LOCKPORT COMPANY CANAL BRIDGE
(Bridge Recall No. 000930)
Carries Louisiana Highway 1 (LA 1) over Lockport Company Canal
Lockport
Lafourche Parish
Louisiana

HAER LA-32
HAER LA-32

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

REDUCED COPIES OF MEASURED DRAWINGS

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
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1849 C Street NW
Washington, DC 20240-0001

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Location: Carries Louisiana Highway 1 (LA 1) over Lockport Company Canal in Lockport, Lafourche Parish, Louisiana. At this location LA 1 is locally known as Crescent Avenue.

The Lockport Company Canal Bridge (Bridge Recall No. 000930) is located at latitude 29.644639 north, longitude -90.544389 west.[1] The coordinate represents the southeast corner of the bridge. It was obtained in 2016 by plotting its location in Google Earth. The location has no restriction on its release to the public.

Present Owner: State of Louisiana.

Present Use: Vehicular and pedestrian traffic. When in its open position, the bridge allows for marine traffic on the Lockport Company Canal.

Significance: The Lockport Company Canal Bridge is significant as an intact representative example of a tower-drive vertical lift bridge, a subtype within the vertical lift bridge subtype. The bridge's variation is demonstrated in the location of a separate motor and drive mechanism on each tower. The motor and drive mechanisms power the two sheaves on each tower. The Lockport Company Canal Bridge was determined eligible for listing in the National Register of Historic Places (National Register) in 2013 under *Criterion C: Design/Engineering* at the state level of significance.[2]

Historian: Timothy S. Smith, Cultural Resource Specialist; Mead & Hunt, Inc. (Mead & Hunt); 2017.

Project Information: This documentation was prepared to fulfill Stipulation IX.5 of the *Programmatic Agreement Among the Federal Highway Administration, the Louisiana Department of Transportation and Development, the Advisory Council on Historic Preservation, and the Louisiana State Historic Preservation Officer Regarding Management of Historic Bridges in Louisiana*, dated August 18, 2015 and executed September 21, 2015. The Louisiana Department of Transportation and Development (LADOTD) retained Mead & Hunt to prepare this document. It was prepared by cultural resource specialist Timothy S. Smith of Mead & Hunt. Dietrich Floeter completed the photography.

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[1] The bridge is also known as Structure No. 02290640601401.

[2] Mead & Hunt, Inc*., National Register Eligibility Determination Report: Pre-1971 Louisiana Highway Bridges* (prepared for the Louisiana Department of Transportation and Development, September 2013).

Part I. Historical Information

A. Physical History:

1. Date(s) of construction: 1959.

2. Engineer: Bridge Design Section, State of Louisiana Department of Highways.

3. Builder/Contractor/Supplier: Available plans do not name a specific builder, contractor, or supplier for the construction of the bridge.

4. Original plans and construction: Plan sheets for the construction of the Lockport Company Canal Bridge are available in the General Files room at the LADOTD's Baton Rouge headquarters. State Project No. 64-06-16 consisted of constructing a 2.3-mile concrete-paved bypass roadway around the west side of Lockport, removing an existing bridge across the Company Canal, and building a new bridge over the Old Intracoastal at 5th Street (now Crescent Avenue). Plans for the new vertical lift span are dated May 3, 1957 (approved on November 7, 1957) and use the LDH's standard plan SL50-150-28 for a 150'-0" long vertical lift span and 28'-0" wide roadway. The SL50-150-28 standard plan included the general arrangement of the operating machinery.[3] Plans for the vertical lift span also include spans 6 and 8, which are located beneath the lift towers. Plans for the eight approach spans (1, 2, 3, 4, 5, 9, 10, and 11) are dated February 12, 1957, and based on the latest LDH standard specifications and American Association of State Highway Officials 1953 standard specifications for highway bridges, as amended to December 31, 1955. The names of those that designed, traced, and approved the plans are illegible.

