

MEMORANDUM FOR CENAP-EM

SUBJECT: Initial Eligibility Inspection of Local Flood Risk Management Project, Deposit, New York, 8 June 2016

1. References.

- a. ER/EP 500-1-1, "Civil Emergency Management Program - Procedures," dated 30 September 2001.
- b. "Levee Owner's Manual for Non-Federal Flood Control Works," dated March 2006.
- c. "Interim Policy for Determining Eligibility Status of Flood Risk Management Projects for the Rehabilitation Program Pursuant to Public Law (P.L.) 84-99," dated 21 March 2014.

2. Introduction.

a. As part of the program for inspecting nonfederal flood control works for eligibility to receive federal assistance in the event of damage due to a major flood, an Initial Eligibility Inspection (IEI) was performed at Deposit, New York, on 8 June 2016. The project had been deemed ineligible due to the results of the 2012 Continuing Evaluation Inspection (CEI). The project sponsor notified the District that appropriate maintenance had been performed, and requested a new IEI. Reference 1a is the authority for this inspection; however, the checklists have been updated per references 1b and 1c. The following personnel (listed alphabetically) participated in the inspection:

<u>Name</u>	<u>Agency</u>
Bob Eckhardt	U.S. Army Corps of Engineers, Emergency Management
Pat Hogan	Broome County Department of Public Works
Bob Phillips, P.E.	U.S. Army Corps of Engineers, Geotechnical Section
Bruce Rogers, P.G.	U.S. Army Corps of Engineers, Geotechnical Section

b. The project was constructed by the Natural Resources Conservation Service (NRCS) in the mid-1980s with both Delaware County and Broome County as local sponsors. The project is physically located just into Delaware County from its boundary with Broome County; however, the NRCS's maintenance agreement is with Broome County. The project consists of two earthen levees, one with a short stretch of sheetpile floodwall, that guide the flow of Butler Brook and Big Hollow Creek through a concrete transition structure into a concrete channel that diverts the flow directly to the West Branch Delaware River, bypassing the original Butler Brook channel. Enclosure 2 depicts the flood control works. The project protects the village of Deposit from flooding.

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c. The inspection checklists appropriate to an IEI were completed in evaluating this project. These included the checklist that is used only for an IEI as well as other checklists based upon project features that are used for both an IEI and a CEI. The inspection checklists and photos can be found in Enclosure 1, a map with photo locations is found in Enclosure 2, and the P.L. 84-99 Eligibility Checklist is in Enclosure 3.

3. Inspection Observations.

a. **Big Hollow Creek Levee and Sheetpile Floodwall.** Although Broome County personnel performed maintenance along the 1100-foot long Big Hollow Creek section earlier in 2016, vegetation had grown back on the levee and on the riprap on the creek side of the sheetpile floodwall by the date of this inspection (see Photos 1, 2, 8, 9, and 10). In addition, removal of excessive vegetation from a short section of the levee was completely missed (see Photo 2). The levee should have the remaining bushes cleared and then be seeded with grass cover on the crest and both slopes (except where there is riprap slope protection). If evidence of slope erosion is apparent upon removal of the remaining vegetation, then the eroded areas should be repaired. The riprap along the sheetpile floodwall should be sprayed with an appropriate water-safe herbicide. The riprap will likely require herbicidal spraying at least every two years. In addition, all trees and bushes should be removed out to 15 feet of either levee toe or as far as the existing easement distance, whichever is less.

b. **Butler Brook Levee.** The 3000-foot long Butler Brook levee was mostly in very good condition (see Photos 12 through 15). Rutting was observed at one small area on the levee crest (see Photo 3). This area should be repaired. Other rutted areas on the levee crest had been filled in, but were inadequately compacted. These areas should be re-compacted; additional fill material will likely be required. One location on the riverside slope of the Butler Brook Levee is rutted due to foot traffic and ATV use (see Photo 4). Recommend installing articulated concrete mat (ACM) at this location. The material that had been dumped near the upstream end of the Butler Brook Levee has been removed. No new encroachments were observed. The eroded scarp just upstream from the transition structure has been repaired, including the addition of large riprap (see Photo 11).

c. **Earthen Channels.** The channels along the levees were in good overall condition. It was noted that the shoal on the right side of the channel immediately upstream from the transition structure continues to build (see Photo 16). The shoaling should be removed periodically in order to maintain the design channel capacity.

d. **Concrete Transition Structure.** The concrete transition structure was in good overall condition.

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e. **Concrete Diversion Channel.** The concrete U-channel was in good overall condition (see Photos 17 and 19). Vegetation overhanging the walls should be removed, especially prior to project inspections. The 18" drainage pipe that enters the concrete U-channel at Station 98+00 (seen in Photo 33) was apparently designed without a flap gate to prevent flood water from backing up the pipe and flowing out of the catch basins into the protected area. Previous assessments of this situation indicate that the highest expected flood water level in the diversion channel would indeed back up the pipe and drop structure, and flow out of the catch basin (see the 2012 inspection report). It is recommended that a flap gate is acquired and installed.

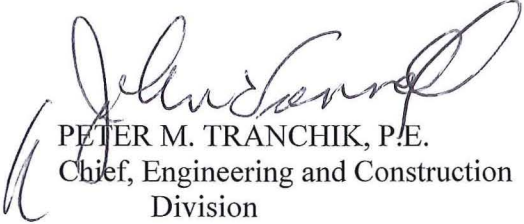
f. **Interior Drainage.** The interior drainage system, which consists of swales, catch basins, and an 18-inch pipe that outlets through the U-channel wall, was in good overall condition. See the comments about the lack of a flap gate in paragraph 3e above.

g. **Emergency Operations.** An Emergency Action Plan specific to this project should be prepared in order to delineate procedures for performing emergency operations, such as levee repairs and treatment of boils.

4. **Conclusions and Recommendations.**

The project is rated **Minimally Acceptable** and, therefore, is now again **Active** in the Public Law 84-99 Rehabilitation and Inspection Program. Broome County personnel are applauded for their efforts taken to date to improve the project. However, the remaining deficiencies noted in the checklists and summarized this memorandum should be attended to by the next inspection in order to raise the project's rating to Acceptable. The highest priority items to attend to are to procure and install a flap gate over the 18" drainage pipe where it outlets into the concrete U-channel, and to prepare an Emergency Action Plan specific to this project. The next inspection is scheduled for 2018.

Encls


PETER M. TRANCHIK, P.E.
Chief, Engineering and Construction
Division

CF: CENAP-EC-EG

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Flood Damage Reduction Segment / System Inspection Report

Name of Segment / System: Deposit, NY

Public Sponsor(s): Broome County, NY, and Delaware County, NY

Public Sponsor Representative: Pat Hogan (Broome County)

Sponsor Phone: 607-778-2449

Sponsor Email: phogan@co.broome.ny.us

Corps of Engineers Inspector: Bruce Rogers, P.G., Bob Phillips, P.E., and Bob Eckhardt

Inspection Start Date: 6/8/2016

Inspection End Date: 6/8/2016

Inspection Report Prepared By: Bruce Rogers, P.G.

Date Report Prepared: 9/2/2016

Internal Technical Review (for Periodic Inspections) By: D. Kelly, P.E., and L. Bittner, P.E.

Date of ITR: 9/7/2016

Final Approved By: Peter M. Tranchik, P.E.

Date Approved: 9/12/2016

Type of Inspection: ☒ **Initial Eligibility Inspection**
☐ **Continuing Eligibility Inspection (Routine)**
☐ **Continuing Eligibility Inspection (Periodic)**

Overall Segment / System Rating: ☐ **Acceptable**
☒ **Minimally Acceptable**
☐ **Unacceptable**

Contents of Report: ☒ **Instructions**
☒ **Initial Eligibility Inspection**
☒ **General Items for All Flood Control Works**
☒ **Levee Embankment**
☒ **Concrete Floodwalls**
☐ **Sheet Pile and Concrete I-walls**
☒ **Interior Drainage System**
☐ **Pump Stations**
☒ **FDR System Channels**

Note: This inspection rating represents the Corps evaluation of operations and maintenance of the flood damage reduction system and may be used in conjunction with other information for a levee certification determination for National Flood Insurance Program (NFIP) purposes if applicable. An Acceptable Corps inspection rating, alone, does not equate to a certifiable levee for the NFIP. It is recommended for levee systems currently accredited by the Federal Emergency Management Agency (FEMA) for NFIP purposes receiving a Corps Minimally Acceptable or Unacceptable rating be evaluated by the levee owner to determine the potential impacts to the certification for FEMA.

