US Army Corps of Engineers®

CHICAGO DISTRICT

MCCOOK LEVEE

MCCOOK, IL

Appendix A: Civil Engineering

January 19, 2018

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1.0 Existing Survey Data

A survey was performed by USACE personnel in the spring of 2017 to obtain updated levee data. This survey obtained crest elevations, along with levee top and toe slopes for the entire levee from Lawndale to the Railroad. Additional crest and slope data were obtained south of Lawndale and from the Railroad to north of 47th street. Those areas that were not surveyed have been supplemented by LIDAR data.

2.0 Site selection and project development

2.1 Alternatives 1-0 and 2-0

These Measures are non-structural only. Standard costs were used for each type of floodproofing method. Floodproofing would be difficult as a protection method in the leveed area, as the majority of the damaged structures are large and industrial, with many of the damages affecting equipment, vehicles etc that move on/off and around the site on a regular basis.

2.2 Alternative 2A – McCook Levee Repair and Ditch Modifications

This alternative repairs the existing levee from Lawndale Ave to 47th street and installs the necessary tiebacks.

The existing culvert at Lawndale will remain partially open, allowing the McCook ditch to continue draining through Summit conduit north of Lawndale. A closure structure will be installed to keep flows at a level that can be drained through the Summit conduit without causing interior flooding. A new concrete headwall will be constructed at the south entrance to the culvert under Lawndale. A 5’ by 5’ sluice gate will be installed with a trashrack installed in front of the gate. The gate will be kept partially closed during most flood conditions. MWRDGC will need to maintain the gate at the correct level, or enter into an O&M agreement with the local community to do so.

The remainder of the water flowing through McCook ditch will drain to the Des Plaines River through a new culvert installed just south of Lawndale. This culvert will be a 39” diameter Reinforce Concrete Pipe (RCP) based on the Hydraulic modeling, to provide sufficient drainage from McCook ditch to the River. Length of pipe will be 35’, with approximately 20’ of open channel drainage ditch leading up to the culvert on both the inlet and outlet ends. No

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backflow preventer will be needed on the river side of the culvert, as this will no longer be a part of the line of protection.

South of Lawndale, a tieback levee will be constructed from the high point along Lawndale, southwest until meeting high ground at elevation 602.3'. This levee is 170' long and will require a clearing area of the existing levee, plus 15' on each side of the toe. 6" of topsoil will be removed and respread at this location.

North of Lawndale, clearing to remove existing woody vegetation will take place along the entire levee from Lawndale to the Railroad. This translates to an approximately clearing area of 4.25 acres. The levee will be repaired to its existing elevation, with minimum side slopes of 2.5H:1V on the land side. To achieve this slope, the existing crest of the levee will be reduced somewhat for the first 500' of the levee. The crest will still meet the minimum requirement of 10' for maintenance. The river side of the levee will be repaired with riprap at a 2:1 slope from stations 0+00 to 20+90. From stations 20+90 to 30+00, clay will be placed on the riverside at a 2.5:1 slope. Beyond station 30+00, the existing riverside elevation does not need improvement, beyond repair from any clearing efforts performed.

A toe drain will also be installed from Stations 30+00 to 41+00 to address seepage issues. The drain will be a 5' by 5' trench filled with permeable material.

At the intersection of the levee with the Railroad, clay blankets will be installed on the north and south sides of the railroad slope, to tie into the levee crest elevation. This is to prevent overtopping and seepage through the railroad ballast. The clay blanket will be 3' thick, and tie into the existing levee to the north and south.

Between the Rail road and 47th street, the levee is also to be repaired to its existing elevation. Elevation data for this stretch of levee indicates that existing slopes vary between 2:1 and 3:1 on both the land and river sides, which meets levee standards. Trial surfaces were created in InRoads, verifying that no fill is needed to meet a 2:1 slope and minimal fill (384 CY) is required to raise the slopes to a 3:1 elevation. Therefore only woody clearing and minimal slope restoration will be performed on this 500 ft length of levee. The existing gravel path can remain in place.

2.3 Alternative 2Ba – West Lyons Levee Repair

This Alternative would repair the existing West Lyons levee to its existing elevation for 870 feet, which varies from 601 to 603.1 (high ground). The majority of the existing levee slopes are greater than 3H:1V. Approximately ½ of the riverside length, or 450 feet, will need minimal regrading to meet slope requirements, approximating 975 CY of fill needed. Woody vegetation will be cleared on the levee and for 15' to each side.

2.4 Alternative 2Bb – West Lyons Levee Repair and Elevation

This Alternative would repair the existing Lyons levee and raise it to elevation 603.1 for 870 feet. The current levee crest is 22' which will be approximately maintained, and slopes will be maintained at existing slope of 3H:1V. Approximately 3300 CY of fill will be required to meet the new elevation requirement, along with topsoil stripping and replacement. Woody vegetation will be cleared on the levee and for 15' to each side.

2.5 Alternative 3A – Repair McCook Levee in Two Segments

South Levee

This alternative creates a southern and a northern levee segment, protecting two individual low ground areas. The Southern levee will require two tiebacks. The southern tieback levee is the same as in Alternative 2A, extending from high ground at Lawndale Ave southwest to meet elevation 602.3'. The existing culvert at Lawndale will remain partially open, allowing the McCook ditch to continue draining through Summit conduit. A closure structure will be installed to keep flows at a level that can be drained through the Summit conduit without causing interior flooding. A new concrete headwall will be constructed at the south entrance to the culvert under Lawndale. A 5' by 5' sluice gate will be installed with a trash rack installed in front of the gate. The gate will be kept partially closed during most flood conditions. MWRDGC will need to maintain the gate at the correct level, or enter into an O&M agreement with the local community to do so.

The remainder of the water flowing through McCook ditch will drain to the Des Plaines River through a new culvert installed just south of Lawndale. This culvert will be a 39" diameter Reinforce Concrete Pipe (RCP) based on the Hydraulic modeling, to provide sufficient drainage from McCook ditch to the River. The length of pipe will be 35', with approximately 20' of open channel drainage ditch leading up to the culvert on both the inlet and outlet ends. No backflow preventer will be needed on the river side of the culvert, as this will no longer be a part of the line of protection.

The main portion of the south levee will be repaired to its existing elevation, side slopes repaired and woody material cleared from the levee and its buffer zone. The length of the south levee is 2,080 feet. The Riverside slopes will be repaired with riprap to a 2:1 slope. The landside slopes will be cut back into the levee to create a 2.5:1 slope, while still maintaining a minimum 10' crest.

The north tieback for this south levee will be onto the adjacent industrial property, and an easement will be required. The tieback is required to elevation 602.3' and will cross McCook ditch. The entire southern levee will need to be cleared of existing woody material, a total length of 2450' for an approximate clearing area of 2.5 acres.

North Levee

The second portion of the alternative is to create a North levee, extending from a tieback just south of the Railroad, north to 47th street. This tieback will also cross McCook Ditch, onto private property and require an easement. This levee will tie into elevation 603'. Along with this tieback, some repair will be done of the levee crest just south of the Railroad to maintain the 603' elevation all the way to the RR tie-in. This requires a repair of approximately 200 feet of existing levee.

The main portion of the levee from the Railroad to 47th street does not require significant work. The existing elevation is sufficient, and the side slopes vary from 2:1 to 3:1. Based on test repair surfaces, a minimal clay quantity of ~350CY would be needed to restore the entire levee length of 540' to 3:1 slopes. Therefore no repair is needed on this portion of the levee to meet the requirements.

Clearing will be done on the main levee and the tieback, for a total clearing distance of 765', and an approximate clearing area of 1.0 acre.

Supporting Features

At the intersection of the levee with the Railroad, clay blankets will be installed on the north and south sides of the railroad slope, to tie into the levee crest elevation. This is to prevent overtopping and seepage through the railroad ballast. The clay blanket will be 3' thick, and tie into the existing levee to the north and south.

In the section of existing levee that will not be repaired, between the north and south levee tiebacks, a new culvert will be added to drain the northern portion of McCook Ditch to the Des Plaines River. The culvert will be a 35' long, 39" diameter RCP, with a small drainage ditch leading up to the inlet and outlet.

3.0 Real Estate

The majority of the area of the existing levee is owned by MWRDGC. Portions of the repair work will occur in the Chicago and Illinois Railroad ROW, but will not impact railroad operations. The work within the railroad easement involves repair of the existing levee and addition of a relatively small volume of clay. Coordinator will begin with the railroad early on to prevent any complications from this work. The selected plan contains tieback levees onto land that is currently leased by MWRDGC to private tenants. The area of the tieback levees is small in proportion to the overall site and the tenants should be able to adjust operations to avoid these areas. Refer to the real estate appendix for further details.

3.1 Staging and Storage

A temporary staging and storage area has been laid out in the public ROW area just southwest of Lawndale Ave, near the south tieback levee. 1.5 acres is available for construction use. An additional staging area may be proposed for work to the north of the Railroad, using the open land between the existing levee and the river.

3.2 Access Roads\Haul Routes

Main access to the site will be via Lawndale Ave. Secondary access to the portions of the levee north of the Railroad crossing will be via 47th street. Existing gravel trails on top of the levee crest will be improved as necessary for use as haul roads.

4.0 Utilities

Existing utility information was requested from the local sponsor, current owner of the site. Historical levee plans were used for reference, along with current county parcel and easement data. There are several existing Com-Ed overhead easement that crosses perpendicular to the existing levee. One easement falls between the two levee segments of the proposed plan and will not be affected by construction. A second easement runs north-south across the levee approximately 600 feet north of Lawndale Ave. The proposed work in this area that can be carried out with minor impacts to the existing power lines and pole. Work in this area includes clearing of woody debris and placement of riprap on the riverside slope. The contractor will be required to follow the relevant codes in EM 385-1-1, which require either consistent clearance of any equipment from the existing line, or for the line to be powered down while work is accomplished. A third overhead Com-Ed line runs parallel to the existing Chicago and IL railroad that crosses the line of protection. A Natural gas pipeline also runs along the railroad in this easement area, based on National Pipeline Mapping System (NPMS) data available online. Work in the area of this easement is limited to a proposed additional 175' of clay blanket. The addition of this feature would have no impact on the existing easement or on ComEd operations. In general, little excavation will be performed as a part of this project. Most of the improvements require stripping of topsoil only and the addition of new clay to the levee. A few areas of excavation will be the installation of the two new culverts from McCook Ditch to the Des Plaines River. No utilities have been identified in those areas of excavation. A full utility survey will be performed along with a full topography survey at the beginning of the PED phase.

5.0 Debris Removal

Based on site visits and photographs of the existing levee area, trash and debris are present along the existing levee, particularly within the McCook ditch and at the culvert underneath Lawndale Ave. This debris, along with all woody debris cleared from the levee, will be taken offsite and brought to a licensed dumping facility. Minimal excavation is included in the project. Topsoil stripping is assumed to be reused for the final levee surface. Some excess material will be excavated from the two new culverts through the existing levee to the Des Plaines River. Based on existing soil knowledge, the geotechnical engineer has advised it is likely that this material will be adequate to be reused on site for levee build up in other areas. Therefore it is assumed that all soil will be reused on site, rather than brought offsite to a disposal facility.

6.0 References

U.S. Army Corps of Engineers, 1993, *Engineering and Design Cost Engineering Policy and General Requirements, Engineering Regulation 1110-1-1300,* Department of the Army, Washington D.C., 26 March 1993.

U.S. Army Corps of Engineers, 1999, *Engineering and Design for Civil Works Projects, Engineering Regulation 1110-2-1150,* Department of the Army, Washington D.C., 31 August 1999.

7.0 Attachments

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7.1 Quantity Takeoff

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US Army Corps of Engineers. Chicago District	PROJECT TITLE: McCook Levee	COMPUTED BY: Laura Vanden Berg	DATE: 11/13/2017	SHT 1
	COMPUTATION TITLE: Alternative 2A Quantities	CHECKED BY: Faye Leffler	DATE: 12/10/2017	

General Assumptions/Notes:

Feature 1: Tieback Levee South of Lawndale

Assumptions:

Clearing and grubbing required.