5. Alterations and additions: In 2011 the LADOTD replaced the electrical conductors and conduit throughout the bridge structure. This work included the removal and replacement of all navigation lights on the bridge and fender system.[4] This work represents in-kind replacement of the bridge's original features. Unspecified repairs were made to the upper deck, tower structures, and the electrical and mechanical components in 2006 as a result of Hurricane Rita.[5] Subsequent work on the bridge included reconfiguration of electrical service at the bridge for a trailer-mounted generator in 2007, replacement of wire ropes in 2008, replacement of the grid floor in 2009, and repairs to limit switches, gate operators, and span locks in 2010.[6]

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[3] State of Louisiana Department of Highways, *Plans of Proposed State Highway, S-253(3) State Project No. 64-06-16*, plans for Lockport Relocation, Lafourche Parish, LA 1, November 7, 1957.

[4] "Drawbridge Operation Regulation; Company Canal, Lockport, LA, *The Federal Register*, April 15, 2011.

[5] Louisiana Department of Transportation and Development, "Projects 064-06-0041 and 064-06-0042," *trns.Port Systems Database*, available at the Louisiana Department of Transportation and Development, Baton Rouge, La.; Louisiana Department of Transportation and Development, "Project 064-06-0042," *trns.Port Systems Database*.

[6] Louisiana Department of Transportation and Development, "Project 064-06-0043," *trns.Port Systems Database*; Louisiana Department of Transportation and Development, "Project 064-06-0044," *trns.Port Systems Database*; Louisiana Department of Transportation and Development, "Project 064-06-0046," *trns.Port Systems Database*; Louisiana Department of Transportation and Development, "Project 064-06-0047," *trns.Port Systems Database*.

B. Historical Context:

Development of highways and bridges in Louisiana

Since the Louisiana Highway Commission's (LHC's) inception in 1921 (replacing the State Highway Department), the agency's Bridge Department was responsible for the design and construction of many of Louisiana's bridges, including some of the largest and most significant examples. The department originally operated within the agency's construction division. Projects with only bridges were handled by the Bridge Department and those with both roads and bridges were completed by the office engineer with assistance from the bridge engineer.[7] The Bridge Department designed and often served a supervisory role in projects, eliminating the need for a general contractor during construction of State-owned bridges. As the Bureau of Public Roads (BPR) created design standards at the national level, the LHC also created Louisiana standard plans developed to assist in bridge design.[8] The LHC was reorganized as the Louisiana Department of Highways (LDH) in the 1940s, which designed the Lockport Company Canal Bridge. LDH biennial reports from the 1950s and 1960s indicate that in the period following World War II economic growth and government funding combined to not only increase investment on a grand scale, but also improve and increase road and bridge construction statewide.[9]

Bridge engineering practices of the Bridge Department/Bridge Design Section in the 1950s and 1960s became an increasingly scientific discipline that stressed a calculated approach to the rapidly increasing demand for plentiful, affordable, and efficient bridge designs and construction methods. Standardization and cost analysis accompanied the use of early computer programs and automated work to aid engineers in new approaches and innovations.[10]

Making the work of the agency more complicated was the state's abundant waterways. Influenced by the need to create and facilitate a reliable transportation system, the agency looked to movable bridges to span these waterways while also allowing for marine navigation below. As a result, Louisiana has one of the largest collections of movable bridges in the nation. Few were constructed in the state prior to 1900; however, they gained popularity and a series of standard plans for movable bridges were developed by the LHC and LDH between 1924 and 1963. Standard plans were periodically revised with small adjustments to meet site-specific needs. Standard plans for tower-drive-with-independent-towers bridges such as the Lockport Company Canal Bridge were available by 1953. As of 2015 Louisiana had 31 vertical lift bridges constructed between 1914 and 1970 and only four known examples with the tower-drive-with-independent-tower structure design. In addition to the Lockport Company Canal Bridge,

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[7] Louisiana Highway Commission, *Biennial Report of the Louisiana Highway Commission of the State of Louisiana, 1922-1924* (Baton Rouge, La.: Louisiana Highway Commission, 1924), 93.

[8] Louisiana Highway Commission, *Biennial Report of the Louisiana Highway Commission of the State of Louisiana, 1922-1924*, 93 and 95; Mead & Hunt, Inc., *Historic Context for Louisiana Bridges* (prepared for the Louisiana Department of Transportation, 2013), 17.

