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Engineer's Report

Vanman Levee Repairs – DeSoto NWR

Drainage District No. 30

Pottawattamie County, Iowa

2020

Submitted by:

Bolton & Menk, Inc.

300 W McKinley St

Jefferson, IA 50129

P: 515-386-4101

Certification

Engineer's Report

For

Vanman Levee Repairs – DeSoto NWR

Drainage District No. 30
Pottawattamie County, Iowa
A16.120834

2020

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Iowa.



By: *Jonathan P. Rosengren*
Jonathan P. Rosengren, P.E.
License No. 21661

Date: *May 20, 2020*

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I. Introduction

A. Scope of Work

In March 2020, the trustees of the Vanman Levee district appointed Bolton & Menk, Inc. to investigate necessary repairs to the levee lying inside of the DeSoto National Wildlife Refuge, damaged in the 2011 Missouri River Flood. This report addresses the work necessary to the repair the levee breaches and restore the historic levee height of the facilities within the boundary of the DeSoto NWR.

B. Location

The area protected by the Vanman Drainage District No. 30 Levee encompasses approximately 7,500 acres within Sections 1, 2, 3, 10, 11, 12, 13 and 14 and Sections 5-8, 17 and 18 of Rockford Township (T-77-N, R-44-W) in Pottawattamie County and Sections 35 and 36 of Cincinnati Township (T-78-N, R-45-W) and Section 31 of St Johns Township (T-78-N, R-44-W) in Harrison County.

The proposed repairs are limited to that portion of the levee in Sections 2 and 3 of Rockford Township (T-77-N, R-45-W) in Pottawattamie County.

C. History

April 1943 – Missouri River flood. Crest elevation 11 feet below 1952 record, making it the 9th highest mark on record.

Spring 1943 – Petition

Sept 22, 1943 – Engineer’s Report filed. Recommends construction of levee 3 feet above 1943 high water mark.

Nov 3, 1943 – District Established.

Nov 13, 1943 – Right-of-Way Acquired, 170’ from centerline on the riverside and 30’ from centerline on the landside.

Nov 19, 1943 – Bid letting

Nov 15, 1944 – Hearing on Commissioners Report, continued to Nov 27, 1944

Sept 18, 1946 – Supplemental Engineer’s report recommending realignment of the levee in Section 18 due to unstable soils.

Oct 1, 1946 – Right-of-Way and assessments in Section 18 adjusted in accordance with the change in levee alignment.

Nov 4, 1946 – Petition to repair damage to levee in the north half of Section 11 of Rockford TWP.

Nov 22, 1946 – Engineer’s Report for repairs to Section 11 Levee. Levee damaged by ice dam in river pushing the river through the “Chute” near the current Wilson Island State Park. Recommended construction of a secondary levee approximately 300 feet east of the original levee.

May 9, 1949 – Petition by Peterson Brothers for emergency repairs to levee (Section 3 Rockford)

May 28, 1952 – Requests made to US Army Corps and US Soil Conservation Service to repair levees damaged by 1952 flood. Repairs made by USACE.

Dec 3, 1954 – Additional 2.6 ac Right-of-Way purchased by agreement to hold newly set back levee at junction with Allen Creek.

May 16, 1957 – Petition to elect private trustees for the Vanman District.

Our investigation of the Vanman district minutes is limited to the last time significant work was done on the levee within DeSoto NWR. The Fish & Wildlife Service purchased the lands constituting the refuge in the late 1950's. Since that time, few repairs have been made on this reach of the levee to our knowledge.

II. Investigation

Full survey of the levee north of DeSoto Ave was completed in the March of 2020. Additional bathymetric survey of the two scour holes and a tree count of the existing right-of-way were also completed at this time. Using the survey and profiles, several cross sections were made. A tree count within the existing district right-of-way was also conducted.

Research was also completed to determine the historic grade of the levee. No hard datum ties were initially found; however, we were provided several documents from several sources to establish a reasonably accurate datum tie. This datum equation has been used to re-establish the original design grade of the levee as shown on the attached plans. Our report describing how this datum tie was established is on file in the Pottawattamie County Auditor's office.

The investigation found three breaches in the levee north of DeSoto Ave caused by the 2011 flood. The largest of the three breaches is the south site which was found to be scoured approximately 35 feet below the natural ground surface. The middle site also includes a large scour hole approximately 30 feet below natural ground. The final north breach extends to ground surface and is significantly smaller than the other two.

In addition to the three breach locations, the entire length of levee north of DeSoto Ave approximately 1 and 2 feet below grade below the original design grade. At the junction of the Vanman Levee with the Coulthard Levee to the north, the levee is approximately 3 feet below the design elevation of the Vanman Levee. The current junction of the two levees is shown on the attached plans; and was relocated to the point by the Coulthard District following the 1952 Flood Reconstruction. As of the writing of this report, we do not have a solid elevation tie to the Coulthard Levee as it relates to the Vanman Levee.

A. Utilities

We are currently unaware of any interfering utilities. Overhead power lines and other utility lines may parallel or cross the levee at various locations; extra care will need to be taken when working under or near these utility lines. The contractor will be responsible to determine and notify utility companies and to cooperate in locating, marking and protecting their facilities

B. District Right-of-Way

The Vanman Levee acquired an easement 200 feet wide on the entire length of the facility in 1943, 30 feet on the landside and 170 feet on the riverside, measured from the centerline of the levee. Review of the site and subsequent survey clearly indicate that most, if not all, fill material for the levee was acquired from the riverside right-of-way. The landside right-of-way is narrow and only just contains the toe of the levee as constructed and additional right-of-way on the landside would be beneficial for the repair and maintenance of the levee.

Following the 1952 Flood, the Coulthard Levee District acquired a very large easement overtop of the Vanman Levee in what is now the DeSoto NWR. The interaction of these two levees and their easements are shown on maps contained in Appendix A of this report.

III. Regulatory Compliance

The repair of the levees recommended in this report will require review by several regulatory

agencies to ensure compliance with Federal, State and local ordinances.

A. Federal Regulations

1. USACE Section 404 Permit

A Joint Application has been filed with the Iowa DNR and the Rock Island District of the USACE for review of impacts to waters of the US. Based on similar projects in Honey Creek and Pigeon Creek, it is likely a Nation Wide Permit No. 3 will be authorized.

2. USACE Section 408 Permit

The Vanman Levees are privately constructed and maintained. They have also never been certified by the USACE and are therefore are not likely to be regulated by the Corps so long as floodplain regulations are followed.

3. USFWS

The USFWS has regulatory authority regarding protection of endangered species which could be impacted by the proposed work. We have been told by USFWS in conversation that an environmental assessment would need to be completed for the work within the DeSoto NWR. Based on experience on other projects, there will likely be little permanent impact from the project.

The exception to this would be tree clearing within the district right-of-way. Specific rules for tree clearing are intended to protect the Northern Long-Eared Bat during the mating season. The worst case scenario based on review of the NLEB 4(d) Rule is no tree clearing may occur during the period of June 1 through July 31. This exclusion period only applies if a roost tree or hibernaculum are located in the project area. At this time, neither is known in this area.

B. State Regulations

1. IDNR Section 401 Permit

The Joint Application has been filed as stated above. The NWP authorized by the USACE will also include the necessary state 401 permit.

2. IDNR Floodplain Permit

The Iowa DNR Floodplain Section provides technical support to the county floodplain section and would assist the county staff in maintaining NFIP benefits.

C. Local Regulations

1. County Floodplain Permit

Pottawattamie County is a participant in the National Flood Insurance Program (NFIP) and must ensure that no rise occurs in the county inside of what is termed the "Floodway". If the county were to allow a project to raise the regulated flood elevation, the county as a whole would be excluded from the NFIP, meaning no property owner in the county could obtain flood insurance.

The floodway is shown on the attached plans. The floodway represents the boundary to which fill can be placed, while limiting the increase in 100 year flood elevation to less than 1 foot. This increase in elevation is accounted for in the determination of the floodway boundary. No work may raise the 100 year flood elevation inside of this boundary. Outside of this boundary, fill may be placed with fewer restrictions.

The top of the Vanman Levee within DeSoto NWR is currently above the 100 year flood elevation. All work proposed on the levee is either the repair of breaches which to pre-disaster height, or adding fill to areas which are not submerged during the

regulated flood. Both activities will have no effect on the 100 year flood elevation and should be easily permitted by both the State and Local Regulators.

IV. Proposed Repair

The investigation has confirmed the need for levee repairs within the district. To restore the original protection, it is necessary to remove the trees which have grown on the structure, fill the three breach/scour hole sites and raise the settled levee top to the original design height within DeSoto NWR.

It is recommended that the right-of-way also be cleared of trees to allow access to borrow material within the levee easement. Up to half of the necessary fill material could be acquired from the existing right-of-way. Additional material will need to be imported from off-site to allow the complete repair of the levee.

Due to the depth of the two scour holes, we recommend that ring levees be constructed to avoid filling of the deepest portion of the holes. This will reduce the estimated fill volume by 40%, allowing the savings to be invested in other necessary repairs in other parts of the district.

A. Outside Funding Sources

The 2019 flood and subsequent Federal Disaster Declaration led to many districts along the Missouri River to receive FEMA cost share for repair of the 2019 damages. Vanman Levee District was one of many districts to receive those funds. In addition, Pottawattamie County pursued the State of Iowa for additional State assistance for those repairs.

1. FEMA Cost Share

The largest costs for repair of this reach of the levee is the restoration of the three breaches described previously in this report. These breaches were the result of the 2011 flood. The district attempted to secure FEMA cost share to restore the damage following that disaster. For various reasons, that funding was not authorized, and the breaches have remained unrepaired since that time.

Because Vanman applied for and received FEMA funding for repairs on other reaches of the levee, FEMA has been able to review the denied funding from 2011. As a result of this review, FEMA has authorized the district to apply for funding as part of the 2019 Disaster Declaration. No certain answer has been received at this time regarding the status of FEMA cost share.

If the funding is authorized, the federal government will cover 75% of the eligible repair costs with Iowa Homeland Security covering 10%. The remaining 15% would typically be the responsibility of the landowners in the district.

2. Iowa Flood Recovery Fund

In February 2020, the Iowa Flood Mitigation Board authorized state funds to many districts in Pottawattamie County to cover the 15% share of the disaster recovery costs. Because of the uncertainty regarding FEMA cost share for the Vanman Levee in DeSoto NWR, the State has offered approximately \$3 million to the district to cover the full cost of repairs.

If FEMA funding is not provided, the full cost of the repair would be covered by the State FRF monies. It is our understanding that any state funds not expended on the repair of the DeSoto levee may be used to make additional repairs to the remaining facilities within the district.

B. Right-of-Way Needs

The current right-of-way is 200 feet wide, with 30 feet on the landside and 170 feet on the

riverside. As stated in the investigation section, the landside right-of-way is too narrow to allow proper maintenance of the levee. We recommend additional right-of-way be acquired on the landside in this reach of levee and the un-needed portions on the riverside be returned to the care of the USFWS as part of DeSoto NWR. The final width proposed will remain 200 feet, with 60 feet on the landside and 140 feet on the riverside, with some additional right-of-way within which to maintain the proposed ring levee repairs.

The table below tabulates the recommended modifications to the district right-of-way. All parcels are owned by the US Government under the jurisdiction of USFWS.

Right-of-Way Tabulation – DeSoto NWR Only						
Parcel No.	Legal Desc	S-T-R	Existing ROW	ROW Acquired	Un-Needed ROW	Proposed ROW
774502100001	NW ¼ exc S1235.5' E891'	2-77-45	6.43	0.70	2.66	4.47
774503200001	NE NE G/L 1 Accretion	3-77-45	5.53	0.70	0.93	5.30
774503200002	SE NE G/L 2 Accr E LTS 10 & 11	3-77-45	7.52	1.13	1.12	7.53
774503400001	SUBD of G/L 5 Accretion	3-77-45	6.50	1.76	0.97	7.29
774503400004	SUBD of G/L 8 Accretion	3-77-45	6.72	2.16	1.00	7.88
Totals			32.70	6.45	6.68	32.47

Drainage district rights-of-way are exempt from real estate taxes and drainage assessments. Under Iowa law, landowners have the right to the beneficial use of the right-of-way subject only to the district's use of the right-of-way to protect and maintain district facilities.

If right-of-way is to be acquired, an appraisal commission, made up of two landowners from the county and the engineer, are appointed to recommend fair payment. The right-of-way appraisers' report is considered at a public hearing prior to adoption.

1. Work Area

Landowners are entitled to compensation for damages outside the right-of-way. Within the permanent right-of-way, construction-related damages will not be compensated. Compensation for use of and damages within any temporary work area outside of the permanent right-of-way is normally determined at the project completion hearing.

C. Engineer's Opinion of Probable Cost

The estimated total cost of the proposed repairs is \$2,312,000, with all costs being covered by a combination of State and Federal monies. A detailed opinion of probable cost for the recommended work is included in Appendix C of this report. The opinion of cost assumes FEMA cost-share is affirmed. It should also be noted that state monies are available to cover the assessable project costs whether FEMA funding is available or not.

We have assumed that all fill material will be imported from the most distant borrow site currently considered. The quantity of fill shown represents 135% of the fill needed to account for settlement of the structure following construction.

We believe between 10,000 and 30,000 cubic yards of material is available within the existing

right-of-way within DeSoto NWR. We have been working with the district trustees to locate additional local borrow locations. Any savings realized by the district on this project allows additional state funds to be transferred to the necessary repairs of the remaining 6 miles of the Vanman Levee.

V. Assessment Schedule Review

A. Benefited Lands Not Now Assessed

There are approximately 7,500 acres within the Vanman Drainage District No. 30 protective zone, including 1,370 acres that have never been assessed for benefits from the levee. This area is shown on the Benefitted Lands Map in Appendix B of this report. The lands lie north of the county line and were likely excluded to expedite the original establishment of the district. The protection of these lands is provided in combination with the Coulthard Levee to the north. Further review of flood flowpaths would be needed before annexation is completed.

Annexation is expected to cost approximately \$5,000. It would be cost effective to do this annexation as part of one of the two anticipated projects. Most landowners now in the district would likely support the annexation; those being annexed would likely be opposed. It should be emphasized to the owners of the annexed lands that assessments are based upon relative benefits and that if this benefit is small, the assessment will also be relatively small.

B. Existing Assessment Schedule Review

Vanman Drainage District has not been reclassified since its' establishment in 1943. Appendix B contains a map showing the existing benefited units assessed per acre in the currently assessed area of DD 30. Review of the schedule shows a reasonably equitable assessment distribution.

We have included a contour on the map representing elevation 996. It appears that lands lower than this elevation tend to receive higher assessments, and those above lower assessments. We recommend that any added lands be classified into the existing schedule rather than full reclassification of the district.

The process for classification of additional lands involves the engineer and two dis-interested landowners be appointed as commissioners. These commissioners will classify the newly annexed lands by comparison with similar lands currently in the district. The report of commissioners would then be reviewed and approved by the trustees after a hearing with the landowners.

VI. Discussions & Recommendations

The Vanman Drainage District No. 30 Levee is in need of repairs to restore the protection originally established by the district. The work described herein can accomplish that repair.

Repair Recommended. The repairs proposed within DeSoto NWR will restore three breaches created in 2011 and return the remaining levee in this reach to the original established grade. The awarded State cost share and potential for FEMA cost share means no assessment against the lands in the district is anticipated for this project. We find that the proposed repairs will be practicable, feasible, and beneficial to the public.

Annexation Recommended. Approximately 18% of the lands now served by Drainage District No. 30 (1,370 acres) appear to benefit from the Vanman Levee but have not been assessed for maintenance costs of the facility. For these lands to now be assessed to help pay for future maintenance, it is necessary to bring them into the Vanman Drainage District No. 30 Levee benefited area.

Classification Recommended. The existing assessment schedule appears generally equitable and can be used as a basis for classification of newly annexed lands into the district.

It is recommended that the trustees for Vanman Drainage District No. 30 take appropriate action, with legal guidance, to accomplish the following:

- Tentatively approve this engineer's report.
- Conduct a public hearing on the proposed repairs.
- Adopt the proposed repair plan, modified as deemed appropriate to satisfy the needs of the district.
- Direct the engineer to prepare the necessary plans and specifications and to proceed toward a bid letting.
- Initiate annexation procedures to bring benefited lands into the district.
- Initiate classification procedures for the newly annexed lands.

Respectfully submitted,

Bolton & Menk, Inc.



