



STANDARD OPERATING PROCEDURE FOR INSTALLING PRESSURE PIPES THROUGH/UNDER FLOODWALLS AND CLOSURE SILLS

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- 1) Pressure piping between the shutoff valves, other than for natural gas or petroleum products, must be either ductile iron with a polyethylene coating or steel pipe cleaned, primed and painted inside and out with USACE Formula-200A or equal (16 mils dry film thickness at any point).
- 2) A pressure (carrier) pipe is required to be continuously “cased” in a larger pipe as it passes through or beneath a closure sill, through a new floodwall, or beneath an existing floodwall, even if the pressure pipe is required to be double/dual-walled. The purpose of the casing pipe is to facilitate future carrier pipe replacements without damaging the wall or sill; it is not for containment. The casing pipe must extend beyond the edges of the floodwall foundation or sill limits by at least 5 feet. The annular space between the casing and carrier pipes must be sealed on both ends using "Link Seal" or approved equal. No joints within the carrier pipe are allowed within the limits of the casing pipe without approval by the Louisville District USACE.
- 3) For new construction, it is preferred that the casing pipe be cast within the concrete with no less than 3 inches of cover between it and any rebar or concrete face. For situations where this is not possible or reasonable, the casing pipe may be installed within a utility trench below the concrete as long as it is positioned such that it can be encased by at least 6 inches of CLSM on all sides for the full length of the casing pipe. The CLSM placement must fully fill the trench to the top to eliminate the possibility of hand-compacting soil in narrow areas which can create preferential seepage paths. Refer to “[Standard Operating Procedure for Controlled Low-Strength Material for Pipes in Levees](#)” for the CLSM mix design.
- 4) For penetrating existing construction, the locations of steel reinforcing bars within the stem must be detected and marked so cutting and coring operations do not damage the internal steel, mainly the primary reinforcement on the tension (water) side of the floodwall. Coring shall be advanced from the wet to dry side of the structure; no percussion tools are permitted. The method to re-establish the structural capacity of any damaged reinforcing must be submitted to the Louisville District USACE for approval. In general, sufficient concrete must be removed around the existing bars on both sides of the repair area to allow for either mechanical or lap splicing in accordance with ACI 318. A mechanical splice, such as the "Zap Screwlok" or similar, is preferred since it minimizes concrete removal; however, if a lap splice repair is chosen, the lap length shall be determined in accordance with ACI 318 and the splicing bars shall be the same diameter and grade or better than the original bars. Completed reinforcing repairs must be approved by USACE or a qualified third-party inspector before placement of concrete.
- 5) A shutoff valve is required between 15 and 50 feet from the sill or floodwall foundation on the “upstream” flow side of the pipe in case a leak threatens the structure. To isolate the structure, a shutoff valve on the other side (having the same stand-off limits) is recommended, but not required. If shutoff valves are installed on both sides of the structure, both valves should be shut during an emergency to prevent the error of only shutting the downstream valve, which would continue to pressurize the pipe under/through the structure. The valve(s) must be operable from the ground surface (i.e., no excavation required to operate the valve). Pressure test results of the carrier pipe

must be submitted to the Louisville District for review/approval and show 0-percent leakage for 30 minutes. The testing pressure is generally determined to be the greater of 200 psi or 150 percent of the working pressure, but the proposed testing pressure must be reviewed and approved by the Louisville District Levee Safety office and is subject to revision..

- 6) It is preferred that joints for steel pipes be welded, but flexible mechanical couplings meeting the requirements below are acceptable. Pipe joints for ductile iron must be flexible mechanical couplings or restrained joints meeting the requirements below:
 - a) Steel Pipe – Flexible Type Couplings*
 - Dresser Style 38
 - Conform to ASTM S1476, type 2 class 3 stainless steel (Straub - Flex will meet this requirement)
 - * These type of couplings require an external type restraint harness designed and installed in accordance with AWWA M11.*
 - b) Ductile Iron Pipes – Flexible Restraint Joints
 - US Pipe: TR Flex Joint
 - American Ductile Iron Pipe: Flex Ring Joint
 - Mc Wayne (Clow): Super-Lock
 - Griffin Pipe3: Snap-Lok or Bolt-Lok
 - EBAA Iron MEGALUG Series 1100
- 7) Alteration submittals must include a detailed, scaled (with no exaggeration) cross-section and profile of the pipe system in relation to the closure sill or floodwall along with any other penetrations.



Example of carrier pipe through an existing floodwall using surface-mounted flanges and annular seals (left), and a casing pipe wall sleeve with water stop collar for casting in stem of new floodwall (right).