[9] Mead & Hunt, Inc., *Historic Context for Louisiana Bridges,* 27.

[10] Mead & Hunt, Inc., *Historic Context for Louisiana Bridges*, 97.

examples of this type are the Intracoastal Waterway Bridge at Larose in Lafourche Parish (Bridge Recall No. 000920), the Judge Seeber Bridge (Bridge Recall No. 020375) in Orleans Parish, and the Intracoastal Waterway/W-J. Perez Bridge (Bridge Recall No. 002500) in Plaquemines, all in the southeast corner of the state.[11]

Construction of the Lockport Company Canal Bridge

A series of canals and locks constructed between approximately 1850 and 1880 in the vicinity of present-day Lockport facilitated shipping and steady economic growth. One of these was the Old Intracoastal Waterway (now known as Company Canal), which bisected Bayou Lafourche. Lockport was eventually established at the juncture of Bayou Lafourche and the Old Intracoastal Waterway and incorporated in 1899. Only two bridges are known to have been constructed at Lockport prior to the existing Lockport Company Canal Bridge: an iron bridge in 1900 across Bayou Lafourche, between Lockport and Rita, and a steel pontoon bridge across the Company Canal built ca. 1948.[12] Both of these bridges are nonextant.

By 1956 plans were underway to construct the existing Lockport Company Canal Bridge.[13] Plans were drawn up in 1957 by the LDH for State Project No. 64-06-16, which consisted of constructing a 2.3-mile concrete-paved bypass around the west side of Lockport to carry LA 1; removing the ca. 1948 steel pontoon bridge (located at 8th Street across the Company Canal); and building a new vertical lift bridge at 5th Street (now Crescent Avenue) across the Company Canal to carry the relocated LA 1. Plans for the 11-span vertical lift bridge are dated May 3, 1957, and plans for eight of the approach spans are dated February 12, 1957. Plans for the entire project were approved on November 7, 1957. Fiscal records for the LDH indicate a total expenditure of $1,087,566.64 for the project.[14]

Engineering background

The Lockport Company Canal Bridge is an example of a tower-drive-with-independent-towers vertical lift bridge. The oldest movable bridges in the U.S. date to the mid-to-late nineteenth century and most early examples were of the swing type. Small-scale vertical lift bridges consisting of girder spans of a maximum span length of 50 feet were first constructed across canals throughout Europe and the U.S. in the early nineteenth century. These early vertical lift bridges had very short lifts and included such

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[11] Mead & Hunt, Inc., *National Register Eligibility Determination Report: Pre-1971 Louisiana Highway Bridges*, 36, 44.

[12] Town of Lockport, Louisiana, *History, June 6, 2016,* http://townoflockport.com/?page_id=20 (accessed July 13, 2016); LaFourche Parish Game and Fish Commission, *Historic Habitat Changes*, June 16, 2016, http://www.lafourchegfc.org/habitathistory1.html (accessed July 12, 2016); Louisiana Department of Highways, "Highway Contracts Reach $4,653,274 Month of December: Year's Total is Over 24 Million," *Louisiana Highways* II, no. 1 (January 1948): 6.

[13] "Legislative Digest," *The Times-Picayune*, July 20, 1956, 14.

[14] State of Louisiana Department of Highways, *Financial & Statistical Report, Fiscal Year Ending June 30, 1958* (Baton Rouge, La.: State of Louisiana Department of Highways, 1958); State of Louisiana Department of Highways, *Financial & Statistical Report, Fiscal Year Ending June 30, 1959* (Baton Rouge, La.: State of Louisiana Department of Highways, 1959); State of Louisiana Department of Highways, *Plans of Proposed State Highway, S-253(3) State Project No. 64-06-16*.

features as cast-iron towers and hydraulically operated movable spans. In the U.S., movable bridges were constructed over the Erie Canal in the early nineteenth century. Toward the end of the nineteenth century a series of other movable bridge types were rapidly developed and brought into common use, including bascule variations and vertical lift examples.[15]

The design of modern vertical lift bridges can be attributed to John Alexander Low Waddell's 1894 South Halsted Street Bridge in Chicago. In vertical lift bridges, the main span consists of steel girders or a truss that is raised and lowered via cables. The cables are carried over large, grooved pulleys or wheels (termed sheaves) at the tops of the bridge towers and attached to the movable span at one end and large counterweights at the other end. The cables and counterweights balance the weight of the lift span so very little effort or power is required to move it up or down. The up and down movement is accomplished through a second and separate set of cables called up-haul and down-haul ropes.

