

PORTNEUF RIVER FLOOD CONTROL PROJECT
Routine Inspection Checklist

Inspection By: Brett Gilmore Inspection Date: 5/26/2010

Overall Project Rating: Acceptable Minimally Acceptable (Maintenance is required) Unacceptable

General Observations and Comments:

*Most of section 1 has been clear cut, the exception would be from Bannock Hwy. to Sue Rd., where we have done selective harvest until we begin siltation removal. Section 3 selective harvest is nearly complete as well.

*Rodent control along the levee has begun and we are actively pursuing it on a daily basis.

*To date we have graded and raised all of the crown in section 1, section 3, and the portion of section 2 from Cheyenne to Bannock Hwy.

*We have replaced two flap gates that were missing (C10 & C31), both are clean and operable. We have clear cut all but 3 of the closures in preparation for the excavation and maintenance of the flap gate and the flap gate structures.

*We have repaired 3 slide gate gear boxes (C20, C21, C48). All slide gates within the project are now functioning properly.

Instructions for the Routine Inspection Guide

GENERAL INSTRUCTIONS.

1. FCW = Flood Control Works.
 2. RODI stands for "Requires Operation During Inspection". Items marked "RODI" will be rated based on the way they work during the inspection.
 3. Additional areas for inspection will be incorporated by the inspector into this guide if the layout or physical characteristics of the project warrant. Appropriate entries will be made in the REMARKS block.
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RATINGS OF INDIVIDUAL ITEMS:

The following terms and definitions are used when determining the rating for each item and/or component in the flood control work.

A - Acceptable: The rated item is in satisfactory condition, with no deficiencies, and will function as designed and intended during the next flood event.

M - Minimally Acceptable: This rated item has minor deficiencies that need to be corrected. The minor deficiencies will not seriously impair the functioning of the item during the next flood event. The overall reliability of the project will be lowered because of the minor deficiency.

U - Unacceptable: The deficiencies are serious enough that the rated item will not adequately function during the next flood event, compromising the project's ability to provide reliable flood protection.

DETERMINATION OF OVERALL PROJECT CONDITION CODE:

The lowest single rating given for a rated item will determine the overall condition of the project:

1. If all items are rated as Acceptable, the overall project condition will be rated as Acceptable.
 2. If one or more items are rated as Minimally Acceptable, the overall project condition will be rated Minimally Acceptable.
 3. If one or more item is rated as Unacceptable, the overall project condition will be rated as Unacceptable.
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PROJECT CONDITION AND ELIGIBILITY FOR PL84-99 ASSISTANCE:

1. Projects rated as Acceptable are considered "**Active**" and eligible for PL84-99 post flood or storm damage rehabilitation assistance from the U.S. Army Corps of Engineers.
2. Projects rated Minimally Acceptable are considered "**Active**" and eligible for PL84-99 rehabilitation assistance during the time that it takes to make needed corrections. This timeframe will be agreed upon between the project sponsor and Corps inspector at the time of the inspection (or shortly thereafter). If the project sponsor does not present the Corps with proof of completion of the repairs/maintenance by the end of this timeframe, then the project will be "Inactive" and will be ineligible for PL84-99 rehabilitation assistance.
3. Projects rated as Unacceptable are immediately put in an "**Inactive**" status and are not eligible for PL84-99 post flood or storm damage rehabilitation assistance from the Corps of Engineers. The project will remain in an inactive status until the project sponsor presents the Corps with proof that all of the required repairs/maintenance has been completed. (This includes any repairs/ maintenance required for project features rated minimally Acceptable, as well as those rated Unacceptable.)