Enclosure 1



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Flood Damage Reduction Segment / System Public Sponsor Pre-Inspection Form

The following information is to be provided by the levee district sponsor prior to an inspection. This information will be used to help evaluate the organizational capability of the levee district to manage the levee segment / system maintenance program.

1. Levee segment / system and district: (name of the segment / system and levee district) Deposit, NY
2. Reporting period: (month/day/year to month/day/year) August 2012 to June 2016
3. Summary of maintenance required by last inspection report: Remove significant woody vegetation and trees; remove dumped material encroaching upon the levee; repair rutting on the levee crest; and repair the vertical scarp upstream of the transition structure. NOTE: These issues resulted in an Unacceptable overall rating.
4. Summary of maintenance performed this reporting period: Vegetation and trees were removed except for portions of the Big Hollow Creek Levee; the dumped material was removed; most of the rutting was repaired; and the scarp was repaired.
5. Summary of maintenance planned next reporting period: Complete removal of excess vegetation so that the levee can be fully inspected; and repair remaining rutted areas on the levee crest.
6. Summary of changes to segment / system since last inspection: None.
7. Problems/ issues requiring the assistance of the US Army Corps of Engineers: None.



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**Flood Damage Reduction Segment / System
Inspection Report**

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Public Sponsor Pre-Inspection Report

The following information is to be provided by the levee district sponsor prior to an inspection

8. Levee district organization: (elected or appointed levee district officials and key employees)

Name	Position	Mailing Address	Phone Number	Email Address
Pat Hogan	Engineer II	Broome County DPW, 60 Hawley St, Binghamton, NY 13902	607-778-2449	phogan@co.broome.ny.us

General Instructions for the Inspection of Flood Damage Reduction Segments / Systems

A. Purpose of USACE Inspections:

The primary purpose of these inspections is to prevent loss of life and catastrophic damages; preserve the value of Federal investments, and to encourage non-Federal sponsors to bear responsibility for their own protection. Inspections should assure that Flood Damage Reduction structures and facilities are continually maintained and operated as necessary to obtain the maximum benefits. Inspections are also conducted to determine eligibility for Rehabilitation Assistance under authority of PL 84-99 for Federal and non-Federal systems. (ER 1130-2-530, ER 500-1-1)

B. Types of Inspections:

The Corps conducts several types of inspections of Flood Damage Reduction systems, as outlined below:

Initial Eligibility Inspections	Continuing Eligibility Inspections	
	Routine Inspections	Periodic Inspections
IEIs are conducted to determine whether a non-Federally constructed Flood Damage Reduction system meets the minimum criteria and standards set forth by the Corps for initial inclusion into the Rehabilitation and Inspection Program.	RIs are intended to verify proper maintenance, owner preparedness, and component operation.	PIs are intended to verify proper maintenance and component operation and to evaluate operational adequacy, structural stability, and safety of the system. Periodic Inspections evaluate the system's original design criteria vs. current design criteria to determine potential performance impacts, evaluate the current conditions, and compare the design loads and design analysis used against current design standards. This is to be done to identify components and features for the sponsor that need to be monitored more closely over time or corrected as needed. (Periodic Inspections are used as the basis of risk assessments.)

C. Inspection Boundaries:

Inspections should be conducted so as to rate each Flood Damage Reduction "Segment" of the system. The overall system rating will be the lowest segment rating in the system.

Project	System	Segment
A flood damage reduction project is made up of one or more flood damage reduction systems which were under the same authorization.	A flood damage reduction system is made up of one or more flood damage reduction segments which collectively provide flood damage reduction to a defined area. Failure of one segment within a system constitutes failure of the entire system. Failure of one system does not affect another system.	A flood damage reduction segment is defined as a discrete portion of a flood damage reduction system that is operated and maintained by a single entity. A flood damage reduction segment can be made up of one or more features (levee, floodwall, pump stations, etc).

D. Land Use Definitions:

The following three definitions are intended for use in determining minimum required inspection intervals and initial requirements for inclusion into the Rehabilitation and Inspection Program. Inspections should be considered for all systems that would result in significant environmental or economic impact upon failure regardless of specific land use.

Agricultural	Rural	Urban
Protected population in the range of zero to 5 households per square mile protected.	Protected population in the range of 6 to 20 households per square mile protected.	Greater than 20 households per square mile; major industrial areas with significant infrastructure investment. Some protected urban areas have no permanent population but may be industrial areas with high value infrastructure with no overnight population.



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E. Use of the Inspection Report Template:

The report template is intended for use in all Army Corps of Engineers inspections of levee and floodwall systems and flood damage reduction channels. The section of the template labeled "Initial Eligibility" only needs to be completed during Initial Eligibility Inspections of Non-Federally constructed Flood Damage Reduction Systems. The section labeled "General Items" needs to be completed with every inspection, along with all other sections that correspond to features in the system. The section labeled "Public Sponsor Pre-Inspection Report" is intended for completion before the inspection, if possible.

F. Individual Item / Component Ratings:

Assessment of individual components rated during the inspection should be based on the criteria provided in the inspection report template, though inspectors may incorporate additional items into the report based on the characteristics of the system. The assessment of individual components should be based on the following definitions.

Acceptable Item	Minimally Acceptable Item	Unacceptable Item
The inspected item is in satisfactory condition, with no deficiencies, and will function as intended during the next flood event.	The inspected item has one or more minor deficiencies that need to be corrected. The minor deficiency or deficiencies will not seriously impair the functioning of the item as intended during the next flood event.	The inspected item has one or more serious deficiencies that need to be corrected. The serious deficiency or deficiencies will seriously impair the functioning of the item as intended during the next flood event.

G. Overall Segment / System Ratings:

Determination of the overall system rating is based on the definitions below. Note that an Unacceptable System Rating may be either based on an engineering determination that concluded that noted deficiencies would prevent the system from functioning as intended during the next flood event, or based on the sponsor's demonstrated lack of commitment or inability to correct serious deficiencies in a timely manner.

Acceptable System	Minimally Acceptable System	Unacceptable System
All items or components are rated as Acceptable.	One or more items are rated as Minimally Acceptable or one or more items are rated as Unacceptable and an engineering determination concludes that the Unacceptable items would not prevent the segment / system from performing as intended during the next flood event.	One or more items are rated as Unacceptable and would prevent the segment / system from performing as intended, or a serious deficiency noted in past inspections (which had previously resulted in a minimally acceptable system rating) has not been corrected within the established timeframe, not to exceed two years.

H. Eligibility for PL84-99 Rehabilitation Assistance:

Replaced by Enclosure 3

Inspected systems that are not operated and maintained by the Federal government may be Active in the Corps' Rehabilitation and Inspection Program (RIP) and eligible for rehabilitation assistance from the Corps as defined below:

If the Overall System Rating is Acceptable	If the Overall System Rating is Minimally Acceptable	If the Overall System Rating is Unacceptable
The system is active in the RIP and eligible for PL84-99 rehabilitation assistance.	The system is Active in the RIP during the time that it takes to make needed corrections. Active systems are eligible for rehabilitation assistance. However, if the sponsor does not present USACE with proof that serious deficiencies (which had previously resulted in a minimally acceptable system rating) were corrected within the established timeframe, then the system will become Inactive in the RIP.	The system is Inactive in the RIP, and the status will remain Inactive until the sponsor presents USACE with proof that all items rated Unacceptable have been corrected. Inactive systems are ineligible for rehabilitation assistance.

I. Reporting:

After the inspection, the Corps is responsible for assembling an inspection report (or a summary report if it was a Periodic Inspection) including the following information:

- a. All sections of the report template used during the inspection, including the cover and pre-inspection materials. (Supplemental data collected, and any sections of the template that weren't used during the inspection do not need to be included with the report.)
- b. Photos of the general system condition and noted deficiencies.
- c. A plan view drawing of the system, with stationing, to reference locations of items rated less than acceptable.
- d. The relative importance of the identified maintenance issues should be specified in the transmittal letter.
- e. If the Overall System Rating is Minimally Acceptable, the report needs to establish a timeframe for correction of serious deficiencies noted (not to exceed two years) and indicate that if these items are not corrected within the required timeframe, the system will be rated as Unacceptable and made Inactive in the Rehabilitation Inspection Program.

J. Notification:

Reports are to be disseminated as follows within 30 days of the inspection date.

If the Overall System Rating is Acceptable	If the Overall System Rating is Minimally Acceptable	If the Overall System Rating is Unacceptable
Reports need to be provided to the local sponsor and the county emergency management agency.	Reports need to be provided to the local sponsor, state emergency management agency, county emergency management agency, and to the FEMA region.	Reports need to be provided to the local sponsor, state emergency management agency, county emergency management agency, FEMA region, and to the Congressional delegation within 30 days of the inspection.