Jonathan P. Rosengren, P.E

Appendix A: DeSoto NWR Easements



Information

Easement area will be shifted 30 feet east from existing.

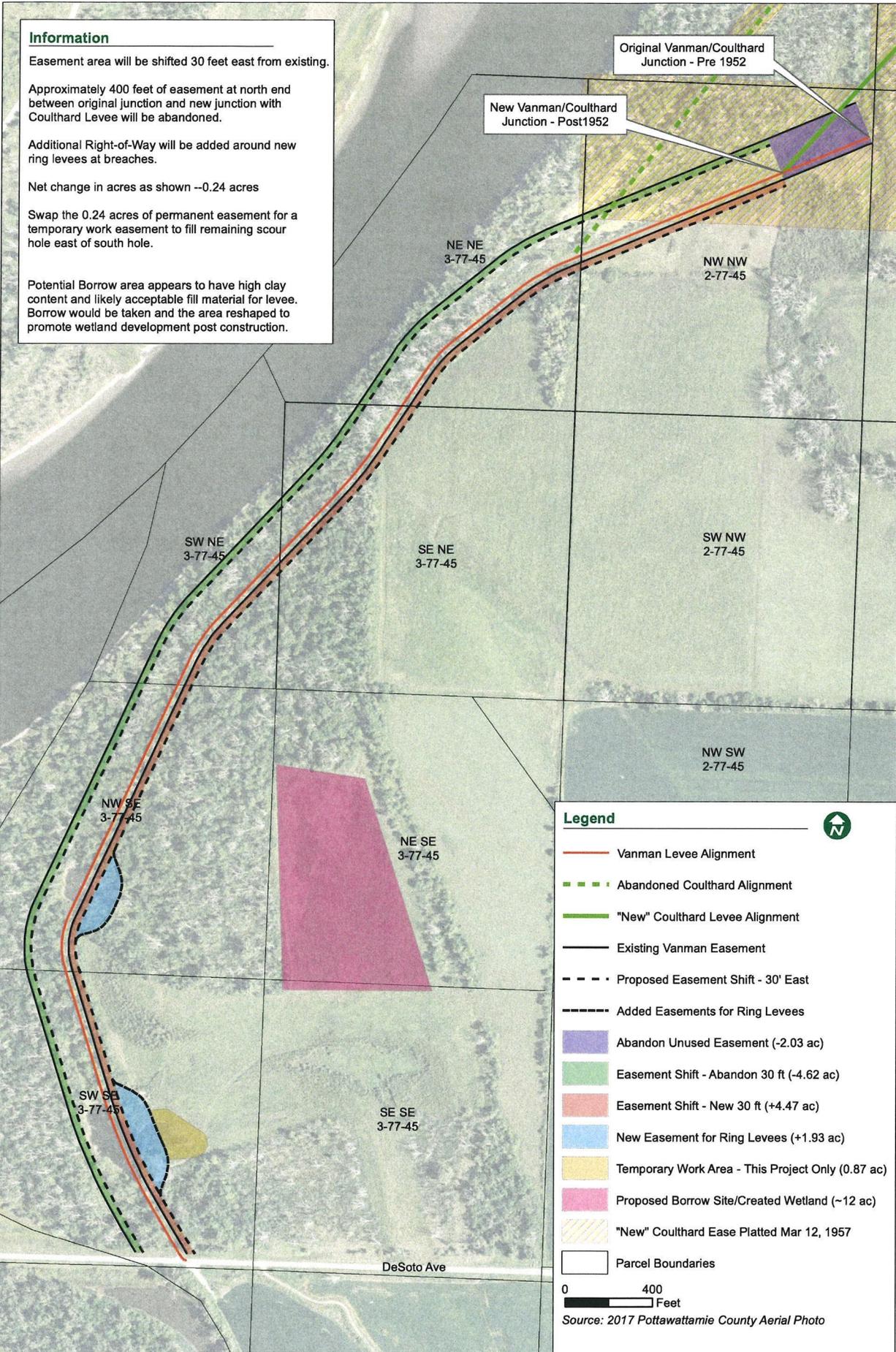
Approximately 400 feet of easement at north end between original junction and new junction with Coulthard Levee will be abandoned.

Additional Right-of-Way will be added around new ring levees at breaches.

Net change in acres as shown --0.24 acres

Swap the 0.24 acres of permanent easement for a temporary work easement to fill remaining scour hole east of south hole.

Potential Borrow area appears to have high clay content and likely acceptable fill material for levee. Borrow would be taken and the area reshaped to promote wetland development post construction.



Legend

- Vanman Levee Alignment
- Abandoned Coulthard Alignment
- "New" Coulthard Levee Alignment
- Existing Vanman Easement
- Proposed Easement Shift - 30' East
- Added Easements for Ring Levees
- Abandon Unused Easement (-2.03 ac)
- Easement Shift - Abandon 30 ft (-4.62 ac)
- Easement Shift - New 30 ft (+4.47 ac)
- New Easement for Ring Levees (+1.93 ac)
- Temporary Work Area - This Project Only (0.87 ac)
- Proposed Borrow Site/Created Wetland (~12 ac)
- "New" Coulthard Ease Platted Mar 12, 1957
- Parcel Boundaries

0 400 Feet

Source: 2017 Pottawattamie County Aerial Photo

Map Document: H:\POTTAWATTAMIE CO IMA18\20834\GIS\Easement Shift.mxd | Date Saved: 4/10/2020 8:48:01 AM

Information

Coulthard Levee was constructed first, extending ~200 feet south of the county line to tie into a high ridge.

Easement width 79 feet west of qtr-qtr and 20 feet east of qtr-qtr, assumed per 1952 easement plat.

Legend



- Qtr-Qtr Line
- County Line
- Coulthard Levee Alignment c. Late 1930's
- Generally High Ground
- Original Coulthard Levee Easement

0 400 Feet



Source: 8-1-1938 Pottawattamie Aerial Photo

NW SW
35-78-45

NE SW
35-78-45

SW SW
35-78-45

SE SW
35-78-45

HARRISON COUNTY
POTTAWATTAMIE COUNTY

NW NW
2-77-45

NE NW
2-77-45

Information

Vanman Levee connected to south end of Coulthard Levee near the county per engineer's report.

Original Coulthard Levee damaged in 1943 flooding, levee abandoned and shifted west to connect to Vanman Levee 912 feet south of county line in 1946. Easement defined by plat 1665, Book 929 page 427

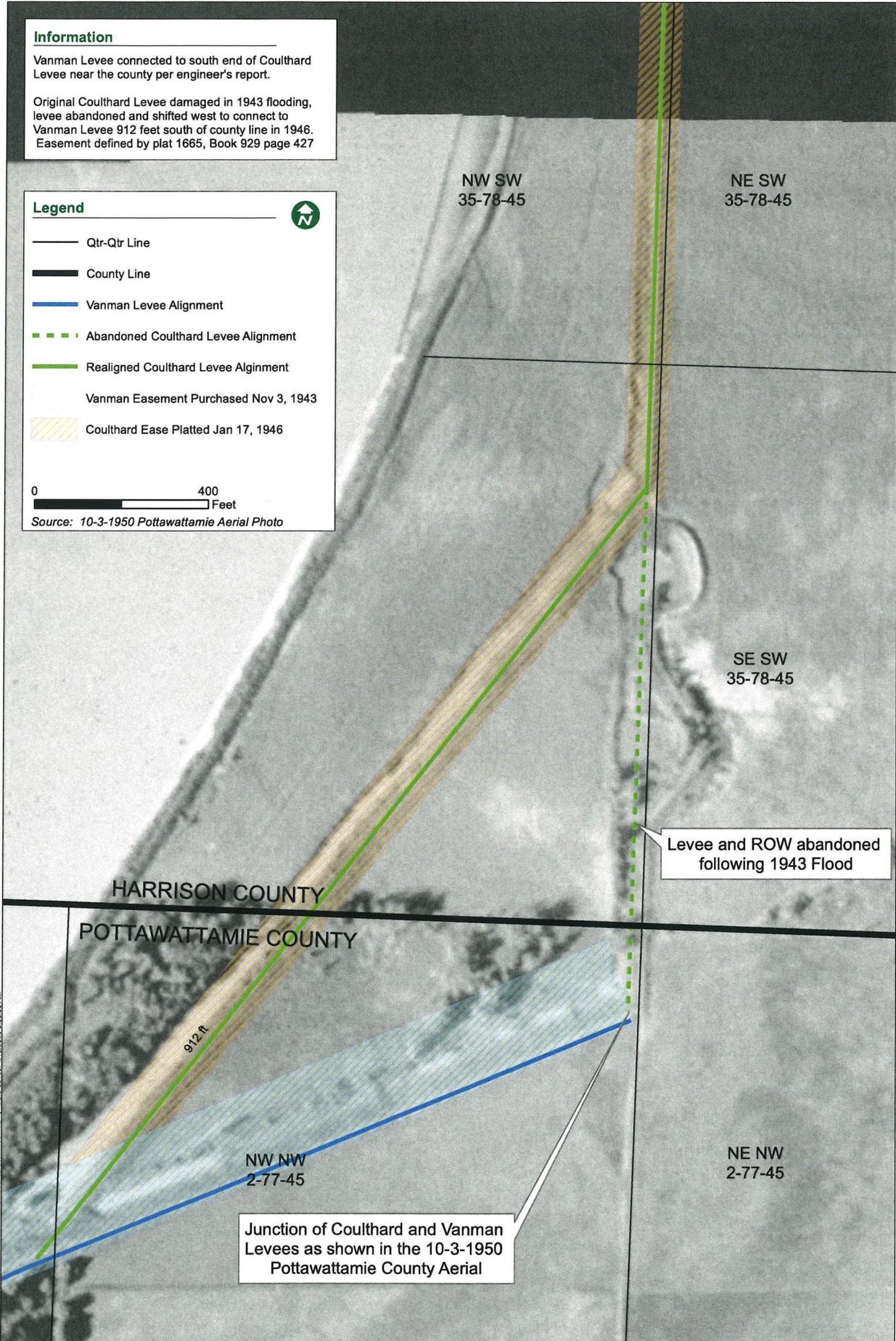
Legend

-  Qtr-Qtr Line
-  County Line
-  Vanman Levee Alignment
-  Abandoned Coulthard Levee Alignment
-  Realigned Coulthard Levee Alginment
-  Vanman Easement Purchased Nov 3, 1943
-  Coulthard Ease Platted Jan 17, 1946

0 400 Feet

Source: 10-3-1950 Pottawattamie Aerial Photo

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Levee and ROW abandoned following 1943 Flood

Junction of Coulthard and Vanman Levees as shown in the 10-3-1950 Pottawattamie County Aerial

HARRISON COUNTY
 POTTAWATTAMIE COUNTY

NW SW
 35-78-45

NE SW
 35-78-45

SE SW
 35-78-45

NW NW
 2-77-45

NE NW
 2-77-45

912 ft



Information

Junction of Vanman and Coulthard Levees destroyed during 1952 flood. Coulthard district purchased ROW for USAC to construct relocated levee. Connection point moved approximately 400 feet west. Easement purchased over the entire area.

Legend

- Qtr-Qtr Line
- County Line
- Vanman Levee Alignment
- Abandoned Coulthard Alignment
- New Coulthard Levee
- Vanman Easement Purchased Nov 3, 1943
- "New" Coulthard Ease Platted Mar 12, 1957

0 400 Feet

Source: 9-7-1954 Harrison Aerial Photo

Levees abandoned following 1952 Flood, Material taken to construct new Coulthard Levee

NW SW 35-78-45

NE SW 35-78-45

SW SW 35-78-45

SE SW 35-78-45

HARRISON COUNTY

POTTAWATTAMIE COUNTY

Junction of New Coulthard and Vanman Levees

940 ft

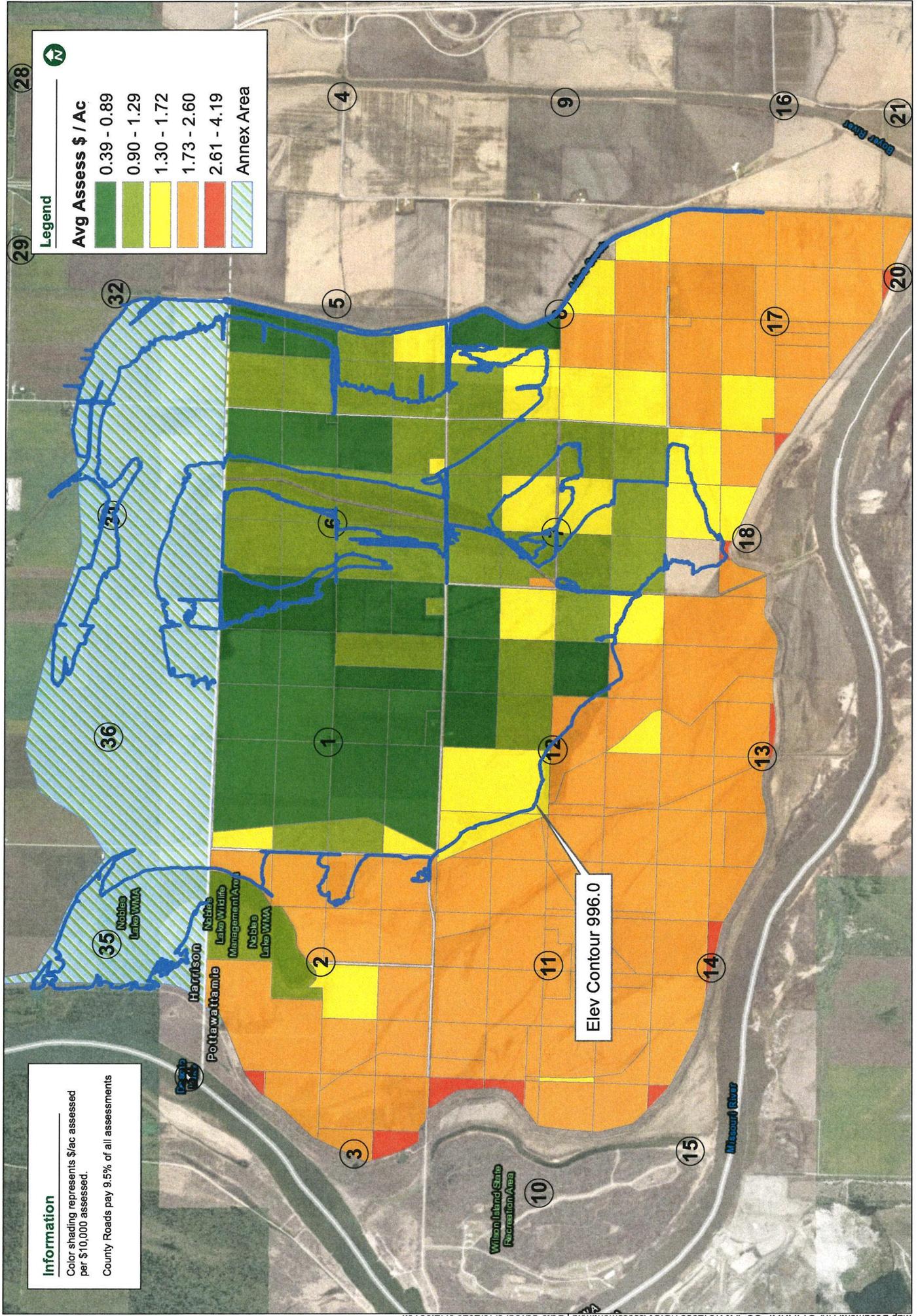
360 ft

NW NW 2-77-45

NE NW 2-77-45

Junction of Coulthard and Vanman Levees as shown in the 10-3-1950 Pottawattamie County Aerial

Appendix B: Existing Assessment Schedule



Information
 Color shading represents \$/ac assessed per \$10,000 assessed.
 County Roads pay 9.5% of all assessments

Elev Contour 996.0

Appendix C: Engineer's Opinion of Probable Costs

ENGINEER'S ESTIMATE

REPAIR AND RESTORE LEVEE ON EXISTING ALIGNMENT - RING REPAIR
 DESOTO BEND REACH OF MAIN LEVEE
 VANMAN LEVEE DISTRICT
 POTTAWATTAMIE COUNTY IOWA
 BMI PROJECT NO. A16.120834



