MISSISSIPPI RIVER - GULF OUTLET
NEW LOCK AND CONNECTING CHANNELS

EXECUTIVE ADDENDUM

INTRODUCTION

EA.1. This executive addendum to the Engineering Appendix has beenadded to present the engineering alternatives developed to address issues raised during the public comment period on the Draft Evaluation Report. These issues related to the need for (1) a section of floodwall proposed on the east bank of the IHNC canal where there is currently an all earthen section, and (2) the interruption of vehicular access across the canal at St. Claude and Claiborne Ave. Bridges during construction of a new bridge at St. Claude and the replacement of the main span and towers of the Claiborne Ave. Bridge.

EA.2. References. For the bridge design one additional reference is needed under the Technical Publications heading. Add:

Louisiana Department of Transportation and Development (LADOTD), Bridge Design Manual, Third Edition, 1987.

FLOODWALL

General

EA.3. The Mississippi River flood protection levees and floodwalls must be extended from the existing lock northward approximately 2500 feet on the east and west banks to tie into the new lock.

EA.4. The recommended flood protection plan for a portion of the east bank, as presented in the main body of this appendix (plates B42 & B43), calls for the construction of 2186 feet of a combined earth/concrete capped I-wall section (MRL B/L Sta. 624+35.17 to 615+53.8 = 0+00 Lock B/L to 13+05.5). The existing Mississippi River flood protection in this reach is an all earthen levee section. The requirements to provide a navigation by-pass channel during demolition of the existing lock along with the design deep draft channel cross-section necessitated some levee degrading and use of a concrete caped I-wall for stability reasons.

EA.5. The replacement of an all earthen levee section with a floodwall is very objectionable to the local residents. To address this issue several alternatives were investigated. Based on these investigations, it is recommended that an earthen section with a concrete fold down wall (see plate EA-6), replace the combined earth/concrete capped I-wall shown on plates B-42. The concrete fold down wall will consist of panels 4 feet high by 10 feet long.

Recommended Operation

EA.6. The proposed fold down floodwall adds a maintenance and operability burden on the Orleans Levee District (OLD). To date this fold down floodwall has not been reviewed by the OLD.

EA.7. The fold down floodwall is 4 feet high and will be raised when the Carrollton gage reading rises to 15' and further rise is predicted. The 15' gage reading translates to a 13.8' stage at the IHNC canal. As shown on plate EA-6, the earthen embankment portion of the fold down wall cross-section is at elevation 18.8. The fold down wall portion of the flood protection provides the freeboard requirements for the MR&T project.

EA.8. Stage duration data indicate that a stage of 15 feet at the Carrollton gage occurs annually for a duration of 23 days, on the average; however, the stage does not reach 15 feet at all during many years. During high water years, stages exceed 15 feet for periods of one to three months. The need to raise the wall, based on occurrences of a stage of 15 feet at Carrollton with a predicted rise, would occur about once every 2 years on the average.

Alternatives

EA.9. Criterion set for the project requires that residential relocations be avoided. This eliminated the possibility of a levee setback. Therefore, several alternative wall designs were evaluated. All, except for the recommended fold down wall concept, were pile supported T-walls of various configurations that included an earthen embankment to within two feet of the top of the walls. All of these options proved prohibitive because of costs. The recommended earthen section with a fold down concrete wall proved to be the best cost alternative that addresses the local residents' concerns. The level of a design effort for these alternatives was sufficient to prove that the concrete capped I-wall could be replaced at an increased cost of $600,000. Refinements to these designs could be realized in the next level of design.

REPLACEMENT OF ST. CLAUDE AND CLAIBORNE AVENUE BRIDGE CROSSINGS

General

EA.10. The recommended plan, as presented in the main body of the appendix, required a two-year interruption of vehicular traffic across the IHNC canal at St. Claude Ave. while the St. Claude Bridge was being replaced. The interruption of traffic at the Claiborne Ave. Bridge was estimated to be seven months. These outages proved to be one of the more significant impacts surfaced through the public review process. We revisited the bridge plans in an effort to reduce delays without greatly increasing the project costs. A/E firms were contracted to provide bridge design expertise. Several alternatives were investigated at both St. Claudeand Claiborne Avenues. The solutions significantly reduced delays/outages to a negligible amount.