General Items for All Flood Control Works

RATED ITEM	A	M	U	N/A	EVALUATION	LOCATIONS/ REMARKS / RECOMMENDATIONS
1. Project Operations and Maintenance Manual (A or U only)	X				A Levee Owner's Manual present.	
					U These manuals are lost or missing.	
2. Emergency Supplies and Equipment	X				A The sponsor maintains a stockpile of sandbags, shovels, and other flood fight supplies which will <u>adequately supply all needs for the initial days of a flood fight.</u>	
					M The sponsor does not maintain an adequate supply of flood fighting materials as part of their <u>preparedness activities.</u>	
3. Flood Preparedness and Training (A or M only)	X				A Sponsor has a solid understanding of how to operate, maintain, and staff the FCW during a flood, and has written plans that include information such as low spots or sand boils. The sponsor also has plans that cover short term situations. (For instance, if a culvert through the levee is being replaced, then the sponsor knows how to respond to a flood while the levee integrity is lacking due to the construction.)	
					M The sponsor maintains a good working knowledge of flood response activities, but there are insufficient plans to address project specific features or short term situations, or the knowledge of flood response activities is maintained by a very small number of individuals within the community. Additional planning or training is required to ensure the success of the FCW during a flood event.	

Levees

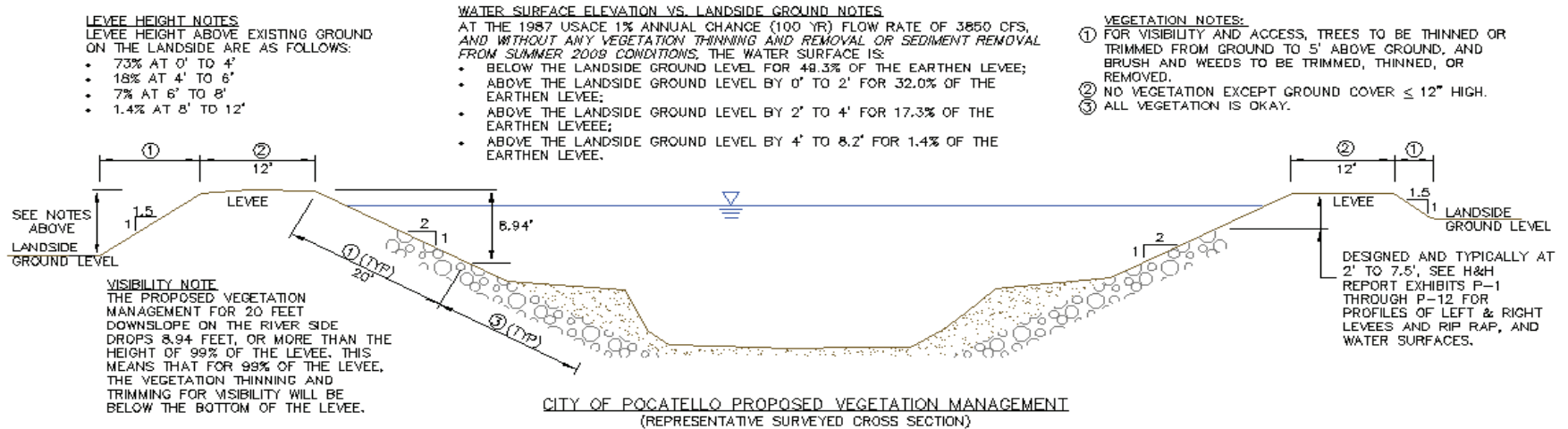
RATED ITEM	A	M	U	N/A	EVALUATION	LOCATIONS/ REMARKS / RECOMMENDATIONS
1. Depressions/ Rutting					A There are no ruts, pot holes, or other depressions on the levee, except for minor depressions caused by levee settlement. The levee crown, embankments, and access road crowns are well established and <u>drain properly without any ponded water.</u>	Depressions have been caused by channelization of water through Centennial Park. Repairs to the levee will be scheduled to divert drainage into the natural park area. See attached drawing.
					M Some minor depressions in the levee crown, embankment, or access roads that will not pond water and <u>do not threaten the integrity of the levee.</u>	
			X		U There are depressions greater than 15 cm (6 inches) deep that will pond water, endangering the integrity of the levee.	
2. Erosion/ Bank Caving	X				A No active erosion or bank caving observed on the landward or on the riverward side of the levee.	The noted erosion problems from previous reports have been addressed and no others have been noted as of this date.
					M There are areas where active erosion is occurring or has occurred on or near the levee embankment, but levee integrity is not threatened.	
					U Erosion or caving is occurring or has occurred that threatens the stability and integrity of the levee. The erosion or caving has progressed into the levee section or into the extended footprint of the levee foundation and has compromised the levee foundation stability.	
3. Slope Stability	X				A No slides present.	
					M Minor superficial sliding that with deferred repairs will not pose an immediate threat to FCW integrity.	
					U Evidence of deep seated sliding that threatens FCW integrity. Repairs are required to reestablish FCW integrity.	
4. Cracking	X				A No cracking observed on the levee greater than 15 cm (6 inches) deep.	
					M Longitudinal and/or transverse cracking greater than 15 cm (6 inches) deep. No evidence of vertical movement <u>along the crack.</u>	
					U Longitudinal and/or transverse cracking present and exhibits signs of vertical movement.	
5. Animal Control					A Continuous animal burrow control program in place that includes the elimination of active burrowing and the <u>filling in of existing burrows.</u>	
		X			M The existing animal burrow control program needs to be improved. Several animal burrows present which may lead to seepage or slope stability problems, and they require immediate attention.	
					U Animal burrow control program is not effective or is nonexistent. Significant maintenance is required to fill existing burrows, and the levee will not provide reliable flood protection until this maintenance is complete.	