The design of vertical lift bridges can vary slightly based on the location of the motor(s) and drive mechanisms that move the span up and down by controlling the up-haul and down-haul ropes. The three basic variations include span drive, tower drive with independent towers, and tower drive with connected towers.[16] Tower-drive vertical lift bridges have a series of operating ropes (typically two up-haul and two down-haul ropes at each corner of the span) attached to geared operating drums. To lift the span, the drum winds the up-haul ropes and simultaneously unwinds the down-haul ropes. The sheaves at the top of each tower carry the counterweight ropes and are free-spinning with no direct control over the movement of the span. Tower drive vertical lift bridges with independent towers are powered by a separate set of drive machinery located at the top of each lift tower. The movable span is raised and lowered by rotating the motorized sheaves by means of interconnected shafts and gears. A single motor operates two sheaves that enable the span to move.[17]

Part II. Structural/Design Information

A. General Statement:

1. Character: The Lockport Company Canal Bridge is a tower-drive-with-independent-towers vertical lift bridge with a steel plate girder movable span. It is a representative example of this uncommon vertical lift bridge subtype.

2. Condition of fabric: Good.

B. Description: The Lockport Company Canal Bridge is located in the Town of Lockport, Louisiana, and carries LA 1 (locally known as Crescent Avenue) over the Lockport Company Canal. The Town of

[15] Terry L. Coglin, *Movable Bridge Engineering* (Hoboken, N.J.: John Wiley & Sons, Inc., 2003), 55.

[16] Coglin, *Movable Bridge Engineering*, 6, 55; Mead & Hunt, Inc., *Crossing the Bayou: Louisiana's Historic Bridges* (prepared for the Louisiana Department of Transportation and Development, 2015), 14.

[17] Mead & Hunt, Inc., *Crossing the Bayou: Louisiana's Historic Bridges,* 14-17.

Lockport is located in Lafourche Parish, east of Houma, Louisiana. LA 1 extends north from Grand Isle, located along the Gulf of Mexico, for approximately 146 miles to Interstate Highway 190 in Baton Rouge.

The bridge is aligned on a nominal southeast-northwest axis. It has an overall structure length of 370'-0" and an out-to-out width of 33'-0". The 11-span structure has a 150'-0" steel vertical lift span (span 7) with a 125'-0" horizontal clearance over the waterway, plus 5'-0" on each side from centerline of the column to the centerline of the live load bearing for each lift span; eight concrete slab approach spans each with an individual length of 20'-0" (spans 1-5 and 9-11); two spans beneath the towers (spans 6 and 8), each with a 25'-0" length; an operator's house mounted within the southernmost tower above the roadway; and machinery houses located at the tops of the two towers that shelter the sheaves and lift machinery.

Main vertical lift span
The vertical lift span of the Lockport Company Canal Bridge is a movable steel plate girder span with welded connections and stiffeners. The vertical-lift span generally has a roadway width of 28'-0" accommodating a two-lane roadway. Across both sides of its entire length the vertical lift span has a raised metal 5'-0" sidewalk with a pipe handrail mounted on a single reinforced-concrete rail, which is integrated with concrete posts. Each railing is integral with railings on approach spans that terminate at a stepped concrete endpost that features a design with rounded, protruding parallel panels and lettering with "1959" and "Company Canal." The majority of the deck consists of a steel grid; portions under the towers within spans 6 and 8 have a concrete deck with asphalt overlay. The substructure for the vertical lift span consists of concrete pile bents that support two massive concrete platforms under each of the lift towers.