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Date: 5/20/2020

Item No.	Item	Notes	Estimated Quantity	Unit	Unit Price	Total Amount
SECTION 1 - RECONSTRUCT ORIGINAL LEVEE - NOT FEMA ELIGIBLE						
101	LEVEE RECONSTRUCT		5,930	LF	\$5.00	\$29,650.00
102	IMPORTED BORROW (REPAIR)	(1) (2)	15,330	CY	\$19.00	\$291,270.00
103	LOCAL BORROW	(4) (5)	-	CY	\$5.00	
104	CLEARING & GRUBBING	(3)	35,127	UNITS	\$4.50	\$158,071.50
105	PERMANENT SEEDING		59	STA	\$300.00	\$17,700.00
106	MOBILIZATION		1	LS	\$25,000.00	\$25,000.00
SECTION 2: SOUTH HOLE - RING REPAIR - FEMA ELIGIBLE						
201	FILL SCOUR AND REBUILD RING LEVEE		1	LS	\$49,680.00	\$49,680.00
202	IMPORTED BORROW (REPAIR)	(1) (2)	24,840	CY	\$19.00	\$471,960.00
203	IMPORTED BORROW (FEMA MITIGATION)		5,743	CY		\$109,117.00
204	STEEL SHEETPILE WAVE BERM ANCHOR (FEMA MITIGATION)		5,190	SF	\$28.00	\$145,320.00
205	CLASS D RIPRAP WAVE PROTECTION (FEMA MITIGATION)		340	TN	\$50.00	\$17,000.00
206	LOCAL BORROW	(4) (5)	-	CY	\$5.00	
207	CLEARING & GRUBBING	(3)	2,592	UNITS	\$4.50	\$11,664.00
208	PERMANENT SEEDING		6	STA	\$300.00	\$1,800.00
209	ROLLED EROSION CONTROL PRODUCT, TYPE 2.C		5,500	SY	\$2.00	\$11,000.00
210	MOBILIZATION		1	LS	\$41,000.00	\$41,000.00
SECTION 3: NORTH HOLE - RING REPAIR - FEMA ELIGIBLE						
301	FILL SCOUR AND REBUILD RING LEVEE		1	LS	\$17,900.00	\$17,900.00
302	IMPORTED BORROW (REPAIR)	(1) (2)	8,950	CY	\$19.00	\$170,050.00
303	IMPORTED BORROW (FEMA MITIGATION)		2,626	CY		\$49,894.00
304	STEEL SHEETPILE WAVE BERM ANCHOR (FEMA MITIGATION)		3,590	SF	\$28.00	\$100,520.00
305	CLASS D RIPRAP WAVE PROTECTION (FEMA MITIGATION)		250	TN	\$50.00	\$12,500.00
306	LOCAL BORROW	(4) (5)	-	CY	\$5.00	
307	CLEARING & GRUBBING	(3)	4,313	UNITS	\$4.50	\$19,408.50
308	PERMANENT SEEDING		5	STA	\$300.00	\$1,500.00
309	ROLLED EROSION CONTROL PRODUCT, TYPE 2.C		2,250	SY	\$2.00	\$4,500.00
310	MOBILIZATION		1	LS	\$19,000.00	\$19,000.00
SECTION 4: SHALLOW BREACH REPAIR - FEMA ELIGIBLE						
401	FILL SCOUR AND REBUILD RING LEVEE		1	LS	\$9,242.00	\$9,242.00
402	IMPORTED BORROW (REPAIR)	(1) (2)	4,621	CY	\$19.00	\$87,799.00
403	LOCAL BORROW	(4) (5)	-	CY	\$5.00	
404	CLEARING & GRUBBING	(3)	4,313	UNITS	\$4.50	\$19,408.50
405	PERMANENT SEEDING		5	STA	\$300.00	\$1,500.00
406	ROLLED EROSION CONTROL PRODUCT, TYPE 2.C		2,250	SY	\$2.00	\$4,500.00
407	MOBILIZATION		1	LS	\$6,000.00	\$6,000.00
SECTION 5: EROSION CONTROL - FEMA ELIGIBLE						
501	SWPPP PREPARATION		1	LS	\$5,000.00	\$5,000.00
502	SWPPP MANAGEMENT		1	LS	\$5,000.00	\$5,000.00
503	SILT FENCE INSTALLATION & REMOVAL		2,000	LF	\$3.00	\$6,000.00
ESTIMATED CONSTRUCTION COSTS TOTAL:						\$1,920,000.00

NOTES:

- (1) Assumes borrow taken from Moran Property at Crescent
- (2) Transport Cost Only - Estimated between \$12.50-\$18.00 per CY YD
- (3) Shift Existing ROW 30' East (Approx. 20' outside existing levee toe and 70' outside existing borrow pit)
- (4) Approximately 30,000 CY available in existing ROW shifted 30' and dug 6' deep to match original borrow.

ENGINEER'S ESTIMATE

REPAIR AND RESTORE LEVEE ON EXISTING ALIGNMENT - RING REPAIR
 DESOTO BEND REACH OF MAIN LEVEE
 VANMAN LEVEE DISTRICT
 POTTAWATTAMIE COUNTY IOWA
 BMI PROJECT NO. A16.120834



Real People. Real Solutions.

Date: 5/20/2020

Item No.	Item	Notes	Estimated Quantity	Unit	Unit Price	Total Amount
Associated Project Costs						
	PURCHASE OF IMPORTED MATERIAL	(5)	62,110	CU YD	\$0.70	\$43,477.00
	DAMAGES					\$48,000.00
Engineering						
	SURVEY, STUDY & REPORT THOROUGH HEARINGS					\$50,000.00
	REGULATORY PERMITS & PERMISSIONS					\$30,000.00
	CONSTRUCTION PLANS, SPECIFICATIONS & BID LETTING					\$20,000.00
	CONSTRUCTION ENGINEERING SERVICES					\$80,000.00
	LEGAL SERVICES, PUBLICATIONS, MAILINGS, ETC.					\$10,000.00
	FINANCE & INTEREST					\$110,100.00
	ESTIMATED ASSOCIATED PROJECT COSTS TOTAL:					\$391,577.00
	ESTIMATED PROJECT COST :					\$2,311,577.00
	Preliminary Estimate - March 30, 2020:					\$1,694,553.00
	Project Cost Minus Mitigation (No Local Borrow):					\$1,855,508.45
	Project Cost Minus Mitigation (10,000 CY Local Borrow):					\$1,705,629.25
	Project Cost Minus Mitigation (30,000 CY Local Borrow):					\$1,409,270.85
	FEMA Eligible Costs (Repairs & Mitigation):					\$1,398,300.00
(6)	FEMA Eligible Costs (Assoc. Project Costs):					\$285,200.00
	Total FEMA Eligible Project Costs:					\$1,683,500.00
	FEMA Cost Share (75%)					\$1,262,625.00
	Iowa HSEMA Cost Share (10%)					\$168,350.00
(7)	PROJECT COSTS ASSESSABLE TO LANDOWNERS					\$880,602.00

NOTES:

- (5) Frank Moran has offered to sell dirt from his pasture at \$0.70 per cubic yard
- (6) FEMA cost share is not yet confirmed
- (7) The State of Iowa has awarded approx. \$3M through the Flood Mitigation Board to pay the cost of the repair. If FEMA funding is not awarded, the state dollars are sufficient to cover the full cost of repair. At this time, we understand that any unspent funds can be transferred to repairs on the remaining portions of the district facilities.

Proposed Plans

PRELIMINARY PLANS FOR DRAINAGE DISTRICT NO. 30 VANMAN LEVEE REPAIRS - DESOTO NWR POTTAWATTAMIE COUNTY, IOWA 2020

PROJECT
LOCATION



THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

POTTAWATTAMIE
COUNTY



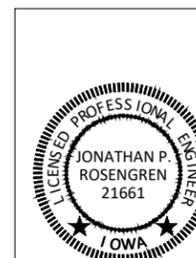
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SHEET NUMBER	SHEET TITLE
A.01	TITLE SHEET
A.02	LOCATION PLAN
A.03	LOCATION PLAN & BENCHMARKS
D.01 - D.03	PLAN & PROFILE - VANMAN LEVEE BASE REPAIR
D.04	PLAN & PROFILE - VANMAN LEVEE RING REPAIR
J.01	WORK AREA PLAN
X.01 - X.08	CROSS SECTION - VANMAN LEVEE & RING LEVEES

GOVERNING SPECIFICATIONS

THE 2018 EDITION OF THE "IOWA STATEWIDE URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS" SHALL GOVERN.

IOWA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION", SERIES 2018 AND ALL CURRENT GENERAL SUPPLEMENTAL SPECIFICATIONS AND MATERIALS INSTRUCTIONAL MEMORANDUM SHALL GOVERN AS REFERENCED.

ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND ORDINANCES WILL BE COMPLIED WITH IN THE CONSTRUCTION OF THIS PROJECT.



I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

JONATHAN P. ROSENGREN, P.E.

REG. NO. 21661 DATE: _____

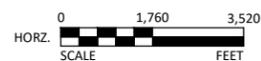
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ALL PLAN SHEETS

DATUM EQUATION
1946 DATUM + 1.52 = NAVD 88

PROJECT DATUM: STATE PLANE
HORIZONTAL: IOWA SOUTH
VERTICAL: NAD 1988



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JPR	CLH	JPR	

DD No. 30 VANMAN LEVEE REPAIRS - DESOTO NWR
POTTAWATTAMIE COUNTY, IOWA

TITLE SHEET

SHEET
A.01

LEGEND

- PARCEL LINES
- VANMAN LEVEE BASE REPAIR
- VANMAN LEVEE RING REPAIR
- BENEFITED AREA
- ASSESSMENT BOUNDARY
- DESOTO BEND BOUNDARY
- NOBLES LAKE WMA BOUNDARY
- FLOODWAY BOUNDARY
- ANNEXATION AREA

BENCH MARKS

No.	Description	Northing	Easting	Elevation
1	MAG-NAIL	553335.51	957004.99	998.91
2	REBAR	553393.79	955398.62	1004.32
10	REBAR	557027.87	956286.65	1000.46
10001	U137	558793.4886	958581.0746	996.38
10002	V137	555719.1771	959863.2776	998.88
10003	N136	565361.9865	941571.8002	1000.38
10004	126/2	563881.7246	962653.3708	1002.82



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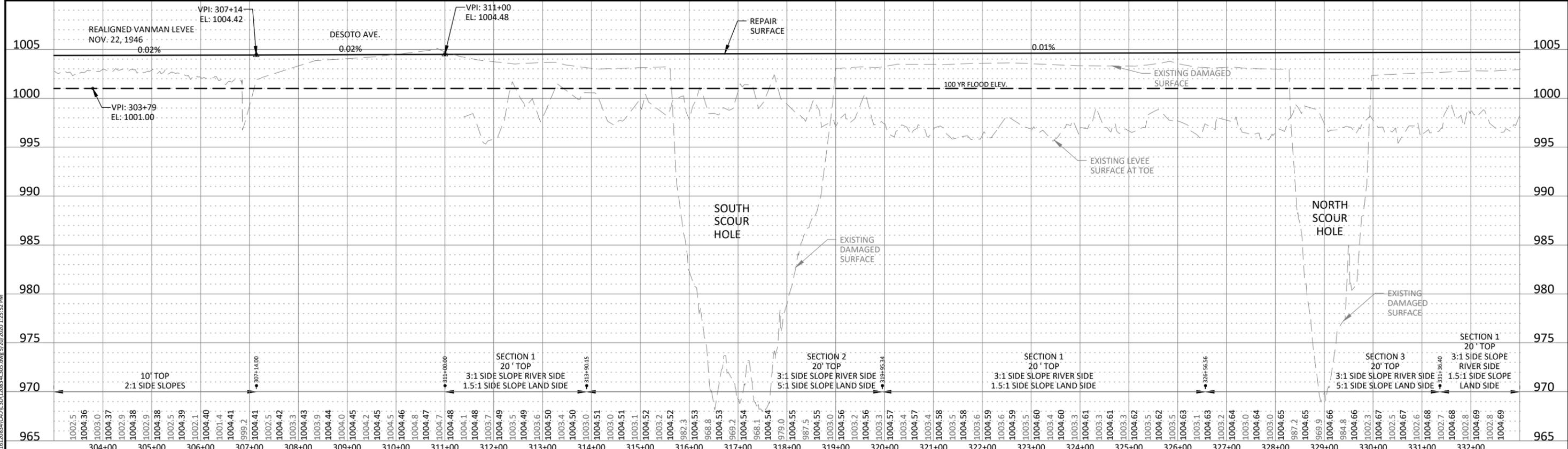


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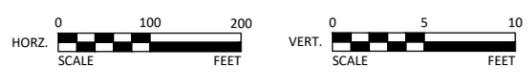
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 POTTAWATTAMIE COUNTY, IOWA
 LOCATION PLAN & BENCHMARKS

SHEET
A.03



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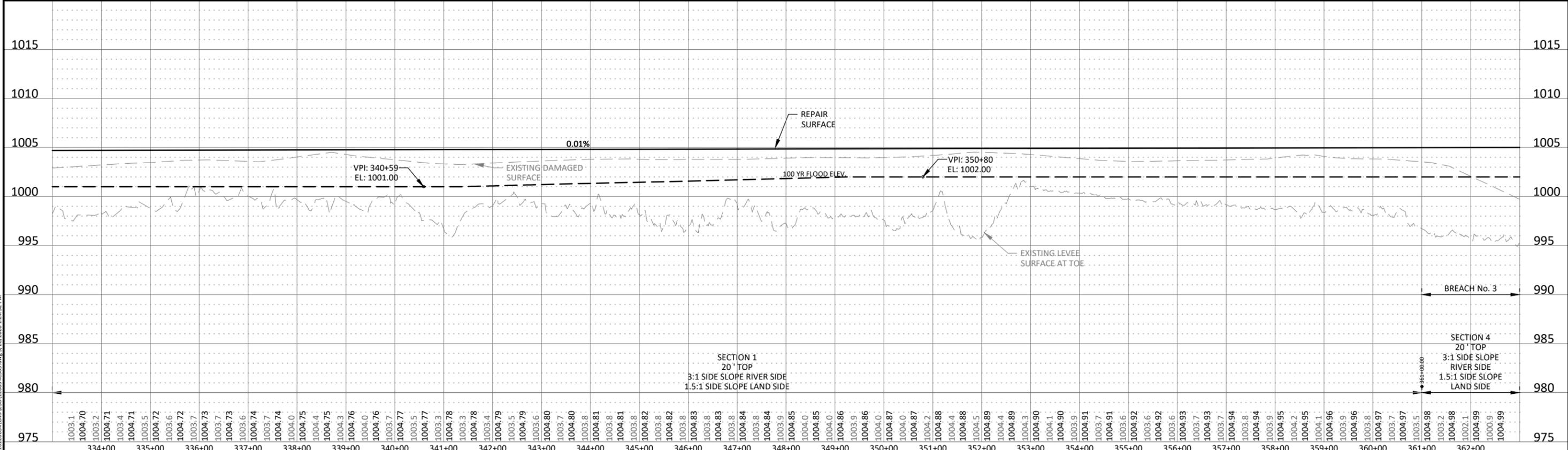


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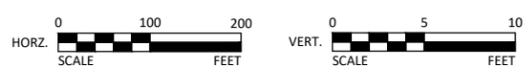
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POTTAWATTAMIE COUNTY, IOWA
PLAN & PROFILE - VANMAN LEVEE BASE REPAIR
STA. 311+00 --> 333+00