Initial Eligibility

For use only during Initial Eligibility Inspections of Non-Federally Constructed Flood Damage Reduction Segments / Systems

Deposit

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
1. Public Sponsor (A or U only)	A	A	The Public Sponsor is a legally constituted public body with full authority and capability to perform the terms of its agreement as the non-Federal partner of the Corps for a segment / system, able to pay damages, if necessary, in the event of its failure to perform. The public sponsor may be a State, County, City, Town, Federally recognized Indian Tribe or tribal organization, Alaska Native Corporation, or any political subpart of a State or group of states that has the legal and financial authority and capability to provide the necessary cash contributions and the lands, easements, rights-of-way, relocations, borrow, and dredged or excavated materials disposal areas (LERRD's) necessary for the segment / system, and who could legally hold and save the Federal government free from damages that could potentially arise during post-flood rehabilitations or other work on the segment / system.	The sponsor consists of two public entities.
		U	The segment / system does not have a public sponsor as defined above.	
2. Flood Protection (A or U only)	A	A	The principal function of the segment / system is to protect people or property from floods.	The project purpose is flood protection.
		U	The segment / system was built or is primarily used for channel alignment, navigation, recreation, fish and wildlife, land reclamation, drainage, to protect against land erosion or tidal inflows, or for some other non-flood related purpose.	
3. Segment / System Completion (A or U only)	A	A	Segment / System construction is fully completed.	The project was completed decades ago.
		U	The segment / system is still under construction.	
4. Construction Compliance (A or U only)	A	A	Appropriate local, State, tribal, and/or Federal permits (right-of-way, easements, regulatory permits, etc.), or waivers thereof, have been obtained for FDR segment / system construction and subsequent modifications. The segment / system was constructed in accordance with all applicable Federal, state and local codes, ordinances, and applicable laws.	
		U	The appropriate permits (or waivers thereof) have not been obtained for the segment / system, or the segment / system was not constructed in accordance with applicable codes, ordinances, and laws.	
5. Primary Levee	A	A	In the case of a levee segment / system, the levee is a primary levee or is a secondary levee which is designed to protect human life.	The combination of two levees and a transition structure form a primary levee system.
		U	The levee is a secondary levee and was not designed to protect human life.	
		N/A	The FDR segment / system is not a levee segment / system.	

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



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Flood Damage Reduction Segment / System Inspection Report

Initial Eligibility
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Initial Eligibility

For use only during Initial Eligibility Inspections of Non-Federally Constructed Flood Damage Reduction Segments / Systems

Deposit

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
6. Minimum Elevation ¹ (A or U only)	A	A	<ul style="list-style-type: none"> • Urban Levees and Floodwalls- Minimum elevation corresponding to a flood level with 10% probability of occurring in a given year (10-year flood). • Agricultural Levees and Floodwalls- Minimum elevation corresponding to a flood level with 20% probability of occurring in a given year (5-year flood). • Flood Damage Reduction Channels- Minimum capacity is for a flood with a 10% probability of occurring in a given year (10-year flood). Improved channels must additionally provide drainage for at least 1.5 square miles of land and have a capacity of at least 800 cfs. (Interior drainage channels within the protected area of a levee segment / system are not considered to be flood damage reduction channels under the RIP.) 	Criteria were met for an urban levee project.
		U	The FDR segment / system does not meet requirements for minimum elevation, capacity, or drainage area.	
7. Physical Location and Cross Section (A or U only)	A	A	The physical location, cross section, and other design elements of the FDR system are sufficient to provide reliable flood protection. The FDR segment / system forms a properly closed segment / system. See Table 5-4, EP 500-1-1.	The levee system ties into high ground at each end.
		U	The FDR segment / system was not constructed in an appropriate location, does not have an appropriate cross section, is not a properly closed segment / system, or has other shortcomings with design elements necessary for providing reliable flood damage reduction.	
8. Embankment Fill Material ²	A	A	Embankment fill material is uniform and adequately compacted throughout the entire FDR segment / system, and the type of embankment material is suitable to prevent slides and seepage problems.	Embankment fill material is appropriate.
		U	Embankment fill material is not uniform, or there is no compaction and evidence indicates a need for compaction, or the type of embankment material is unsuitable and is likely to contribute to the development of slides or seepage problems.	
9. Foundations ²	A	A	Foundation material and construction methods adequately address piping, sand boils, seepage, or settlements that would reduce the level of protection.	Foundation treatment was appropriate.
		U	Foundation material and construction methods are such that excessive uncontrolled seepage, sand boils, and piping will occur. Performance history indicates significant uncontrolled seepage, sand boils or piping.	
10. Erosion Control	A	A	Erosion protection is capable of handling the designed flow velocity for the level of protection for the entire FDR segment / system. The FDR segment / system is protected against bank caving and slides in all necessary areas, and has adequate drainage to protect FDR segment / system slopes from runoff erosion.	Riprap was provided for erosion control at critical locations where the force of flood flows were calculated to be the strongest.
		U	Erosion protection is not present and there is evidence indicating a need for erosion protection.	

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



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Initial Eligibility

For use only during Initial Eligibility Inspections of Non-Federally Constructed Flood Damage Reduction Segments / Systems

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Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
11. Interior Drainage System ³ (including culverts, gates, pump stations)	A	A	Given the level of protection provided by the FDR system, interior drainage structures are appropriately sized, situated, and constructed to move anticipated runoff and seepage out of the protected area. Pump stations will not become inundated during regular operation and their power system is adequately designed and reliable.	The leveed area adjacent to the Big Hollow Creek Levee drains along the former channel of Butler Brook to the West Branch Delaware River. The leveed area adjacent to the Butler Brook Levee feeds to a pipe that passes through the left wall of the concrete U-shaped bypass channel, and then down the bypass channel to the West Branch Delaware River. Thus, there are no drainage structures that pass through the levees.
		U	Interior drainage structures are undersized, poorly constructed, poorly situated, or unreliably designed.	
		N/A	The issue of interior drainage does not apply to this type of FDR segment / system.	
12. Structures ³	A	A	Structures are designed and constructed to withstand anticipated loadings.	The transition structure was designed to withstand the combined loading from Butler Brook and Big Hollow Creek.
		U	Structures are unreliably designed or inadequately constructed.	

¹ Depending on available data and local Corps policy, the minimum elevation required may be calculated using traditional methods, with the addition of 1 foot of freeboard in agricultural areas and 2 feet of freeboard in urban areas, or using annual exceedance probability, which numerically accounts for the natural variation and uncertainty when estimating discharge-probability and stage-discharge functions so that additional requirements for elevation are based on the level of uncertainty in the data.

² This item should be evaluated based on a review of performance history. If this is not available, some form of engineering assessment is required.

³ Documentation (plans, at a minimum) required for any necessary engineering evaluation is to be provided by the public sponsor.

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Flood Damage Reduction Segment / System
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Initial Eligibility
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General Items for All Flood Damage Reduction Segments / Systems

For use during all inspections of all Flood Damage Reduction Segments / Systems

Deposit

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
1. Operations and Maintenance Manuals	A	A	Levee Owner's Manual, O&M Manuals, and/or manufacturer's operating instructions are present.	An O&M Manual was provided for the project by the design agency.
		M	Sponsor manuals are lost or missing or out of date; however, sponsor will obtain manuals prior to next scheduled inspection.	
		U	Sponsor has not obtained lost or missing manuals identified during previous inspection.	
2. Emergency Supplies and Equipment (A or M only)	A	A	The sponsor maintains a stockpile of sandbags, shovels, and other flood fight supplies which will adequately supply all needs for the initial days of a flood fight. Sponsor determines required quantity of supplies after consulting with inspector.	Broome County DPW maintains a supply of emergency supplies, although none are stored at the project.
		M	The sponsor does not maintain an adequate supply of flood fighting materials as part of their preparedness activities.	
3. Flood Preparedness and Training (A or M only)	M	A	Sponsor has a written system-specific flood response plan and a solid understanding of how to operate, maintain, and staff the FDR system during a flood. Sponsor maintains a list of emergency contact information for appropriate personnel and other emergency response agencies.	Although the county maintains an all-hazards emergency action plan, no emergency action plan has been prepared specifically for the project.
		M	The sponsor maintains a good working knowledge of flood response activities, but documentation of system-specific emergency procedures and emergency contact personnel is insufficient or out of date.	