Lift towers
The vertical lift span is situated between two cross-braced, independent, steel I-beam lift towers and has a maximum vertical lift of 50'-0". Each tower is approximately 90' tall and comprised of three, vertically oriented outer panels with an approximate dimension of 25' by 25'. The steel cross-bracing in each tower and panel has a combination of riveted and bolted connections. Metal staircases mounted on the exterior of the tower structure provide access to the machinery houses located at the top of each tower. Portals integrated with the lift tower structure are located at either end of the movable span above the roadway. Adjacent to the portals, at the edge of the outermost panels of the lift tower structure, are vertical drop-bar traffic barriers that extend the full width of the roadway. These traffic barriers are raised and lowered via an electrically controlled shaft that rotates two grooved wheels, which carry metal chains attached to the barrier at one end and a concrete counterweight at the other. These original traffic barriers are still extant but may no longer operate.

Machinery
This bridge has a tower-drive-with-independent-towers configuration, meaning the electrically powered drive machinery used to raise and lower the main span is located at the top of each independent lift tower. Many of the movable components that enable the movement of the span are also housed within each independent tower structure. Components of the drive machinery include an electric motor, speed reducer, coupling, shafts, and sheaves (grooved steel wheels at the corner of each tower, two within each machinery house). The electric motor provides the power for simultaneously rotating the sheaves and the

speed reducer adjusts the torque of the motor based on rotations per minute. Two shafts extend from the motor to the sheaves. The coupling is a device that connects the ends of the two independent shafts for the purposes of transmitting power to the sheaves. Based on review of plans and field inspection, the machinery at the top of each lift tower generally retains its original configuration and components.

Each of the sheaves carries a heavy steel cable that moves up and down within the lift tower structure. One end is attached to the movable span below and the other end is attached to a large counterweight that consists of a steel beam encased in concrete and balance chains that are suspended within each tower structure. The combined weight of the two counterweights is equal to the weight of the lift span, thus giving the movable span minimal weight for ease of movement; the drive machinery needs to provide only enough force to overcome friction and wind resistance to operate the cables in the corresponding direction.

Each machinery house has an irregular form with small extensions to account for the rounded protrusion of the sheaves at the top of each corner of the lift tower. The metal-frame structures are clad in corrugated sheet metal and have small, metal, louvered vents on each end. A band of five, metal-frame, awning windows opens from the interior elevation (facing the movable span) for air circulation.

Other mechanical features on the vertical lift span include span locks that secure the span in place when in closed position as well as guide rollers at the end of the span for the purposes of proper span alignment.

Operator's house

The operator's house is mounted above the roadway within the south lift tower structure and is accessed by a metal stairway on the west side of the tower. The operator's house is important as the location of the switchboard or operator's console that controls the electrical and mechanical components of the movable span. Aerial electrical cables strung between the two lift towers provide electricity from the operator's house to the motors and machinery at the top of each lift tower.

The concrete-walled, box-like building features pairs of horizontal grooves beneath the flat roofline that gives the building a restrained Streamline Moderne appearance. Paired sets of aluminum-frame windows with louvered horizontal glass panels are located on the northwest and southeast facades; the windows on the northwest side of the operator's house wrap around the building corners. A round stylized emblem of a pelican is set into the wall between the windows on the northwest and southeast elevations. The house interior consists of a large rectangular room with a control desk and switchboard under the northwest-facing windows and small bathroom at the eastern end of the building.

Approach spans

The bridge has 10 total approach spans that are reinforced-concrete slab spans. Spans 1-5 are located on the southeast approach and are each 20'-0" long, spans 9-11 are on the northwest approach and are also each 20'-0" long, and spans 6 and 8 are located beneath the lift towers and are each 25'-0" long. The approach spans generally have a roadway width of 28'-0" accommodating two traffic lanes. The approach spans have a concrete deck and two 5'-0" concrete sidewalks with raised curb. Pipe handrails

mounted on single reinforced-concrete rails, which are integrated with concrete posts, extend along both sides of the approaches. The substructure consists of concrete pile bents with concrete bent caps. The end bents are concrete with small wingwalls that serve as bases for the ornamental endposts that feature raised parallel rounded panels. A single roadway approach slab is located at each end of the bridge structure and measures approximately 20' long. Metal drop-arm traffic barriers are located adjacent to the outermost approach span on each end of the bridge structure; a metal two-light signal is paired with each barrier.

