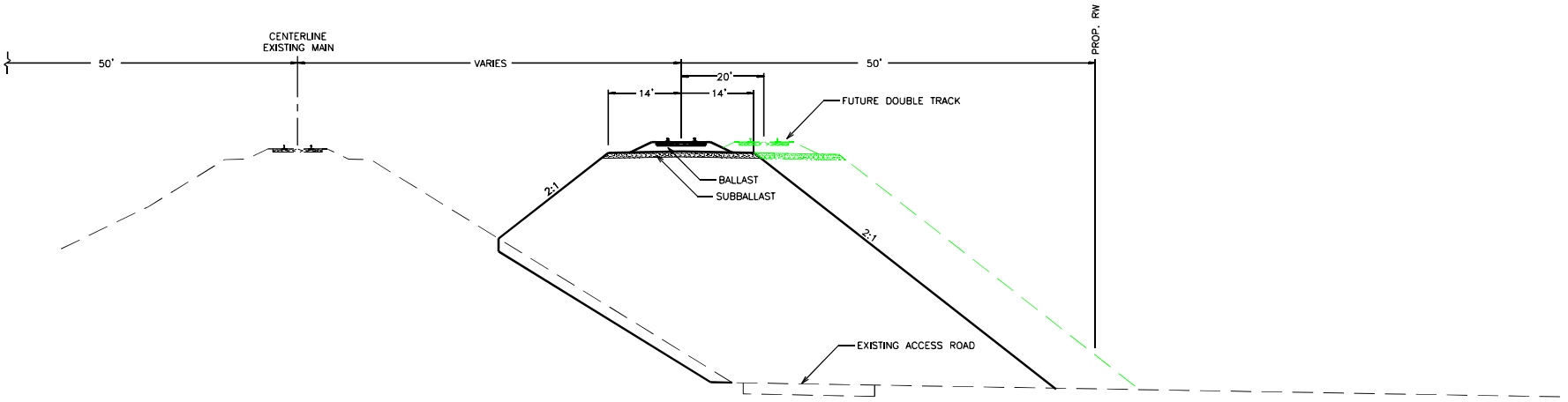
LAST REVISED
OCTOBER 19, 2023

10/23/2023 12:51:13 PM BRILES



TYPICAL SECTION FOR MAIN WITH ACCESS ROAD

NTS



TYPICAL SECTION FOR MAIN WITHOUT ACCESS ROAD

NTS

SHEET NOTE:

1. DESIGN CRITERIA FOR RAIL DESIGN IS ADHERES TO AMERICAN RAILWAY ENGINEERING AND MAINTENANCE OF WAY ASSOCIATION (AREMA) STANDARD

CONCEPTUAL

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TRANSYSTEMS
500 WEST 7TH STREET
SUITE 1100
FORT WORTH, TX 76102
(817) 339-8950
FIRM REG. #: 3557

Texas Department of Transportation

DRAWN BY:	DRC
CHECKED BY:	AJG
DATE:	10/23/2023
SHEET NUMBER	2

TEXAS DEPARTMENT OF TRANSPORTATION

LOCATION & DESCRIPTION:
VICTORIA, TEXAS
VICTORIA CANAL BRIDGE REPLACEMENT

SHEET TITLE:
TYPICAL SECTION

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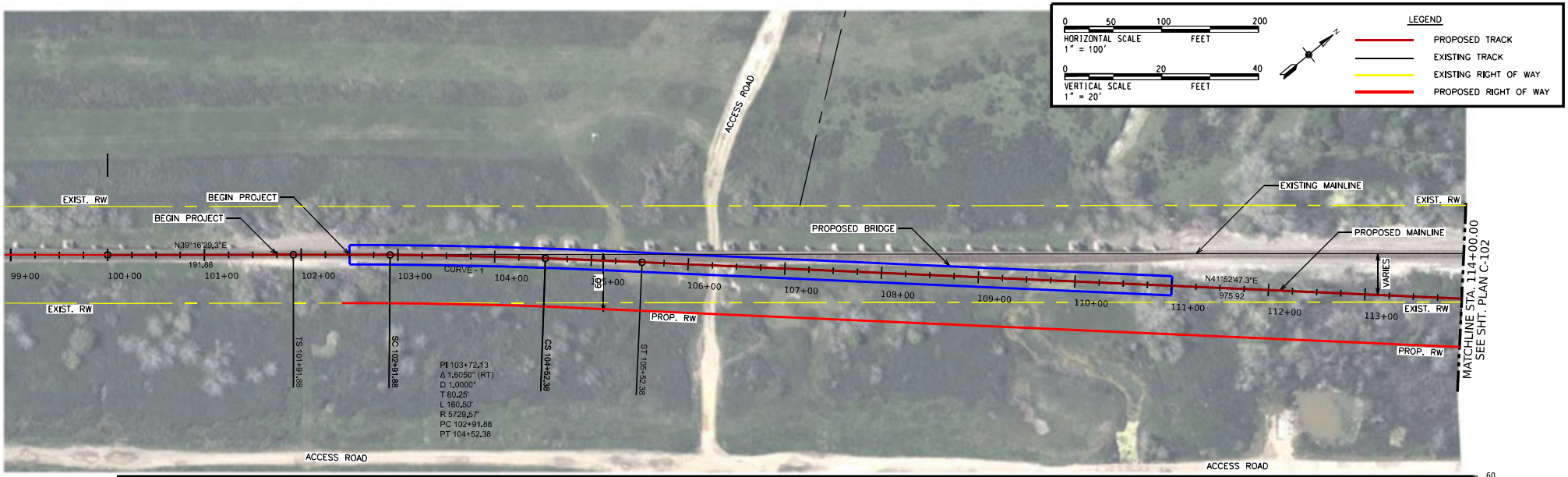