6" Topsoil removal and respread.

Tied into elevation 602.3 south of Lawndale Ave. See corridor/surface 'McCook2: Tieback'

Levee length	169	LF
Fill Volume:	550	CY
Seeding Area	4965	SF
Clear & Grub Area*	8345	SF

*Clear and Grub area includes New levee seeding area + 20' easement total (less than 15' on each toe due to proximity to existing Lawndale Ave)

16200

Feature 3: Revise McCook Ditch culvert at Lawndale

Assumptions:

1. Existing culvert is 60" diameter.
2. Exiting culvert is 100' long.
3. Install Sluice gate in concrete structure just upstream of current culvert entrance at Lawndale. Gate stays partially open during normal flow conditions.
4. Trash rack installed at the entrance, 65" by 65". ** Use Rick's structure as a reference
5. Replace existing headwall. Based on observation, 7' by 12' concrete structure, 1' thick. Structure is directly below Lawndale Ave, which would need to be supported during construction of a new headwall.

Feature 3: Construct a culvert under the existing levee from McCook Ditch to Des Plaines River

Assumptions:

1. Culvert will be 35' long Circular pipe, RCP or CMP depending on cost differential.
2. 39 or 60 inch pipe (depending on material) based on hydraulic analysis.
3. A flap gate will be installed at the Des Plaines River outlet, sized to the pipe chosen.
4. Remaining 50' will be a ditch from the existing McCook Ditch to the culvert entrance. Ditch bottom elevation and culvert invert are 584.87'. Excavation and seeding area quantities calculated in InRoads.
5. Clearing/Grubbing and seeding will be required for the disturbed area.

Length Pipe (ft)	RCP, Diameter Pipe (in)*	CMP, Diameter Pipe (in)*
35	39	60

*Either/or pipe type

Landside Ditch:

Length Ditch (ft)	Side Slopes ditch	Bottom Width of Ditch (ft)	Excavation Area (CY)	Clear/Grub and Reseeding area (SF)
16	2 : 1	6	40	350

Riverside Ditch:

Length Ditch (ft)	Side Slopes ditch	Bottom Width of Ditch (ft)	Excavation Area (CY)	Clear/Grub and Reseeding area (SF)
26	2 : 1	6	61	545

Feature 4: Clear Woody vegetation on existing levee

Assumptions:

1. Clear 15' on each side of levee
2. Existing vegetation includes small trees and brush.
3. Includes levee from Lawndale to Railroad, and Railroad to 47th st.

Levee length (ft)	Clearing width (ft)	Area to clear (AC)
4600	45	4.75

Feature 5: Repair levee to existing elevation

Assumptions:

1. Total length of levee to be repaired is 4100'

Seeding Area (entire levee)	200,000	SF

Feature 5 Landside Quantities:

Assumptions:

1. Landside Sta 0+40 to 4+00 will be regraded to a 2.5:1 slope, existing slopes vary and are approximately 2:1. The Landside levee crest point will be cut back in order to meet this slope requirement without filling the existing ditch.
2. The majority of the remainder of the landside slopes (4+00 to 41+00) are at a 2.5:1 slope and meet minimum requirements. Assumed minimal grading and recovery will be needed. Assumed 500' of slope will need to be regraded along entire length, and existing soil will be used to even the slopes.
3. Average height of levee slope on landside is 18' (592' to 600').

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Sta 0+40 to 4+00

Cut Volume:	156	CY
Fill Volume:	387	CY

Sta 4+00 to 41+00

500' of Existing landside slopes to be regraded based on topographic survey.

Landside topsoil stripping:

Stations	Length (ft)	Depth Strip (FT)	Depth Topsoil (FT)	Volume Strip (CY)	Volume Topsoil (CY)
0+40 to 4+00	380	0.5	0.5	240	283
4+00 to 41+00	500	0.5	0.5	316	373

	Landside Stations 0+40 to 4+00
Existing Surface Length of Hypotenuse	34
Proposed Surface Length of Hypotenuse	40

Feature 5 Riverside Quantities:

Assumptions:

1. The existing slope area calculated below is based on an avg. 15' levee height.
2. No Riverside Improvements needed past Station 30+75, as meets minimum slope requirement
3. Stations 0+00 to 20+00 will have riprap placed on the riverside at a 2:1 slope.
4. Station 20+00 to 30+00 will have clay built up on the riverside to 2.5:1 slope. After reviewing cross section data from the HEC-RAS model, the existing slopes beyond station 31+00 meet the 2.5: 1 requirement.
5. Assume weight conversion for rip rap is 1.5
6. Assume will need to remove topsoil on the landside slope and Riverside slope where clay and riprap are proposed.

Existing survey data:

Survey XS	Levee Stationing	Levee Crest Elevation (NAVD88)	SSP Top Elevation (NAVD88)	Notes	dy/dx (Based on HEC-RAS model)
77614	0+30	604.79			
77821	2+60	601.49	602.4		0.63
78741	12+25	598.86	602.5		0.56
79597	20+90	599.43	602.7		0.68
79900	23+85	599.13	602.8		0.45
80640	30+75	600.39	603.5		0.22
81300	38+25	601.09	603.0		0.44
81609	39+95	601.18	603.0		0.32
82076	41+00	600.63	603.2	End of Sheet pile at RR	
82107		603.17		South side of RR	
82141					
82199					
82234		602.27		North side of RR	
82284		602.32			
82415		603.34			
82605		603.69			
82651				South side of 47th	
82726				North side of 47th	
83026		602.6			
83480		603.75			
83788		604.81			

Calculated Stone quantities:

Survey XS	Existing Slope	Proposed Slope	Length (ft)	Existing slope Area (sf)	Desired slope area (sf)	Avg Cross Sectional addition (sf)	Vol Material (CY)	Volume + 15% contingency	
77821	1.6 : 1	2 : 1	260	180	225	45	433	498	
78741	1.8 : 1	2 : 1	965	202.5	225	22.5	804	925	**Total Stone Volume (CY) (Sta 0+00 to 20+90):**
79597	1.5 : 1	2:1	865	168.75	225	56.25	1802	2072	**3,496**
79900	2.2 : 1	2.5 : 1	295	247.5	281.25	33.75	369	424	**Total Clay Volume (Sta 20+90 to 30+00)**
80640	4.5 : 1	2.5 : 1	690	247.5	281.25	33.75	863	992	**1,416**
81300	2.3 : 1	2.5 : 1							
81609	3.1: 1	2.5 : 1							

Riverside Topsoil Stripping:

	STRIP/REPLACE TOPSOIL			
	Depth Strip (FT)	Depth Topsoil (FT)	Volume Strip (CY)	Volume Topsoil (CY)
Riverside riprap	0.5	0	1,095	0
Riverside clay	0.5	0.5	579	370

RIVERSIDE RIPRAP **RIVERSIDE CLAY**

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Existing Surface Length of Hypotenuse	28	32
Proposed Surface Length of Hypotenuse	34	40

Replace Existing Gravel Path:

Path will be replaced from Sta. 0+00 to 4+00, 500' for repair along Sta. 4+00 to 41+00, for a total of 900'. Allow 10% contingency for additional area damaged during construction.

Path Width (ft)	12
Path Length (ft)	1,000
Stone Path Area (SF)	12,000

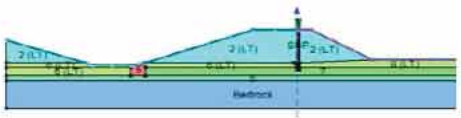
Feature 6: Install toe drain

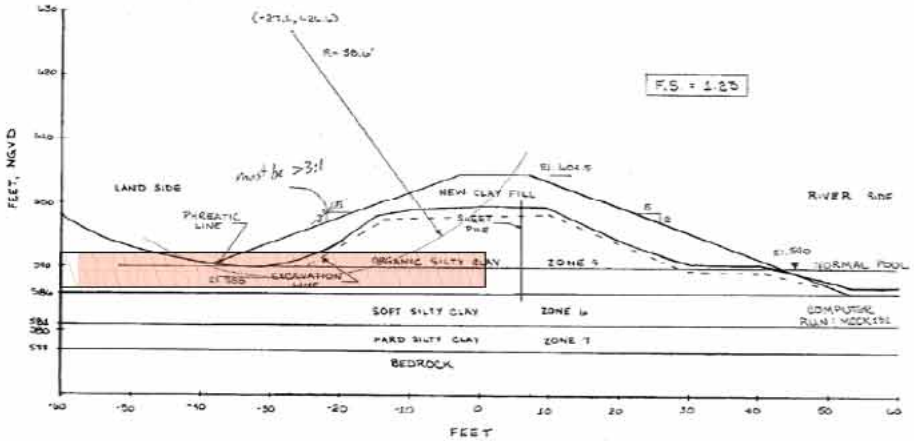
Assumptions:

1. Required from station 30+00 to 41+00
2. 5' by 5' toe drain filled with gravel installed along the landside of the levee.

Toe drain length (ft)	Cross sectional area (sf)	Volume Excavation & grave	15% Overdig Allowance (CY)
1100	25	1019	1171

Geotext Surface Area (SF)
16500





Feature 7: Repair levee between railroad and 47th St to existing elevation

Assumptions:

1. Total length of levee to be repaired is 550'
2. Since not raising the levee, existing gravel path will remain in place.
3. Based on Lidar data combined with survey data, existing slope varies between 2:1 and 3:1, which meets levee standards. Refer to trial surfaces ('RR to 47th Repair 3:1' and 'RR to 47th Repair 2:1'). Minimal fill (384 CY) was needed at the 3:1 slope to meet the requirement, no fill needed at 2:1 slope.

*No work required for this scenario, only clearing which is included under Feature 4.

Feature 8: Railroad clay blanket tiebacks

	Length (ft)	Thickness (ft)	Length along slope (ft)	Volume Clay (CY)
North Side blanket:	175	3.00	25	486
South Side blanket:	200	3.00	25	556

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US Army Corps of Engineers, Chicago District	PROJECT TITLE: McCook Levee	COMPUTED BY: Laura Vanden Berg	DATE: 11/13/2017	SHT 2
	COMPUTATION TITLE: Alternative 3A Quantities	CHECKED BY: Faye Leffler	DATE: 12/10/2017	

Feature 1: South Levee

Assumptions:

1. Levee is repaired to existing elevation
2. Elevations are based on USACE survey performed June, 2017 and supplemented by Lidar contour data for the area.
3. Sta 0+40 to 4+00, levee landside slopes vary and are approximately 2:1. They will be repaired to 2.5:1, and the levee crest point will be cut back to avoid excess fill in the ditch.
4. Sta 4+00 to 20+90, levee landside slopes vary but meet levee standards and are at least 2.5:1 overall. Minimal repair will be needed, assumed 300' over entire length, and will reuse existing material.
5. Levee river slopes are 2:1, repaired with riprap.
6. Assume weight conversion for rip rap is 1.5
7. Assume will need to remove topsoil on the landside slope and Riverside slope where clay and riprap are proposed.

Landside slope improvements

	Cut Volume (CY)	Fill Volume (CY)	Seeding Area (SF)
Sta 0+40 to 4+00*	156	387	12,000
Sta 4+00 to 20+90	0	0	

*See InRoads Corridor 'Landside Slope_Cutback' for source of quantities.

Riverside slope improvements

Levee Stationing	Existing Slope (Based on HEC-RAS)	Proposed Slope	Length (ft)	Existing slope Area (sf)	Desired slope area (sf)	Avg Cross Sectional addition (sf)	Vol Material (CY)	Volume Mat'l + 15% contingeny	
0+30									
2+60	1.6 : 1	2 : 1	260	180	225	45	433	498	
12+25	1.8 : 1	2 : 1	965	202.5	225	22.5	804	925	Total Stone Volume (CY)
20+90	1.5 : 1	2:1	865	168.75	225	56.25	1802	2072	3,496

Landside topsoil stripping:

Stations	Length (ft)	Depth Strip (FT)	Depth Topsoil (FT)	Volume Strip (CY)	Volume Topsoil (CY)
0+40 to 4+00	380	0.5	0.5	240	283
Sta 4+00 to 20+90	300	0.5	0.5	190	224

	Landside Stations 0+40 to 4+00
Existing Surface Length of Hypotenuse	34
Proposed Surface Length of Hypotenuse	40

South Levee Tieback:

Tied into elevation 602.3 south of Lawndale Ave. See corridor/surface 'McCook 2: Tieback"

Topsoil stripping assumed to be 6" and replaced.