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Levees (continued)

RATED ITEM	A	M	U	N/A	EVALUATION	LOCATIONS/ REMARKS / RECOMMENDATIONS
6. Sod Cover	X				A There is good coverage of sod cover over the levee.	
					M Approximately 25% of the sod cover is missing or damaged over a significant portion or over significant portions of the levee embankment. This may be the result of over-grazing or feeding on the levee, unauthorized vehicular traffic, chemical or insect problems, or burning during inappropriate seasons.	
					U Over 50% of the sod cover is missing or damaged over a significant portion or over significant portions of the levee embankment. This may be the result of over-grazing or feeding on the levee, unauthorized vehicular traffic, chemical or insect problems, or burning during inappropriate seasons.	
7. Unwanted Vegetation Growth					A The levee has good grass cover and has been mowed recently enough to allow visibility of any geotechnical and burrowing animal problems (<12", preferably <6"). Trees and brush have been thinned sufficiently and trees trimmed to at least 5 ft above ground from the landside toe to 20 ft down the riverside slope to allow adequate visibility for inspection and access for flood fighting activities. No trees which are of sufficient size and location so as to undermine or damage the levee if they were to fall under wet, windy, and/or hydrostatic conditions, or decaying trees susceptible to breaking that could substantially divert and direct flow in an erosive manner towards levee embankments or that could cause restrictive jams. See figure below.	
					M Minimal number of trees and/or brush present on the levee which begin to obscure visibility during inspection, that will not threaten the integrity of the project but which need to be removed and/or thinned.	
			X		U Tree, weed, and brush cover exists in the FCW requiring removal to reestablish or ascertain FCW integrity. (NOTE: If significant growth on levees exists, prohibiting the inspection of animal burrows or other inspection items, then the levee inspection should be ended until this item is corrected.)	

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Levees (continued)