EA.11. The revised bridge plans increased the project cost by approximately $13,000,000. These bridge revisions eliminate the need for the extensive detour routes previously proposed. The cost of the detours is $8,400,000, leaving a net increase to the project cost of $4,600,000 for the bridge revisions. However, the detour routes were added back into the project mitigation plan for other reasons described in Volume 2, Community Impact Mitigation Plan. The revisions leave the main arteries virtually unaffected, and may in fact actually be an improvement in comparison to the existing substandard lane widths at the St. Claude Bridge.

ST. CLAUDE BRIDGE REPLACEMENT AND DETOUR

General

EA.12. The A/E firm of URS-Greiner was contracted to provide consultation and bridge expertise. The recommended plan is based on information provided by URS-Greiner and the work previously done by N.Y. Assoc., INC. The recommended replacement bridge at St. Claude will be a 200 foot horizontal clearance double leaf bascule bridge in the existing bridge footprint as originally proposed. However, a four lane detour located 100 feet north of the existing bridge will be provided during construction of the replacement bridge. See plates EA-1, EA-2 and EA-3. The detour will include two single leaf temporary bascule bridges that will span both the existing lock and the demolition bypass channel. The operating time for the new double leaf bascule bridge is 90 seconds. The operating time for the detour bridge is 120 seconds.

EA.13. The construction of the new bridge is complicated by the project criterion requiring avoidance of residential relocations, concurrent demolition of the existing lock, and community opposition to anything but a low level bridge. Under the initial plan, St. Claude Ave. would be closed for 24 months, the channel would be closed to ship traffic for 24 months and barge traffic would be obstructed for 30 continuous days plus intermittent closures to accommodate demolition blasting. In order to reduce vehicular outage, the detour must provide passage over the lock and the bypass channels.

St. Claude Bridge Replacement

EA.14. The initial proposal is described in paras. B.2.138 to B.2.151 of the engineering appendix. The plans for the permanent bridge will not change except that para. B.2.142 is no longer applicable. The construction sequence is described in paras. EA.21 and 22. At the recommendation of the A/E, in the next level of design, a through truss design will replace the submitted girder design. The through truss construction will significantly reduce the elevation of the bridge final grade. This change will reduce the length and height of the approaches.

EA.15. The permanent bridge replacement cost, including the approaches, is estimated to be $28,067,700. This cost has a 25% contingency factor.

St. Claude Detour

EA.16. There is sufficient area north of the existing bridge to construct a 4 lane detour. The western half of the detour is severely constrained by a house that is located at approximate Station 24+10, between Japonica Street and the railroad tracks (see Plate EA-1). On the Eastern side of the canal, the constraints are a pump station located at approximate Station 34+30 between Sister Street and Jordan Avenue and a house on the northeast corner of Jordan Avenue, approximate Station 37+60. The pump station is offset from the existing bridge approach by approximately 160 feet and does not appear to pose any clearance problems for the detour bridge approach structure. In evaluating the location of the detour bridge, it was determined that an offset of 100 feet would provide adequate clearance from the existing structure for demolition. This offset provides approximately 13 feet of clearance from the existing control house to the edge of the detour road. On the east side, a standard LADOTD Type C detour can be utilized within the space available. This configuration has a design speed of 40 mph. On the west side, due to the severe constraints imposed by the buildings between Japonica Street and the railroad, a Type B detour is recommended with 12 foot lanes instead of 11. This configuration has a design speed of 30 mph, which dictates the posted speed limit of 25 mph.