Levee length:	169	LF
Fill Volume:	550	CY
Seeding Area	4965	SF
Clear/Grub Area*	8345	SF
Topsoil stripping/replace:	92	CY

*Clear and Grub area includes New levee seeding area + 20' easement total (less than 15' on each toe due to proximity to existing Lawndale Ave)

North Levee Tieback:

Tied to elevation 602.3', crossing McCook ditch. See corridor/surface 'McCook4: South levee north tieback'

Levee length:	172	LF
Fill Volume:	1271	CY
Seeding Area	7355	SF
Clear/Grub Area*	10795	CY
Topsoil stripping/replace:	136	CY

*Clear and Grub area includes New levee seeding area + 20' easement total (less than 15' on each toe due to proximity to existing Lawndale Ave)

Clear Woody vegetation on entire south levee

Assumptions:

1. Clear 15' on each side of levee
2. Existing vegetation includes small trees and brush.
3. Length measured in Microstation. South levee + south levee tieback + north levee tieback

Levee length (ft)	Clearing width (ft)	Area to clear (AC)
2438	45	2.52

Replace Existing Gravel Path:

Path Width (ft)	12
Path Length (ft)	1,500
Stone Path Area (SF)	18,000

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Feature 3: North Levee

Tieback levee for north levee:

Assumptions:

1. Levee tied into elevation 603

Refer to Corridor/Surface 'McCook 4:North levee to RR'

Length of levee:		LF
Fill Volume:	1602	CY
Seeding Area	12738	SF

Install toe drain

Assumptions:

1. Required along the north tieback levee.
2. 5' by 5' toe drain filled with gravel installed along the landside of the levee.

Toe drain length (ft)	Cross sectional area (sf)	Volume Excavation & gravel (C	15% Overdig Allowance (CY)
350	25	324	373

Geotext Surface Area (SF)
5250

US Army Corps of Engineers. Chicago District	PROJECT TITLE: McCook Levee	COMPUTED BY: Laura Vanden Berg	DATE: 11/13/2017 SHT 2
	COMPUTATION TITLE: Alternative 3A Quantities	CHECKED BY: Jeremiah Gadbois	DATE:

Clear Woody vegetation on tieback levee

13460

1. Clear 15' on each side of levee. Levee distance toe to toe is 60' at widest portion.
2. Existing vegetation includes small trees and brush.

Levee length (ft)	Clearing width (ft)	Area to clear (AC)
223	90	0.46

Feature 3: RR to 47th Street Levee

Assumptions:

1. Levee repaired to existing elevation
2. Elevations are based on USACE Survey in June 2017 and supplemented by Lidar contour data for the area.
3. Levee side slopes are 2.5: 1
4. Levee material is clay.
5. Levee distance from RR to 47th Street, 540'
2. Since not raising the levee, existing gravel path will remain in place.
3. Based on Lidar data combined with USACE survey data, existing slope varies between 2:1 and 3:1, which meets levee standards. Refer to trial surfaces ('RR to 47th Repair 3:1' and 'RR to 47th Repair 2:1'). Minimal fill (384 CY) was needed at the 3:1 slope to meet the requirement, no fill needed at 2:1 slope.

Clear Woody vegetation on existing levee

Assumptions:

1. Clear 15' on each side of levee
2. Existing vegetation includes small trees and brush.

Levee length (ft)	Clearing width (ft)	Area to clear (AC)
540	45	0.56

Feature 4: Railroad clay blanket tiebacks

Assumptions:

1. Strip and replace topsoil.
2. Meet top elevation at railroadembankment, approx. elevation 601 based on Lidar data.
3. Blanket ends at existing railroad bridge overpass.

	Length (ft)	Thickness (ft)	Length along slope (ft)	Volume Clay (CY)
North Side blanket:	175	3.00	25	486
South Side blanket:	200	3.00	25	556

Feature 5: Revise McCook Ditch culvert at Lawndale

Assumptions:

1. Existing culvert is 60" diameter.
2. Exiting culvert is 100' long.
3. Install Sluice gate in concrete structure just upstream of current culvert entrance at Lawndale. Gate stays partially open during normal flow conditions.
4. Trash rack installed at the entrance, 65" by 65". ** Use Rick's structure as a reference
5. Replace existing headwall. Based on observation, 7' by 12' concrete structure, 1' thick. Structure is directly below Lawndale Ave, which would need to be supported during construction of a new headwall.

Feature 6: Construct a culvert under the existing levee from McCook Ditch to Des Plaines River

Assumptions:

1. Culvert will be 35' long Circular pipe, RCP or CMP depending on cost differential.
2. 39 or 60 inch pipe (depending on material) based on hydraulic analysis. RCP pipe is recommended over CMP.

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3. A flap gate will be installed at the Des Plaines River outlet.
4. Remaining 50' will be a ditch from the existing McCook Ditch to the culvert entrance. Ditch bottom elevation and culvert invert are 584.87'. Excavation and seeding area quantities calculated in InRoads.

Length Pipe (ft)	RCP, Diameter Pipe (in)	CMP (in)
35	39	60

Landside Ditch:

Length Ditch (ft)	Side Slopes ditch	Bottom Width of Ditch (ft)	Excavation Area (CY)	Reseeding area (SF)	Riprap Protection (CY)
16	2 : 1	6	40	350	6

Riverside Ditch:

Length Ditch (ft)	Side Slopes ditch	Bottom Width of Ditch (ft)	Excavation Area (CY)	Reseeding area (SF)	Riprap Protection (CY)
26	2 : 1	6	61	545	10

Feature 6: Construct a second culvert under the existing levee from north portion of McCook Ditch to Des Plaines River

Assumptions:
1. Culvert will be 50' long Circular RCP.
2. 24" pipe, only needs to drain area directly between the two levees.
3. No backflow preventer is needed, since this will no longer be part of the line of protection.
4. Remaining 50' will be a ditch from the existing McCook Ditch to the culvert entrance. Ditch bottom elevation is 584.5'. Excavation and seeding area quantities calculated in InRoads.
5. ** This plan may be revised in further design to remove the existing sheetpile and notch a ditch in lieu of a culvert.

Length Pipe (ft)	Diameter Pipe (in)
50	24

Landside Ditch:

Length Ditch (ft)	Side Slopes ditch	Bottom Width of Ditch (ft)	Excavation Area (CY)	Reseeding area (SF)	Riprap Protection (CY)
16	2 : 1	6	40	350	6

Riverside Ditch:

Length Ditch (ft)	Side Slopes ditch	Bottom Width of Ditch (ft)	Excavation Area (CY)	Reseeding area (SF)	Riprap Protection (CY)
26	2 : 1	6	61	545	10

DRAFT

US Army Corps of Engineers. Chicago District	PROJECT TITLE: McCook Levee 205	COMPUTED BY: Laura Vanden Berg	DATE: 11/30/2017 SHT 4
	COMPUTATION TITLE: Alternative 2Ba quantities	CHECKED BY: Faye Leffler	DATE: 12/10/2017

Feature: Repair levee north of 47th street

Assumptions:

1. Repair levee to existing elevation (varies from 601 to 603.1, which is considered high ground)

Refer to InRoads reports for Basis of quantities. Cut quantities are ignored, as the slopes in these areas are greater than 3:1 and can remain. Approximately 1/2 the riverside length will be regarded. Majority of levee slopes are already at 3:1 land side slope. Assumed created or retained 3:1 slope to toe elevation of 593.

	Fill Volume (CY)	Seeding Area (SF)
Riverside slope:	975	25,150
Landside slope:	0	0

Riverside topsoil stripping:

*Use higher topsoil QTY to be conservative, estimated using the 0.5 ft over the calculated seeding area.

Stations	Length (ft)	Depth Strip (FT)	Depth Topsoil (FT)	Volume Strip (CY)	Volume Topsoil (CY)	Volume Topsoil CHECK (CY)*
0+00 to 8+70	500	0.5	0.5	316	373	466

Existing Surface Length of Hypotenuse	34
Proposed Surface Length of Hypotenuse	40

Clear Woody vegetation on existing levee

Assumptions:

1. Clear 15' on each side of levee
2. Existing vegetation includes small trees and brush.

Levee length (ft)	Clearing width (ft)	Area to clear (AC)
870	45	0.90

DRAFT

US Army Corps of Engineers, Chicago District	PROJECT TITLE: McCook Levee 205	COMPUTED BY: Laura Vanden Berg	DATE: 11/30/2017 SHT 4
	COMPUTATION TITLE: Alternative 2Bb	CHECKED BY: Faye Leffler	DATE: 12/10/2017

Feature: Raise levee north of 47th street (Lyons Levee)

Assumptions:

1. Raise levee to minimum elevation 603.1
2. Crest is 22', approximately the same as existing. Side Slopes are 3:1
3. Assume 6" topsoil remove and replace.

Refer to InRoads reports for Basis of quantities.

Fill Volume:	3277	CY
Seeding Area	56908	SF

Riverside topsoil stripping:

Stations	Length (ft)	Depth Strip (FT)	Depth Topsoil (FT)	Volume Strip (CY)	Volume Topsoil (CY)
Landside 0+00 to 8+70	870	0.5	0.5	548	709
Riverside 0+00 to 8+70	870	0.5	0.5	548	709

Existing Surface Length of Hypotenuse	34
Proposed Surface Length of Hypotenuse	44

Clear Woody vegetation on existing levee

Assumptions:

1. Clear 15' on each side of levee
2. Existing vegetation includes small trees and brush.

Levee length (ft)	Clearing width (ft)	Area to clear (AC)
870	45	0.90

DRAFT

Corridor Model Component Quantities Report

Report Created: 7/28/2017
Time: 2:06pm

Corridor Name: Landside Slope_Cutback

Alignment Name: C-Alignments

Input Grid Factor: 1.000000

Note: All units in this report are in feet, square feet and cubic yards unless specified otherwise.

		Component End Area Totals		Component Surface Area Totals			
Station	**Material**	**Area**	**Volume**	**Length**	**Area**	**Unit Cost**	**Material Cost**
0+40.0000						[redacted]	
	C-Levee Bench:			37.78			
	Cut Volume:	19.80					
	Fill Volume:	14.98					
0+50.0000							
	C-Levee Bench:			37.11	374.43		
	Cut Volume:	13.26	6.1				
	Fill Volume:	44.70	11.1				
0+60.0000							
	C-Levee Bench:			36.43	367.68		
	Cut Volume:	8.03	3.9				
	Fill Volume:	53.66	18.2				
0+70.0000							
	C-Levee Bench:			35.76	360.93		
	Cut Volume:	4.10	2.2				
	Fill Volume:	57.14	20.5				
0+76.9654							
	C-Levee Bench:			35.29	247.41		
	Cut Volume:	2.58	0.9				
	Fill Volume:	53.89	14.3				
0+80.0000							
	C-Levee Bench:			35.20	106.95		
	Cut Volume:	3.41	0.3				
	Fill Volume:	49.71	5.8				
0+90.0000							
	C-Levee Bench:			34.93	350.68		
	Cut Volume:	5.64	1.7				
	Fill Volume:	37.16	16.1				