RATED ITEM	A	M	U	N/A	EVALUATION	LOCATIONS/ REMARKS / RECOMMENDATIONS
8. Encroachments					A No trash, debris, excavations, structures, fences without approved gates, or other obstructions present within the project easement area. Encroachments which do not diminish proper functioning of the project have been previously approved by the City Engineer.	
		X			M Trash, debris, excavations, structures, or other obstructions present, or inappropriate activities that will not inhibit project operations and maintenance or emergency operations. Encroachments have not been approved by the Corps.	
					U Trash, debris, excavation, structures, or other obstructions present, or inappropriate activities that will inhibit project operations and maintenance or emergency operations.	
9. Riprap Revetments & Banks					A Existing riprap protection is properly maintained and is undamaged. Riprap clearly visible. No loss of material at bends or transitions.	The trees and vegetation have been removed in all of section 1 and the portion of section 2 between Cheyenne and Bannock Hwy. Section 3 is being selectively harvested until siltation removal beings.
		X			M No riprap displacement or scouring activity that could undercut banks, erode embankments, or restrict desired flow. Unwanted vegetation must be cleared and sprayed with an appropriate herbicide.	
					U Dense brush, trees, or grasses hide the rock protection, or meandering and/or scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling.	
					N/A There is no riprap protecting the levee.	
10. Closure Structures (Stop Log, Earthen Closures, or Gates) (A or U only)					A Closure structure in good repair. Placing equipment, stoplogs, and other materials are readily available at all times. Components of closure clearly marked and installation instructions / procedures readily available.	
			X		U Closure structure in poor condition. Parts missing or corroded. Placing equipment may not be available within normal warning time.	
					N/A There are no closure structures along the levee.	

Earthen (Excavated) Flood Control Channels

RATED ITEM	A	M	U	N/A	EVALUATION	LOCATIONS/ REMARKS / RECOMMENDATIONS
1. Vegetation and Obstructions	X				A There are minimal obstructions or vegetation blocking the FCW.	
					M The channel is obstructed by minor log jams, snags, or vegetation. Less than 20% of the channel is obstructed.	
					U Obstructions or vegetation growth have obstructed over 20% of the river or channel.	
2. Encroachments					A No trash, debris, excavations, structures, or other obstructions present within the project easement area. Encroachments which do not diminish proper functioning of the project have been previously approved by the Corps.	
		X			M Trash, debris, excavations, structures, or other obstructions present, or inappropriate activities that will not inhibit project operations and maintenance or emergency operations. Encroachments have not been approved by the Corps.	
					U Trash, debris, excavation, structures, or other obstructions present, or inappropriate activities that will inhibit project operations and maintenance or emergency operations.	
3. Riprap Revetments & Banks					A Existing riprap protection is properly maintained and is undamaged. Riprap clearly visible. No loss of material at bends or transitions.	
		X			M No riprap displacement or scouring activity that could undercut banks, erode embankments, or restrict desired flow. Unwanted vegetation must be cleared and sprayed with an appropriate herbicide.	
					U Dense brush, trees, or grasses hide the rock protection, or meandering and/or scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling.	
4. Erosion	X				A No head cutting or horizontal deviation observed.	
					M Head cutting and horizontal deviation evident, but is less than 30 cm (1 foot) from the designed grade or cross section.	
					U Apparent head cutting and horizontal deviation of more than 30 cm (1 foot) from the designed grade or cross section. Corrective actions required to stop or slow erosion.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable.

Earthen (Excavated) Flood Control Channels (continued)

RATED ITEM	A	M	U	N/A	EVALUATION	LOCATIONS/ REMARKS / RECOMMENDATIONS
5. Concrete Surfaces	X				A Negligible spalling, scaling or cracking. If the concrete surface is weathered, rough to the touch, or holds moisture, it is still satisfactory but should be seal coated to prevent freeze/ thaw damage.	
					M Spalling, scaling, and open cracking present, but the immediate integrity or performance of the structure is not threatened. Reinforcing steel may be exposed. Repairs/ sealing is necessary to prevent additional damage during periods of thawing and freezing.	
					U Surface deterioration or deep, controlled cracks present that result in an unreliable structure.	
					N/A There are no concrete structures associated with the flood control channel.	
6. Tilting, Sliding or Settlement of Concrete Structures	X				A There are no significant areas of tilting, sliding, or settlement that would endanger the integrity of the project.	
					M There are areas of tilting, sliding, or settlement (either active or inactive) that need to be repaired. The integrity of the structure is not in danger.	
					U There are areas of tilting, sliding, or settlement (either active or inactive) that threaten the structure's integrity and performance.	
					N/A There are no concrete structures associated with the flood control channel.	
7. Foundation of Concrete Structures	X				A No scouring / erosion, or undermining near the structure.	
					M Scouring / erosion near the footing of the structure but not close enough to affect structure stability during the next flood.	
					U Scouring or undermining at the foundation that has affected structural integrity.	
					N/A There are no concrete structures associated with the flood control channel.	
8. Flap Gates/Flap Valves/ Pinch Valves RODI					A Flap gates open and close easily with minimal leakage. Gates show no corrosion damage and have been maintained.	
		X			M Gate will not fully open or close because of obstructions that can be easily removed, or has corrosion damage that requires maintenance.	
					U Gate is missing, has been damaged, or has deteriorated and needs repair.	
					N/A There are no flap gates.	