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General Items for All Flood Damage Reduction
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Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee segments / systems

Deposit

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
1. Unwanted Vegetation Growth ¹	M	A	The levee has little or no unwanted vegetation (trees, bush, or undesirable weeds), except for vegetation that is properly contained and/or situated on overbuilt sections, such that the mandatory 3-foot root-free zone is preserved around the levee profile. The levee has been recently mowed. The vegetation-free zone extends 15 feet from both the landside and riverside toes of the levee to the centerline of the tree. If the levee access easement doesn't extend to the described limits, then the vegetation-free zone must be maintained to the easement limits. Reference EM 1110-2-301 or Corps policy for regional vegetation variance.	DEPO_2016_a_0001: Station_1 NA: More clearing to do (see Photo 1).: Remove vegetation/ (U) DEPO_2016_a_0003: Station_1 NA: Station_2 NA: Vegetation prevents inspection (see Photo 2).: Remove vegetation (U)
		M	Minimal vegetation growth (brush, weeds, or trees 2 inches in diameter or smaller) is present within the zones described above. This vegetation must be removed but does not currently threaten the operation or integrity of the levee.	Excessive vegetation has been removed from the Butler Brook Levee and from most of the Big Hollow Creek Levee. However, portions of the Big Hollow Creek Levee still need vegetation removed (see Photos 1 and 2).
		U	Significant vegetation growth (brush, weeds, or any trees greater than 2 inches in diameter) is present within the zones described above and must to be removed to reestablish or ascertain levee integrity.	
2. Sod Cover	A	A	There is good coverage of sod over the levee.	Sod cover was adequate.
		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 portions of the levee embankment.	
		N/A	Surface protection is provided by other means.	
3. Encroachments	A	A	No trash, debris, unauthorized farming activity, structures, excavations, or other obstructions present within the easement area. Encroachments have been previously reviewed by the Corps, and it was determined that they do not diminish proper functioning of the levee.	The material that had been dumped near the upstream end of the Butler Brook Levee has been removed. No new encroachments were observed.
		M	Trash, debris, unauthorized farming activity, structures, excavations, or other obstructions present, or inappropriate activities noted that should be corrected but will not inhibit operations and maintenance or emergency operations. Encroachments have not been reviewed by the Corps.	
		U	Unauthorized encroachments or inappropriate activities noted are likely to inhibit operations and maintenance, emergency operations, or negatively impact the integrity of the levee.	
4. Closure Structures (Stop Log, Earthen Closures, Gates, or Sandbag	NA	A	Closure structure in good repair. Placing equipment, stoplogs, and other materials are readily available at all times. Components are clearly marked and installation instructions/ procedures readily available. Trial erections have been accomplished in accordance with the O&M Manual.	

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Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
Closures) (A or U only)		U	Any of the following issues is cause for this rating: Closure structure in poor condition. Parts missing or corroded. Placing equipment may not be available within the anticipated warning time. The storage vaults cannot be opened during the time of inspection. Components of closure are not clearly marked and installation instructions/ procedures are not readily available. Trial erections have not been accomplished in accordance with the O&M Manual.	
		N/A	There are no closure structures along this component of the FDR segment / system.	
5. Slope Stability	A	A	No slides, sloughs, tension cracking, slope depressions, or bulges are present.	No evidence of slope instability was observed.
		M	Minor slope stability problems that do not pose an immediate threat to the levee embankment.	
		U	Major slope stability problems (ex. deep seated sliding) identified that must be repaired to reestablish the integrity of the levee embankment.	
6. Erosion/ Bank Caving	A	A	No erosion or bank caving is observed on the landward or riverward sides of the levee that might endanger its stability.	The eroded scarp just upstream from the transition structure has been repaired, including the addition of large riprap (see Photo 11).
		M	There are areas where minor 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.	
7. Settlement ²	A	A	No observed depressions in crown. Records exist and indicate no unexplained historical changes.	No indication of settlement was observed.
		M	Minor irregularities that do not threaten integrity of levee. Records are incomplete or inclusive.	
		U	Obvious variations in elevation over significant reaches. No records exist or records indicate that design elevation is compromised.	
8. Depressions/ Rutting	M	A	There are scattered, shallow ruts, pot holes, or other depressions on the levee that are unrelated to levee settlement. The levee crown, embankments, and access road crowns are well established and drain properly without any ponded water.	DEPO_2016_a_0005: Station_1 NA: 4-inch deep rutting on the levee crest (see Photo 3). Fill in and compact. (A) DEPO_2016_a_0006: Station_1 NA: Rutting of the riverside slope due to foot traffic and ATV use (see Photo 4). Fill and compact. Consider additional measures such as articulated concrete mat. (U) Most of the rutted areas on the levee crest were filled in, but were inadequately compacted. Also, the riverside slope of the Butler Brook Levee is rutted due to foot traffic and ATV use (see Photo 4). Recommend installing articulated concrete mat (ACM) at this location.
		M	There are some infrequent minor depressions less than 6 inches deep in the levee crown, embankment, or access roads that will pond water.	
		U	There are depressions greater than 6 inches deep that will pond water.	

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Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
9. Cracking	A	A	Minor longitudinal, transverse, or desiccation cracks with no vertical movement along the crack. No cracks extend continuously through the levee crest.	No cracking observed.
		M	Longitudinal and/or transverse cracks up to 6 inches in depth with no vertical movement along the crack. No cracks extend continuously through the levee crest. Longitudinal cracks are no longer than the height of the levee.	
		U	Cracks exceed 6 inches in depth. Longitudinal cracks are longer than the height of the levee and/or exhibit vertical movement along the crack. Transverse cracks extend through the entire levee width.	
10. Animal Control	A	A	Continuous animal burrow control program in place that includes the elimination of active burrowing and the filling in of existing burrows.	No animal burrows observed.
		M	The existing animal burrow control program needs to be improved. Several burrows are 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.	
11. Culverts/ Discharge Pipes ³ (This item includes both concrete and corrugated metal pipes.)	NA	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	No drainage pipes pass under the levees. The one that used to pass under the Big Hollow Creek Levee was filled with concrete and abandoned.
		M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	

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		N/A	There are no discharge pipes/ culverts.	
12. Riprap Revetments & Bank Protection	M	A	No riprap displacement or stone degradation that could pose an immediate threat to the integrity of channel bank. Riprap intact with no woody vegetation present.	New riprap has been placed where the scarp was just upstream of the transition structure (see Photo 11). Riprap along the Big Hollow Creek Levee was difficult to inspect due to excessive vegetation (see Photo 2).
		M	Minor riprap displacement or stone degradation that could pose an immediate threat to the integrity of the channel bank. Unwanted vegetation must be cleared or sprayed with an appropriate herbicide.	
		U	Significant riprap displacement, exposure of bedding, or stone degradation observed. Scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling. Rock protection is hidden by dense brush, trees, or grasses.	
		N/A	There is no riprap protecting this feature of the segment / system, or riprap is discussed in another section.	
13. Revetments other than Riprap	NA	A	Existing revetment protection is properly maintained, undamaged, and clearly visible.	
		M	Minor revetment displacement or deterioration that does not pose an immediate threat to the integrity of the levee. Unwanted vegetation must be cleared or sprayed with an appropriate herbicide.	
		U	Significant revetment displacement, deterioration, or exposure of bedding observed. Scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling. Revetment protection is hidden by dense brush and trees.	
		N/A	There are no such revetments protecting this feature of the segment / system.	
14. Underseepage Relief Wells/ Toe Drainage Systems	NA	A	Toe drainage systems and pressure relief wells necessary for maintaining FDR segment / system stability during high water functioned properly during the last flood event and no sediment is observed in horizontal system (if applicable). Nothing is observed which would indicate that the drainage systems won't function properly during the next flood, and maintenance records indicate regular cleaning. Wells have been pumped tested within the past 5 years and documentation is provided.	
		M	Toe drainage systems or pressure relief wells are damaged and may become clogged if they are not repaired. Maintenance records are incomplete or indicate irregular cleaning and pump testing.	
		U	Toe drainage systems or pressure relief wells necessary for maintaining FDR segment / system stability during flood events have fallen into disrepair or have become clogged. No maintenance records. No documentation of the required pump testing.	
		N/A	There are no relief wells/ toe drainage systems along this component of the FDR segment / system.	
15. Seepage		A	No evidence or history of unrepaired seepage, saturated areas, or boils.	No seepage was observed.

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Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
	A	M	Evidence or history of minor unrepaired seepage or small saturated areas at or beyond the landside toe but not on the landward slope of levee. No evidence of soil transport.	
		U	Evidence or history of active seepage, extensive saturated areas, or boils.	

¹ If there is significant growth on the levee that inhibits the inspection of animal burrows or other items, the inspection should be ended until this item is corrected.

² Detailed survey elevations are normally required during Periodic Inspections, and whenever there are obvious visual settlements.

³ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

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Photo 1. Inspect ID: DEPO_2016_a_0001 **Title:** USACE_CENAP_DEPO_2016_a_0001_1.jpg **Rated Item:** 1. Unwanted Vegetation Growth. **Caption:** Excessive vegetation on the Big Hollow Creek Levee.



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Photo 2. Inspect ID: DEPO_2016_a_0003 **Title:** USACE_CENAP_DEPO_2016_a_0003_1.jpg **Rated Item:** 1. Unwanted Vegetation Growth. **Caption:** Looking upstream along the Big Hollow Creek Levee. Excessive vegetation on the riverside slope.



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Photo 3. Inspect ID: DEPO_2016_a_0005 **Title:** USACE_CENAP_DEPO_2016_a_0005_1.jpg **Rated Item:** 8. Depressions/ Rutting. **Caption:** Rutting on the Butler Brook Levee crest that was not repaired.



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Photo 4. Inspect ID: DEPO_2016_a_0006 **Title:** USACE_CENAP_DEPO_2016_a_0006_1.jpg **Rated Item:** 8. Depressions/ Rutting. **Caption:** Rutting of the riverside slope of the Butler Brook Levee where foot traffic and ATVs pass through.



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Floodwalls

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Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
1. Unwanted Vegetation Growth ¹	M	A	A grass-only or paved zone is maintained on both sides of the floodwall, free of all trees, brush, and undesirable weeds. The vegetation-free zone extends 15 feet from both the land and riverside of the floodwall, at ground-level, to the centerline of the tree. Additionally, an 8-foot root-free zone is maintained around the entire structure, including the floodwall toe, heel, and any toe-drains. If the floodwall access easement doesn't extend to the described limits, then the vegetation-free zone must be maintained to the easement limits. Reference EM 1110-2-301 and/or Corps policy for regional vegetation variance.	[NOTE: This checklist was used for the portion of the Big Hollow Creek Levee that is a sheetpile floodwall.] Excessive vegetation made it difficult to inspect the riverside of the sheetpile floodwall. The top of the sheetpile floodwall was acceptable (see Photo 9).
		M	Minimal vegetation growth (brush, weeds, or trees 2 inches in diameter or smaller) is present within the zones described above. This vegetation must be removed but does not currently threaten the operation or integrity of the floodwall.	
		U	Significant vegetation growth (brush, weeds, or any trees greater than 2 inches in diameter) is present within the zones described above. This vegetation threatens the operation or integrity of the floodwall and must be removed.	
2. Encroachments	A	A	No trash, debris, unauthorized structures, excavations, or other obstructions present within the easement area. Encroachments have been previously reviewed by the Corps, and it was determined that they do not diminish proper functioning of the floodwall.	No encroachments were observed.
		M	Trash, debris, unauthorized structures, excavations, or other obstructions present, or inappropriate activities noted that should be corrected but will not inhibit operations and maintenance or emergency operations. Encroachments have not been reviewed by the Corps.	
		U	Unauthorized encroachments or inappropriate activities noted are likely to inhibit operations and maintenance, emergency operations, or negatively impact the integrity of the floodwall.	
3. Closure Structures (Stop Log Closures and Gates) (A or U only)	NA	A	Closure structure in good repair. Placing equipment, stoplogs, and other materials are readily available at all times. Components are clearly marked and installation instructions/ procedures readily available. Trial erections have been accomplished in accordance with the O&M Manual.	
		U	Any of the following issues is cause for this rating: Closure structure in poor condition. Parts missing or corroded. Placing equipment may not be available within the anticipated warning time. The storage vaults cannot be opened during the time of inspection. Components of closure are not clearly marked and installation instructions/ procedures are not readily available. Trial erections have not been accomplished in accordance with the O&M Manual.	
		N/A	There are no closure structures along this component of the FDR segment / system.	
4. Concrete Surfaces	A	A	Negligible spalling, scaling or cracking. If the concrete surface is weathered or holds moisture, it is still satisfactory but should be seal coated to prevent freeze/ thaw damage.	No concrete. Metal surfaces were acceptable.
		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.	

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Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
		U	Surface deterioration or deep cracks present that may result in an unreliable structure. Any surface deterioration that exposes the sheet piling or lies adjacent to monolith joints may indicate underlying reinforcement corrosion and is unacceptable.	
5. Tilting, Sliding or Settlement of Concrete Structures ²	A	A	There are no significant areas of tilting, sliding, or settlement that would endanger the integrity of the structure.	The structure appeared to be plumb and level.
		M	There are areas of tilting, sliding, or settlement (either active or inactive) that need to be repaired. The maximum offset, either laterally or vertically, does not exceed 2 inches unless the movement can be shown to be no longer actively occurring. 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. Any movement that has resulted in failure of the waterstop (possibly identified by daylight visible through the joint) is unacceptable. Differential movement of greater than 2 inches between any two adjacent monoliths, either laterally or vertically, is unacceptable unless it can be shown that the movement is no longer active. Also, if the floodwall is of I-wall construction, then any visible or measurable tilting of the wall toward the protected side that has created an open horizontal crack on the riverside base of a monolith is unacceptable.	
6. Foundation of Concrete Structures ¹	A	A	No active erosion, scouring, or bank caving that might endanger the structure's stability.	No indication of foundation concerns.
		M	There are areas where the ground is eroding towards the base of the structure. Efforts need to be taken to slow and repair this erosion, but it is not judged to be close enough to the structure or to be progressing rapidly enough to affect structural stability before the next inspection. For the purposes of inspection, the erosion or scour is not closer to the riverside face of the wall than twice the floodwall's underground base width if the wall is of L-wall or T-wall construction; or if the wall is of sheetpile or I-wall construction, the erosion is not closer than twice the wall's visible height. Additionally, rate of erosion is such that the wall is expected to remain stable until the next inspection.	
		U	Erosion or bank caving observed that is closer to the wall than the limits described above, or is outside these limits but may lead to structural instabilities before the next inspection. Additionally, if the floodwall is of I-wall or sheetpile construction, the foundation is unacceptable if any turf, soil or pavement material got washed away from the landside of the I-wall as the result of a previous overtopping event.	
7. Monolith Joints	NA	A	The joint material is in good condition. The exterior joint sealant is intact and cracking/desiccation is minimal. Joint filler material and/or waterstop is not visible at any point.	
		M	The joint material has appreciable deterioration to the point where joint filler material and/or waterstop is visible in some locations. This needs to be repaired or replaced to prevent spalling and cracking during freeze/ thaw cycles, and to ensure water tightness of the joint.	

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Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
		U	The joint material is severely deteriorated or the concrete adjacent to the monolith joints has spalled and cracked, damaging the waterstop; in either case damage has occurred to the point where it is apparent that the joint is no longer watertight and will not provide the intended level of protection during a flood.	
		N/A	There are no monolith joints in the floodwall.	
8. Underseepage Relief Wells/ Toe Drainage Systems	NA	A	Toe drainage systems and pressure relief wells necessary for maintaining FDR segment / system stability during high water functioned properly during the last flood event and no sediment is observed in horizontal system (if applicable). Nothing is observed which would indicate that the drainage systems won't function properly during the next flood, and maintenance records indicate regular cleaning. Wells have been pumped tested within the past 5 years and documentation is provided.	
		M	Toe drainage systems or pressure relief wells are damaged and may become clogged if they are not repaired. Maintenance records are incomplete or indicate irregular cleaning and pump testing.	
		U	Toe drainage systems or pressure relief wells necessary for maintaining FDR segment / system stability during flood events have fallen into disrepair or have become clogged. No maintenance records. No documentation of the required pump testing.	
		N/A	There are no relief wells/ toe drainage systems along this component of the FDR segment / system.	
9. Seepage	A	A	No evidence or history of unrepaired seepage, saturated areas, or boils.	No seepage observed.
		M	Evidence or history of minor unrepaired seepage or small saturated areas at or beyond the landside toe but not on the landward slope of levee. No evidence of soil transport.	
		U	Evidence or history of active seepage, extensive saturated areas, or boils.	

¹ Inspectors must have as-built drawings available during the inspection so that the lateral distance to the heel and toe of the floodwalls can be determined in the field.

² The sponsor should be monitoring any observed movement to verify whether the movement is active or inactive.