SHEET
D.01



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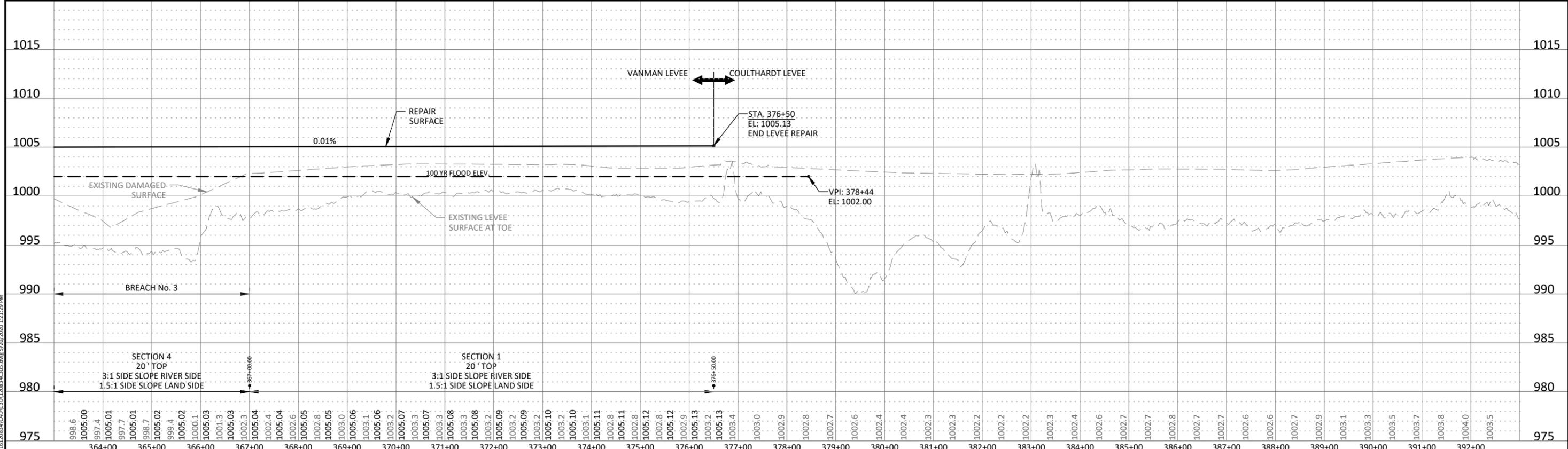
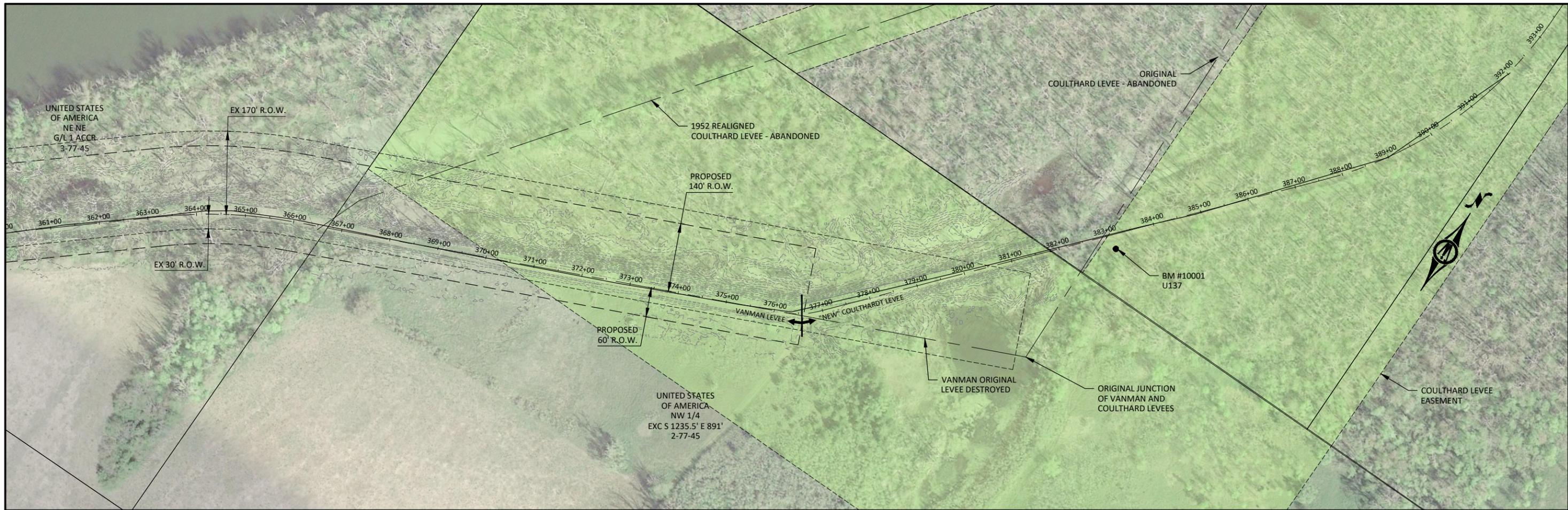


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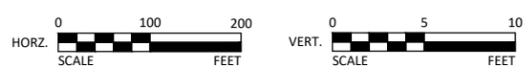
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POTTAWATTAMIE COUNTY, IOWA
PLAN & PROFILE - VANMAN LEVEE BASE REPAIR
STA. 333+00 --> 363+00

SHEET
D.02



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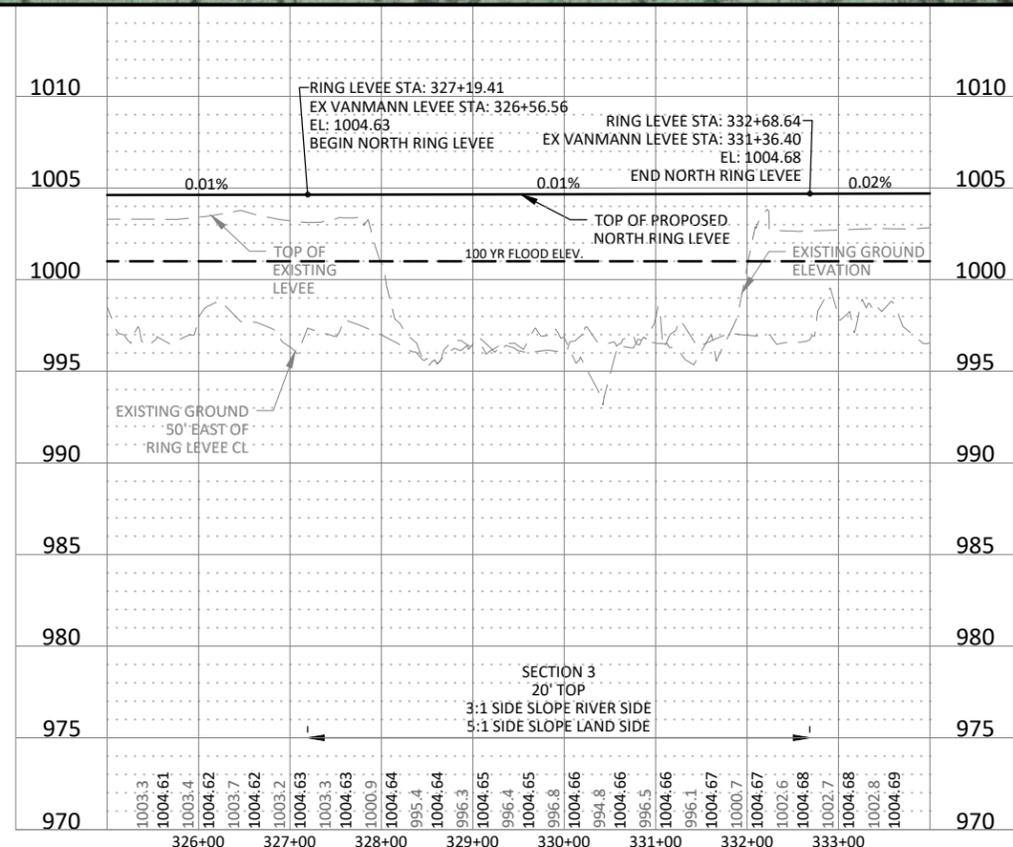
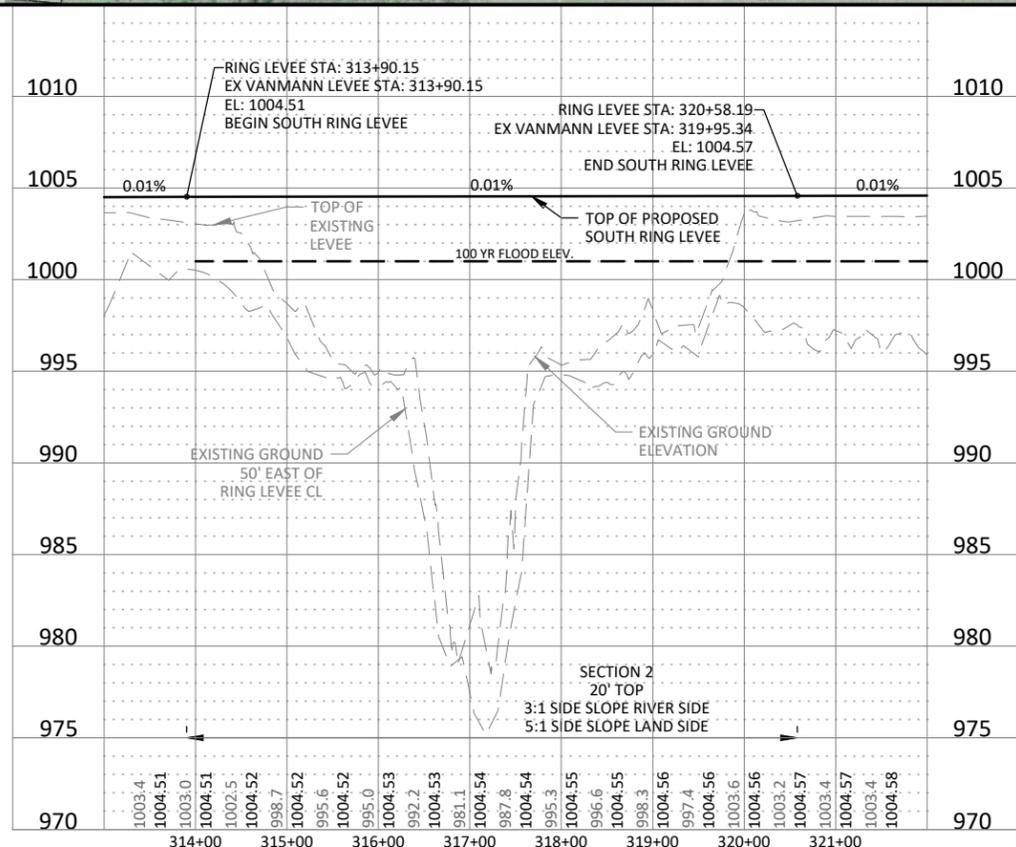
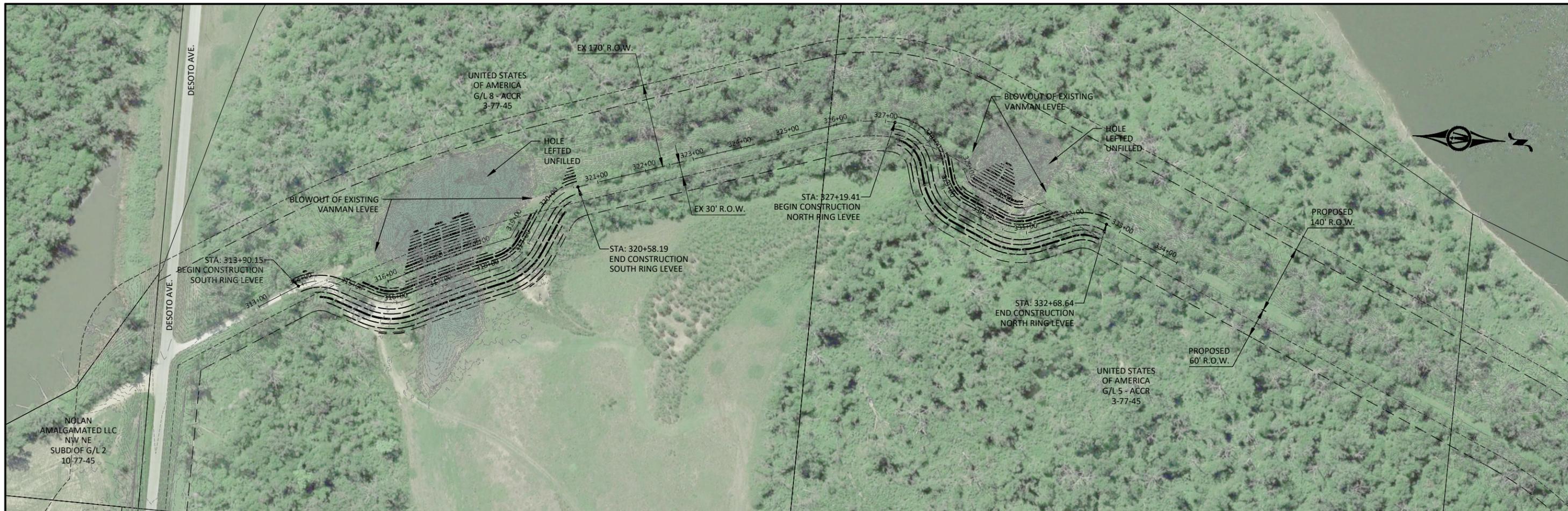


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STA. 363+00 --> 376+50

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D.03



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D.04

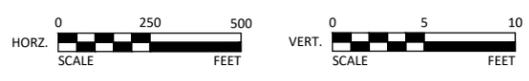
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-  PARCEL LINES
-  VANMAN LEVEE BASE REPAIR
-  RECONSTRUCTION ORIGINAL LEVEE - SECTION 1
-  SOUTH HOLE RING LEVEE - SECTION 2
-  NORTH HOLE RING LEVEE - SECTION 3
-  BREACH AREA - SECTION 4

BENCH MARKS				
No.	Description	Northing	Easting	Elevation
1	MAG-NAIL	553335.51	957004.99	998.91
2	REBAR	553393.79	955398.62	1004.32
10	REBAR	557027.87	956286.65	1000.46
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10004	126/2	563881.7246	962653.3708	1002.82



