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Final Engineer's Report

Buffalo Creek Watershed District

Improvement of Judicial Ditch No. 15 Branch Q

Renville County, Minnesota

November 2022

S15.120831

Submitted by:
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Certification

Final Engineer's Report

For

Buffalo Creek Watershed District
Improvement of Judicial Ditch No. 15 Branch Q

In

Renville County, Minnesota

S15.120831
November 2022

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 Minnesota.

By: Shaun P. Luker

Shaun P. Luker, P.E.
License No. 48756

Date: 11-15-2022

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STATE OF MINNESOTA

BUFFALO CREEK WATERSHED DISTRICT

IN THE MATTER OF THE PETITION FOR AN IMPROVEMENT TO PORTIONS OF BRANCH Q, JUDICIAL DITCH NO. 15 IN RENVILLE COUNTY, MINNESOTA:

In February 2020, the Buffalo Creek Watershed District, acting as the Ditch Authority for Judicial Ditch No. 15 (JD 15) in Renville County, in accordance with Minnesota Statute 103D.215, accepted a petition for the improvement to portions of Branch Q of JD 15 in Renville County. After that authorization, preliminary field surveys were performed to obtain field elevations and establish an alignment for a proposed drain tile improvement as well as to evaluate the outlet for the system. In April 2021 the Drainage Authority held a preliminary hearing and ordered the preparation of this Final Engineers report. This report summarizes the findings of the research, surveys and analysis and is submitted for the consideration by the Ditch Authority.

I. LOCATION AND SCOPE OF IMPROVEMENT

The petitioned improvement area within Branch Q of Judicial Ditch No. 15 lies within and provides drainage to portions of Sections 16, 17, 18, 19, 20 and 21 of Preston Lake Township in Renville County. The system consists of a Main tile (Branch Q1) and a secondary outlet (Branch Q25) about 6.7 miles in length and several branches of varying length. The outlet for Branch Q1 and Branch Q25 is the open ditch of JD 15 in Section 21 of the Preston Lake Township. The Main open ditch of JD 15 becomes Buffalo Creek as it enters McLeod County. The system is located about 2 miles northwest of Buffalo Lake, Minnesota. The total estimated watershed for the Branch Q tile system from Lidar contour data, is 1190 acres.

The improvement of Branch Q of Judicial Ditch No. 15 proposes replacing all of Branch Q4 through Q19 (except Q15 and Q17) and Q25 through Q28. Exhibit 1 shows the general location of JD 15 and the proposed improvement. Exhibit 2 is the copy of the petition for the improvement.

Field survey information was collected by Bolton & Menk, Inc. in May 2020. The survey included GPS locations and elevations for the outlet of the tile and for private and public intakes on the system. The tile system design utilized Lidar data, provided by the Minnesota Department of Natural Resources. This data, obtained from an aerial flight, results in contours of equal elevation at 2' vertical intervals.

Other information used for this report included plans obtained from the Renville County files. However, the plans do not provide accurate location and elevation data. If the project proceeds to construction, performing exploratory excavations at key locations to verify the existing tile sizes, locations, and elevations is recommended.

II. EXISTING DITCH SYSTEM

Public records regarding the Judicial Ditch No. 15 system were reviewed from Renville County. This information provides a limited history of the JD 15 system.

JD 15 was petitioned for establishment in 1916. Branch Q was included in this petition. Construction occurred in about 1923. The original construction cost was $1,586,102.

The current benefits for the ditch system have recently been redetermined.

III. CAPACITY OF EXISTING DRAINAGE SYSTEM

The portion of the JD 15 Branch Q system proposed to be improved consists of underground tiles. From reports of the petitioners, the system is not able to adequately drain the JD 15 watershed, resulting in extended ponding in portions of the watershed. This ponding results in crop stress and crop loss. Renville County has televised portions of the existing Branch Q tile system. The pipe televised was noted to be in need of repair. Because of these limitations of the drainage system, the petitioners have now requested that the drainage system be improved.

As a way of evaluating the capacity of the existing tile system, an analysis has been performed of the existing system using standard engineering methods. The capacity of the existing tile has been estimated using the Manning equation, assuming the original hydraulic efficiency of the system as constructed and subsequently improved. Estimated tile sizes and grades are based on the original design plans supplemented with limited field data collected through tile intakes and general surface grades. The amount of drainage which is needed for modern crop production has been compared to standards recommended by the Buffalo Creek Watershed District (BCWD) of 3/8 of an inch of runoff per day. Watershed areas have been estimated using DNR Lidar maps. Table 1 shows the results of this analysis. Branches Q15 and Q17 are not petitioned for improvement.