Concrete Lined Flood Control Channels

RATED ITEM	A	M	U	N/A	EVALUATION	LOCATIONS/ REMARKS / RECOMMENDATIONS
1. Vegetation and Obstructions					A No obstructions, vegetation, debris, or sediment accumulation within the channel. Channel joints and weep holes are also free of grass and weeds.	
		X			M Sediment and debris present, but not to the degree that it supports vegetation. Obstructions/ debris have not impaired the channel flow capacity. Sediment and debris removal recommended.	
					U Sediment shoals are well established and support vegetation, or there are obstructions or accumulated debris that have impaired the channel flow capacity. Sediment and debris removal required to re-establish flow capacity.	
2. Shoaling					A No shoaling present.	
		X			M Non-aquatic grasses present on shoal. No trees or brush is present on shoal, and channel flow is not impeded.	
					U Shoaling is well established, stabilized by saplings, brush, or other vegetation. Shoals are diverting flow to channel walls. Channel flow capacity is reduced and maintenance is required.	

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Concrete Lined Flood Control Channels (continued)

RATED ITEM	A	M	U	N/A	EVALUATION	LOCATIONS/ REMARKS / RECOMMENDATIONS
3. Concrete Surfaces					A Negligible spalling, scaling or cracking. If the concrete surface is weathered, rough to the touch, or holds moisture, it is still satisfactory but should be seal coated to prevent freeze/ thaw damage.	
		X			M Spalling, scaling, and open cracking present, but the immediate integrity or performance of the structure is not threatened. Reinforcing steel may be exposed. Repairs/ sealing is necessary to prevent additional damage during periods of thawing and freezing.	
					U Surface deterioration or deep, controlled cracks present that result in an unreliable structure.	
4. Tilting, Sliding or Settlement of Concrete Structures	X				A There are no significant areas of tilting, sliding, or settlement that would endanger the integrity of the project.	
					M There are areas of tilting, sliding, or settlement (either active or inactive) that need to be repaired. The integrity of the structure is not in danger.	
					U There are areas of tilting, sliding, or settlement (either active or inactive) that threaten the structure's integrity and performance.	
5. Foundation of Concrete Structures	X				A No scouring / erosion, or undermining near the structure.	
					M Scouring / erosion near the footing of the structure but not close enough to affect structure stability during the next flood.	
					U Scouring or undermining at the foundation that has affected structural integrity.	
6. Monolith Joints	X				A The monolith joint material is in good condition.	
					M The monolith joint material is deteriorating and needs to be repaired or replaced to prevent spalling and cracking during freeze/ thaw cycles.	
					U The monolith joint material is severely deteriorated and the concrete has spalled and cracked, damaging the waterstop to the point where it will not provide the intended level of protection during a flood.	
					N/A There are no monolith joints.	
7. Flap Gates/Flap Valves/ Pinch Valves RODI	X				A Flap gates open and close easily with minimal leakage. Gates show no corrosion damage and have been maintained.	
					M Gate will not fully open or close because of obstructions that can be easily removed, or has corrosion damage that requires maintenance.	
					U Gate is missing, has been damaged, or has deteriorated and needs repair.	
					N/A There are no flap gates.	