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Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
1. Vegetation and Obstructions	A	A	No obstructions, vegetation, debris, or sediment accumulation noted within interior drainage channels or blocking the culverts, inlets, or discharge areas. Concrete joints and weep holes are free of grass and weeds.	The drainage swales that lead to the drainage pipe that exits into the diversion channel were unobstructed (see Photo 13).
		M	Obstructions, vegetation, debris, or sediment are minor and have not impaired channel flow capacity or blocked more than 10% of any culvert openings, but should be removed. A limited volume of grass and weeds may be present in concrete channel joints and weep holes.	
		U	Obstructions, vegetation, debris, or sediment have impaired the channel flow capacity or blocked more than 10% of a culvert opening. Sediment and debris removal required to re-establish flow capacity.	
2. Encroachments	A	A	No trash, debris, unauthorized structures, excavations, or other obstructions present within the easement area. Encroachments have been previously reviewed by the Corps, and it was determined that they do not diminish proper functioning of the interior drainage system.	No encroachments were observed in the drainage swales that lead to the drainage pipe that exits into the diversion channel (see Photo 13).
		M	Trash, debris, unauthorized structures, excavations, or other obstructions present, or inappropriate activities noted that should be corrected but will not inhibit operations and maintenance or emergency operations. Encroachments have not been reviewed by the Corps.	
		U	Unauthorized encroachments or inappropriate activities noted are likely to inhibit operations and maintenance, emergency operations, or negatively impact the integrity of this component of the interior drainage system.	
3. Ponding Areas	NA	A	No trash, debris, structures, or other obstructions present within the ponding areas. Sediment deposits do not exceed 10% of capacity.	
		M	Trash, debris, excavations, structures, or other obstructions present, or inappropriate activities that will not inhibit operations and maintenance. Sediment deposits do not exceed 30% of capacity.	
		U	Trash, debris, excavations, structures, or other obstructions, or other encroachments or activities noted that will inhibit operations, maintenance, or emergency work. Sediment deposits exceeds 30% of capacity.	
		N/A	There are no ponding areas associated with the interior drainage system.	
4. Fencing and Gates ¹	NA	A	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	Fencing or gates are damaged or corroded but appear to be maintainable. Locks may be missing or damaged.	
		U	Fencing and gates are damaged or corroded to the point that replacement is required, or potentially dangerous features are not secured.	
		N/A	There are no features noted that require safety fencing.	
5. Concrete Surfaces (Such as gate)	NA	A	Negligible spalling, scaling or cracking. If the concrete surface is weathered or holds moisture, it is still satisfactory but should be seal coated to prevent freeze/ thaw damage.	

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Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
wells, outfalls, intakes, or culverts)		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 cracks present that may result in an unreliable structure. Any surface deterioration that exposes the sheet piling or lies adjacent to monolith joints may indicate underlying reinforcement corrosion and is unacceptable.	
		N/A	There are no concrete items in the interior drainage system.	
6. Tilting, Sliding or Settlement of Concrete and Sheet Pile Structures ² (Such as gate wells, outfalls, intakes, or culverts)	NA	A	There are no significant areas of tilting, sliding, or settlement that would endanger the integrity of the structure.	
		M	There are areas of tilting, sliding, or settlement (either active or inactive) that need to be repaired. The maximum offset, either laterally or vertically, does not exceed 2 inches unless the movement can be shown to be no longer actively occurring. 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. Any movement that has resulted in failure of the waterstop (possibly identified by daylight visible through the joint) is unacceptable. Differential movement of greater than 2 inches between any two adjacent monoliths, either laterally or vertically, is unacceptable unless it can be shown that the movement is no longer active. Also, if the floodwall is of I-wall construction, then any visible or measurable tilting of the wall toward the protected side that has created an open horizontal crack on the riverside base of a monolith is unacceptable.	
		N/A	There are no concrete items in the interior drainage system.	
7. Foundation of Concrete Structures ³ (Such as culverts, inlet and discharge structures, or gatewells.)	NA	A	No active erosion, scouring, or bank caving that might endanger the structure's stability.	
		M	There are areas where the ground is eroding towards the base of the structure. Efforts need to be taken to slow and repair this erosion, but it is not judged to be close enough to the structure or to be progressing rapidly enough to affect structural stability before the next inspection. The rate of erosion is such that the structure is expected to remain stable until the next inspection.	
		U	Erosion or bank caving observed that may lead to structural instabilities before the next inspection.	
		N/A	There are no concrete items in the interior drainage system.	
8. Monolith Joints	NA	A	The joint material is in good condition. The exterior joint sealant is intact and cracking/ desiccation is minimal. Joint filler material and/or waterstop is not visible at any point.	
		M	The joint material has appreciable deterioration to the point where joint filler material and/or waterstop is visible in some locations. This needs to be repaired or replaced to prevent spalling and cracking during freeze/ thaw cycles, and to ensure water tightness of the joint.	

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		U	The joint material is severely deteriorated or the concrete adjacent to the monolith joints has spalled and cracked, damaging the waterstop; in either case damage has occurred to the point where it is apparent that the joint is no longer watertight and will not provide the intended level of protection during a flood.	
		N/A	There are no monolith joints in the interior drainage system.	
9. Culverts/ Discharge Pipes ⁴	M	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	The 18" diameter concrete drainage pipe that exits into the diversion channel (see Photo 5) is short and can be visually inspected; however, the pipe was not inspected during this project inspection.
		M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
		N/A	There are no discharge pipes/ culverts.	
10. Sluice / Slide Gates ⁵	NA	A	Gates open and close freely to a tight seal or minor leakage. Gate operators are in good working condition and are properly maintained. Sill is free of sediment and other obstructions. Gates and lifters have been maintained and are free of corrosion. Documentation provided during the inspection.	
		M	Gates and/or operators have been damaged or have minor corrosion, and open and close with resistance or binding. Leakage quantity is controllable, but maintenance is required. Sill is free of sediment and other obstructions.	
		U	Gates do not open or close and/or operators do not function. Gate, stem, lifter and/or guides may be damaged or have major corrosion.	
		N/A	There are no sluice/ slide gates.	

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Interior Drainage System

For use during Initial and Continuing Eligibility Inspections of interior drainage systems

Deposit

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
11. Flap Gates/ Flap Valves/ Pinch Valves ¹	M	A	Gates/ valves open and close easily with minimal leakage, have no corrosion damage, and have been exercised and lubricated as required.	There is no flap gate on the 18" diameter drainage pipe that exits into the diversion channel (see Photo 5); however, the design did not include a flap gate. Previous assessments of this situation indicate that the highest expected flood water level in the diversion channel would back up the pipe and drop structure, and flow out of the catch basin. It is recommended that a flap gate is acquired and installed.
		M	Gates/ valves will not fully open or close because of obstructions that can be easily removed, or have minor corrosion damage that requires maintenance.	
		U	Gates/ valves are missing, have been damaged, or have deteriorated to the point that they need to be replaced.	
		N/A	There are no flap gates.	
12. Trash Racks (non-mechanical)	NA	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, bars are corroded to the point that up to 10% of the sectional area may be lost. Repair or replacement is required.	
		U	Trash racks are missing or damaged to the extent that they are no longer functional and must be replaced. (For example, more than 10% of the sectional area may be lost.)	
		N/A	There are no trash racks, or they are covered in the pump stations section of the report.	
13. Other Metallic Items	NA	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 appears 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.	
14. Riprap Revetments of Inlet/ Discharge Areas	NA	A	No riprap displacement or stone degradation that could pose an immediate threat to the integrity of channel bank. Riprap intact with no woody vegetation present.	
		M	Minor riprap displacement or stone degradation that could pose an immediate threat to the integrity of the channel bank. Unwanted vegetation must be cleared or sprayed with an appropriate herbicide.	
		U	Significant riprap displacement, exposure of bedding, or stone degradation observed. Scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling. Rock protection is hidden by dense brush, trees, or grasses.	
		N/A	There is no riprap protecting this feature of the segment / system, or riprap is discussed in another section.	
15. Revetments other than Riprap	NA	A	No riprap displacement or stone degradation that could pose an immediate threat to the integrity of channel bank. Riprap intact with no woody vegetation present.	

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Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
		M	Minor riprap displacement or stone degradation that could pose an immediate threat to the integrity of the channel bank. Unwanted vegetation must be cleared or sprayed with an appropriate herbicide.	
		U	Significant riprap displacement, exposure of bedding, or stone degradation observed. Scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling. Rock protection is hidden by dense brush, trees, or grasses.	
		N/A	There are no such revetments protecting this feature of the segment / system.	

¹ Proper operation of this item must be demonstrated during the inspection.

² The sponsor should be monitoring any observed movement to verify whether the movement is active or inactive.

³ Inspectors must have as-built drawings available during the inspection so that the lateral distance to the heel and toe of the floodwalls can be determined in the field.

⁴ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

⁵ Proper operation of the gates (full open and closed) must be demonstrated during the inspection if no documentation is available. Be aware of both manual and electrical operators.