Table 1: Existing Tile Capacity

Tile	Location	Drainage Area (Acres)	BCWD Flow (CFS) 3/8"/Day	Existing Tile Size (Inches)	Existing Tile Grade (%)	Calculated Tile Capacity (CFS) n=0.013	Calculated Coefficient (In. Per Day)
Br Q14	West of 530th Ave	24	0.38	6	0.65	0.45	0.45
Br Q13	End of Pipe to Br Q12	28	0.44	5	0.80	0.31	0.26
Br Q12	End of Pipe to 150' East of 530th St	13	0.20	6	2.00	0.80	1.46
	150' East of 530th St to Br Q14	29	0.46	7	0.10	0.27	0.22
	Br Q14 to Br Q13	58	0.91	7	0.65	0.68	0.28
	Br Q13 to Br Q10	104	1.64	9	0.25	0.83	0.19
Br Q11	End of Pipe to Bend/6" Increase	17	0.27	5	0.60	0.27	0.38
	Bend/6" Increase to Br Q10	30	0.47	6	0.75	0.49	0.39
Br Q10	End of Pipe to 100' N. of 807th Ave	42	0.66	6	0.25	0.28	0.16
	100' N. of 807th Ave to 500' N. of 807th Ave.	56	0.88	8	0.05	0.27	0.12
	500' N. of 807th Ave. to Br Q12	85	1.34	10	0.10	0.69	0.19
	Br Q12 to Br Q11	214	3.37	15	0.10	2.05	0.23
	Br Q11 to Br Q1	271	4.27	16	0.05	1.72	0.15

Table 1: Existing Tile Capacity							
Tile	Location	Drainage Area (Acres)	BCWD Flow (CFS) 3/8"/Day	Existing Tile Size (Inches)	Existing Tile Grade (%)	Calculated Tile Capacity (CFS) n=0.013	Calculated Coefficient (In. Per Day)
Br Q8	End of Pipe to W 530th St	17	0.27	5	0.10	0.11	0.15
	W 530th St to N 815th Ave	23	0.36	6	0.80	0.50	0.52
	N 815th Ave to Br Q6	28	0.44	8	0.35	0.72	0.61
Br Q7	End of Pipe to Br Q6	17	0.27	6	0.20	0.25	0.35
Br Q6	End of Pipe to Br Q8	4	0.06	6	0.05	0.13	0.75
	Br Q8 to Br Q7	70	1.10	6	0.05	0.13	0.04
	Br Q7 to Br Q1	87	1.37	8	0.15	0.47	0.13
Br Q5	End of Pipe to Br Q4	43	0.68	7	0.70	0.71	0.39
Br Q4	End of Pipe to Br Q5	12	0.19	5	0.55	0.26	0.51
	Br Q5 to Br Q1	69	1.09	8	0.05	0.27	0.09
Br Q9	End of Pipe to Br Q1	7	0.11	6	1.00	0.56	1.91
Br Q15	End of Pipe to Br Q1	49	0.77	6	0.10	0.18	0.09
Br Q28	End of Pipe to Br Q16	35	0.55	5	0.65	0.28	0.19
Br Q16	End of Pipe to Br Q28	38	0.60	6	0.15	0.22	0.14
	Br Q28 to 7"/8" Tile Increase	116	1.83	7	1.00	0.85	0.17
	7"/8" Tile Increase to Br Q1	116	1.83	8	1.00	1.21	0.25
Br Q17	End of Pipe to Br Q1	10	0.16	6	0.10	0.18	0.42
Br Q18	End of Pipe to Br Q1	14	0.22	6	1.10	0.59	1.00
Br Q19	End of Pipe to Br Q1	22	0.35	6	1.00	0.56	0.61
Br Q1	End of Pipe to Br Q4	135	2.13	9	0.35	0.98	0.17
	Br Q4 to Br Q6	206	3.25	12	0.15	1.38	0.16
	Br Q6 to Br Q9	310	4.88	15	0.15	2.51	0.19
	Br Q9 to Br Q10	354	5.58	16	0.15	2.98	0.20
	Br Q10 to Br Q15	625	9.85	22	0.10	5.69	0.22
	Br Q15 to Br Q16	684	10.78	22	0.10	5.69	0.20
	Br Q16 to Br Q17	815	12.84	22	0.10	5.69	0.17
	Br Q17 to Br Q18	837	13.19	22	0.10	5.69	0.16
	Br Q18 to Br Q19	890	14.02	22	0.10	5.69	0.15
	Br Q19 to Open Judicial Ditch 15	912	14.37	22	0.15	6.97	0.18

