Regional Categorical Permission Alteration Description – 17. Pressurized Pipes

The Regional Categorical Permission covers the installation, modification, and replacement of pressurized pipes. All pressurized pipes must be designed and installed in accordance with current USACE standards. The total area of disturbance, including staging and access areas, must not exceed 5 acres. Pressurized pipes also must be designed to prevent (1) flotation from uplift; (2) scour or erosion; (3) damage from debris on the waterside, particularly during flood flows; (4) leakage; (5) seepage along proposed pipes; (6) corrosion; and (7) damage from vehicular loads.

All new pressurized pipes should go up and over the levee DWSE. Pressurized pipes passing over or within the freeboard zone of a levee (i.e., above the levee DWSE) should be made of metal, preferably ductile iron or coated steel, suitable for use with flexible couplings.

Backfill under and around the proposed pipe (to 1 foot over) must be CLSM. Pipes that pass above the DWSE must have 2 feet of cover (low permeability or CLSM) to prevent damage by vehicles and equipment. Cover material on the levee crown must be placed at a 10-to-1, horizontal-to-vertical ratio in the upstream/downstream direction of the levee. Pipes on the sides of the levee should be covered with a minimum of 1 foot of low permeability material, compacted in 4–6-inch lifts or CLSM to protect them from debris during high water (waterside) or to keep them from interfering with or being damaged by operations or maintenance of the levee (landside). Fill must be free of deleterious materials and construction debris and placed in 4–6-inch-thick loose lifts and compacted to not less than 95 percent of the maximum density at moistures between 2 percent less (-2%) and 3 percent more (+3%) than the optimum moisture content obtained from ASTM D698 (the USACE preferred method) or, alternately, 90 percent of the maximum density at moisture content obtained from ASTM D1557. At the discretion of the non-federal sponsor and the levee maintaining agency, pipes on the levee slopes may be left exposed.

Only suitable material must be used as levee fill materials. Fill must be free of roots and other organic matter, contaminated hazardous and toxic material, debris, frozen materials, and trash. Satisfactory fill material must have a plasticity index between 8 and 25, a liquid limit less than 45, a minimum fines content of 20 percent, and 100 percent passing the 3-inch sieve.

Pressurized pipes terminating in the channel require a positive closure device on the waterside that is accessible from the levee crown. Pressurized pipes transporting product completely across or through the federal project easement require positive closure devices located landward of any levees and channel. The positive closure device shall be located within 1 mile on both sides of the federal project. If the invert of the pipe is over the levee crown, the combination of a pump station on the waterside and a siphon breaker is considered an appropriate means of closure. Pipes located within or beneath a levee must have watertight joints that can accommodate movements resulting from settlement.

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All pressurized pipes that cross the levee foundation at a depth less than or equal to two times the height of the levee should be evaluated for uplift. Pipes crossing the surface of the levee must be designed to counteract buoyancy forces of an empty pipe, with water at the DWSE.

Pressurized pipelines running parallel to flood risk management projects should be located at least 15 feet beyond the levee toe. Pipe location and orientation must be clearly marked in the field so they can be easily identified for flood-fighting crews.

If appropriate, the requester should prepare an excavation plan demonstrating the effects of excavation on the stability of the embankments.

The site layout should provide adequate access for maintenance vehicles to refill fuel tanks and service and replace pumps, generators, and so forth. Pressurized pipes also must allow easy access for rapid closure in the event of leakage or rupture.

No plastic pipes (e.g., HDPE or PVC) are allowed in the levee embankment or its foundation unless they are embedded in concrete.

If an electrochemical or chemical reaction between the substratum or groundwater and pipe materials is expected, the pipe and pipe couplings must be protected.

After installation of pressurized pipes, the requester must demonstrate zero percent pipe leakage in pipes in the levee. Pipes must be pressure tested to industry standards. Pipes must be regularly inspected, including the interior, if possible, looking for signs of maintenance issues. If an inspection indicates alignment sag or heave, corrosion, or separation at joints, corrective action must be taken as soon as possible to avoid failure. Pipe valves must be periodically inspected and pressure tested to ensure they are functioning properly. Pressure tests must show no significant loss in pressure. Leaks and other deficiencies must be addressed as soon as possible. All replacement parts must be of equivalent or better quality than those being replaced.

The preferred method for abandoning pipes that pass through or over a levee is complete removal. If removal is not feasible, the pipes and other structures may be filled with a cement-bentonite-based grout or flowable fill. The grout needs to be sufficiently fluid so that it can be pumped to completely fill the pipe, leaving no voids.

Regional Categorical Permission Alteration Checklist – 17. Pressurized Pipes

Note: The following checklist is intended for planning purposes only, and includes information that USACE reviewers look for when considering a Section 408 request for pressurized pipes under the Categorical Permission. To be reviewed under the Categorical Permission, the proposed project must adhere to all requirements of the Categorical Permission, including the full alteration description (see previous page). The plans and narrative project description should reflect this information.