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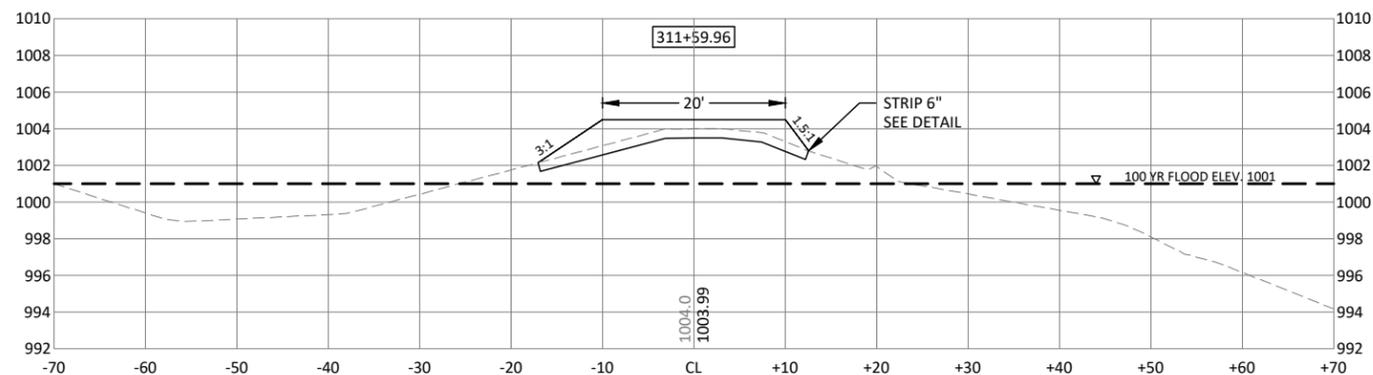
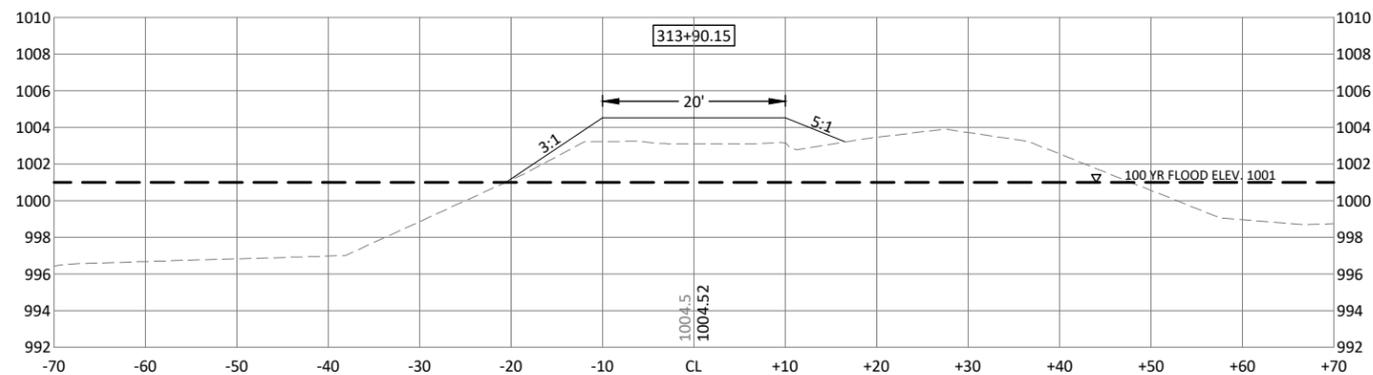
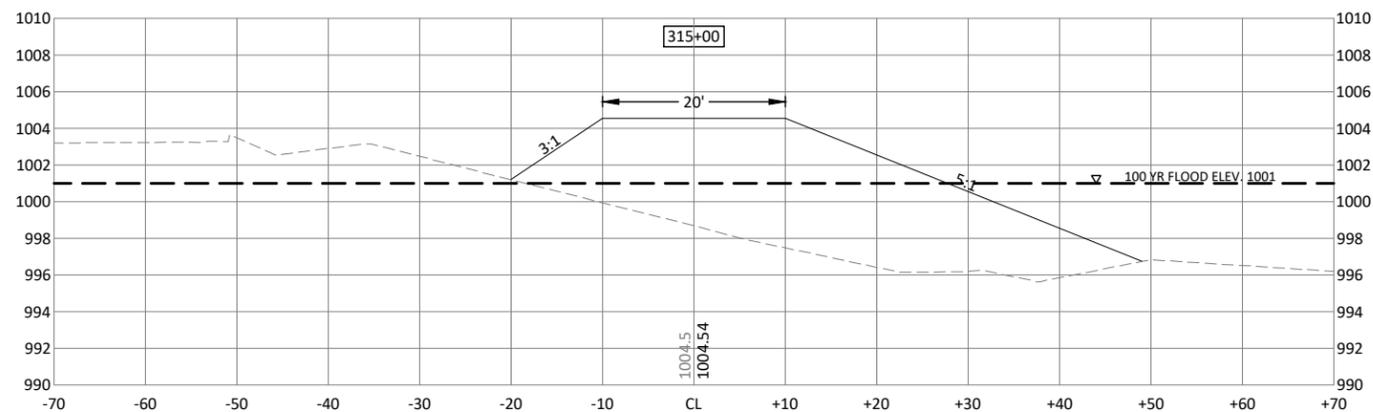
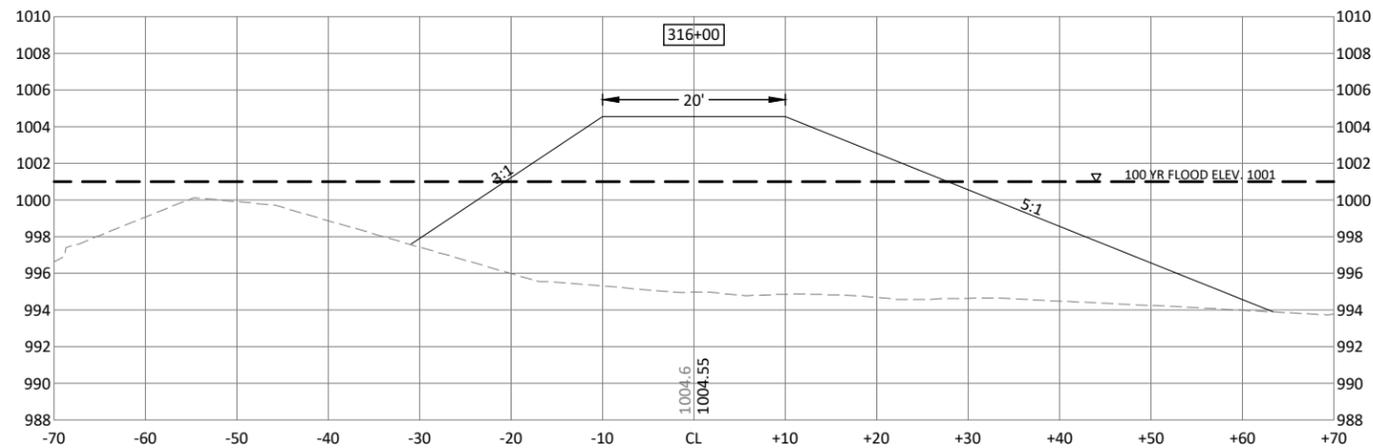


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WORK AREA PLAN

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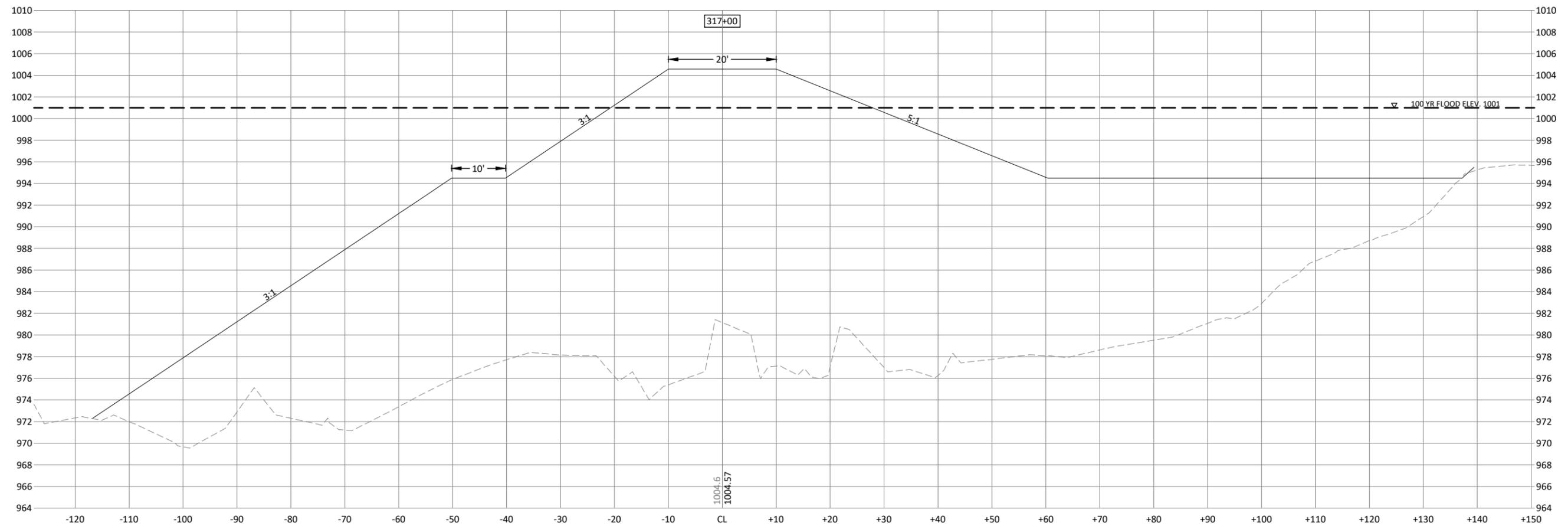
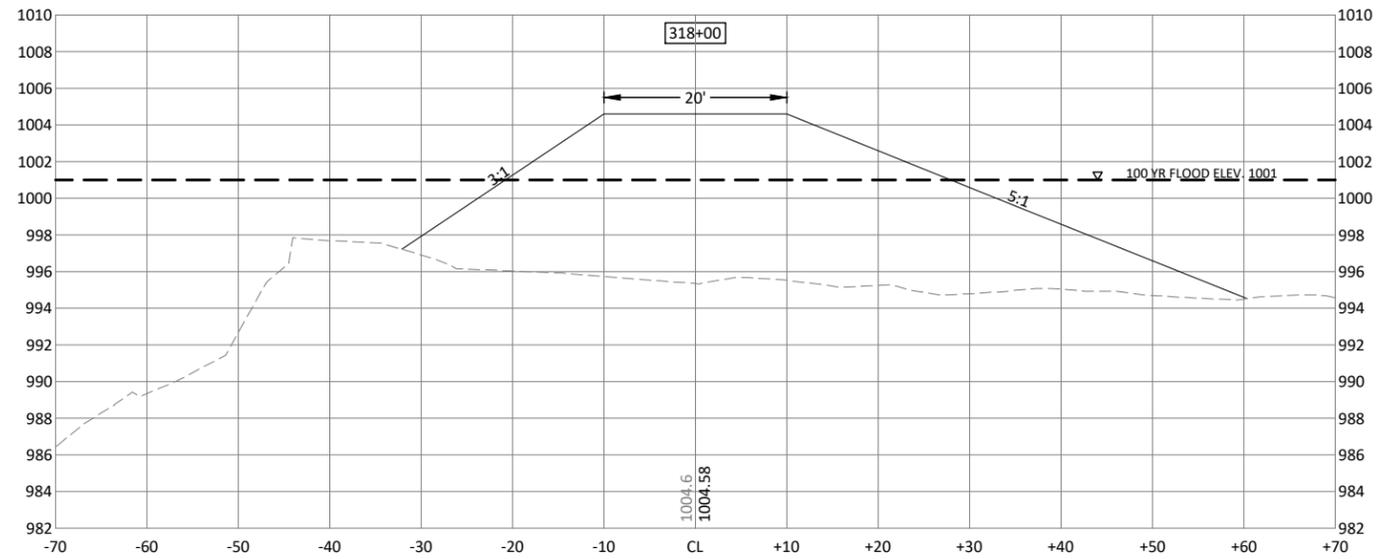


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CROSS SECTIONS - VANMAN LEVEE AND RING LEVEES

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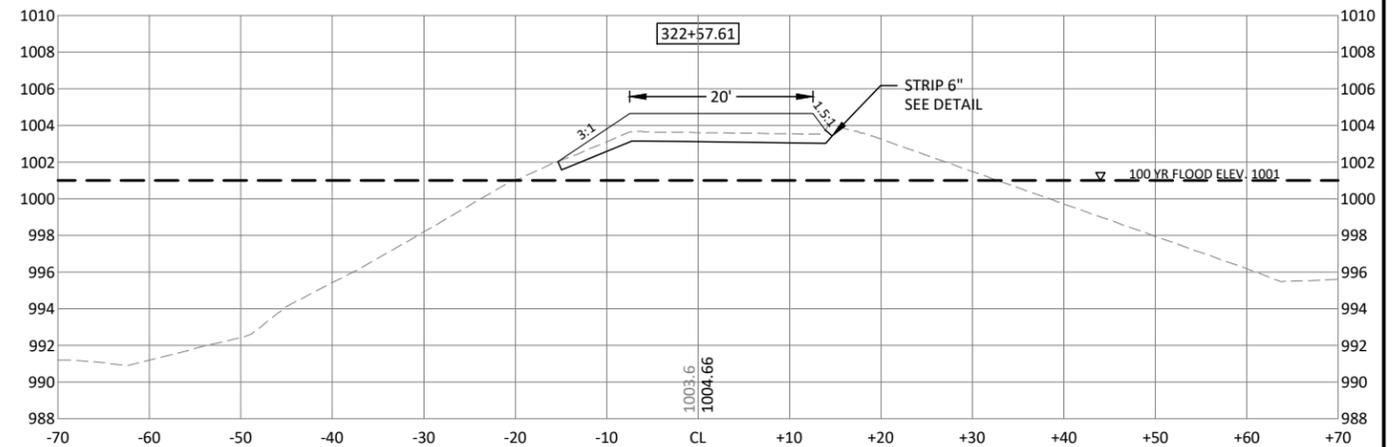
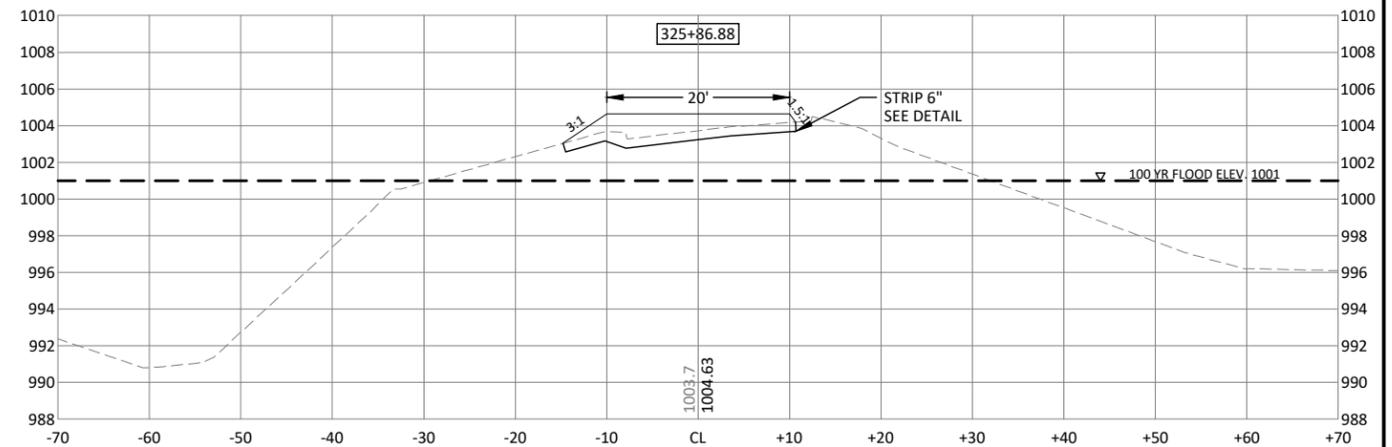
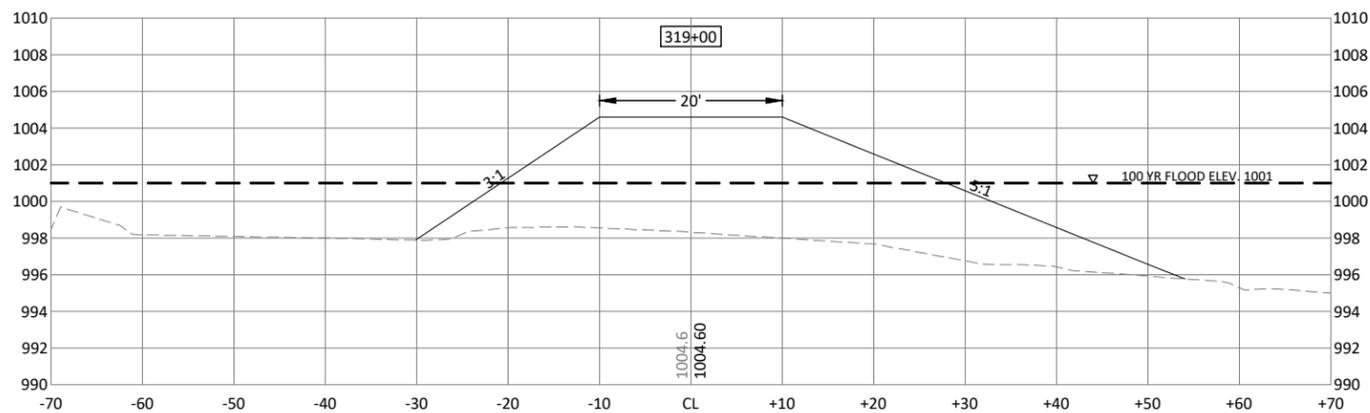
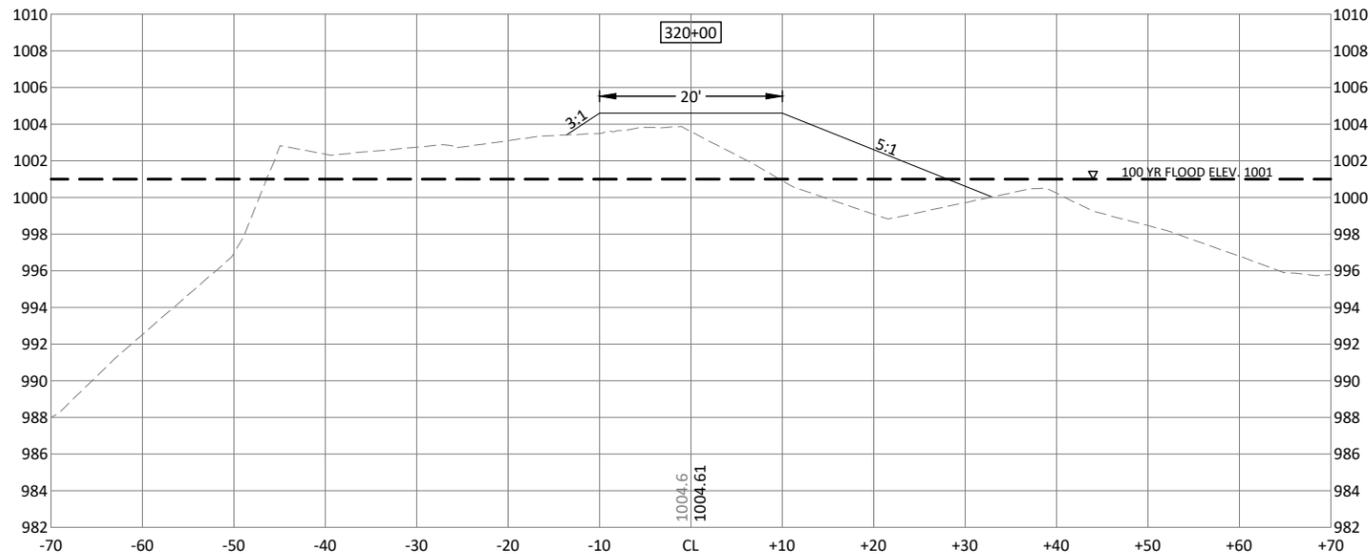
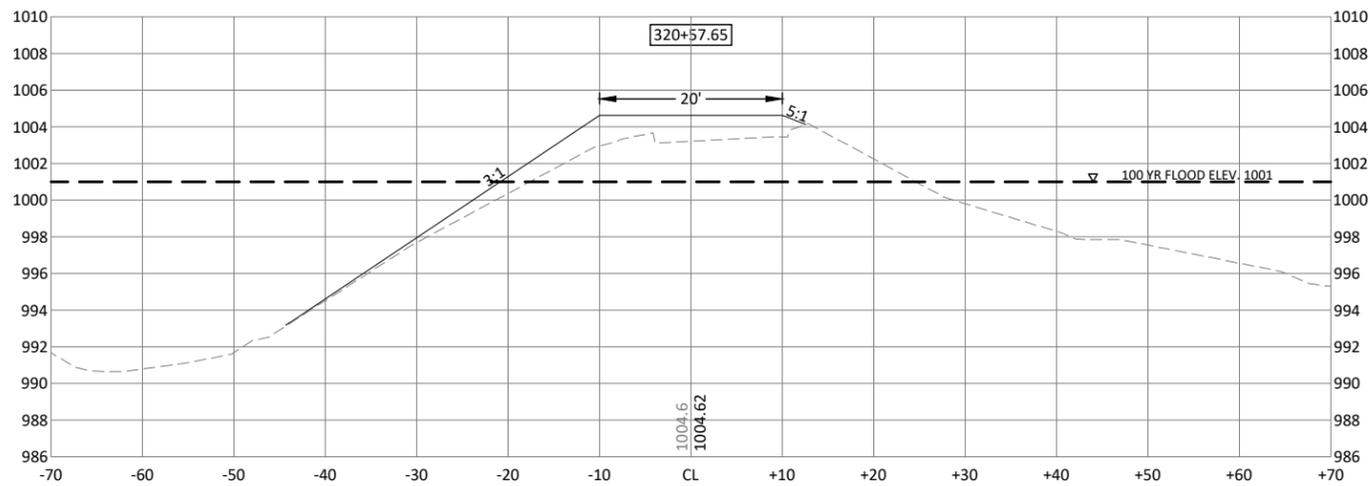