Interior Drainage System

RATED ITEM	A	M	U	N/A	EVALUATION	LOCATIONS/ REMARKS / RECOMMENDATIONS
1. Vegetation and Obstructions	X				A Minimal, scattered obstructions or vegetation. The flow is not impeded.	
					M Log jams, snags, vegetation growth (such as cat tails, bull rushes, bushes, or saplings), or other obstructions block approximately 25% of the FCW.	
					U Log jams, snags, vegetation growth (such as cat tails, bull rushes, bushes, or saplings), or other obstructions block approximately 50% of the FCW.	
2. Encroachments					A No trash, debris, excavations, structures, or other obstructions present within the project easement area. Encroachments which do not diminish proper functioning of the project have been previously approved by the Corps.	
		X			M Trash, debris, excavations, structures, or other obstructions present, or inappropriate activities that will not inhibit project operations and maintenance or emergency operations. Encroachments have not been approved by the Corps.	
					U Trash, debris, excavation, structures, or other obstructions present, or inappropriate activities that will inhibit project operations and maintenance or emergency operations.	

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Interior Drainage System (continued)

RATED ITEM	A	M	U	N/A	EVALUATION	LOCATIONS/ REMARKS / RECOMMENDATIONS
3. Riprap Revetments of Inlet/ Discharge Areas					A Existing riprap protection is properly maintained and is undamaged. Riprap clearly visible.	
		X			M No riprap displacement or scouring activity that could undercut banks, erode embankments, or restrict desired flow. Unwanted vegetation must be cleared and sprayed with an appropriate herbicide.	
					U Dense brush, trees, or grasses hide the rock protection, or meandering and/or scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling.	
					N/A There is no riprap protecting the interior drainage system, or the riprap is discussed in another section.	
4. Erosion of Inlet/ Discharge Areas	X				A No active erosion or bank caving observed on the landward or on the riverward side of the levee.	
					M There are areas where active erosion is occurring or has occurred on or near the levee embankment, but levee integrity is not threatened.	
					U Erosion or caving is occurring or has occurred that threatens the stability and integrity of the levee. The erosion or caving has progressed into the levee section or into the extended footprint of the levee foundation and has compromised the levee foundation stability.	
					N/A There are no inlet/discharge areas.	
5. Blockage of Culverts (Inlets, and Discharge Areas					A There is little or no debris, sediment, or vegetation blocking the culverts, inlets, or discharge areas. The channel capacity for designed flow is not affected.	
					M Debris, sediment, or vegetation blocks less than 10 percent of the culvert opening, but must be removed.	
			X		U Accumulated debris, sediment, or vegetation blocks more than 10 percent of the culvert opening, impairing the culvert's capacity and hydraulic effectiveness.	
6 Culverts	X				A There are no breaks, holes, cracks in the culvert that would result in significant water leakage. Corrugated metal pipes, if present, are in good condition or have been relined with appropriate material, which is still in good condition.	
					M There are breaks, holes, cracks in the culvert that would result in water leakage and need to be repaired, but do not threaten the integrity of the project. Corrugated metal pipes, if present, are showing deterioration but the entire length of pipe is still structurally sound and is not in danger of collapsing.	
					U Culvert has deterioration and/or has significant leakage such that it threatens the integrity of the FCW. Corrugated metal pipes are in danger of collapsing or have already begun to collapse.	
7. Trash Racks (non-mechanical)	X				A Trash racks are fastened in place and properly maintained.	
					M Trash racks are in place but are unfastened or have bent bars that allow debris to enter into the pipe or pump station. Repair or replacement is required.	
					U Trash rack is missing or damaged to the extent that it is no longer functional and must be replaced.	
8. Flap Gates/Flap Valves/ Pinch Valves RODI					A Flap gates open and close easily with minimal leakage. Gates show no corrosion damage and have been maintained.	
		X			M Gate will not fully open or close because of obstructions that can be easily removed, or has corrosion damage that requires maintenance.	
					U Gate is missing, has been damaged, or has deteriorated and needs repair.	
9. Sluice / Slide Gates RODI	X				A Gates open and close freely with minor leakage. Sill is free of sediment and other obstructions. Gates and lifters have been maintained.	
					M Gates have been damaged or have deteriorated, and open and close with resistance or binding. Leakage quantity is controllable and is not a threat to project performance. Maintenance is required.	
					U Gates do not open or close. Gate, stem, lifter and/or guides may be damaged or corroded.	