Table 1: Existing Tile Capacity							
Tile	Location	Drainage Area (Acres)	BCWD Flow (CFS) 3/8"/Day	Existing Tile Size (Inches)	Existing Tile Grade (%)	Calculated Tile Capacity (CFS) n=0.013	Calculated Coefficient (In. Per Day)
Br Q27	End of Pipe to 6"/7" Tile Transition	13	0.20	6	0.85	0.52	0.95
	6"/7" Tile Transition to Br Q25	52	0.82	7	1.05	0.87	0.40
Br Q26	End of pipe to Br Q25	46	0.72	9	0.90	1.57	0.81
Br Q25	End of pipe to 6"/8" Transition	21	0.33	6	0.10	0.18	0.20
	6"/8" Transition to Br Q27	32	0.50	8	0.10	0.38	0.28
	Br Q27 to Br Q26	135	2.13	10	0.20	0.98	0.17
	Br Q26 to Open JD 15	278	4.38	14	0.25	2.69	0.23

From Table 1, the Branch Q1 tile in the lower part of the system is capable of draining the lands within the watershed at a rate of about 0.18" per day. When compared to the Buffalo Creek Watershed District recommended standard of 3/8" (0.375") per day, BR Q1, in its originally constructed condition, is delivering about 50% of the recommended flow. The lateral branches are capable of draining their watersheds at rates ranging from about 0.04" per day to 1.91" per day, with an average of 0.36" per day. Thus, as constructed, most of the system provides nearly adequate capacity, however, the main tile line is restricting the flow creating an inadequate efficiency for the production of row crops. Since there is televising evidence that the pipe system is in poor repair, the system is likely delivering even less flow than has been calculated. However, because it is the responsibility of the Drainage Authority to maintain the tile system in its as constructed and subsequently improved condition, we are analyzing the capacity of the existing system in that type of condition.

If the project were to move forward to construction, the existing tiles that are to be improved will be decommissioned by breaking the pipe and connecting any existing private laterals to the new tile. This way no additional flow will be carried by the old system in the improvement area.

IV. DISCUSSION OF IMPROVEMENT

As noted earlier, the petitioners for the Improvement of JD 15 Branch Q have requested the consideration of the construction of an improved tile system to increase the capacity. A preliminary survey and the hydrologic and hydraulic analysis of such a drainage system has been performed in order to establish preliminary grades and depths for the tile system, to determine the quantities for the construction of such a system, to determine the size of proposed tile lines and to analyze the outlet. General observations and results of the analysis are summarized as follows:

A. DESCRIPTION

As shown in Exhibit 1, the proposed Improvement consists of 6-inch to 30-inch diameter tile to replace the function of the existing JD 15 Branch Q tile from the outlet to the upper end. The township road crossings would be made by open trench methods, and the road surface

restored with class 5 gravel. The new tile will be constructed at a lower elevation than the existing tile in order to allow all existing tiles to be connected to the new tile to accommodate adequate drainage, to accommodate current farming practices, and to provide more ground cover over the new tile to reduce the probability of crushing.

B. DESIGN DATA

The proposed grades for the tile improvements are shown on Exhibit 1 and vary from 0.07% to 28%. The type of pipe should be used for the construction will be bid as a contractor option as follows:

1. Dual Wall Polyethylene Drain Tile meeting the requirements of the American Society for Testing Materials F 2648. Pipe will be bedded in granular material as shown on Exhibit 1. Non-perforated pipe will be used where the tile is to be greater than 6 feet deep, and perforated pipe will be used where the tile is to be less than 6 feet deep. The perforated pipe will include a drain tile sock in order to avoid granular infiltration into the pipe. An option would be provided for the contractor to shape the bottom of the trench to conform to the pipe and eliminate some of the granular bedding if the pipe manufacturer would warrant the material installation.
2. Reinforced concrete pipe meeting the requirements of MnDOT Specification 2501, with the joints being covered with geotextile fabric.