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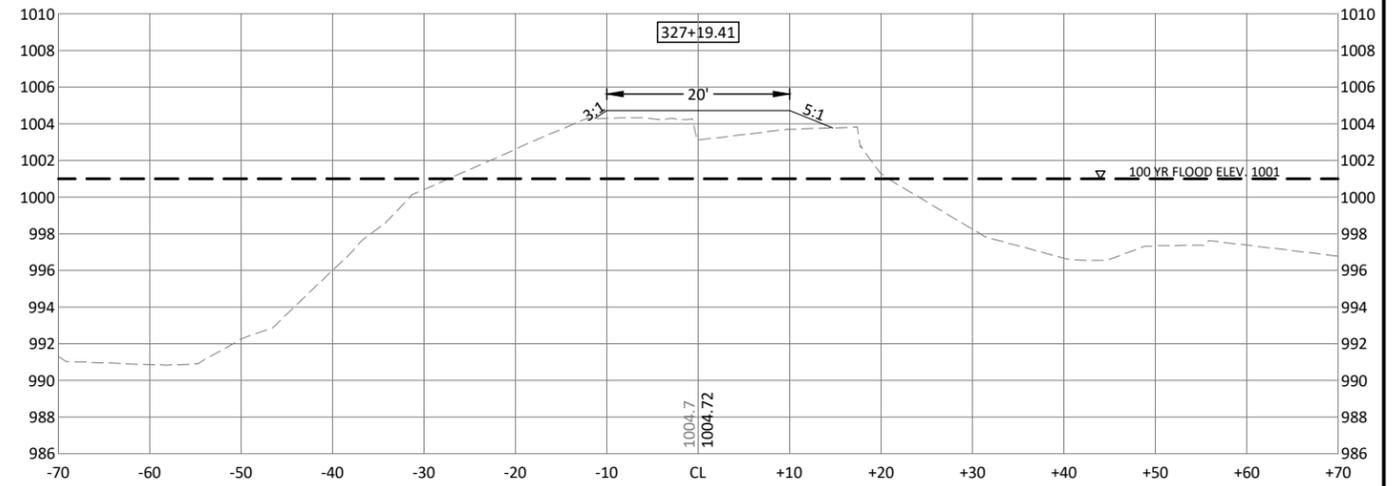
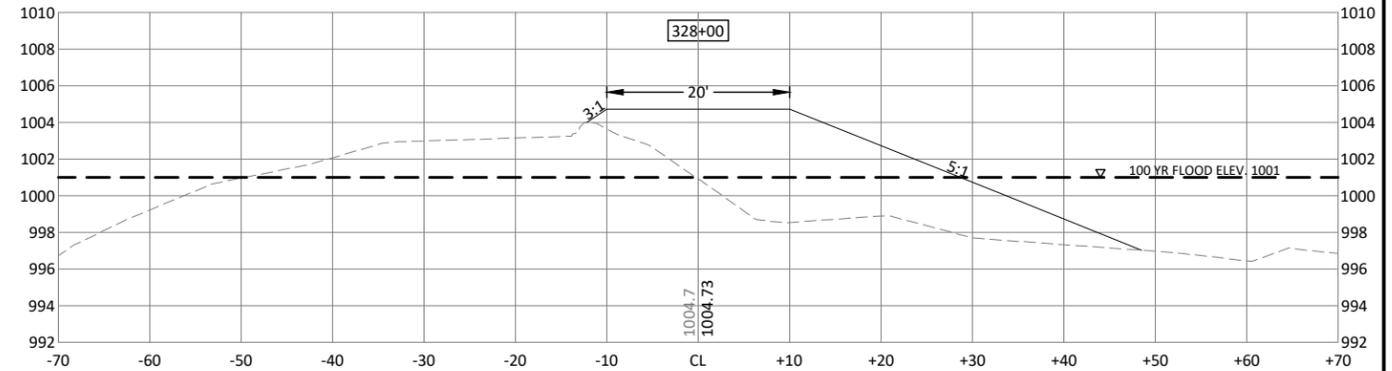
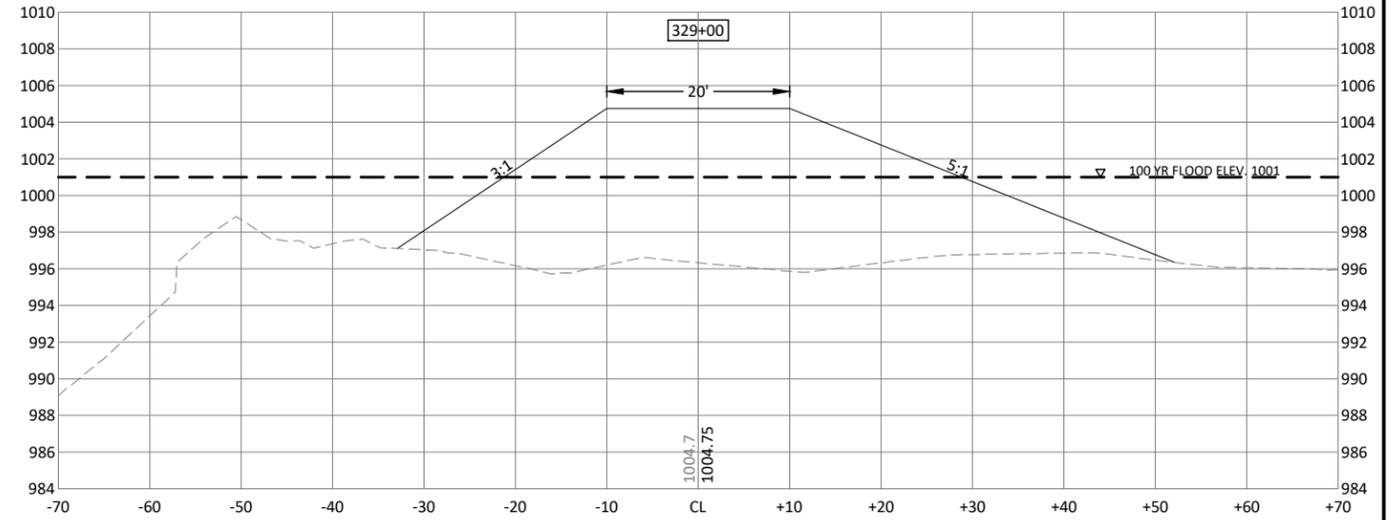
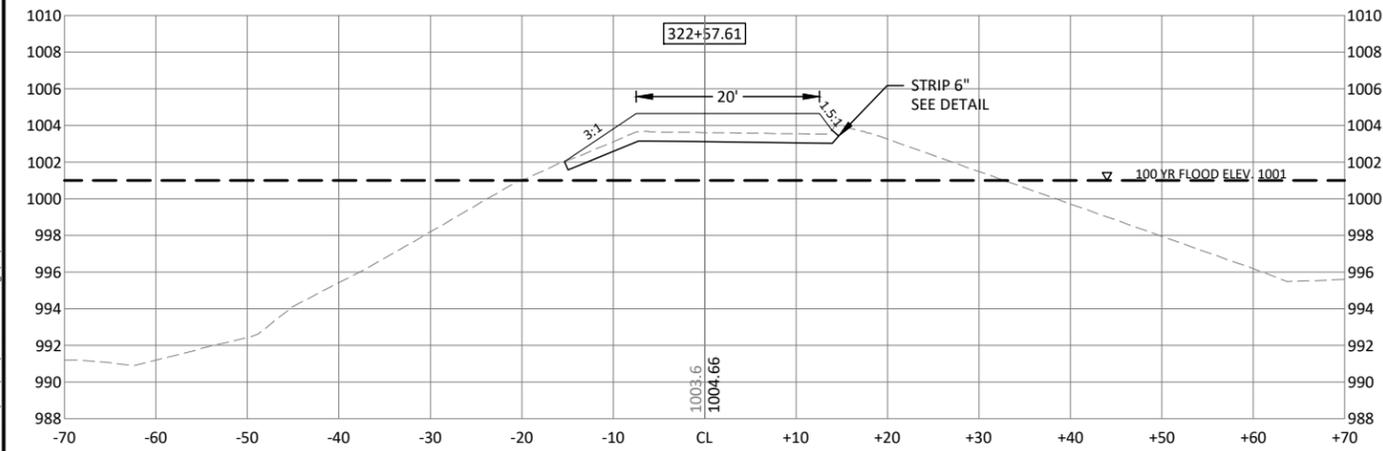
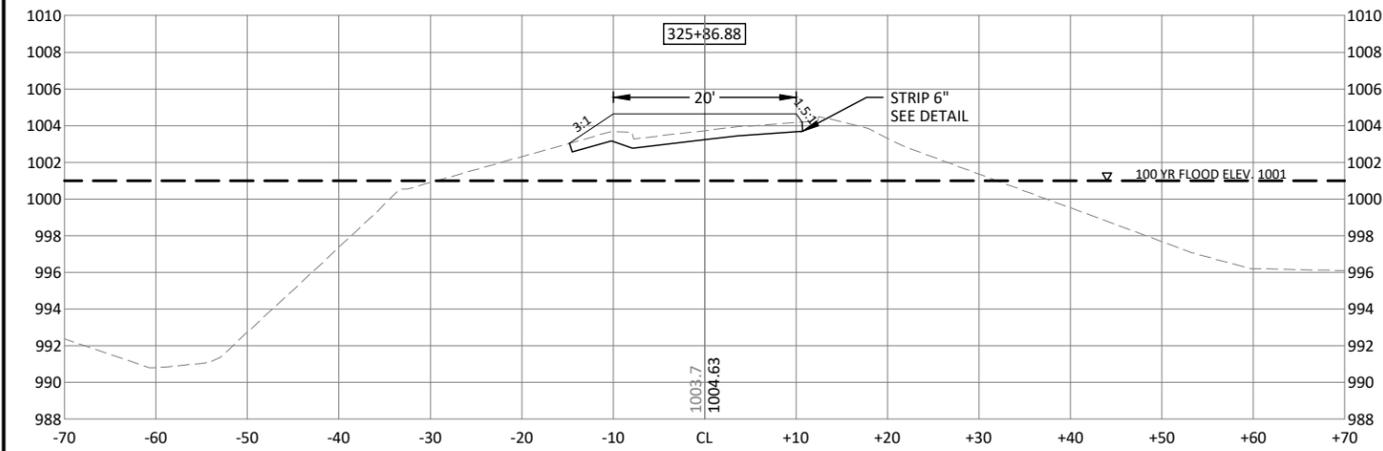
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CROSS SECTIONS - VANMAN LEVEE AND RING LEVEES

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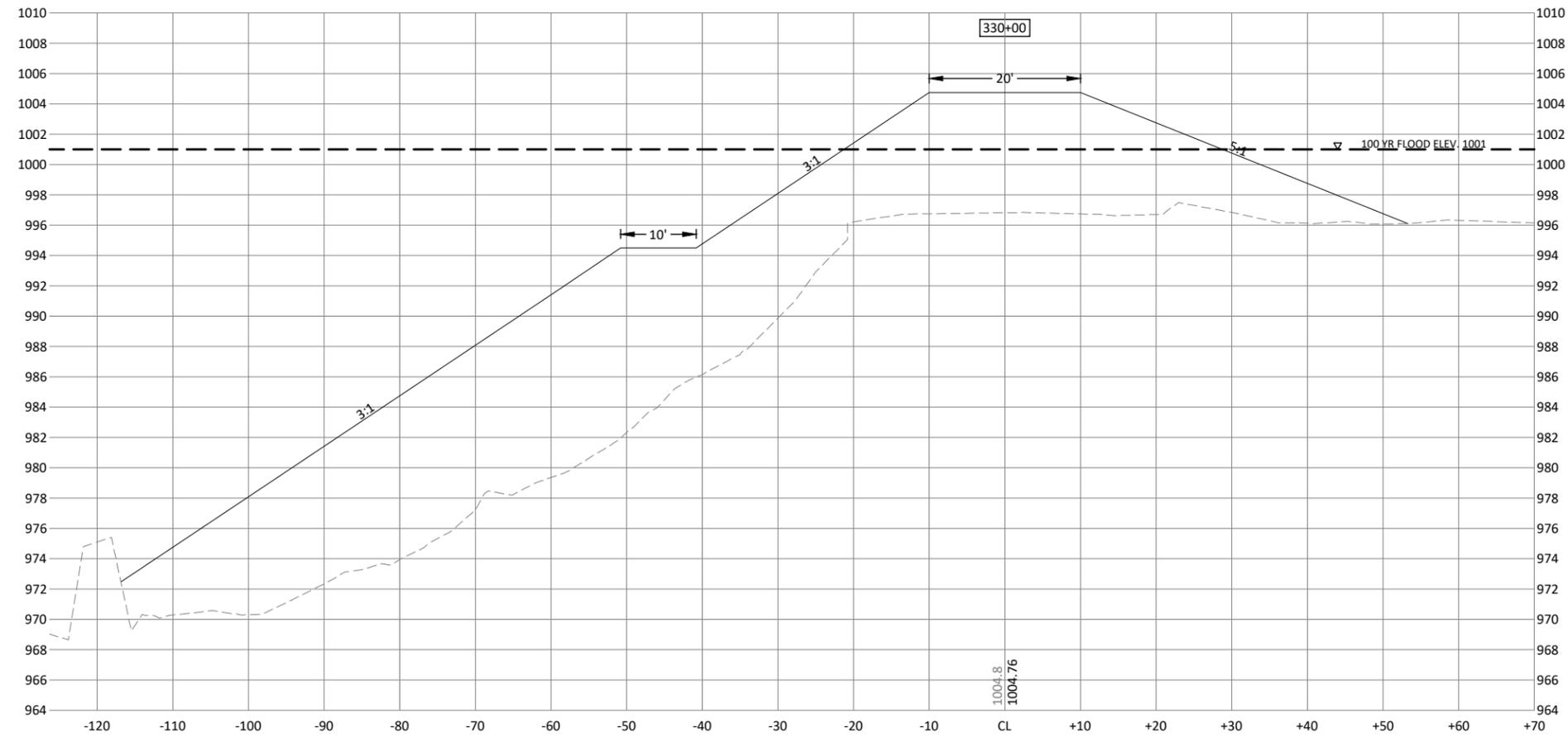
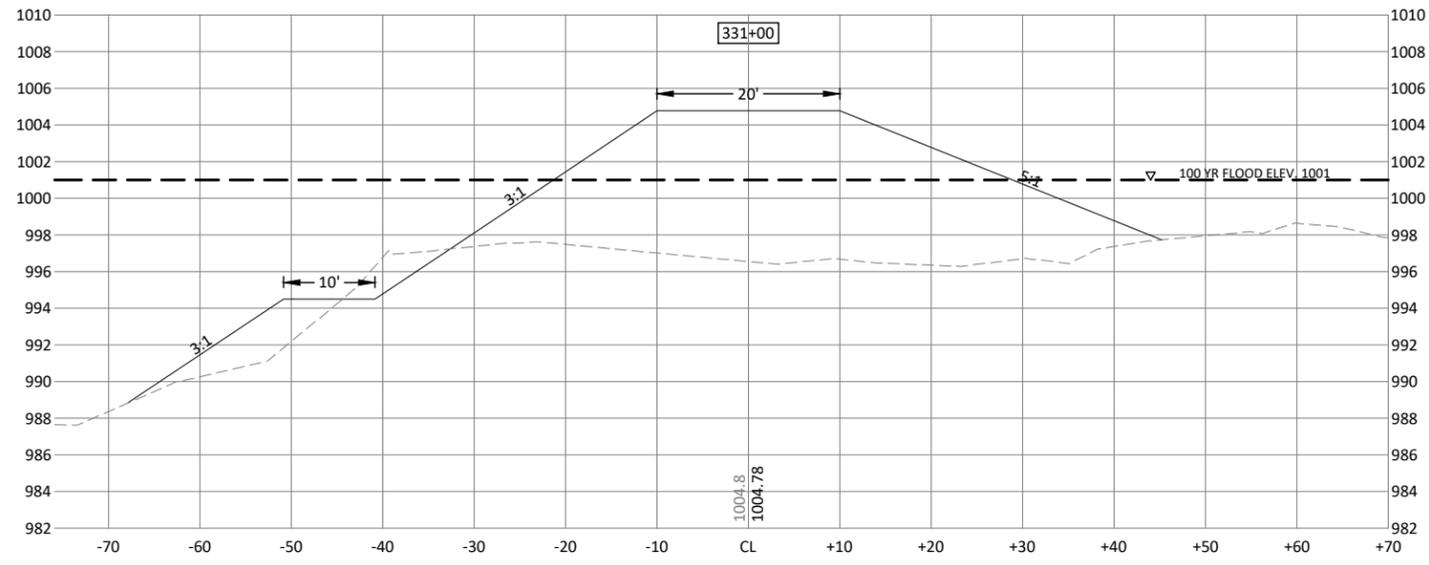