EA.17. Adequate space has been provided to accommodate a 4-lane roadway with 12 foot travel lanes and a 5 foot sidewalk on the northern side (See Plate EA-1). Access to the walkway will be provided by a staircase located east of the houses between Japonica Street and the railroad tracks on the west side and at Sister Street on the east side. By locating the western stairway east of the existing buildings, the roadway section prior to that point will not require a walkway, thus reducing the roadway section and improving the clearance to those buildings. Also note that with more accurate surveys and minor refinements to the detour geometry, the conflict between the east side detour and the pedestrian tunnel might be able to be avoided, thus eliminating the need for the extension of this structure.

EA.18. In order to accommodate both lock demolition and bypass channel two single leaf bascule bridges are required. Only one span will be movable at a time. Both leaf free ends are supported by a common pier. By using a through girder single leaf bascule bridge, the profile for the detour bridge can be set lower than for a similar conventional bridge. This will significantly reduce the amount of fill required for the recommended sheet-pile retained embankment. The profile also maintains existing clearances for all tunnel crossings.

EA.19. The single-leaf bascule with an overhead counterweight is recommended for the temporary movable spans. This bridge type will span the existing navigation lock structure and demolition channel, provide at least 156' of vertical clearance with the span raised, and carry four (4) lanes of vehicular traffic and a 5' pedestrian sidewalk. The single-leaf bascule with an overhead counterweight can be achieved with conventional bascule span types such as a Dutch-style trunnion bascule with an overhead balance frame or Scherzer rolling bascule with a fixed counterweight. The overhead counterweight eliminates the need for a large bascule pier, and corresponding mass excavation to provide for rotation of the counterweight. In general, bascule piers required for overhead counterweight schemes are of a simplified configuration. The simplified configuration translates to significant reductions in material and formwork required for bascule pier construction. Also, these simplified

piers are generally much lighter than conventional bascule piers resulting in reduced loads on the foundations. Thus, the bascule piers will be less expensive than piers for bascule spans with underdeck counterweights. A single-leaf bascule will require a span length of 125' from center of heel trunnion to center of bearing at the toe of the leaf. The piers are pile founded. Excavation and demolition of a portion of the emergency crane support on the west wall may be required to install the piles. The detour alignment over the emergency dam does not present a problem since the new lock will be in operation and the river flood protection completed.

EA.20. In evaluating the detour approach structure, two alternatives were investigated: a sheet pile retained embankment to support the approaches and a steel H-pile frame to support a concrete deck system. The steel H-pile frame option was eliminated due to the complexity of this type of structure with the detour geometry proposed. This type of structure would be particularly complex around the railroad and vehicular tunnel extensions required for this project. At these points, the detour roadway is skewed significantly from the direction of the tunnel; therefore orientation of the steel H-pile frame would be difficult to achieve without interfering with the tunnel geometry. The retaining wall approach is more economical and simpler to construct. The railroad, vehicular and pedestrian tunnels will be accommodated by extending the tunnel structure and abutting the sheet pile retaining wall into that structure. A headwall will be constructed at the end of the tunnel section to match the height and geometry of the retaining wall.

EA.21. The detour route including the two single leaf bascule bridges, approaches, traffic control, and detour removal is estimated to be $17,122,100. This cost has a 20% contingency factor. The salvage value of the bascule bridges and sheet piling has not been considered.

ST. CLAUDE BRIDGE REPLACEMENT CONSTRUCTION SEQUENCE

EA.22. The construction sequence proposed in the engineering appendix must be revised slightly to accommodate the St. Claude detour plan. The new sequence will not lengthen the overall project duration. The construction duration of critical path items is as follows:

EVENT	DURATION
-Claiborne Ave Bridge Complete	N/A
-Detour Construction	9 months
-Bypass Excavation w/ minimal Lock Demolition	4 months
-Lock Demolition	18 months
-New Bridge Construction Except East Pier & Superstructure	16 months
-New Bridge East Pier & Superstructure	3 months
-Remove Detour	3 months