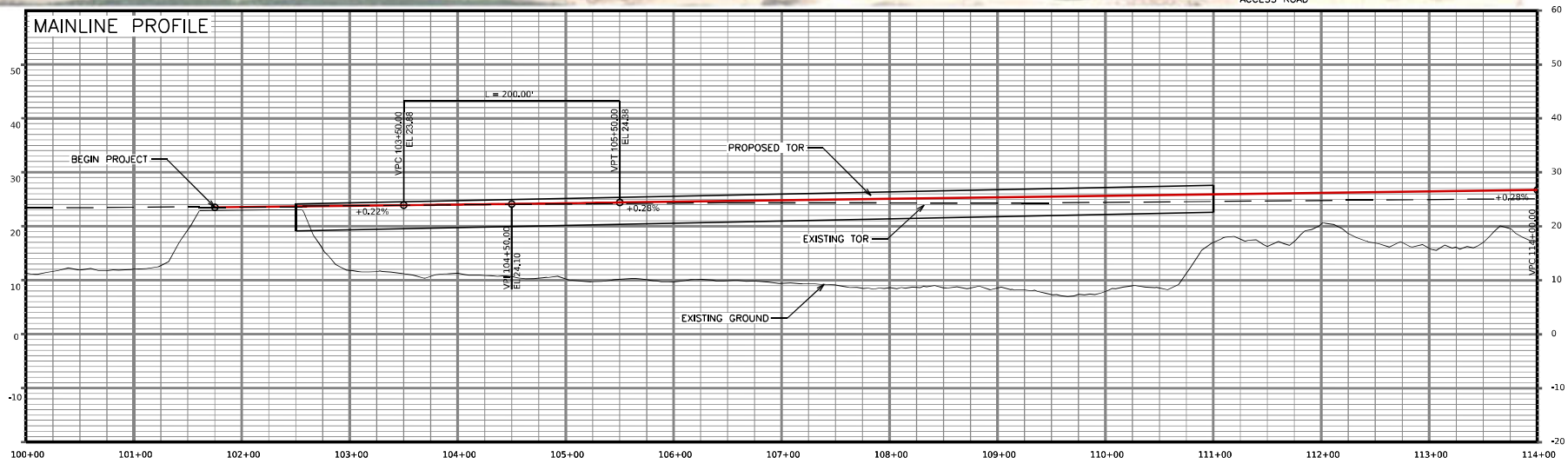

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DRAWN BY:	DRC