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Flood Damage Reduction Channels

For use during Initial and Continuing Eligibility Inspections of flood damage reduction channels

Deposit

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
1. Vegetation and Obstructions	M	A	No obstructions, vegetation, debris, or sediment accumulation within the channel. Concrete channel joints and weep holes are free of grass and weeds.	DEPO_2016_a_0009: Station_1 NA: Station_2 NA: Vegetation along the concrete diversion channel walls (see Photos 5, 17, and 19). Remove vegetation. (M) Vegetation needs to be cut back off of the diversion channel walls for full inspection of the walls (see Photos 5, 17, and 19).
		M	Obstructions (including log jams), vegetation, debris, or sediment are minor and have not impaired channel flow capacity, but should be removed. Sediment shoals have not developed to the extent that they can support vegetation other than non-aquatic grasses. A limited volume of grass and weeds may be present in concrete channel joints and weep holes.	
		U	Obstructions (including log jams), vegetation, debris or sediment have impaired the channel flow capacity. Sediment shoals are well established and support woody and/or brushy vegetation. Sediment and debris removal required to re-establish flow capacity.	
2. Shoaling ¹ (sediment deposition)	A	A	No shoaling or minor, non-vegetated shoaling is present.	Shoaling on the inside of the curve of the diversion channel was minimal.
		M	More widespread vegetated and non-vegetated shoaling is present. Non-aquatic grasses are present on shoal. No trees or brush is present on shoal, and channel flow is not significantly reduced. Sediment and debris removal recommended.	
		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.	
3. Encroachments	A	A	No trash, debris, unauthorized structures, excavations, or other obstructions present within the easement area. Encroachments have been previously reviewed by the Corps, and it was determined that they do not diminish proper functioning of the channel.	No encroachments observed in the diversion channel. However, firewood has been placed by a property owner immediately against the fence at the edge of the channel (see Photo 18). The firewood might need to be moved if that portion of the channel is needed to be accessed for maintenance or emergency operations.
		M	Trash, debris, unauthorized structures, excavations, or other obstructions present, or inappropriate activities noted that should be corrected but will not inhibit operations and maintenance or emergency operations. Encroachments have not been reviewed by the Corps.	
		U	Unauthorized encroachments or inappropriate activities noted are likely to inhibit operations and maintenance, emergency operations, or negatively impact the integrity of the channel.	
4. Erosion	A	A	No head cutting or horizontal deviation observed.	No erosion observed in the concrete channel.
		M	Head cutting and horizontal deviation evident, but is less than 1 foot from the designed grade or cross section.	
		U	Head cutting and horizontal deviation of more than 1 foot from the designed grade or cross section. Corrective actions required to stop or slow erosion.	
5. Concrete Surfaces	M	A	Negligible spalling, scaling or cracking. If the concrete surface is weathered or holds moisture, it is still satisfactory but should be seal coated to prevent freeze/ thaw damage.	Concrete surfaces of the diversion channel were in good condition. However, some of the surfaces could not be inspected due to excessive vegetation.
		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.	

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For use during Initial and Continuing Eligibility Inspections of flood damage reduction channels

Deposit

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
		U	Surface deterioration or deep cracks present that may result in an unreliable structure. Any surface deterioration that exposes the sheet piling or lies adjacent to monolith joints may indicate underlying reinforcement corrosion and is unacceptable.	
		N/A	There are no concrete items in the channel.	
6. Tilting, Sliding or Settlement of Concrete Structures ²	A	A	There are no significant areas of tilting, sliding, or settlement that would endanger the integrity of the structure.	No concerns noted.
		M	There are areas of tilting, sliding, or settlement (either active or inactive) that need to be repaired. The maximum offset, either laterally or vertically, does not exceed 2 inches unless the movement can be shown to be no longer actively occurring. 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. Any movement that has resulted in failure of the waterstop (possibly identified by daylight visible through the joint) is unacceptable. Differential movement of greater than 2 inches between any two adjacent monoliths, either laterally or vertically, is unacceptable unless it can be shown that the movement is no longer active. Also, if the floodwall is of I-wall construction, then any visible or measurable tilting of the wall toward the protected side that has created an open horizontal crack on the riverside base of a monolith is unacceptable.	
		N/A	There are no concrete items in the channel.	
7. Foundation of Concrete Structures ³	A	A	No active erosion, scouring, or bank caving that might endanger the structure's stability.	No concerns noted.
		M	There are areas where the ground is eroding towards the base of the structure. Efforts need to be taken to slow and repair this erosion, but it is not judged to be close enough to the structure or to be progressing rapidly enough to affect structural stability before the next inspection. For the purposes of inspection, the erosion or scour is not closer to the riverside face of the wall than twice the floodwall's underground base width if the wall is of L-wall or T-wall construction; or if the wall is of sheetpile or I-wall construction, the erosion is not closer than twice the wall's visible height. Additionally, rate of erosion is such that the wall is expected to remain stable until the next inspection.	
		U	Erosion or bank caving observed that is closer to the wall than the limits described above, or is outside these limits but may lead to structural instabilities before the next inspection. Additionally, if the floodwall is of I-wall or sheetpile construction, the foundation is unacceptable if any turf, soil or pavement material got washed away from the landside of the I-wall as the result of a previous overtopping event.	
		N/A	There are no concrete items in the channel.	
8. Slab and Monolith Joints	A	A	The joint material is in good condition. The exterior joint sealant is intact and cracking/desiccation is minimal. Joint filler material and/or waterstop is not visible at any point.	Joints and joint material appeared to be in good condition.

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Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
9. Flap Gates/ Flap Valves/ Pinch Valves ⁴	M	M	The joint material has appreciable deterioration to the point where joint filler material and/or waterstop is visible in some locations. This needs to be repaired or replaced to prevent spalling and cracking during freeze/ thaw cycles, and to ensure water tightness of the joint.	
		U	The joint material is severely deteriorated or the concrete adjacent to the monolith joints has spalled and cracked, damaging the waterstop; in either case damage has occurred to the point where it is apparent that the joint is no longer watertight and will not provide the intended level of protection during a flood.	
		N/A	There are no concrete items in the channel.	
9. Flap Gates/ Flap Valves/ Pinch Valves ⁴	M	A	Gates/ valves open and close easily with minimal leakage, have no corrosion damage, and have been exercised and lubricated as required.	DEPO_2016_a_0008: Station_1 NA: Design deficiency? No flap gate in the original design (see Photo 5). Consider adding a flap gate. (M) See comments under Item 11 of the Interior Drainage System checklist.
		M	Gates/ valves will not fully open or close because of obstructions that can be easily removed, or have minor corrosion damage that requires maintenance.	
		U	Gates/ valves are missing, have been damaged, or have deteriorated to the point that they need to be replaced.	
		N/A	There are no flap gates.	
10. Riprap Revetments & Banks	NA	A	No riprap displacement or stone degradation that could pose an immediate threat to the integrity of channel bank. Riprap intact with no woody vegetation present.	
		M	Minor riprap displacement or stone degradation that could pose an immediate threat to the integrity of the channel bank. Unwanted vegetation must be cleared or sprayed with an appropriate herbicide.	
		U	Significant riprap displacement, exposure of bedding, or stone degradation observed. Scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling. Rock protection is hidden by dense brush, trees, or grasses.	
		N/A	There is no riprap protecting this feature of the segment / system, or riprap is discussed in another section.	
11. Revetments other than Riprap	NA	A	Existing revetment protection is properly maintained, undamaged, and clearly visible.	
		M	Minor revetment displacement or deterioration that does not pose an immediate threat to the integrity of the levee. Unwanted vegetation must be cleared or sprayed with an appropriate herbicide.	
		U	Significant revetment displacement, deterioration, or exposure of bedding observed. Scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling. Revetment protection is hidden by dense brush and trees.	
		N/A	There are no such revetments protecting this feature of the segment / system.	

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¹ If weather and flow conditions allow, inspectors should walk in the channel and probe shoal areas in order to estimate extent of blockage of the cross-sectional area where shoaling is present.

² The sponsor should be monitoring any observed movement to verify whether the movement is active or inactive.

³ Inspectors must have as-built drawings available during the inspection so that the lateral distance to the heel and toe of the floodwalls can be determined in the field.

⁴ Proper operation of this item must be demonstrated during the inspection.

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Photo 5. Inspect ID: DEPO_2016_a_0008 **Title:** USACE_CENAP_DEPO_2016_a_0008_1.jpg **Rated Item:** 9. Flap Gates/ Flap Valves/ Pinch Valves. **Caption:** Drainage pipe exiting into the diversion channel.



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Photo 6: Looking upstream at the upstream tie-in to high ground of the Big Hollow Creek Levee.



Photo 7: Looking downstream from the upstream tie-in to high ground of the Big Hollow Creek Levee.



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Photo 8: Looking downstream along the Big Hollow Creek Levee.