EA.23. The Claiborne Avenue Bridge Replacement will be completed at any time prior to the commencement of the St. Claude Bridge Replacement and lock demolition. The St. Claude bridge replacement is built in the same alignment as the existing bridge. The new bridge cannot be built in its entirety until the existing lock is demolished and the marine traffic moved from the demolition bypass back to the existing navigation channel centerline. The new east pier is located in the center of the bypass. Without the bypass, barge traffic would experience an outage the entire 18 month lock demolition period. This would impose a serious burden to the barge industry and has been eliminated from consideration. Once demolition is complete and marine traffic is returned to the existing navigation channel centerline, the new bridge will be completed. The St. Claude Ave. Bridge and detour construction sequence is further described in paras. EA.35 and 36.

CLAIBORNE BRIDGE REPLACEMENT

General

EA.24. The A/E firm of Modjeski and Masters was contracted to provide consultation and bridge expertise. The recommended plan is based on information provided by Modjeski and Masters and the work previously done by Parsons, Brinckerhoff, Quade and Douglas, INC. Several alternatives were pursued. The recommendation is to replace the main span as submitted in the engineering appendix, but without the pier retro fit. The superstructure will be fabricated and installed in such a manner that vehicular outage will be two to four weeks. Since the work is on the existing alignment, it is not prudent to erect or dismantle steelwork over or adjacent to vehicular traffic. Therefore, the work would be accomplished over weekends thus minimizing impacts during peak demand. The canal would be closed to marine traffic during float-out and float-in periods, each of 12-24 hour duration. The marine outage would be approximately 21 days. The continuous outage only applies to marine traffic requiring over a 40' height. Scheduled intermittent marine traffic will be allowed throughout the marine closure period for all traffic that can clear the 40' clearance restriction.

EA.25. The replacement of the main span is described in paras B.2.152 to B.2.159. Paragraphs addressing the pier retrofit are no longer applicable. Note that the replacement roadway will match the existing span in-kind; however, the roadway width is substandard for a LADOTD UA-1 classification. The main span replacement is shown on plates EA-4 and EA-5.

EA.26. Opening Times. The estimated time for opening the bridge will be:

Full opening, about 185 seconds.

Half opening, about 90 seconds.

Replacement Span Future Improvements

EA.27. Modjeski and Masters recommended improving the present design. The improvements include replacing the parallel chord Warren Truss with a variable depth Warren Truss and replace the deck with an orthotropic deck. The orthotropic design would reduce the depth of the bottom chord and floor system, thus providing additional vertical clearance for marine traffic. The issue of available vertical clearance is further discussed in para. EA.31 below. Also, the A/E recommends using a span drive system rather than the tower-drive. The advantage of the span drive is that it is installed and tested on the main span prior to installation. The lift mechanism would be brought to the site in a ready to use condition. The tower drive would have to be installed after the piers are completedand adjusted. The tower drive added two days to the vehicular outage time.

Existing Piers

EA.28. The plan proposed in the engineering appendix includes an encapsulation of the existing tower piers based on a theory that the timber piles may be deteriorated, and that the actual load capacity of the piles may be inadequate. Modjeski and Masters has inspected thisbridge for the state for several years. They do not accept or endorse this conclusion on the basis that there is no evidence to support it. Rather, they believe that the existing piers, which have served satisfactorily for the last 40 years, will continue to serve satisfactorily for another 50 years. They strongly recommend not modifying the pier. Representatives from the LADOTD agreed with this recommendation. The pier retrofit work has been deleted.

Construction Procedures

EA.29. Both the new lift span and the two new towers will be fabricated and erected off-site for float-in erection. The new towers will be designed to be erected complete in the horizontal position, then floated-in, lifted and pinned to the front tower base shoes, then rotated into a vertical position using heavy lifting equipment. Rear tower leg adjustments will allow for field plumbing of the towers. The new lift span will be floated into position between erected towers, and while flooding the barges to set the span onto the pier tops, the counterweight ropes will be attached. The counterweights will be precast concrete sections lifted and joined to a frame positioned above the tower roadway on temporary support beams, then raised into position and connected to the ropes. Balancing and operational start-up will follow.