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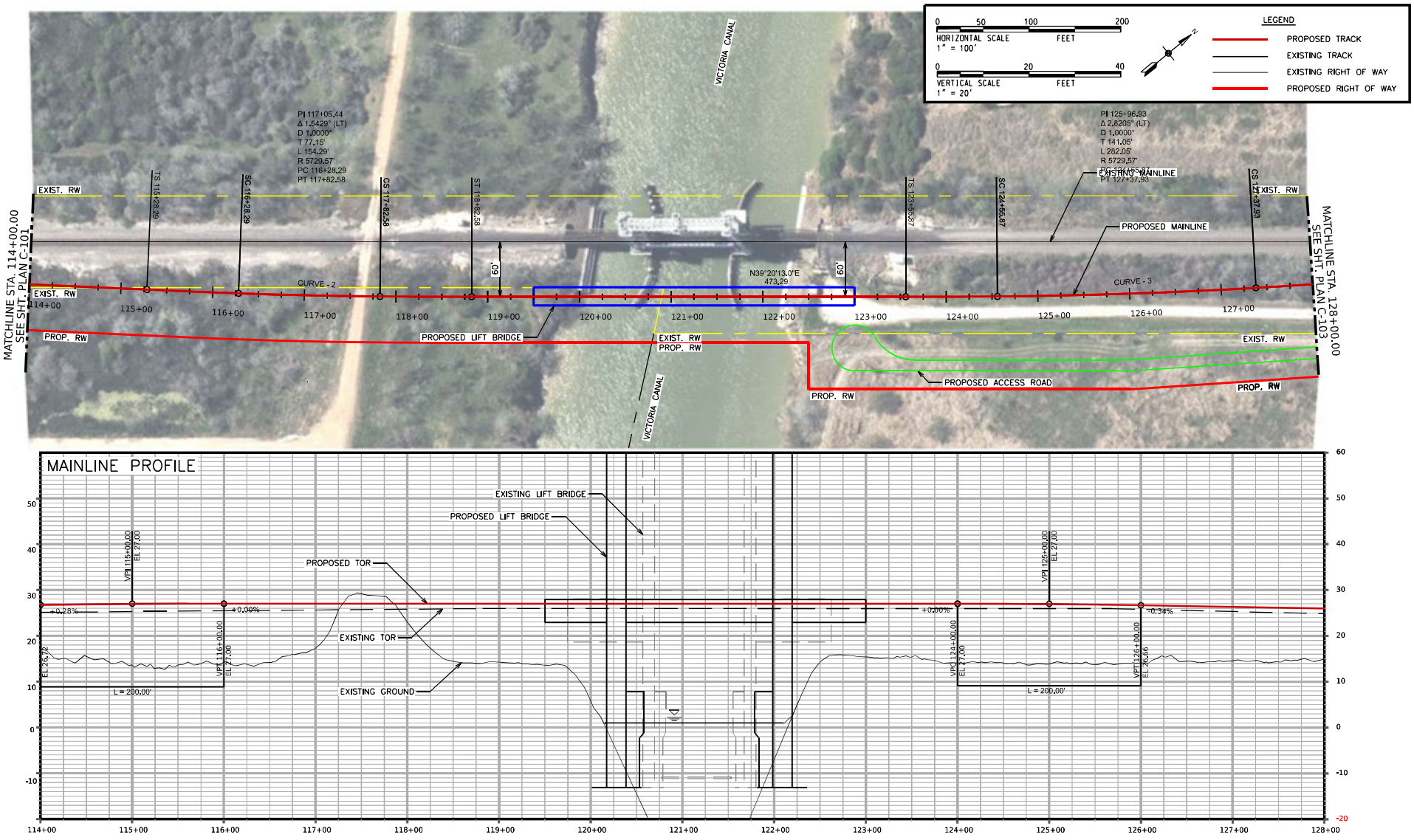
DATE:	10/23/2023
SHEET NUMBER	3