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
1+00.0000							
	C-Levee Bench:			34.66	347.97		
	Cut Volume:	7.98	2.5				
	Fill Volume:	27.43	12.0				
1+10.0000							
	C-Levee Bench:			34.39	345.26		
	Cut Volume:	10.73	3.5				
	Fill Volume:	20.79	8.9				
1+20.0000							
	C-Levee Bench:			34.12	342.56		
	Cut Volume:	13.96	4.6				
	Fill Volume:	18.41	7.3				
1+30.0000							
	C-Levee Bench:			33.85	339.85		
	Cut Volume:	17.43	5.8				
	Fill Volume:	21.97	7.5				
1+40.0000							
	C-Levee Bench:			33.58	337.14		
	Cut Volume:	17.20	6.4				
	Fill Volume:	27.56	9.2				
1+42.4936							
	C-Levee Bench:			33.51	83.65		
	Cut Volume:	16.37	1.6				
	Fill Volume:	29.06	2.6				
1+50.0000							
	C-Levee Bench:			33.33	250.87		
	Cut Volume:	15.46	4.4				
	Fill Volume:	30.50	8.3				
1+60.0000							
	C-Levee Bench:			33.09	332.09		
	Cut Volume:	14.00	5.5				
	Fill Volume:	31.60	11.5				
1+70.0000							
	C-Levee Bench:			32.85	329.67		
	Cut Volume:	12.58	4.9				

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
		33.65	12.1			[redacted]	[redacted]
1+80.0000							
C-Levee Bench:				32.60	327.25		
	Cut Volume:	11.23	4.4				
	Fill Volume:	35.68	12.8				
1+90.0000							
C-Levee Bench:				32.36	324.84		
	Cut Volume:	9.97	3.9				
	Fill Volume:	37.37	13.5				
2+00.0000							
C-Levee Bench:				32.12	322.42		
	Cut Volume:	8.77	3.5				
	Fill Volume:	38.75	14.1				
2+10.0000							
C-Levee Bench:				31.88	320.00		
	Cut Volume:	7.65	3.0				
	Fill Volume:	39.90	14.6				
2+14.9869							
C-Levee Bench:				31.76	158.68		
	Cut Volume:	7.11	1.4				
	Fill Volume:	40.40	7.4				
2+20.0000							
C-Levee Bench:				31.64	158.92		
	Cut Volume:	6.58	1.3				
	Fill Volume:	40.80	7.5				
2+30.0000							
C-Levee Bench:				31.41	315.28		
	Cut Volume:	5.60	2.3				
	Fill Volume:	41.49	15.2				
2+40.0000							
C-Levee Bench:				31.18	312.99		
	Cut Volume:	4.87	1.9				
	Fill Volume:	42.16	15.5				
2+50.0000							
C-Levee Bench:				30.95	310.69		

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
		7.42	2.3			[redacted]	[redacted]
	Fill Volume:	35.52	14.4				
2+60.0000							
	C-Levee Bench:			30.72	308.39		
	Cut Volume:	12.15	3.6				
	Fill Volume:	29.05	12.0				
2+70.0000							
	C-Levee Bench:			30.49	306.09		
	Cut Volume:	18.06	5.6				
	Fill Volume:	26.89	10.4				
2+80.0000							
	C-Levee Bench:			30.26	303.80		
	Cut Volume:	22.43	7.5				
	Fill Volume:	26.32	9.9				
2+90.0000							
	C-Levee Bench:			30.03	301.50		
	Cut Volume:	22.32	8.3				
	Fill Volume:	26.13	9.7				
2+90.3492							
	C-Levee Bench:			30.03	10.49		
	Cut Volume:	21.06	0.3				
	Fill Volume:	28.31	0.4				
3+00.0000							
	C-Levee Bench:			29.43	286.93		
	Cut Volume:	18.85	7.1				
	Fill Volume:	26.44	9.8				
3+10.0000							
	C-Levee Bench:			28.82	291.28		
	Cut Volume:	14.21	6.1				
	Fill Volume:	24.81	9.5				
3+20.0000							
	C-Levee Bench:			28.21	285.15		
	Cut Volume:	9.69	4.4				
	Fill Volume:	25.96	9.4				
3+30.0000							

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
				27.59	279.01		
	Cut Volume:	6.04	2.9				
	Fill Volume:	30.61	10.5				
3+30.5153							
	C-Levee Bench:			27.56	14.21		
	Cut Volume:	5.87	0.1				
	Fill Volume:	30.96	0.6				
3+40.0000							
	C-Levee Bench:			27.19	259.68		
	Cut Volume:	6.47	2.2				
	Fill Volume:	26.46	10.1				
3+50.0000							
	C-Levee Bench:			26.81	270.00		
	Cut Volume:	7.36	2.6				
	Fill Volume:	18.10	8.3				
3+60.0000							
	C-Levee Bench:			26.42	266.12		
	Cut Volume:	8.24	2.9				
	Fill Volume:	7.53	4.7				
3+70.0000							
	C-Levee Bench:			26.03	262.23		
	Cut Volume:	14.48	4.2				
	Fill Volume:	0.14	1.4				
3+79.9345							
	C-Levee Bench:			25.64	256.67		
	Cut Volume:	23.05	6.9				
	Fill Volume:		0.0				
3+80.0000							
	C-Levee Bench:			25.64	1.68		
	Cut Volume:	22.84	0.1				
	Fill Volume:						
3+90.0000							
	C-Levee Bench:			25.40	255.22		
	Cut Volume:	24.08	8.7				
	Fill Volume:	0.00	0.0				

		Component End Area Totals		Component Surface Area Totals			
Station	**Material**	**Area**	**Volume**	**Length**	**Area**	**Unit Cost**	**Material Cost**
C-Levee Bench:				25.28	126.71	[redacted]	
Cut Volume:		24.61	4.5				
Fill Volume:		0.00	0.0				
Totals:							
C-Levee Bench:					11153.38		
Cut Volume:			156.3				
Fill Volume:			386.9				
						Total Estimated Cost:	[redacted]

Corridor Model Component Quantities Report

Report Created: 7/11/2017
Time: 2:57pm

Corridor Name: McCook2: Tieback

Alignment Name: C-Alignments66

Input Grid Factor: 1.000000

Note: All units in this report are in feet, square feet and cubic yards unless specified otherwise.

		Component End Area Totals		Component Surface Area Totals			
Station	**Material**	**Area**	**Volume**	**Length**	**Area**	**Unit Cost**	**Material Cost**
0+27.7771						[redacted]	
	C-Levee Top:			10.00			
	C-Levee Bench:			22.66			
	Cut Volume:	5.77					
	Fill Volume:	55.88					
0+30.0000							
	C-Levee Top:			10.00	22.23		
	C-Levee Bench:			22.14	49.78		
	Cut Volume:	4.41	0.4				
	Fill Volume:	56.39	4.6				
0+40.0000							
	C-Levee Top:			10.00	100.00		
	C-Levee Bench:			19.97	210.53		
	Cut Volume:	0.55	0.9				
	Fill Volume:	69.33	23.3				
0+50.0000							
	C-Levee Top:			10.00	100.00		
	C-Levee Bench:			19.69	198.31		
	Cut Volume:		0.1				
	Fill Volume:	86.29	28.8				
0+60.0000							
	C-Levee Top:			10.00	100.00		
	C-Levee Bench:			20.32	200.09		
	Cut Volume:						
	Fill Volume:	101.94	34.9				
0+70.0000							
	C-Levee Top:			10.00	100.00		
	C-Levee Bench:			21.05	206.85		
	Cut Volume:						

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
	Fill Volume:	115.66	40.3			[redacted]	
0+80.0000							
	C-Levee Top:			10.00	100.00		
	C-Levee Bench:			21.77	214.07		
	Cut Volume:						
	Fill Volume:	127.23	45.0				
0+90.0000							
	C-Levee Top:			10.00	100.00		
	C-Levee Bench:			22.85	223.10		
	Cut Volume:						
	Fill Volume:	136.82	48.9				
1+00.0000							
	C-Levee Top:			10.00	100.00		
	C-Levee Bench:			24.33	235.93		
	Cut Volume:						
	Fill Volume:	144.44	52.1				
1+10.0000							
	C-Levee Top:			10.00	100.00		
	C-Levee Bench:			25.81	250.73		
	Cut Volume:						
	Fill Volume:	149.64	54.5				
1+20.0000							
	C-Levee Top:			10.00	100.00		
	C-Levee Bench:			26.78	262.97		
	Cut Volume:						
	Fill Volume:	149.87	55.5				
1+30.0000							
	C-Levee Top:			10.00	100.00		
	C-Levee Bench:			27.01	268.95		
	Cut Volume:						
	Fill Volume:	150.65	55.7				
1+40.0000							
	C-Levee Top:			10.00	100.00		
	C-Levee Bench:			25.70	263.54		
	Cut Volume:						
	Fill Volume:	116.78	49.5				

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
	C-Levee Top:			10.00	100.00	[redacted]	[redacted]
	C-Levee Bench:			19.12	224.11	[redacted]	[redacted]
	Cut Volume:					[redacted]	[redacted]
	Fill Volume:	66.09	33.9			[redacted]	[redacted]
1+60.0000						[redacted]	[redacted]
	C-Levee Top:			10.00	100.00	[redacted]	[redacted]
	C-Levee Bench:			9.49	143.05	[redacted]	[redacted]
	Cut Volume:					[redacted]	[redacted]
	Fill Volume:	25.23	16.9			[redacted]	[redacted]
1+68.4696						[redacted]	[redacted]
	C-Levee Top:			10.00	84.70	[redacted]	[redacted]
	C-Levee Bench:			2.77	51.90	[redacted]	[redacted]
	Cut Volume:	0.06	0.0			[redacted]	[redacted]
	Fill Volume:	5.23	4.8			[redacted]	[redacted]
Totals:						[redacted]	[redacted]
	C-Levee Top:				1406.92	[redacted]	[redacted]
	C-Levee Bench:				3003.92	[redacted]	[redacted]
	Cut Volume:		1.4			[redacted]	[redacted]
	Fill Volume:		548.5			[redacted]	[redacted]
					Total Estimated Cost:	[redacted]	[redacted]

Corridor Model Component Quantities Report

Report Created: 7/26/2017
Time: 1:00pm

Corridor Name: Lawndale Ditch_landside

Alignment Name: Northern Grading Alignment7

Input Grid Factor: 1.000000

Note: All units in this report are in feet, square feet and cubic yards unless specified otherwise.

		Component End Area Totals		Component Surface Area Totals			
Station	**Material**	**Area**	**Volume**	**Length**	**Area**	**Unit Cost**	**Material Cost**
0+00.0000							
	Cut Volume:	15.54					
	Fill Volume:						
	Bottom Mesh:			11.77			
0+01.0000							
	Cut Volume:	26.35	0.8				
	Fill Volume:						
	Bottom Mesh:			14.23	13.00		
0+02.0000							
	Cut Volume:	32.43	1.1				
	Fill Volume:						
	Bottom Mesh:			15.73	14.98		
0+03.0000							
	Cut Volume:	36.87	1.3				
	Fill Volume:						
	Bottom Mesh:			16.68	16.21		
0+04.0000							
	Cut Volume:	41.53	1.5				
	Fill Volume:						
	Bottom Mesh:			17.63	17.16		
0+05.0000							
	Cut Volume:	46.42	1.6				
	Fill Volume:						
	Bottom Mesh:			18.58	18.11		
0+06.0000							
	Cut Volume:	51.53	1.8				
	Fill Volume:						
	Bottom Mesh:			19.53	19.06		

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
0+07.0000						[redacted]	
	Cut Volume:	56.87	2.0				
	Fill Volume:						
	Bottom Mesh:			20.49	20.01		
0+08.0000							
	Cut Volume:	62.43	2.2				
	Fill Volume:						
	Bottom Mesh:			21.44	20.96		
0+09.0000							
	Cut Volume:	68.22	2.4				
	Fill Volume:						
	Bottom Mesh:			22.39	21.91		
0+10.0000							
	Cut Volume:	74.32	2.6				
	Fill Volume:						
	Bottom Mesh:			23.41	22.90		
0+11.0000							
	Cut Volume:	80.89	2.9				
	Fill Volume:						
	Bottom Mesh:			24.45	23.93		
0+12.0000							
	Cut Volume:	87.92	3.1				
	Fill Volume:						
	Bottom Mesh:			25.48	24.96		
0+13.0000							
	Cut Volume:	95.42	3.4				
	Fill Volume:						
	Bottom Mesh:			26.52	26.00		
0+14.0000							
	Cut Volume:	103.38	3.7				
	Fill Volume:						
	Bottom Mesh:			27.56	27.04		
0+15.0000							
	Cut Volume:	111.81	4.0				
	Fill Volume:						

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
				28.61	28.08	[redacted]	
0+16.0000							
	Cut Volume:	120.59	4.3				
	Fill Volume:						
	Bottom Mesh:			29.72	29.16		
0+16.3480							
	Cut Volume:	123.72	1.6				
	Fill Volume:						
	Bottom Mesh:			30.11	10.41		
Totals:							
	Cut Volume:		40.3				
	Fill Volume:						
	Bottom Mesh:				353.88		
					Total Estimated Cost:		[redacted]

Corridor Model Component Quantities Report

Report Created: 7/26/2017
Time: 12:56pm

Corridor Name: Lawndale Ditch_riverside

Alignment Name: Northern Grading Alignment8

Input Grid Factor: 1.000000

Note: All units in this report are in feet, square feet and cubic yards unless specified otherwise.