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 CROSS SECTIONS - VANMAN LEVEE AND RING LEVEES

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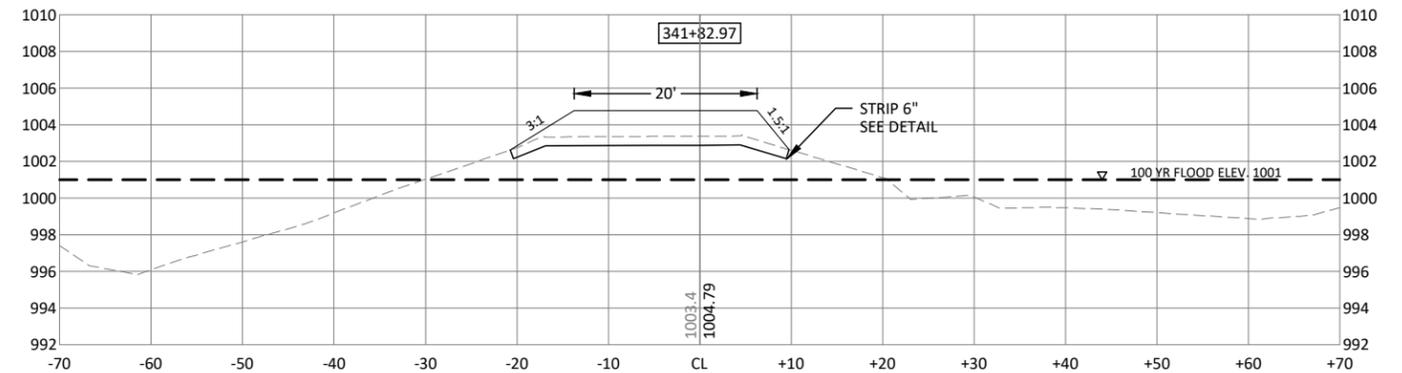
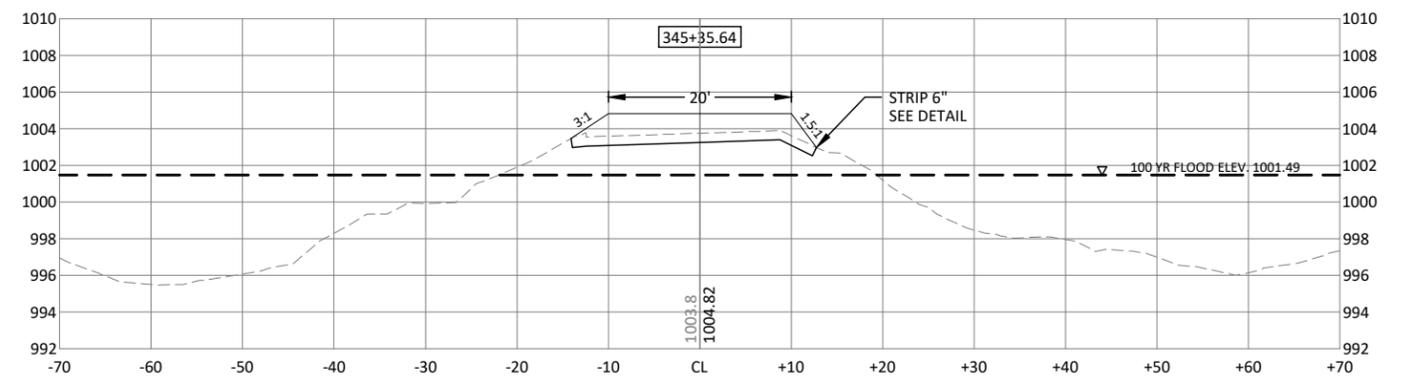
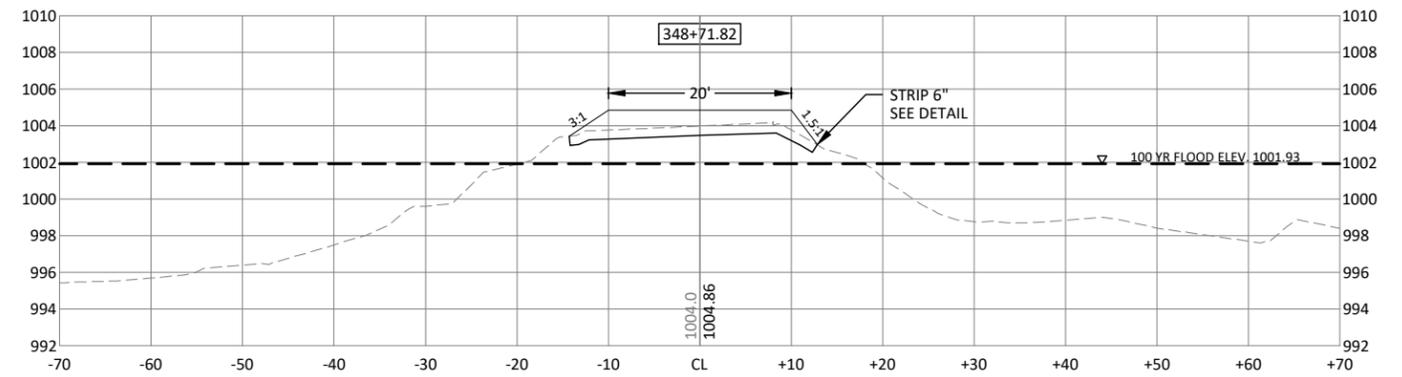
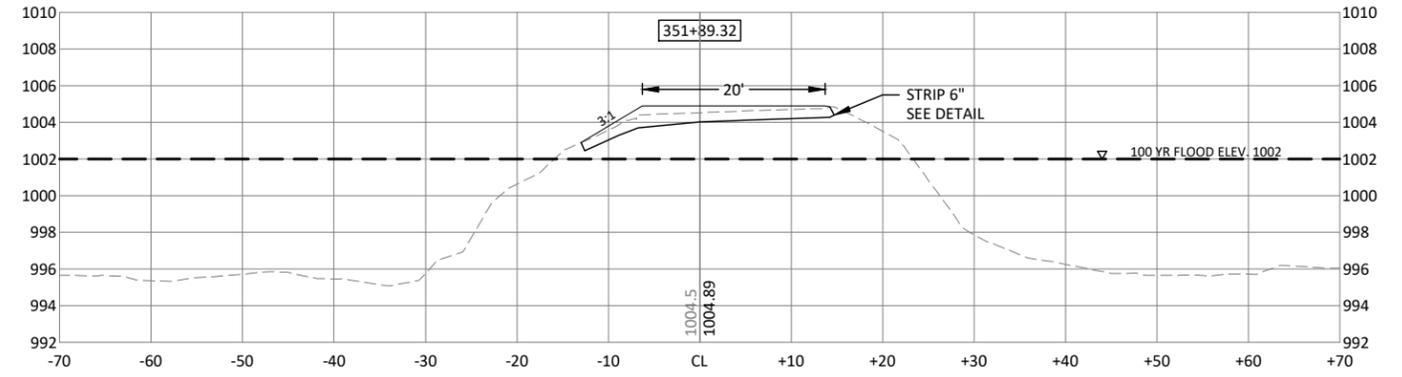
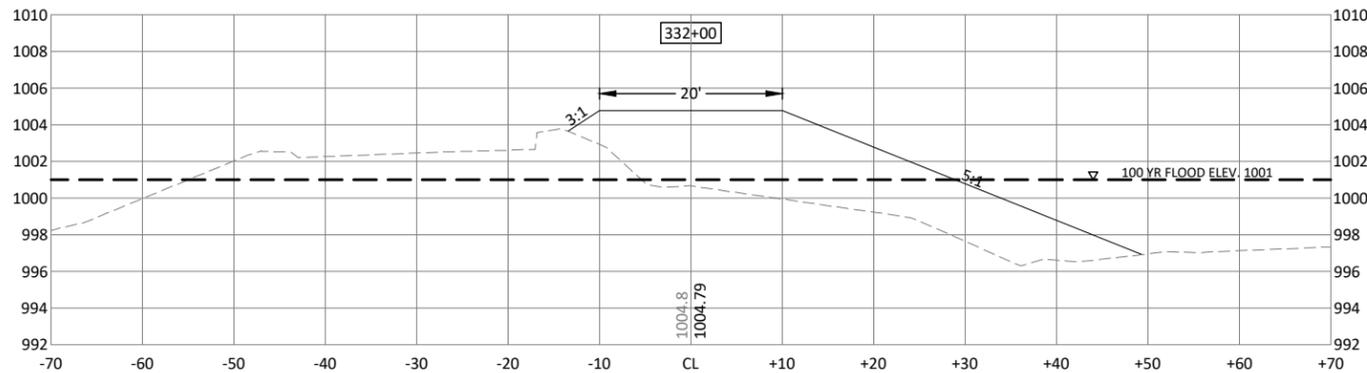
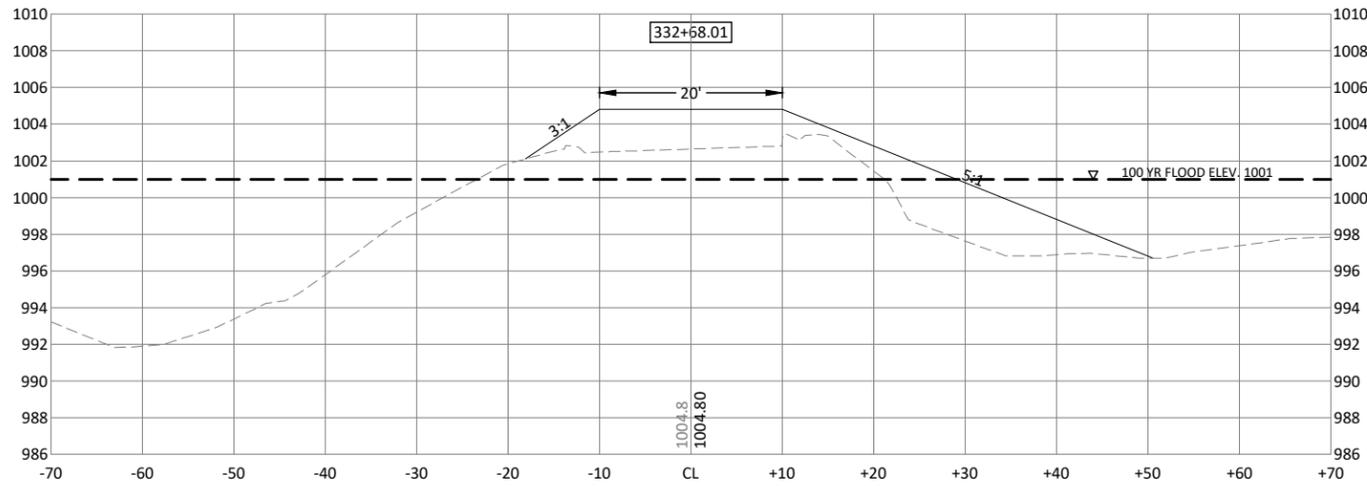
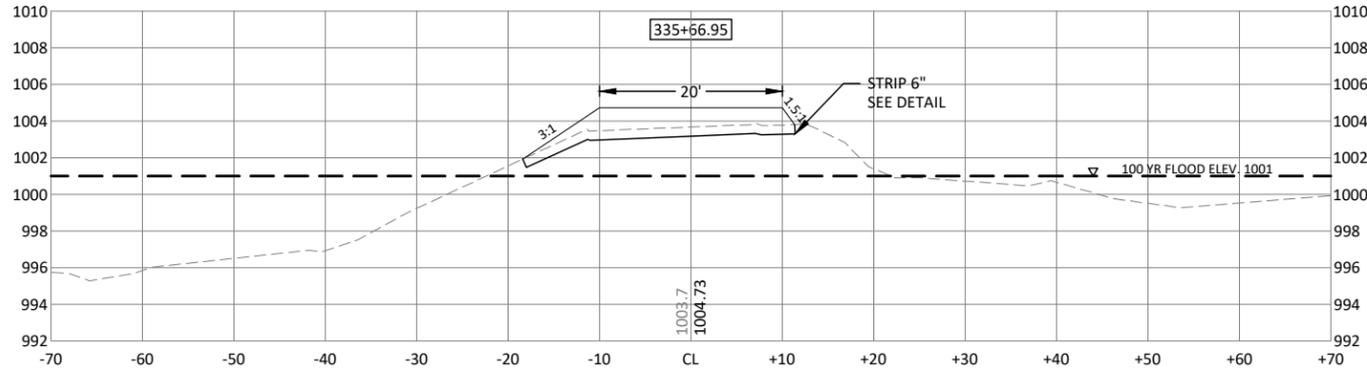
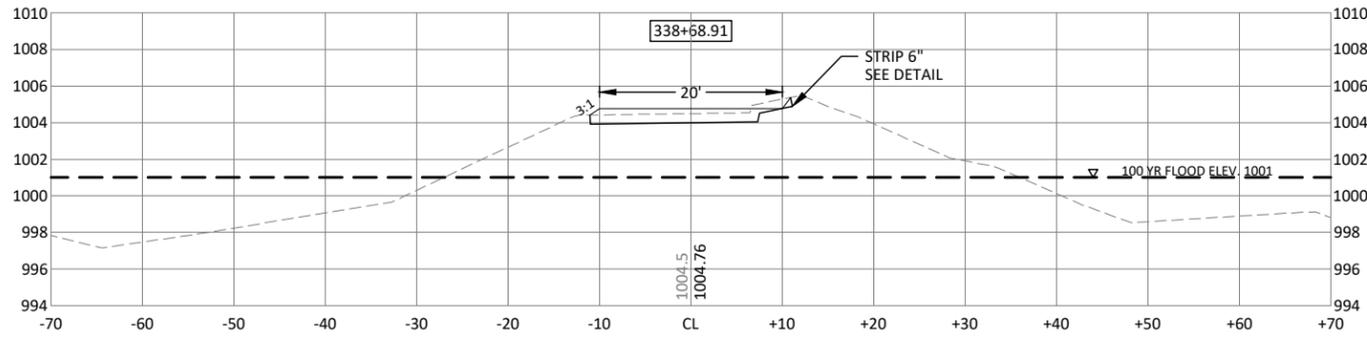
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CROSS SECTIONS - VANMAN LEVEE AND RING LEVEES