Other features around the bridge include two concrete flood control structures under the south approach spans and timber fenders are located under both sides of the bridge to protect those portions of the bridge that are exposed to potential damage by marine traffic should there be a collision.

C. Site Information: The Lockport Company Canal Bridge spans the Lockport Company Canal in Lockport, Louisiana. The canal runs in a northeast-southwest direction, connecting Bayou Lafourche with Lake Fields. The landscape immediately surrounding the bridge and canal consists of mostly narrow banks of landscaped grass as the area is primarily commercial development. The bridge carries two lanes of vehicular traffic, one in each direction.

Part III. Sources of Information

A. Primary Sources:

Bridge Inspection Report, February 20, 2013. Available in Bridge Maintenance and Inspection Division, Louisiana Department of Transportation and Development, Baton Rouge, Louisiana.

"Drawbridge Operation Regulation; Company Canal, Lockport, LA." *The Federal Register*, April 15, 2011.

"Legislative Digest." *The Times-Picayune,* July 20, 1956, 14.

Louisiana Department of Highways. "Highway Contracts Reach $4,653,274 Month of December: Year's Total is Over 24 Million." *Louisiana Highways* II, no. 1 (January 1948): 6.

Louisiana Department of Transportation and Development. "Project 064-06-0041." *trns.Port Systems Database*. Available at the Louisiana Department of Transportation and Development, Baton Rouge, La.

Louisiana Department of Transportation and Development. "Project 064-06-0042." *trns.Port Systems Database*. Available at the Louisiana Department of Transportation and Development, Baton Rouge, La.

Louisiana Department of Transportation and Development. "Project 064-06-0043." *trns.Port Systems Database*. Available at the Louisiana Department of Transportation and Development, Baton Rouge, La.

Louisiana Department of Transportation and Development. "Project 064-06-0044." *trns.Port Systems Database*. Available at the Louisiana Department of Transportation and Development, Baton Rouge, La.

Louisiana Department of Transportation and Development. "Project 064-06-0046." *trns.Port Systems Database*. Available at the Louisiana Department of Transportation and Development, Baton Rouge, La.

Louisiana Department of Transportation and Development. "Project 064-06-0047." *trns.Port Systems Database*. Available at the Louisiana Department of Transportation and Development, Baton Rouge, La.

State of Louisiana Department of Highways. *Plans of Proposed State Highway, S-253(3) State Project No. 64-06-16.* Plans for Lockport Relocation, Lafourche Parish, LA 1. November 7, 1957.

State of Louisiana Department of Highways. *Financial & Statistical Report, Fiscal Year Ending June 30, 1958*. Baton Rouge, La.: State of Louisiana Department of Highways, 1958.

State of Louisiana Department of Highways. *Financial & Statistical Report, Fiscal Year Ending June 30, 1959*. Baton Rouge, La.: State of Louisiana Department of Highways, 1959.

B. Secondary Sources:

Coglin, Terry L. *Movable Bridge Engineering*. Hoboken, N.J.: John Wiley & Sons, Inc., 2003.

LaFourche Parish Game and Fish Commission. *Historic Habitat Changes,* June 16, 2016.

Mead & Hunt, Inc. *Crossing the Bayou: Louisiana's Historic Bridges*. Prepared for the Louisiana Department of Transportation and Development, 2015.

Mead & Hunt, Inc. *Historic Context for Louisiana Bridges*. Prepared for the Louisiana Department of Transportation and Development, December 2013.

Mead & Hunt, Inc. *National Register Eligibility Determination Report: Pre-1971 Louisiana Highway Bridges*. Prepared for the Louisiana Department of Transportation and Development, September 2013.

Town of Lockport, Louisiana. *History*, *June 6, 2016.* http://townoflockport.com/?page_id=20 (accessed July 13, 2016).