		Component End Area Totals		Component Surface Area Totals			
Station	**Material**	**Area**	**Volume**	**Length**	**Area**	**Unit Cost**	**Material Cost**
0+00.0000							
	Cut Volume:	121.43					
	Fill Volume:						
	Bottom Mesh:			29.82			
0+01.0000							
	Cut Volume:	116.63	4.4				
	Fill Volume:						
	Bottom Mesh:			29.22	29.52		
0+02.0000							
	Cut Volume:	111.91	4.2				
	Fill Volume:						
	Bottom Mesh:			28.62	28.92		
0+03.0000							
	Cut Volume:	107.29	4.1				
	Fill Volume:						
	Bottom Mesh:			28.02	28.32		
0+04.0000							
	Cut Volume:	102.76	3.9				
	Fill Volume:						
	Bottom Mesh:			27.42	27.72		
0+05.0000							
	Cut Volume:	98.32	3.7				
	Fill Volume:						
	Bottom Mesh:			26.82	27.12		
0+06.0000							
	Cut Volume:	93.97	3.6				
	Fill Volume:						
	Bottom Mesh:			26.22	26.52		

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
0+07.0000						[redacted]	[redacted]
	Cut Volume:	89.70	3.4				
	Fill Volume:						
	Bottom Mesh:			25.62	25.92		
0+08.0000							
	Cut Volume:	85.53	3.2				
	Fill Volume:						
	Bottom Mesh:			25.02	25.32		
0+09.0000							
	Cut Volume:	81.45	3.1				
	Fill Volume:						
	Bottom Mesh:			24.42	24.72		
0+10.0000							
	Cut Volume:	77.41	2.9				
	Fill Volume:						
	Bottom Mesh:			23.68	24.05		
0+11.0000							
	Cut Volume:	73.27	2.8				
	Fill Volume:						
	Bottom Mesh:			22.88	23.28		
0+12.0000							
	Cut Volume:	69.03	2.6				
	Fill Volume:						
	Bottom Mesh:			22.08	22.48		
0+13.0000							
	Cut Volume:	64.69	2.5				
	Fill Volume:						
	Bottom Mesh:			21.28	21.68		
0+14.0000							
	Cut Volume:	60.25	2.3				
	Fill Volume:						
	Bottom Mesh:			20.49	20.89		
0+15.0000							
	Cut Volume:	55.71	2.1				
	Fill Volume:						

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
				19.69	20.09	[redacted]	[redacted]
0+16.0000							
	Cut Volume:	51.07	2.0				
	Fill Volume:						
	Bottom Mesh:			18.89	19.29		
0+17.0000							
	Cut Volume:	46.33	1.8				
	Fill Volume:						
	Bottom Mesh:			18.10	18.50		
0+18.0000							
	Cut Volume:	41.49	1.6				
	Fill Volume:						
	Bottom Mesh:			17.30	17.70		
0+19.0000							
	Cut Volume:	36.54	1.4				
	Fill Volume:						
	Bottom Mesh:			16.50	16.90		
0+20.0000							
	Cut Volume:	31.53	1.3				
	Fill Volume:						
	Bottom Mesh:			15.59	16.05		
0+21.0000							
	Cut Volume:	26.73	1.1				
	Fill Volume:						
	Bottom Mesh:			14.49	15.04		
0+22.0000							
	Cut Volume:	22.24	0.9				
	Fill Volume:						
	Bottom Mesh:			13.39	13.94		
0+23.0000							
	Cut Volume:	18.08	0.7				
	Fill Volume:						
	Bottom Mesh:			12.35	12.87		
0+24.0000							
	Cut Volume:	14.50	0.6				

Station	Material	Component End Area Totals Area	Volume	Component Surface Area Totals Length	Area	Unit Cost	Material Cost
	Bottom Mesh:			11.42	11.89	[redacted]	[redacted]
0+25.0000							
	Cut Volume:	11.57	0.5				
	Fill Volume:						
	Bottom Mesh:			10.49	10.96		
0+26.0000							
	Cut Volume:	9.27	0.4				
	Fill Volume:						
	Bottom Mesh:			9.61	10.05		
0+26.3761							
	Cut Volume:	8.50	0.1				
	Fill Volume:						
	Bottom Mesh:			9.36	3.57		
Totals:							
	Cut Volume:		61.4				
	Fill Volume:						
	Bottom Mesh:				543.30		
						Total Estimated Cost:	[redacted]

Corridor Model Component Quantities Report

Report Created: 7/19/2017
Time: 3:12pm

Corridor Name: McCook4: South Levee tieback

Alignment Name: C-Alignments52

Input Grid Factor: 1.000000

Note: All units in this report are in feet, square feet and cubic yards unless specified otherwise.

		Component End Area Totals		Component Surface Area Totals			
Station	**Material**	**Area**	**Volume**	**Length**	**Area**	**Unit Cost**	**Material Cost**
0+06.7726						[redacted]	
C-Levee Bench:				0.47			
Cut Volume:		0.21					
Fill Volume:		0.39					
Bottom Mesh:				10.00			
0+10.0000							
C-Levee Bench:				1.56	3.28		
Cut Volume:			0.0				
Fill Volume:		4.25	0.3				
Bottom Mesh:				11.22	34.24		
0+20.0000							
C-Levee Bench:				3.64	26.01		
Cut Volume:							
Fill Volume:		15.64	3.7				
Bottom Mesh:				13.59	124.06		
0+30.0000							
C-Levee Bench:				3.92	37.81		
Cut Volume:							
Fill Volume:		22.49	7.1				
Bottom Mesh:				14.82	142.09		
0+40.0000							
C-Levee Bench:				4.31	41.18		
Cut Volume:							
Fill Volume:		22.15	8.3				
Bottom Mesh:				14.90	148.62		
0+50.0000							
C-Levee Bench:				4.82	45.65		
Cut Volume:							
Fill Volume:		21.02	8.0				

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
	Bottom Mesh:			15.03	149.66	[redacted]	[redacted]
0+60.0000							
	C-Levee Bench:			9.52	71.71		
	Cut Volume:						
	Fill Volume:	32.68	9.9				
	Bottom Mesh:			16.09	155.63		
0+70.0000							
	C-Levee Bench:			38.69	241.06		
	Cut Volume:						
	Fill Volume:	149.75	33.8				
	Bottom Mesh:			16.84	164.65		
0+80.0000							
	C-Levee Bench:			40.09	393.89		
	Cut Volume:						
	Fill Volume:	308.59	84.9				
	Bottom Mesh:			20.36	185.98		
0+90.0000							
	C-Levee Bench:			35.24	376.67		
	Cut Volume:						
	Fill Volume:	425.78	136.0				
	Bottom Mesh:			27.25	238.02		
1+00.0000							
	C-Levee Bench:			30.44	328.44		
	Cut Volume:						
	Fill Volume:	494.60	170.4				
	Bottom Mesh:			36.68	319.63		
1+10.0000							
	C-Levee Bench:			25.64	280.42		
	Cut Volume:						
	Fill Volume:	509.65	186.0				
	Bottom Mesh:			43.46	400.69		
1+20.0000							
	C-Levee Bench:			20.84	232.41		
	Cut Volume:						
	Fill Volume:	466.22	180.7				
	Bottom Mesh:			47.18	453.18		

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
	C-Levee Bench:			16.04	184.39	[redacted]	
	Cut Volume:						
	Fill Volume:	395.28	159.5				
	Bottom Mesh:			48.99	480.84		
1+40.0000							
	C-Levee Bench:			11.38	137.11		
	Cut Volume:						
	Fill Volume:	297.10	128.2				
	Bottom Mesh:			51.72	503.55		
1+50.0000							
	C-Levee Bench:			7.24	93.11		
	Cut Volume:						
	Fill Volume:	190.78	90.3				
	Bottom Mesh:			49.72	507.22		
1+60.0000							
	C-Levee Bench:			2.79	50.13		
	Cut Volume:						
	Fill Volume:	71.05	48.5				
	Bottom Mesh:			40.25	449.85		
1+70.0000							
	C-Levee Bench:			0.72	17.51		
	Cut Volume:						
	Fill Volume:	9.17	14.9				
	Bottom Mesh:			18.98	296.11		
1+72.1560							
	C-Levee Bench:			0.92	1.76		
	Cut Volume:						
	Fill Volume:	3.77	0.5				
	Bottom Mesh:			15.98	37.69		
Totals:							
	C-Levee Bench:				2562.55	[redacted]	
	Cut Volume:		0.0				
	Fill Volume:		1271.0				
	Bottom Mesh:				4791.71		
					Total Estimated Cost:	[redacted]	

Corridor Model Component Quantities Report

Report Created: 7/19/2017
Time: 2:57pm

Corridor Name: McCook4: North Levee to RR

Alignment Name: North Levee to RR

Input Grid Factor: 1.000000

Note: All units in this report are in feet, square feet and cubic yards unless specified otherwise.

		Component End Area Totals		Component Surface Area Totals			
Station	**Material**	**Area**	**Volume**	**Length**	**Area**	**Unit Cost**	**Material Cost**
0+00.0000						[redacted]	
C-Levee Bench:				35.97			
Cut Volume:		16.82					
Fill Volume:		11.49					
Bottom Mesh:				10.00			
0+10.0000							
C-Levee Bench:				52.56	442.63		
Cut Volume:		2.42	3.6				
Fill Volume:		85.17	17.9				
Bottom Mesh:				10.00	100.00		
0+20.0000							
C-Levee Bench:				52.41	524.84		
Cut Volume:		0.23	0.5				
Fill Volume:		154.32	44.4				
Bottom Mesh:				10.00	100.00		
0+30.0000							
C-Levee Bench:				56.00	542.06		
Cut Volume:		0.06	0.1				
Fill Volume:		304.17	84.9				
Bottom Mesh:				10.00	100.00		
0+40.0000							
C-Levee Bench:				54.13	550.63		
Cut Volume:			0.0				
Fill Volume:		375.07	125.8				
Bottom Mesh:				10.00	100.00		
0+50.0000							
C-Levee Bench:				53.58	538.52		
Cut Volume:							
Fill Volume:		385.47	140.8				

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
	Bottom Mesh:			10.00	100.00	[redacted]	[redacted]
0+60.0000							
	C-Levee Bench:			55.28	544.31		
	Cut Volume:						
	Fill Volume:	383.86	142.5				
	Bottom Mesh:			10.00	100.00		
0+70.0000							
	C-Levee Bench:			56.03	556.58		
	Cut Volume:	0.02	0.0				
	Fill Volume:	370.01	139.6				
	Bottom Mesh:			10.00	100.00		
0+80.0000							
	C-Levee Bench:			56.00	560.18		
	Cut Volume:	3.11	0.6				
	Fill Volume:	351.99	133.7				
	Bottom Mesh:			10.00	100.00		
0+90.0000							
	C-Levee Bench:			56.00	560.04		
	Cut Volume:	3.76	1.3				
	Fill Volume:	340.52	128.2				
	Bottom Mesh:			10.00	100.00		
1+00.0000							
	C-Levee Bench:			55.46	557.30		
	Cut Volume:	4.84	1.6				
	Fill Volume:	334.68	125.0				
	Bottom Mesh:			10.00	100.00		
1+10.0000							
	C-Levee Bench:			55.09	552.71		
	Cut Volume:	9.11	2.6				
	Fill Volume:	326.58	122.5				
	Bottom Mesh:			10.00	100.00		
1+20.0000							
	C-Levee Bench:			54.68	548.82		
	Cut Volume:	18.61	5.1				
	Fill Volume:	295.18	115.1				
	Bottom Mesh:			10.00	100.00		