SHEET

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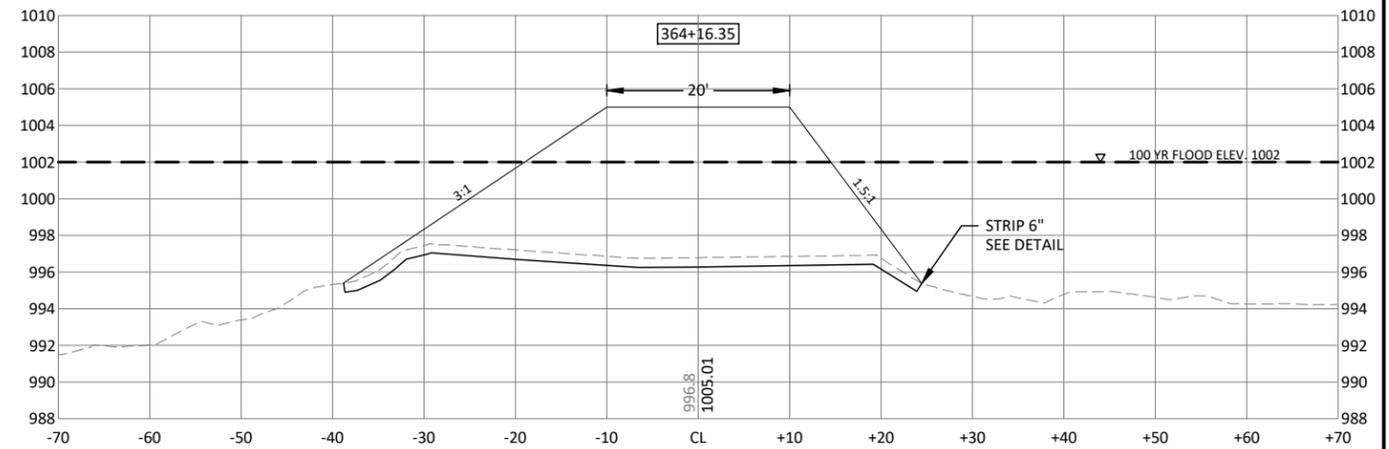
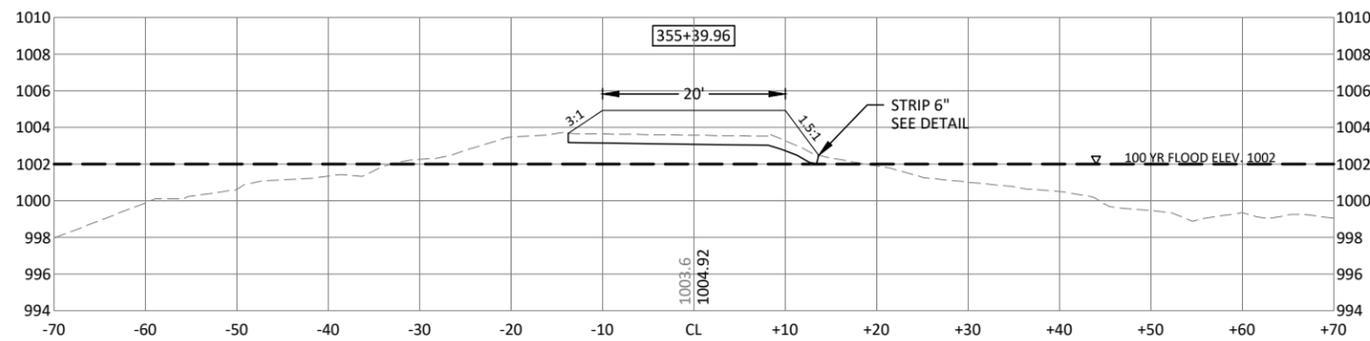
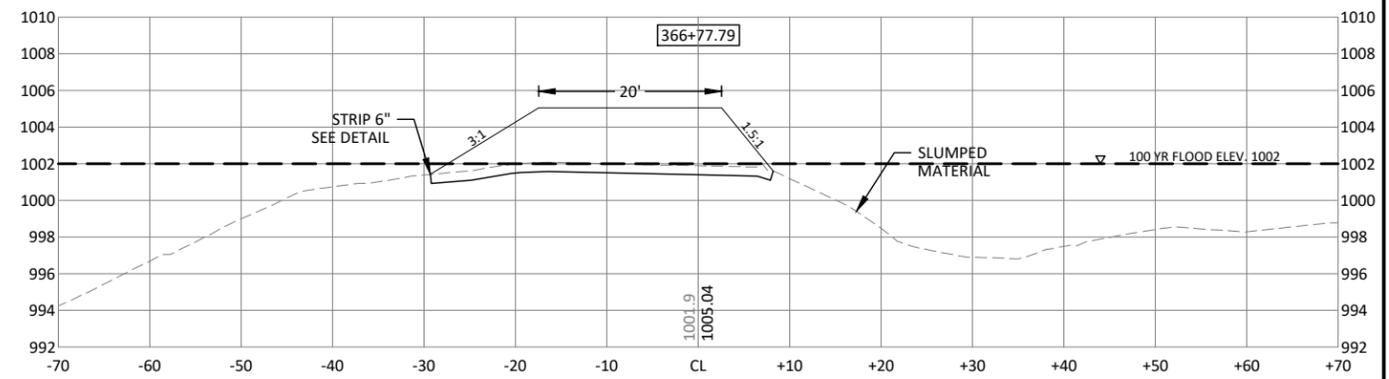
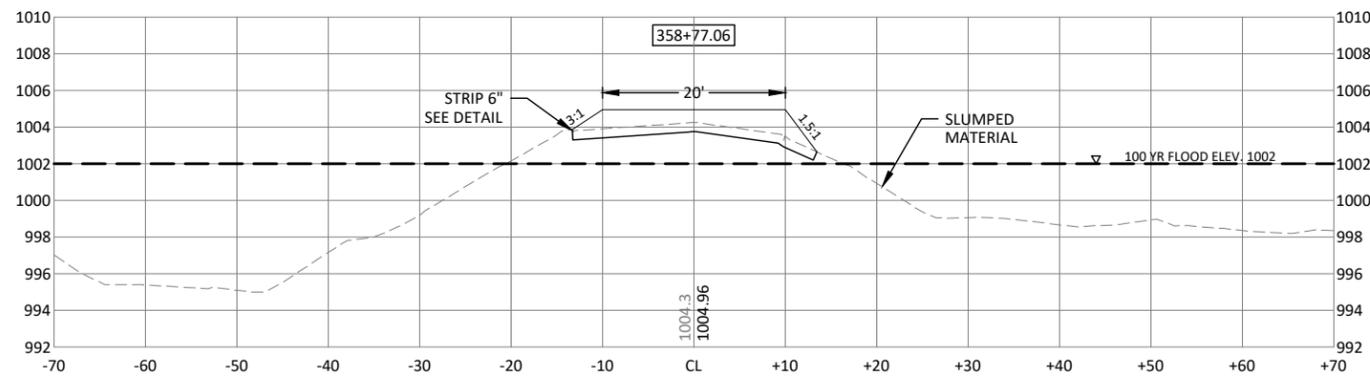
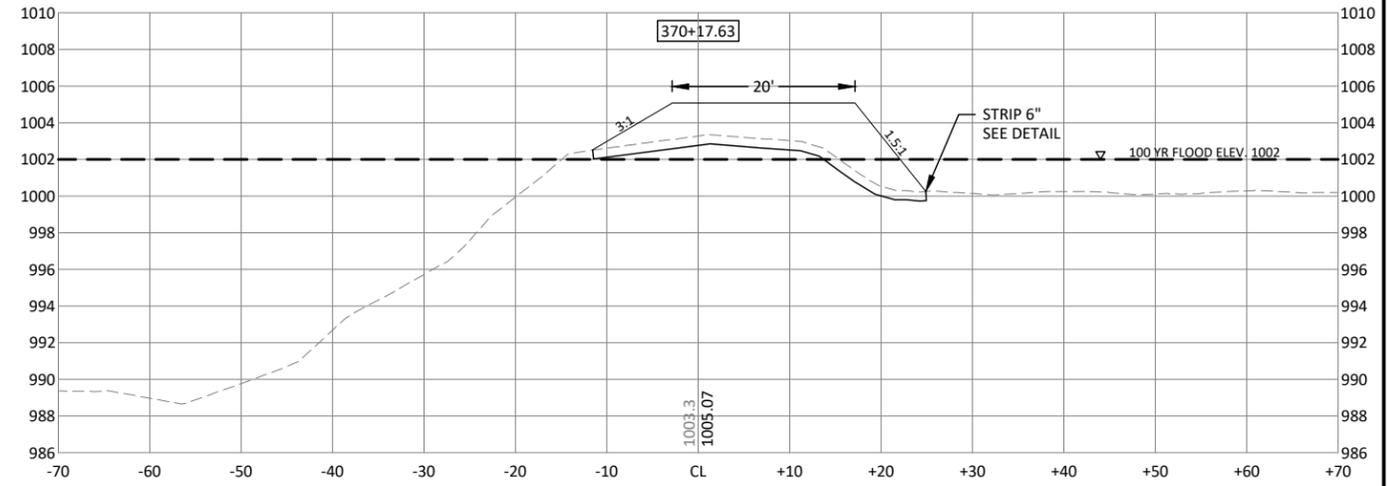
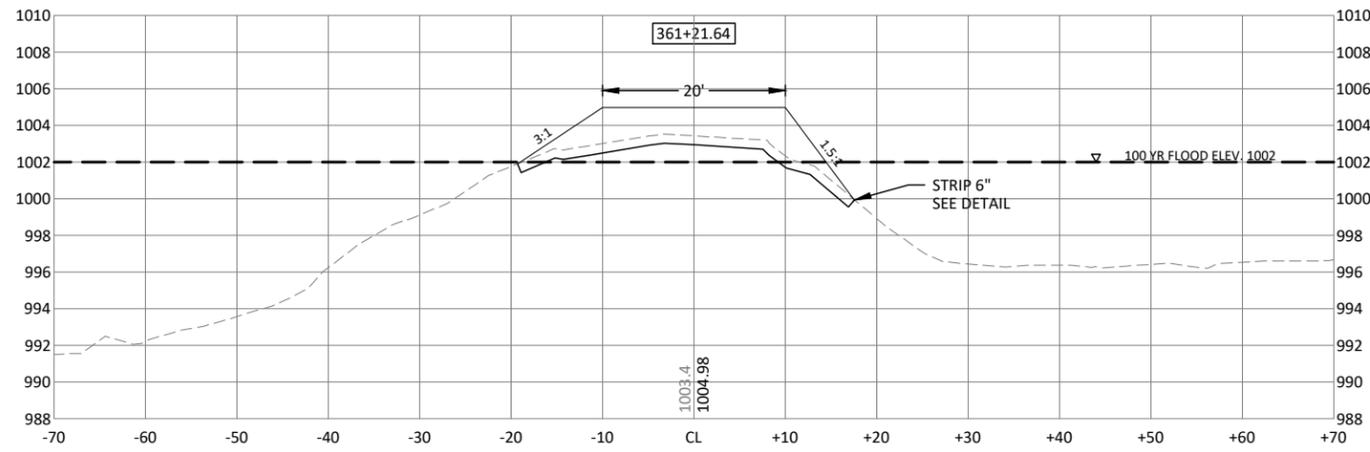
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CROSS SECTIONS - VANMAN LEVEE AND RING LEVEES

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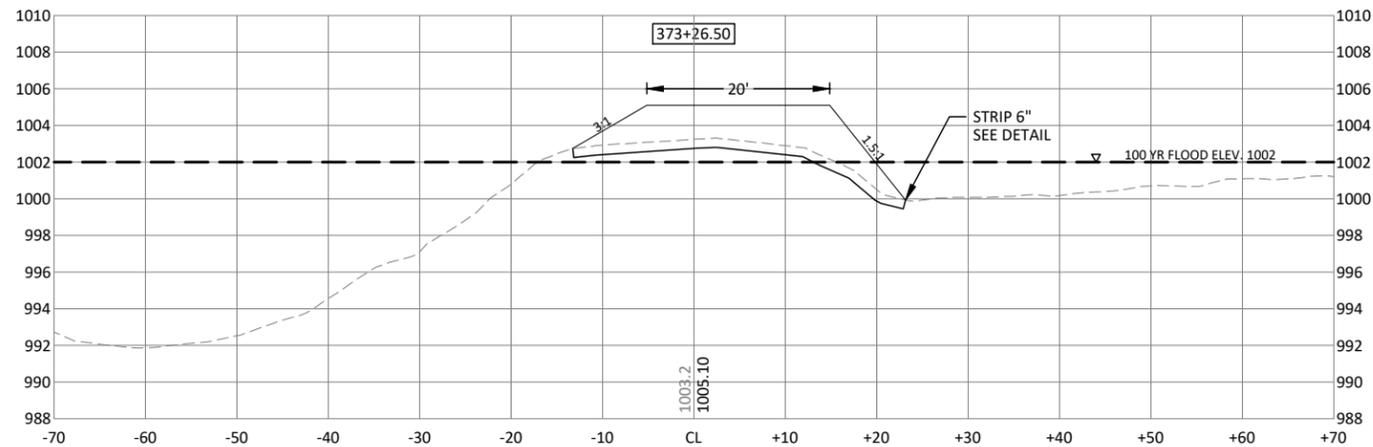
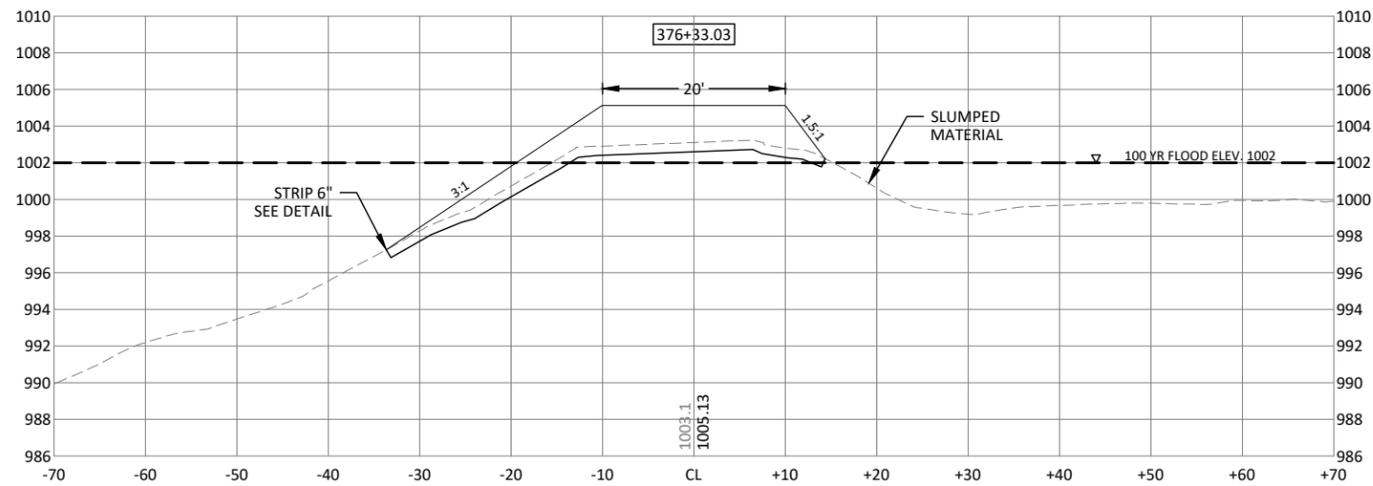
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