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Interior Drainage System (continued)

RATED ITEM	A	M	U	N/A	EVALUATION	LOCATIONS/ REMARKS / RECOMMENDATIONS
10. Electric Gate Operators for Sluice / Slide Gates RODI					A All electric gate operators are in good working condition and are adequately powered, and are capable of opening and closing the gate properly. Preventative maintenance is being performed and the system is tested periodically.	
					M All electric gate operators are operational with minor deficiencies, but should perform through the next period of usage.	
					U The electric gate operators are not operational, or the power source is not considered reliable to sustain operations during flood conditions.	
				X	N/A There are no electric gate operators.	
11. Manual Operators (Backups) for Sluice / Slide Gates RODI	X				A All manual gate operators are in good working condition and are capable of opening and closing the gate properly. Preventative maintenance is being performed and the system is tested periodically.	
					M Manual gate operators are operational with minor deficiencies, but should perform through the next period of usage.	
					U Manual gate operators are not operational.	
					N/A If there are sluice or slide gates, there needs to be means of operating them manually. If there are no sluice/slide gates, this item is N/A.	
12. Concrete Surfaces (Such as gate wells, outfalls, intakes or culverts)	X				A Negligible spalling, scaling or cracking. If the concrete surface is weathered, rough to the touch, or holds moisture, it is still satisfactory but should be seal coated to prevent freeze/ thaw damage.	
					M Spalling, scaling, and open cracking present, but the immediate integrity or performance of the structure is not threatened. Reinforcing steel may be exposed. Repairs/ sealing is necessary to prevent additional damage during periods of thawing and freezing.	
					U Surface deterioration or deep, controlled cracks present that result in an unreliable structure.	
13. Tilting, Sliding or Settlement of Concrete and Sheet Pile Structures (Such as gate wells, outfalls, intakes, or culverts)	X				A There are no significant areas of tilting, sliding, or settlement that would endanger the integrity of the project.	
					M There are areas of tilting, sliding, or settlement (either active or inactive) that need to be repaired. The integrity of the structure is not in danger.	
					U There are areas of tilting, sliding, or settlement (either active or inactive) that threaten the structure's integrity and performance.	
14. Foundation of Concrete Structures (Such as gate wells, outfalls, or culverts)	X				A No scouring / erosion, or undermining near the structure.	
					M Scouring / erosion near the footing of the structure but not close enough to affect structure stability during the next flood.	
					U Scouring or undermining at the foundation that has affected structural integrity.	
					N/A There are no concrete structures.	
15. Safety Fencing RODI	X				A Safety/ security fencing is in good condition and provides protection against falling or unauthorized access. Gates open and close freely, locks are in place, and there is little corrosion on metal parts.	
					M Safety/ security fencing or gates are damaged or corroded but appear to be maintainable. Locks may be missing or damaged.	
					U Safety/ security fencing and gates are damaged or corroded to the point that replacement is required, or potentially dangerous project features are not secured.	
					N/A There are no features of the internal drainage system that require safety fencing.	
16. Other Metallic Items	X				A All metal parts are protected from corrosion damage, and show no rust, damage, or deterioration that would cause a safety concern.	
					M Corrosion seen on metallic parts appear to be maintainable.	
					U Metallic parts are severely corroded and require replacement to prevent failure, equipment damage, or safety issues.	
					N/A There are no other significant metallic items associated with the interior drainage system.	

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