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
	C-Levee Bench:			53.88	542.79	[redacted]	[redacted]
	Cut Volume:	43.68	11.5				
	Fill Volume:	228.61	97.0				
	Bottom Mesh:			10.00	100.00		
1+40.0000							
	C-Levee Bench:			50.94	524.10		
	Cut Volume:	88.11	24.4				
	Fill Volume:	146.91	69.5				
	Bottom Mesh:			10.00	100.00		
1+50.0000							
	C-Levee Bench:			45.38	481.62		
	Cut Volume:	115.84	37.8				
	Fill Volume:	80.70	42.1				
	Bottom Mesh:			10.00	100.00		
1+60.0000							
	C-Levee Bench:			37.68	415.33		
	Cut Volume:	122.32	44.1				
	Fill Volume:	41.14	22.6				
	Bottom Mesh:			10.00	100.00		
1+68.2479							
	C-Levee Bench:			33.63	294.11		
	Cut Volume:	47.96	26.0				
	Fill Volume:	28.73	10.7				
	Bottom Mesh:			10.00	82.48		
1+70.0000							
	C-Levee Bench:			33.64	58.93		
	Cut Volume:	46.70	3.1				
	Fill Volume:	28.51	1.9				
	Bottom Mesh:			10.00	17.52		
1+80.0000							
	C-Levee Bench:			33.67	336.56		
	Cut Volume:	37.00	15.5				
	Fill Volume:	24.52	9.8				
	Bottom Mesh:			10.00	100.00		
1+90.0000							
	C-Levee Bench:			33.83	337.52		

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
		34.50	13.2			[redacted]	[redacted]
	Fill Volume:	17.48	7.8				
	Bottom Mesh:			10.00	100.00		
2+00.0000							
	C-Levee Bench:			33.41	336.23		
	Cut Volume:	33.70	12.6				
	Fill Volume:	19.18	6.8				
	Bottom Mesh:			10.00	100.00		
2+08.0379							
	C-Levee Bench:			32.68	265.64		
	Cut Volume:	39.04	10.8				
	Fill Volume:	28.20	7.1				
	Bottom Mesh:			10.00	80.38		
2+10.0000							
	C-Levee Bench:			32.16	63.62		
	Cut Volume:	42.02	2.9				
	Fill Volume:	21.97	1.8				
	Bottom Mesh:			10.00	19.62		
2+20.0000							
	C-Levee Bench:			29.20	306.84		
	Cut Volume:	86.59	23.8				
	Fill Volume:	1.29	4.3				
	Bottom Mesh:			10.00	100.00		
2+22.4434							
	C-Levee Bench:			29.07	71.19		
	Cut Volume:	101.07	8.5				
	Fill Volume:		0.1				
	Bottom Mesh:			10.00	24.43		
Totals:							
	C-Levee Bench:				10513.11	[redacted]	
	Cut Volume:		249.6				
	Fill Volume:		1601.8				
	Bottom Mesh:				2224.43		
					Total Estimated Cost:	[redacted]	

Corridor Model Component Quantities Report

Report Created: 7/19/2017
Time: 12:44pm

Corridor Name: West Lyons Levee_Raise

Alignment Name: C-Alignments

Input Grid Factor: 1.000000

Note: All units in this report are in feet, square feet and cubic yards unless specified otherwise.

		Component End Area Totals		Component Surface Area Totals			
Station	**Material**	**Area**	**Volume**	**Length**	**Area**	**Unit Cost**	**Material Cost**
0+59.1881						[redacted]	[redacted]
	C-Levee Top:			86.71			
	Cut Volume:	0.02					
	Fill Volume:	143.36					
0+60.0000							
	C-Levee Top:			86.80	70.43		
	Cut Volume:		0.0				
	Fill Volume:	143.62	4.3				
0+70.0000							
	C-Levee Top:			86.94	868.71		
	Cut Volume:						
	Fill Volume:	162.88	56.8				
0+80.0000							
	C-Levee Top:			86.48	867.10		
	Cut Volume:						
	Fill Volume:	166.80	61.1				
0+84.1139							
	C-Levee Top:			86.60	356.02		
	Cut Volume:						
	Fill Volume:	168.98	25.6				
0+90.0000							
	C-Levee Top:			86.49	509.40		
	Cut Volume:						
	Fill Volume:	172.49	37.2				
1+00.0000							
	C-Levee Top:			86.86	866.74		
	Cut Volume:						
	Fill Volume:	170.97	63.6				

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
1+10.0000						[redacted]	
	C-Levee Top:			87.49	871.76		
	Cut Volume:						
	Fill Volume:	180.59	65.1				
1+20.0000							
	C-Levee Top:			87.19	873.39		
	Cut Volume:						
	Fill Volume:	178.29	66.5				
1+30.0000							
	C-Levee Top:			84.40	857.92		
	Cut Volume:						
	Fill Volume:	153.56	61.5				
1+40.0000							
	C-Levee Top:			82.27	833.35		
	Cut Volume:						
	Fill Volume:	141.46	54.6				
1+50.0000							
	C-Levee Top:			83.46	828.67		
	Cut Volume:						
	Fill Volume:	131.81	50.6				
1+60.0000							
	C-Levee Top:			83.85	836.56		
	Cut Volume:						
	Fill Volume:	142.88	50.9				
1+70.0000							
	C-Levee Top:			84.89	843.71		
	Cut Volume:						
	Fill Volume:	147.20	53.7				
1+80.0000							
	C-Levee Top:			85.40	851.43		
	Cut Volume:						
	Fill Volume:	146.54	54.4				
1+90.0000							
	C-Levee Top:			85.06	852.28		
	Cut Volume:						

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
		145.20	54.0			[redacted]	[redacted]
1+94.4274							
C-Levee Top:				84.06	374.38		
Cut Volume:							
Fill Volume:		139.17	23.3				
2+00.0000							
C-Levee Top:				83.04	465.58		
Cut Volume:							
Fill Volume:		135.00	28.3				
2+10.0000							
C-Levee Top:				81.85	824.45		
Cut Volume:							
Fill Volume:		126.53	48.4				
2+20.0000							
C-Levee Top:				80.27	810.61		
Cut Volume:							
Fill Volume:		126.84	46.9				
2+30.0000							
C-Levee Top:				78.46	793.65		
Cut Volume:							
Fill Volume:		124.36	46.5				
2+40.0000							
C-Levee Top:				77.98	782.17		
Cut Volume:							
Fill Volume:		133.59	47.8				
2+50.0000							
C-Levee Top:				76.87	774.22		
Cut Volume:							
Fill Volume:		120.01	47.0				
2+60.0000							
C-Levee Top:				75.93	763.98		
Cut Volume:							
Fill Volume:		118.17	44.1				
2+70.0000							
C-Levee Top:				76.26	760.95		

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
	Fill Volume:	115.37	43.2			[redacted]	[redacted]
2+80.0000							
	C-Levee Top:			76.40	763.30		
	Cut Volume:						
	Fill Volume:	123.31	44.2				
2+90.0000							
	C-Levee Top:			76.85	766.24		
	Cut Volume:						
	Fill Volume:	115.31	44.2				
2+96.8503							
	C-Levee Top:			77.49	528.61		
	Cut Volume:						
	Fill Volume:	114.72	29.2				
3+00.0000							
	C-Levee Top:			77.58	244.21		
	Cut Volume:						
	Fill Volume:	117.66	13.6				
3+10.0000							
	C-Levee Top:			78.58	780.81		
	Cut Volume:						
	Fill Volume:	125.33	45.0				
3+20.0000							
	C-Levee Top:			79.63	791.06		
	Cut Volume:						
	Fill Volume:	133.23	47.9				
3+30.0000							
	C-Levee Top:			81.20	804.14		
	Cut Volume:						
	Fill Volume:	138.71	50.4				
3+40.0000							
	C-Levee Top:			84.38	827.88		
	Cut Volume:						
	Fill Volume:	148.80	53.2				
3+50.0000							

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
				87.06	857.20	[redacted]	[redacted]
	Cut Volume:						
	Fill Volume:	162.39	57.6				
3+60.0000							
	C-Levee Top:			87.21	871.36		
	Cut Volume:						
	Fill Volume:	161.24	59.9				
3+70.0000							
	C-Levee Top:			88.93	880.70		
	Cut Volume:						
	Fill Volume:	163.86	60.2				
3+80.0000							
	C-Levee Top:			90.96	899.42		
	Cut Volume:						
	Fill Volume:	164.15	60.7				
3+90.0000							
	C-Levee Top:			91.90	914.26		
	Cut Volume:						
	Fill Volume:	159.24	59.9				
3+99.3363							
	C-Levee Top:			90.83	853.00		
	Cut Volume:						
	Fill Volume:	157.00	54.7				
4+00.0000							
	C-Levee Top:			90.80	60.28		
	Cut Volume:						
	Fill Volume:	157.42	3.9				
4+10.0000							
	C-Levee Top:			90.52	906.60		
	Cut Volume:						
	Fill Volume:	154.85	57.8				
4+20.0000							
	C-Levee Top:			90.28	903.98		
	Cut Volume:						
	Fill Volume:	147.75	56.0				

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
	C-Levee Top:			90.41	903.45	[redacted]	[redacted]
	Cut Volume:						
	Fill Volume:	138.13	52.9				
4+40.0000							
	C-Levee Top:			91.05	907.31		
	Cut Volume:						
	Fill Volume:	132.10	50.0				
4+50.0000							
	C-Levee Top:			91.60	913.24		
	Cut Volume:						
	Fill Volume:	135.12	49.5				
4+60.0000							
	C-Levee Top:			90.77	911.82		
	Cut Volume:						
	Fill Volume:	123.43	47.9				
4+70.0000							
	C-Levee Top:			89.24	900.01		
	Cut Volume:						
	Fill Volume:	124.49	45.9				
4+80.0000							
	C-Levee Top:			89.22	892.27		
	Cut Volume:						
	Fill Volume:	139.47	48.9				
4+90.0000							
	C-Levee Top:			88.01	886.11		
	Cut Volume:						
	Fill Volume:	135.96	51.0				
5+00.0000							
	C-Levee Top:			88.47	882.37		
	Cut Volume:						
	Fill Volume:	130.11	49.3				
5+10.0000							
	C-Levee Top:			84.17	863.18		
	Cut Volume:						
	Fill Volume:	124.23	47.1				

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
5+20.0000						[redacted]	[redacted]
	C-Levee Top:			83.33	837.48		
	Cut Volume:						
	Fill Volume:	122.84	45.8				
5+30.0000							
	C-Levee Top:			80.75	820.40		
	Cut Volume:						
	Fill Volume:	113.46	43.8				
5+40.0000							
	C-Levee Top:			81.77	812.59		
	Cut Volume:						
	Fill Volume:	117.28	42.7				
5+50.0000							
	C-Levee Top:			81.03	813.96		
	Cut Volume:						
	Fill Volume:	113.30	42.7				
5+60.0000							
	C-Levee Top:			86.31	836.67		
	Cut Volume:						
	Fill Volume:	128.93	44.9				
5+70.0000							
	C-Levee Top:			86.47	863.87		
	Cut Volume:						
	Fill Volume:	142.19	50.2				
5+80.0000							
	C-Levee Top:			85.96	862.15		
	Cut Volume:						
	Fill Volume:	131.56	50.7				
5+90.0000							
	C-Levee Top:			85.91	859.35		
	Cut Volume:						
	Fill Volume:	125.80	47.7				
6+00.0000							
	C-Levee Top:			85.95	859.28		
	Cut Volume:						
	Fill Volume:	129.32	47.2				