1.	□ New Construction	Replacement	□ Modification	□ Authorize Existing		
2.	Maximum total area of o	disturbance is 5 acres:		Yes 🗆	No 🗆	
	Reference: [Click to enter docu	ment source. Example – plan sh	eet (p. 4), specs, report.]			
	Comment: [Click to enter ratio	nale, explanation, unique situatio	n, etc.]			
3.	Pipes are designed to p waterside (particularly of from vehicular loads:	revent flotation from u luring flood flows), lea	plift, scour or erosion, kage, seepage along p	damage from debris roposed pip, and da Yes □	s on the amage No □	
	Reference: [Click to enter docu	ment source. Example – plan sh	eet (p. 4), specs, report.]			
	Comment: [Click to enter ratio	nale, explanation, unique situatio	n, etc.]			
4.	Backfill under and arou material (CLSM):	ind the proposed pipe	(to 1 foot over) will be	controlled low-stren Yes □	igth No □	
	Reference: [Click to enter docu	ment source. Example – plan sh	eet (p. 4), specs, report.]			
	Comment: [Click to enter ratio	nale, explanation, unique situatio	n, etc.]			
5.	Pipes passing over the	DWSE will have a mir	imum of 2 feet of cove	r (low permeability o Yes □	or CLSM): N/A □	
	Reference: [Click to enter docu	iment source. Example – plan sh	eet (p. 4), specs, report.]			
	Comment: [Click to enter ratio	nale, explanation, unique situatio	n, etc.]			
6.	Cover material on the le	evee crown will be plac	ced at a 10-to-1, horizo	ntal-to-vertical ratio	in the	
	upstream/downstream of	direction of the levee:		Yes ⊔	N/A ∐	
	Reference: [Click to enter docu	ment source. Example – plan sh	eet (p. 4), specs, report.]			
	Comment: [Click to enter ratio	nale, explanation, unique situatio	n, etc.]			
1.	Fill will be placed in 4-6-inch-thick loose lifts, compacted to at least 95% of maximum density as determined by ASTM D698 or to at least 90% of maximum density as determined by ASTM					
	D1557, and between -2	and +3% of optimum	moisture content:	Yes 🗆	No 🗆	
	Reference: [Click to enter docu	iment source. Example – plan sh	eet (p. 4), specs, report.]			
	Comment: [Click to enter ratio	nale, explanation, unique situatio	n, etc.]			
8.	Only suitable material w	Only suitable material will be used as levee fill. Fill will be free of roots and other organic matter,				
	contaminated hazardou	s and toxic material, d	ebris, frozen materials	, and trash: $\nabla_{aa} \Box$		
	Reference: [Click to enter docu	ment source. Example – plan sh	eet (p. 4), specs, report.]			
	Comment: [Click to enter ratio	nale, explanation, unique situatio	n, etc.]			

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9.	Satisfactory fill material will have a plasticity index between 8 and 25, have a	liquid limit le	ss than			
	45, a minimum fines content of 20%, and 100% passing the 3-inch sieve: Yes \Box N/A \Box					
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]					
	Comment: [Click to enter rationale, explanation, unique situation, etc.]	Comment: [Click to enter rationale, explanation, unique situation, etc.]				
10.	Pipes terminating in the channel have a positive closure device on the waters	side that is a	cessible			
	from the levee crown:	Yes 🗆	N/A □			
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]					
	Comment: [Click to enter rationale, explanation, unique situation, etc.]					
11.	Pipes transporting product completely across or through the federal project easement have a					
	positive closure device located within 1 mile on both sides of the federal pro	ect:				
	Yes ⊔ N/A ⊔					
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]					
	Comment: [Click to enter rationale, explanation, unique situation, etc.]	-				
12.	Pipes located within or beneath a levee have watertight joints that can accor	nmodate mo	vements			
	resulting from settlement:	Yes ⊔	No 🗆			
	Deference: [Click to enter desument equires Example _ plan sheet (n_4) ences report 1					
	Reference. [Click to enter document source. Example – plan sheet (p. 4), specs, report.]					
10	Comment: [Click to enter rationale, explanation, unique situation, etc.]	forces of an	omntv			
13.	nine with water at the DWSF.	Yes \Box	N/A □			
	Peference: [Click to enter document source, Example – plan sheet (p. 4), space, report 1					
	Commont: [Click to enter rationale, evaluation, unique situation, etc.]					
14	Pipe location and orientation will be clearly marked in the field:		No 🗆			
14.	Petersneet [Click to orten decument sources Exemple					
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]					
	Comment: [Click to enter rationale, explanation, unique situation, etc.]					
15.	Pipes will allow easy access for rapid closure:	Yes 🗆	No 🗆			
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]					
	Comment: [Click to enter rationale, explanation, unique situation, etc.]					
16.	Plastic pipes within the levee embankment or its foundation are embedded i	n concrete:				
		Yes 🗆	N/A 🗆			
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]					
	Comment: [Click to enter rationale, explanation, unique situation, etc.]					
17.	If a chemical or electrochemical reaction is expected, the pipe and pipe coul	olings will be				
	protected:	Yes 🗆	N/A □			
1	Reference: [Click to enter document source, Example – plan sheet (p. 4), specs, report [
	Tererenee. [ener te enter desanen establise. Example plan eneer (p. 1); epece, report.]					

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18.	Hydraulic blockage calculation ≥1%?	Yes 🗆	No 🗆	N/A 🗆
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]			
	Comment: [Click to enter rationale, explanation, unique situation, etc.]			
19.	Hydraulic model used for hydraulic analysis?	Yes 🗆	No 🗆	N/A 🗆
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]			
	Comment: [Click to enter rationale, explanation, unique situation, etc.]			
	 For Official Use Only below this 	s line –		

Comment

RCP Eligibility Review

<u>Yes</u>	<u>No</u>	<u>Add'l. Info</u> Requested			
			Environmental Reviewer:	Date: Click date	
			Engineering Reviewer:	Date: Click date	