The criterion for the design of the tile system size is based on the Buffalo Creek Watershed District standard of 3/8" per day. In other words, the system should be able to drain the amount of water produced by about 3/8" of runoff over the entire watershed in one day. Since the Improvement is within the Buffalo Creek Watershed District, the 3/8" per day design criterion has been selected.

The capacity of the proposed tiles is shown in Table 2. Table 2 also shows the resulting runoff coefficient provided for the watershed served.

Table 2: Proposed Tile Capacity

Tile	Location	Drainage Area (Acres)	BCWD Flow (CFS) 3/8"/Day	Proposed Tile Size (Inches)	Proposed Tile Grade (%)	Calculated Tile Capacity (CFS) n=0.012	Calculated Coefficient (In. Per Day)
Br Q14	West of 530th Ave to BR Q12	24	0.38	6	1.05	0.62	0.62
Br Q13	End of Pipe to to Br Q12	28	0.44	6	1.30	0.69	0.59
	Grade Break Sta. 219+65	28	0.44	6	0.58	0.46	0.39
Br Q12	End of Pipe to 150' East of 530th St	13	0.20	6	1.50	0.75	1.37
	150' East of 530th St to Br Q14	29	0.46	8	0.30	0.72	0.59
	Br Q14 to Br Q13	58	0.91	8	0.55	0.97	0.40
	Br Q13 to Br Q10	104	1.64	12	0.18	1.64	0.38
Br Q11	End of Pipe to Bend/6" Increase	17	0.27	6	1.10	0.64	0.90
	Grade Break Sta. 237+66	17	0.27	6	0.80	0.55	0.76
	Bend/6" Increase to Q10	30	0.47	8	0.30	0.72	0.57

Table 2: Proposed Tile Capacity							
Tile	Location	Drainage Area (Acres)	BCWD Flow (CFS) 3/8"/Day	Proposed Tile Size (Inches)	Proposed Tile Grade (%)	Calculated Tile Capacity (CFS) n=0.012	Calculated Coefficient (In. Per Day)
Br Q10	End of Pipe to 100' N. of 807th Ave	42	0.66	8	0.50	0.93	0.53
	100' N. of 807th Ave to 500' N. of 807th Ave.	56	0.88	8	0.50	0.93	0.39
	500' N. of 807th Ave. to Br Q12	85	1.34	12	0.12	1.34	0.38
	Grade Break	85	1.34	12	0.12	1.34	0.38
	Br Q12 to Br Q11	214	3.37	18	0.10	3.61	0.40
	Br Q11 to Br Q1	271	4.27	24	0.07	6.50	0.57
Br Q8	End of Pipe to W 530th St	17	0.27	6	0.40	0.39	0.54
	W 530th St to N 815th Ave	23	0.36	6	0.40	0.39	0.40
	N 815th Ave to Br Q6	28	0.44	8	0.34	0.77	0.65
Br Q7	End of Pipe to Br Q6	17	0.27	6	0.49	0.43	0.60
Br Q6	End of Pipe to Br Q8	4	0.06	6	0.40	0.39	2.29
	Br Q8 to Br Q7	70	1.10	10	0.25	1.19	0.40
	Br Q7 to 300' prior of Br Q1	87	1.37	10	0.35	1.41	0.39
	300' prior of Br Q1 to Br Q1	87	1.37	10	1.00	2.38	0.65
Br Q5	End of Pipe to 30' S 815th Ave	43	0.68	6	1.29	0.69	0.38
	30' S 815th Ave to Br Q4	43	0.68	8	0.31	0.73	0.40
Br Q4	End of Pipe to Br Q5	12	0.19	6	0.40	0.39	0.76
	Grade Break Sta. 259+19	12	0.19	6	0.40	0.39	0.76
	Br Q5 to Br Q1	69	1.09	10	0.22	1.12	0.39
Br Q9	End of Pipe to Br Q1	7	0.11	6	1.00	0.61	2.07
Br Q28	End of Pipe to Sta. 132+80	26	0.41	6	0.50	0.43	0.39
	Sta. 132+80 to Br Q16	35	0.55	6	1.38	0.72	0.49
Br Q16	End of Pipe to Br Q28	38	0.60	8	0.30	0.72	0.45
	Br Q28 to 7"/8" Tile Increase	116	1.83	10	0.60	1.84	0.38
	7"/8" Tile Increase to Br Q1	116	1.83	12	0.23	1.86	0.38