EA.30. The overall cost of the main span replacement, including new mechanical and electrical components is $14,060,700. This cost has a 25% contingency factor.

Vertical Clearance Comparison

EA.31. By locating the new lock north of the Claiborne Ave. Bridge, the Claiborne Ave. Bridge (in the closed position) will be influenced by Mississippi River stages as compared to Lake Pontchartrain stages with the existing lock. The proposed Claiborne Ave. Bridge replacement will not change the low steel elevation when the bridge is closed. River design stages are rarely encountered. With design refinements, an additional 4 feet of clearance could be provided. The net effect is that a negligible loss of vertical clearance (2.5' or less) will occur over 70% of the year.

Bypass Channel for Old Lock Demolition

EA.32. The bypass channel is described in the engineering appendix paras. B.2.98 to B.2.102. The bypass does not change, however, the construction sequence for bridges, detour, bypass and lock demolition is altered. The revised sequence is detailed in paras. EA.34 thru 37.

EA.33. Demolition of the Existing Lock is described in the engineering appendix paras. B.2.120 to B.2.123. The demolition procedures do not change, however, the sequence is revised to accommodate the St. Claude Avenue Bridge Replacement and detour. The construction sequence is described in paras. EA.35 thru 37. The sequence is shown on Plates EA-7, EA-8, and EA-9.

CONSTRUCTION SEQUENCE FOR BRIDGES, DETOUR, AND LOCK DEMOLITION

EA.34. The construction of the Claiborne Bridge Main Span Replacement is not on the critical path; it may be completed anytime within the initial seven years of lock construction. However, it must be complete prior to working on the St. Claude Avenue Bridge replacement.

EA.35. The St. Claude Avenue detour will take nine months to construct. The two single bascule bridges will be fabricated off-site. The bridges shall be installed after the new lock is in operation so that the emergency dam and crane can be removed from the existing lock. Concurrent with the detour construction, the east lock wall backfill will be excavated (after the new lock is in place and the river flood protection established). After the backfill is removed, the old lock northeast retaining wall shall be demolished and removed. Dredging of the demolition bypass will then commence starting at the northern end. Navigation traffic will continue to pass through the existing lock as it will be used as a "pass-through" lock only (no lockages or head differential).

EA.36. When the detour is completed and opened to traffic, the St. Claude bridge demolition will commence. The east side bridge pier and retaining walls will also be demolished. Demolition of the steel superstructure will be limited to the minimum time required by the contractor to take down the bridge. Bridge demolition equipment shall work without occupying the lock chamber. The canal will be closed only when safety hazards exist to navigation. This is expected to be only a few hours per day, during actual debris removal operations, within a 30-day time frame for the steel superstructure. Concrete masonry removal will require an estimated 30 additional days during which navigation will be impeded only minutes per day (work is underwater) for potential safety hazards during debris removal operations. Dredging of the bypass will be timed so that the dredge will reach the south end after the pier and retaining wall are removed. The bypass will then be opened to barge traffic. Ship traffic will be excluded throughout the 18 month lock demolition.

EA.37. Lock demolition commences, starting at the south end and proceeding north (see plate EA-7). Concurrent with lock demolition will be the construction of the new St. Claude Bridge. The approaches and west pier are constructed and the bascule superstructure is fabricated off-site. Once lock demolition is complete the existing navigation channel is reopened to all navigation. The bridge east pier is constructed within a braced excavation. The superstructure is brought to the site on barge and installed within a 5 day navigation closure. The new St. Claude Bridge is opened and the detour removed.

COST ESTIMATES

EA.38. The code of account cost tables for the NED and Recommended Plans have been revised to reflect these changes to the plans presented in the main body of this appendix. They are attached at the end of this addendum.

RIGHTS OF WAY

EA.39. The rights of way for the lock North of Claiborne Avenue site as shown on plates B-57 thru B-59 are changed only to include acreage for the temporary detour at St. Claude Ave.