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
6+10.0000						[redacted]	
	C-Levee Top:			87.07	865.09		
	Cut Volume:						
	Fill Volume:	131.19	48.2				
6+20.0000							
	C-Levee Top:			86.68	868.75		
	Cut Volume:						
	Fill Volume:	127.65	47.9				
6+30.0000							
	C-Levee Top:			86.78	867.28		
	Cut Volume:						
	Fill Volume:	144.89	50.5				
6+40.0000							
	C-Levee Top:			56.59	716.84		
	Cut Volume:						
	Fill Volume:	82.33	42.1				
6+50.0000							
	C-Levee Top:			56.14	563.67		
	Cut Volume:						
	Fill Volume:	85.03	31.0				
6+60.0000							
	C-Levee Top:			55.11	556.29		
	Cut Volume:						
	Fill Volume:	81.72	30.9				
6+70.0000							
	C-Levee Top:			54.54	548.27		
	Cut Volume:						
	Fill Volume:	80.40	30.0				
6+80.0000							
	C-Levee Top:			55.07	548.03		
	Cut Volume:						
	Fill Volume:	75.11	28.8				
6+90.0000							
	C-Levee Top:			54.40	547.31		
	Cut Volume:						

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
		74.10	27.6			[redacted]	[redacted]
7+00.0000							
C-Levee Top:				53.20	537.99		
Cut Volume:							
Fill Volume:		69.64	26.6				
7+02.8214							
C-Levee Top:				52.77	149.50		
Cut Volume:							
Fill Volume:		69.13	7.3				
7+10.0000							
C-Levee Top:				52.62	378.27		
Cut Volume:							
Fill Volume:		66.99	18.1				
7+20.0000							
C-Levee Top:				51.70	521.56		
Cut Volume:							
Fill Volume:		58.97	23.3				
7+30.0000							
C-Levee Top:				50.85	512.74		
Cut Volume:							
Fill Volume:		48.60	19.9				
7+40.0000							
C-Levee Top:				28.70	397.77		
Cut Volume:							
Fill Volume:		16.30	12.0				
7+50.0000							
C-Levee Top:				28.62	286.59		
Cut Volume:							
Fill Volume:		15.43	5.9				
7+60.0000							
C-Levee Top:				28.48	285.46		
Cut Volume:							
Fill Volume:		14.65	5.6				
7+70.0000							
C-Levee Top:				28.31	283.92		

Station	Material	Component End Area Totals Area	Component End Area Totals Volume	Component Surface Area Totals Length	Component Surface Area Totals Area	Unit Cost	Material Cost
	Fill Volume:	13.94	5.3			[redacted]	[redacted]
7+80.0000							
	C-Levee Top:			28.22	282.64		
	Cut Volume:						
	Fill Volume:	13.33	5.0				
7+90.0000							
	C-Levee Top:			28.10	281.59		
	Cut Volume:						
	Fill Volume:	12.84	4.8				
8+00.0000							
	C-Levee Top:			27.97	280.34		
	Cut Volume:						
	Fill Volume:	12.42	4.7				
8+09.7109							
	C-Levee Top:			27.52	269.41		
	Cut Volume:						
	Fill Volume:	10.81	4.2				
8+10.0000							
	C-Levee Top:			27.51	7.95		
	Cut Volume:						
	Fill Volume:	10.69	0.1				
8+20.0000							
	C-Levee Top:			25.41	264.59		
	Cut Volume:						
	Fill Volume:	7.31	3.3				
8+30.0000							
	C-Levee Top:			25.09	252.50		
	Cut Volume:	0.05	0.0				
	Fill Volume:	4.44	2.2				
8+30.7263							
	C-Levee Top:			25.17	18.25		
	Cut Volume:	0.24	0.0				
	Fill Volume:	4.09	0.1				

		Component End Area Totals		Component Surface Area Totals			
Station	**Material**	**Area**	**Volume**	**Length**	**Area**	**Unit Cost**	**Material Cost**
C-Levee Top:					56908.59	[redacted]	
Cut Volume:			0.0				
Fill Volume:			3277.4				
					Total Estimated Cost:		[redacted]

7.2 Plates

DRAFT

MCCOOK LEVEE SECTION 205

US Army Corps
of Engineers®
Chicago District

LOCALITY MAP
N.T.S

VICINITY MAP
N.T.S

FEASIBILITY SUBMITTAL FOR TSP
JANUARY, 2018

DESIGNED BY: L VANDENBERG, P.E.	ISSUE DATE: 1/19/2018
DRAWN BY: LCV	SOLICITATION NO.: XXXXXX-XX-X-XXXX
CHECKED BY: L VANDENBERG, P.E.	CONTRACT NO.: XXXXXX-XX-X-XXXX
SUBMITTED BY:	PROJECT CODE:
SIZE: ANSI B	FILE NAME: G-001.dgn

MCCOOK LEVEE
SECTION 205
MCCOOK, ILLINOIS

LOCATION AND VICINITY MAP

SHEET ID

G-001

%STATUS%

SHEET INDEX

SHEET NUMBER	SHEET REF NUMBER	SHEET TITLE
01	G-001	LOCALITY, PROJECT, & VICINITY MAPS
02	G-002	SHEET INDEX, ABBREVIATIONS AND GENERAL NOTES
03	C-101	EXISTING SITE PLAN
04	C-102	ALTERNATIVE 2A: MCCOOK LEVEE REPAIR
05	C-103	ALTERNATIVE 3A: MCCOOK LEVEE SEGMENTED REPAIR
06	C-104	ALTERNATIVE 2Ba: WEST LYONS LEVEE RAISE
07	C-105	ALTERNATIVE 2Bb: WEST LYONS LEVEE REPAIR
08	C-301	TYPICAL LEVEE SECTIONS
09	C-302	TYPICAL SECTIONS
10	C-303	TYPICAL CULVERT SECTIONS

STANDARD ABBREVIATIONS

NTS	NOT TO SCALE	DTM	DIGITAL TERRAIN MODEL
MIN	MINIMUM	ACOE	ARMY CORPS OF ENGINEERS
V	VERTICAL	COE	CORPS OF ENGINEERS
H	HORIZONTAL	NGVD	NATIONAL GEODETIC VERTICAL DATUM
S	PIPE SLOPE	NAVD	NORTH AMERICAN VERTICAL DATUM
VIF	VERIFY IN FIELD	COR	CONTRACTING OFFICER'S REPRESENTATIVE
MH	MANHOLE	FPD	FOREST PRESERVE DISTRICT
FH	FIRE HYDRANT	DBH	DIAMETER AT BREAST HEIGHT
WL	WORK LIMIT	WP	WORK POINT
CL	CENTERLINE		

GENERAL NOTES

1. HORIZONTAL_POSITIONAL_ACCURACY HORIZONTAL_POSITIONAL_ACCURACY_REPORT: DATA SET BASED ON PHOTOGRAMMETRICALLY COMPILED MAP DATA PURPORTED TO MEET NATIONAL MAP ACCURACY STANDARDS FOR 1:1200 SCALE MAPS, IMPLYING THAT NO MORE THAN 10 PERCENT OF TESTED POINTS ARE IN ERROR OF MORE THAN 1/50TH OF AN INCH PROVIDED THE TEST IS APPLIED TO WELL DEFINED POINTS. HORIZONTAL ACCURACY FOR THIS DATA, THEN, IS APPROX. +/- .5 FT. AT THE TIME OF COMPILATION. STANDARD COUNTY QUALITY ASSURANCE AND CHECKING HAS BEEN PERFORMED.

2. VERTICAL_POSITIONAL_ACCURACY_REPORT: SURVEY WAS PERFORMED IN APRIL 2017 TO IDENTIFY LEVEE CREST, SLOPES, AND OTHER KEY POINTS. IN ALL OTHER AREAS, VERTICAL DATA SET BASED ON PHOTOGRAMMETRICALLY COMPILED MAP DATA PURPORTED TO MEET NATIONAL MAP ACCURACY STANDARDS FOR 1:1200 SCALE MAPS, IMPLYING THAT NO MORE THAN 10 PERCENT OF TESTED ELEVATIONS ARE IN ERROR OF MORE THAN ONE-HALF THE CONTOUR INTERVAL PROVIDED THE PERMISSIBLE HORIZONTAL ERROR TOLERANCE IS ALLOWED. VERTICAL ACCURACY FOR THIS DATA, THEN, IS APPROX. +/- 1 FT. AT THE TIME OF COMPILATION. STANDARD COUNTY QUALITY ASSURANCE AND CHECKING HAS BEEN PERFORMED.

3. BEFORE BEGINNING CONSTRUCTION, VERIFY ALL CRITICAL DIMENSIONS, LOCATIONS AND ELEVATIONS BEFORE PROCEEDING WITH PROPOSED WORK. IMMEDIATELY NOTIFY THE CONTRACTING OFFICER'S REPRESENTATIVE OF ANY SIGNIFICANT DISCREPANCIES.

4. BEFORE START OF CONSTRUCTION, CONSULT WITH ALL UTILITY SYSTEM OWNERS. CALL JULIE (JOINT UTILITY LOCATING INFORMATION FOR EXCAVATORS) AT 1-800-892-0123 NO LESS THAN 48 HOURS BEFORE START OF ANY EXCAVATION. IN ADDITION CONTACT THE MORTON ARBORETUM FOR LOCATION OF ALL THEIR IN-HOUSE UTILITIES.

9. WORK MUST BE IN ACCORDANCE WITH CORPS OF ENGINEERS SAFETY AND HEALTH REQUIREMENTS MANUAL EM385-1-1, AS CURRENT AT TIME OF CONTRACT AWARD.

10. THE CONTRACTOR MUST INSTALL AND MAINTAIN TEMPORARY EROSION CONTROL BEST MANAGEMENT PRACTICIES (BMPs) AND IN ACCORDANCE WITH THE ILLINOIS URBAN MANUAL AND SECTION 01 57 20 ENVIROMENTAL PROTECTION FOR ILLINOIS, AS NECESSARY TO CONTROL SEDIMENT AND EROSION ON THE SITE DURING CONSTRUCTION.

DRAFT

DESIGNED BY: L VANDENBERG, P.E.	ISSUE DATE: 1/19/2018
DRAWN BY: LCV	SOLICITATION NO.:
CHECKED BY: FAYE LEFFLER, P.E.	CONTRACT NO.:
SUBMITTED BY: JOHN GROBOSKI, P.E.	PROJECT CODE:
SIZE: ANSI B	FILE NAME: G-002.dgn

MCCOOK LEVEE
SECTION 205
MCCOOK, ILLINOIS

GENERAL NOTES AND ABBREVIATIONS

SHEET ID

G-002

%STATUS%

N

A1 MCCOOK LEVEE: EXISTING PLAN VIEW

SCALE: NTS

GENERAL NOTES

1. LEVEE CONTINUES TO THE SOUTH OF LAWNDALE AVE. ONLY THE PORTION NORTH OF LAWNDALE IS RECOMMENDED TO BE REPAIRED UNDER THIS PROJECT.

DESIGNED BY: L VANDENBERG, P.E.	ISSUE DATE: 11/17/2017
DRAWN BY: LCV	SOLICITATION NO.:
CHECKED BY: FAYE LEFFLER, P.E.	CONTRACT NO.:
SUBMITTED BY: JOHN GROBOSKI, P.E.	PROJECT CODE:
SIZE: ANSI B	FILE NAME: C-101.dgn

MCCOOK LEVEE
SECTION 205
MCCOOK, ILLINOIS

EXISTING SITE PLAN

SHEET ID

C-101

GENERAL NOTES

1. LEVEE WILL BE CLEARED OF EXISTING VEGETATION FOR 15' ON EACH SIDE OF THE TOE.
2. IMPROVEMENTS TO LEVEE VARY BASED ON STATIONING REFER TO SHEET CS-301 FOR DETAILS.
3. THE TWO EXISTING COMED EASEMENTS ARE FOR OVERHEAD LINES. WORK IN THESE AREAS IS LIMITED TO CLEARING OF WOODY DEBRIS AND PLACEMENT OF ADDITIONAL FILL ON THE RIVERSIDE OF THE LEVEE. WORK CAN BE COMPLETED BUT MUST BE DONE IN ACCORDANCE WITH EM 385-1-1, ALLOWING A CLEARANCE OF ANY EQUIPMENT FROM THE OVERHEAD LINES OR REQUIRING THE LINES TO BE POWERED DOWN DURING ACTIVE WORK.