TEXAS DEPARTMENT OF TRANSPORTATION

LOCATION & DESCRIPTION:
VICTORIA, TEXAS
VICTORIA CANAL BRIDGE REPLACEMENT

SHEET TITLE:
PLAN AND PROFILE



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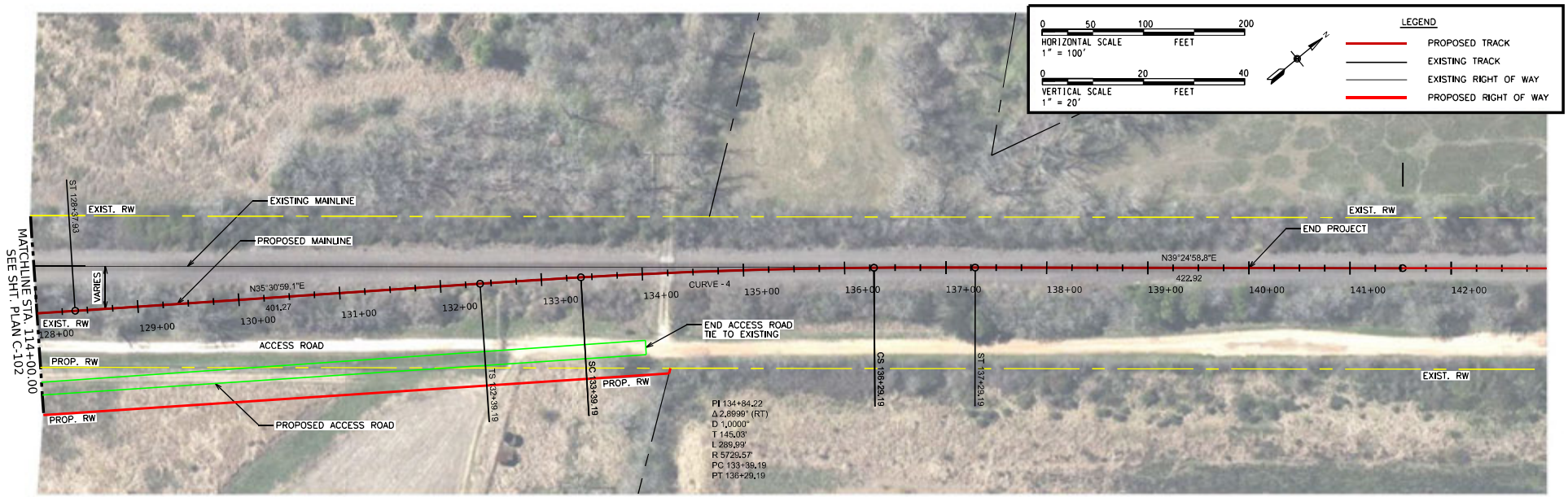
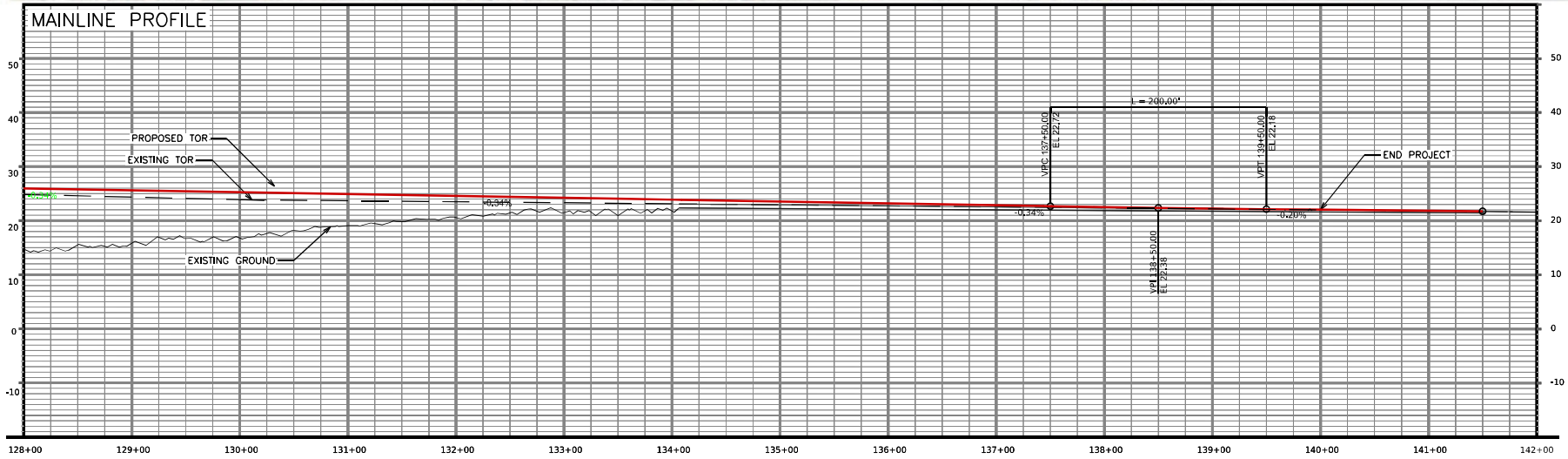
CHECKED BY:	AJG
DATE:	10/23/2023
SHEET NUMBER	4

TEXAS DEPARTMENT OF TRANSPORTATION

LOCATION & DESCRIPTION:
VICTORIA, TEXAS
VICTORIA CANAL BRIDGE REPLACEMENT

SHEET TITLE:
PLAN AND PROFILE





CONCEPTUAL

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FIRM REG. #: 3557

Texas Department of Transportation

DRAWN BY:	DRC
CHECKED BY:	AJG
DATE:	10/23/2023
SHEET NUMBER	5

TEXAS DEPARTMENT OF TRANSPORTATION

LOCATION & DESCRIPTION:
VICTORIA, TEXAS
VICTORIA CANAL BRIDGE REPLACEMENT

SHEET TITLE:
PLAN AND PROFILE