Photo 9: Looking downstream along the sheetpile floodwall portion of the Big Hollow Creek Levee.



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Photo 10: Looking downstream along the Big Hollow Creek Levee.



Photo 11: Repaired scarp area on the Butler Brook Levee just upstream from the transition structure.



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Photo 12: Looking upstream along the Butler Brook Levee.



Photo 13: Drainage swale.



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Photo 14: Looking upstream along the Butler Brook Levee.



Photo 15: Looking downstream from the upstream tie-in to high ground of the Butler Brook Levee.



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Photo 16: Looking upstream through the transition structure.



Photo 17: Looking downstream along the diversion channel.



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Photo 18: Firewood stacked immediately against the diversion channel.



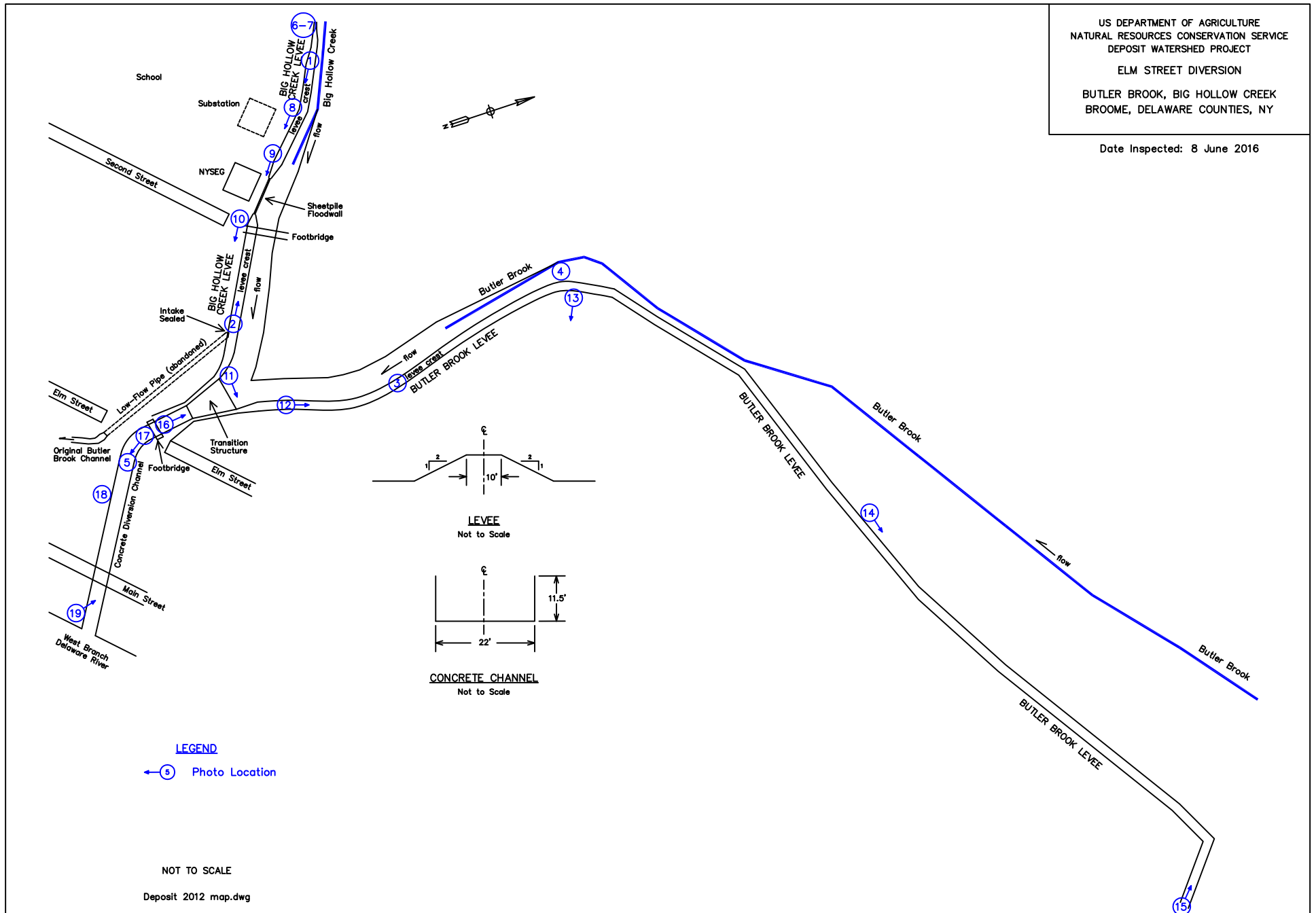
Photo 19: Looking upstream along the diversion channel.



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US DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
DEPOSIT WATERSHED PROJECT
ELM STREET DIVERSION
BUTLER BROOK, BIG HOLLOW CREEK
BROOME, DELAWARE COUNTIES, NY

Date Inspected: 8 June 2016



Enclosure 3: Subset of Inspection Items for Rehabilitation Program Eligibility Determination

In order to be eligible, all of the following items must be rated A, M, N/A or Yes.

Note: Item numbers listed below refer to their placement in the Inspection Checklist (Enclosure 2).

Rehabilitation Program Eligibility Determination	
Yes <input type="checkbox"/> No <input type="checkbox"/>	Public sponsor provided maintenance information per the Public Sponsor Pre-Inspection Form.
Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	Non-federal levee system meets Initial Eligibility criteria.
If either of the above items is marked "No" the levee system is not eligible.	
Rating	Rated Item
Levee Embankments	
A <input type="checkbox"/> M <input type="checkbox"/> U <input type="checkbox"/>	3. Encroachments
A <input type="checkbox"/> U <input type="checkbox"/> N/A <input type="checkbox"/>	4. Closure Structures (Stop Log, Earthen Closures, Gates, or Sandbag Closures)
A <input type="checkbox"/> M <input type="checkbox"/> U <input type="checkbox"/>	5. Slope Stability
A <input type="checkbox"/> M <input type="checkbox"/> U <input type="checkbox"/>	6. Erosion/ Bank Caving
A <input type="checkbox"/> M <input type="checkbox"/> U <input type="checkbox"/>	10. Animal Control
A <input type="checkbox"/> M <input type="checkbox"/> U <input type="checkbox"/> N/A <input type="checkbox"/>	11. Culverts/Discharge Pipes (This item includes both concrete and corrugated metal pipes.)
A <input type="checkbox"/> M <input type="checkbox"/> U <input type="checkbox"/> N/A <input type="checkbox"/>	14. Underseepage Relief Wells/Toe Drainage Systems
Floodwalls	
A <input type="checkbox"/> M <input type="checkbox"/> U <input type="checkbox"/>	2. Encroachments
A <input type="checkbox"/> U <input type="checkbox"/> N/A <input type="checkbox"/>	3. Closure Structures (Stop Log Closures and Gates)
A <input type="checkbox"/> M <input type="checkbox"/> U <input type="checkbox"/>	5. Tilting, Sliding, or Settlement of Concrete Structures

A <input type="checkbox"/>	M <input type="checkbox"/>	U <input type="checkbox"/>	6. Foundation of Concrete Structures
A <input type="checkbox"/>	M <input type="checkbox"/>	U <input type="checkbox"/>	8. Underseepage Relief Wells/Toe Drainage Systems
N/A <input type="checkbox"/>			
Interior Drainage System			
A <input type="checkbox"/>	M <input type="checkbox"/>	U <input type="checkbox"/>	9. Culverts/Discharge Pipes
N/A <input type="checkbox"/>			
A <input type="checkbox"/>	M <input type="checkbox"/>	U <input type="checkbox"/>	10. Sluice/Slide Gates
N/A <input type="checkbox"/>			
A <input type="checkbox"/>	M <input type="checkbox"/>	U <input type="checkbox"/>	11. Flap Gates/Flap Valves/Pinch Valves
N/A <input type="checkbox"/>			
Pump Stations			
A <input type="checkbox"/>	M <input type="checkbox"/>	U <input type="checkbox"/>	17. Intake and Discharge Pipelines
A <input type="checkbox"/>	M <input type="checkbox"/>	U <input type="checkbox"/>	18. Sluice/Slide Gates
N/A <input type="checkbox"/>			
A <input type="checkbox"/>	M <input type="checkbox"/>	U <input type="checkbox"/>	19. Flap Gates/Flap Valves/Pinch Valves
N/A <input type="checkbox"/>			
Rehabilitation Program Status			
Active	<input type="checkbox"/>	System meets all interim eligibility criteria, including having received a rating of A, M, N/A or Yes for all subset items and is therefore eligible for rehabilitation assistance.	
Inactive	<input type="checkbox"/>	System does not meet interim eligibility requirements.	
Comments:			