N

A1 ALTERNATIVE 2A: MCCOOK LEVEE REPAIR

SCALE: 1" = 500'

DESIGNED BY: L VANDENBERG, P.E.	ISSUE DATE: 11/17/2017
DRAWN BY: LCV	SOLICITATION NO.:
CHECKED BY: FAYE LEFFLER, P.E.	CONTRACT NO.:
SUBMITTED BY: JOHN GROBOSKI, P.E.	PROJECT CODE:
SIZE: ANSI B	FILE NAME: C-102.dgn

MCCOOK LEVEE
SECTION 205
MCCOOK, ILLINOIS

ALTERNATIVE 2A
MCCOOK LEVEE REPAIR

SHEET ID

C-102

A1 ALTERNATIVE 3A: SEGMENTED MCCOOK LEVEE REPAIR

SCALE: 1" = 500'

0 500' 1000'

GENERAL NOTES

1. LEVEE IMPROVEMENT AREAS WILL BE CLEARED OF EXISTING VEGETATION TO 15 FEET FROM EACH TOE.
2. SEE SHEET C-302 FOR TYPICAL LEVEE SECTIONS.
3. SEE SHEET C-303 FOR TYPICAL CULVERT SECTIONS.
4. THE TWO EXISTING COMED EASEMENTS ARE FOR OVERHEAD LINES. WORK IN THE SOUTHERN EASEMENT IS LIMITED TO CLEARING OF WOODY DEBRIS AND PLACEMENT OF ADDITIONAL FILL ON THE RIVERSIDE OF THE LEVEE. WORK CAN BE COMPLETED BUT MUST BE DONE IN ACCORDANCE WITH EM 385-1-1, ALLOWING A CLEARANCE OF ANY EQUIPMENT FROM THE OVERHEAD LINES OR REQUIRING THE LINES TO BE POWERED DOWN DURING ACTIVE WORK.

DESIGNED BY: L VANDENBERG, P.E.	ISSUE DATE: 1/19/2018
DRAWN BY: LCV	SOLICITATION NO.:
CHECKED BY: FAYE LEFFLER, P.E.	CONTRACT NO.:
SUBMITTED BY: JOHN GROBOSKI, P.E.	PROJECT CODE:
SIZE: ANSI B	FILE NAME: C-103.dgn

MCCOOK LEVEE
SECTION 205
MCCOOK, ILLINOIS

ALTERNATIVE 3A
SEGMENTED LEVEE REPAIR

SHEET ID

C-103

A1 PLAN 2BA

SCALE: NTS

GENERAL NOTES

1.

DRAFT

DESIGNED BY: L VANDENBERG, P.E.	ISSUE DATE:
DRAWN BY: LCV	SOLICITATION NO.:
CHECKED BY:	CONTRACT NO.:
SUBMITTED BY: JOHN GROBOSKI, P.E.	PROJECT CODE:
SIZE: ANSI X	FILE NAME: C-104.dgn

MCCOOK LEVEE
SECTION 205
MCCOOK, ILLINOIS

ALTERNATIVE 2BA
WEST LYONS LEVEE REPAIR

SHEET ID

C-104

GENERAL NOTES

1. EXISTING ASPHALT TRAIL ON LEVEE CREST WILL BE REMOVED AND REPLACED.

N

A1 ALTERNATIVE 2Bb: WEST LYONS LEVEE RAISE

SCALE: 1"=175'

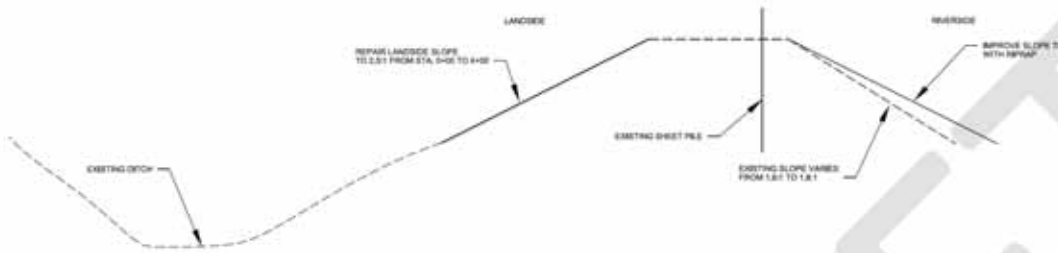
DESIGNED BY: L VANDENBERG, P.E.	ISSUE DATE: 1/17/20189
DRAWN BY: LCV	SOLICITATION NO.:
CHECKED BY: FAYE LEFFLER, P.E.	CONTRACT NO.:
SUBMITTED BY: JOHN GROBOSKI, P.E.	PROJECT CODE:
SIZE: ANSI B	FILE NAME: C-105.dgn

MCCOOK LEVEE
SECTION 205
MCCOOK, ILLINOIS

ALTERNATIVE 2BB

SHEET ID

C-105

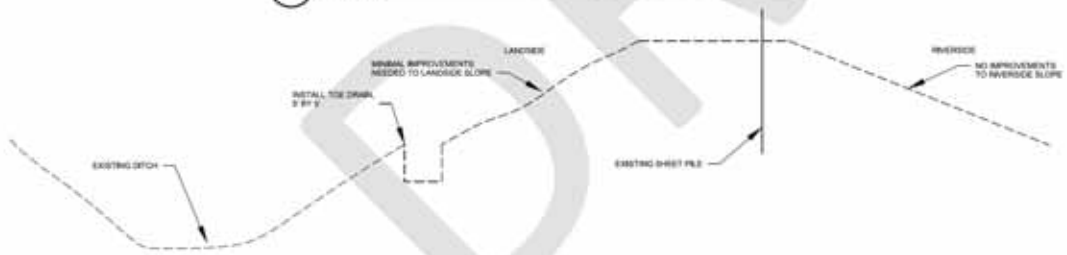


GENERAL NOTES

1. EXISTING SLOPES, LEVEE HEIGHT AND LEVEE CREST WIDTH VARY ALONG LEVEE LENGTH.
2. CROSS SECTIONS APPLY FOR BOTH PLANS 3A AND 3A.

C1 LEVEE STA. 0+00 TO 20+90
SCALE: NTS

C2 LEVEE STA. 20+90 TO 30+00
SCALE: NTS



C3 LEVEE STA. 30+00 TO 41+00
SCALE: NTS

DRAFT

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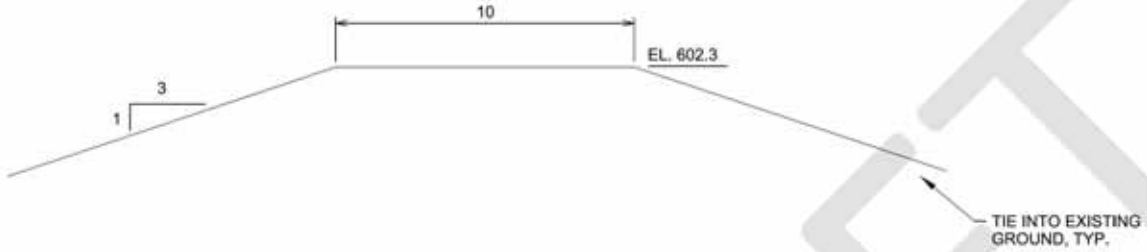
SIZE: ANSI B	FILE NAME: C-301.dgn

MCCOOK LEVEE
SECTION 205
MCCOOK, ILLINOIS

TYPICAL SECTIONS

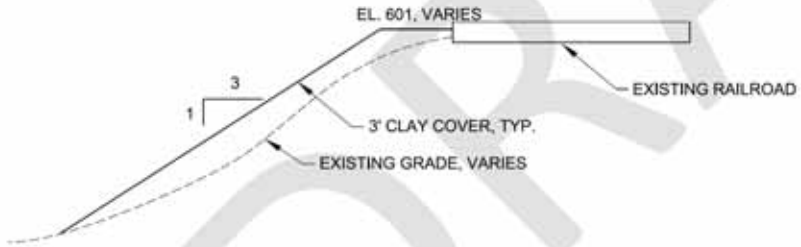
SHEET ID

C-301



C1 TIEBACK LEVEES TYPICAL SECTION

SCALE: NTS



A1 RAILROAD TIEBACK TYPICAL SECTION

SCALE: NTS

DRAFT

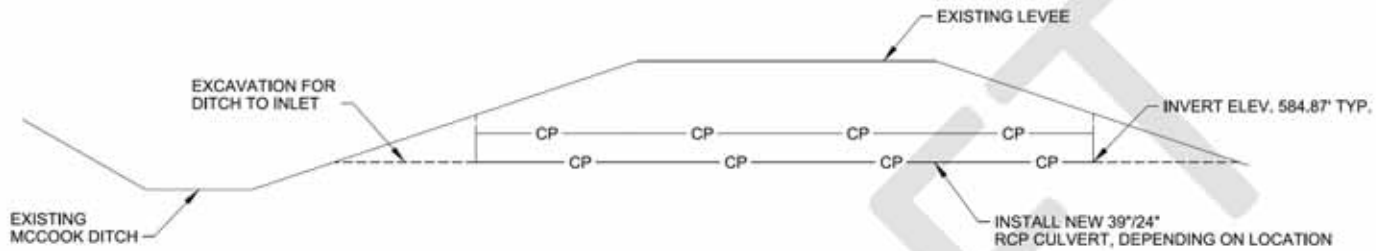
DESIGNED BY: L VANDENBERG, P.E.	ISSUE DATE: 11/17/2017
DRAWN BY: LCV	SOLICITATION NO.:
CHECKED BY: FAYE LEFFLER, P.E.	CONTRACT NO.:
SUBMITTED BY: JOHN GROBOSKI, P.E.	PROJECT CODE:
SIZE: ANSI B	FILE NAME: C-302.dgn

MCCOOK LEVEE
SECTION 205
MCCOOK, ILLINOIS

TYPICAL SECTIONS

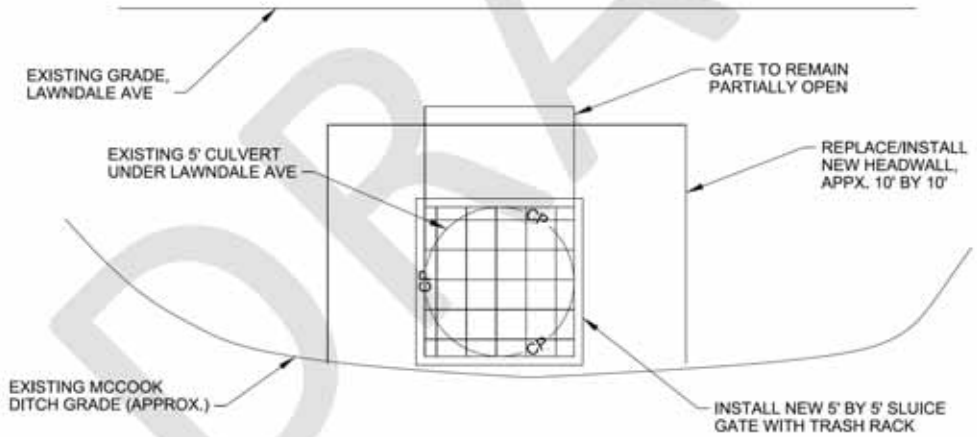
SHEET ID

C-302



C1 CULVERT THROUGH LEVEE, TYP. SECTION

SCALE: NTS



A1 PLAN VIEW: SLUICE GATE AT LAWNDALE CULVERT

SCALE: NTS

DRAFT

DESIGNED BY: L VANDENBERG, P.E.	ISSUE DATE: 1/19/2018
DRAWN BY: LCV	SOLICITATION NO.:
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SUBMITTED BY: JOHN GROBOSKI, P.E.	PROJECT CODE:
SIZE: ANSI B	FILE NAME: C-303.dgn

MCCOOK LEVEE
SECTION 205
MCCOOK, ILLINOIS

TYPICAL CULVERT SECTIONS

SHEET ID

C-303