Table 2: Proposed Tile Capacity							
Tile	Location	Drainage Area (Acres)	BCWD Flow (CFS) 3/8"/Day	Proposed Tile Size (Inches)	Proposed Tile Grade (%)	Calculated Tile Capacity (CFS) n=0.012	Calculated Coefficient (In. Per Day)
Br Q18	End of Pipe to Br Q1	14	0.22	6	0.55	0.45	0.77
	Grade Break Sta. 92+56	14	0.22	6	1.65	0.78	1.33
	Grade Break Sta. 88+50	14	0.22	6	1.80	0.82	1.39
Br Q19	End of Pipe to Br Q1	22	0.35	6	1.00	0.61	0.66
	Grade Break Sta. 79+56	22	0.35	6	2.89	1.04	1.12
Br Q1	End of Pipe to Br Q4	135	2.13	12	1.75	5.12	0.90
	Grade Break Sta. 76+85	135	2.13	12	0.32	2.19	0.39
	Grade Break Sta. 72+40	135	2.13	15	0.10	2.22	0.39
	Br Q4 to Br Q6	206	3.25	18	0.10	3.61	0.42
	Br Q6 to Br Q9	310	4.88	18	0.20	5.10	0.39
	Br Q9 to Br Q10	354	5.58	18	0.25	5.71	0.38
	Grade Break Sta. 51+43	354	5.58	24	0.13	8.86	0.60
	Br Q10 to Br Q15	625	9.85	24	0.17	10.13	0.39
	Br Q15 to Br Q16	684	10.78	30	0.08	12.60	0.44
	Br Q16 to Br Q17	815	12.84	30	0.09	13.37	0.39
	Br Q17 to Br Q18	837	13.19	30	0.09	13.37	0.38
	Br Q18 to Br Q19	890	14.02	30	0.10	14.09	0.38
	Br Q19 to Open Judicial Ditch 15	912	14.37	30	0.11	14.78	0.39
	Grade Break Sta. 2+25	912	14.37	30	1.68	57.75	1.51
Br Q27	End of Pipe to 6"/7" Tile Transition	13	0.20	6	0.40	0.39	0.71
	Grade Break Sta. 471+50	13	0.20	6	1.50	0.75	1.37
	Grade Break Sta. 470+50	13	0.20	6	1.50	0.75	1.37
	Grade Break Sta 467+00	13	0.20	6	0.75	0.53	0.97
Br Q26	End of pipe to Br Q25	46	0.72	10	0.90	2.26	1.17
	Grade Break Sta 478+60	46	0.72	10	0.90	2.26	1.17
	Grade Break Sta 478+40	46	0.72	10	0.90	2.26	1.17
Br Q25	End of pipe to 6"/8" Transition	21	0.33	8	0.25	0.66	0.74
	6"/8" Transition to Br Q27	32	0.50	10	0.20	1.06	0.79
	Br Q27 to Br Q26	88	1.39	12	0.31	2.15	0.38
	Br Q26 to Sta. 432+00	278	4.38	15	0.20	3.14	0.41
	Sta 432+00 to 418+00	278	4.38	15	0.41	4.49	0.38
	Br Q26 to Open Judicial Ditch 15	278	4.38	18	0.15	4.42	0.38

Some of the tiles listed to be improved have drainage coefficients greater than 3/8" of an inch. These are due to several factors. In some areas of the improvement the existing pipe

size is currently greater than what is needed to provide a 3/8" coefficient. Reducing the pipe size from what currently exists is not an option because that would take away drainage rights that those individual landowners currently have. In other instances the pipe is installed at a steeper grade to go up a hill and is then flattened out to serve a depressional area. It is not recommended to downsize these pipes in the steeper areas as any debris or foreign objects, such as dead animals, that happen to get into the tile may not be able to pass through the pipe. The capacity of these tiles with a higher drainage coefficient will still be restricted by the downstream pipe that they connect to that is at or close to the 3/8" coefficient.

Also included as part of the project will be provisions to strip and replace the topsoil on the trench area, to provide riprap as erosion protection at the outlet, and to construct several intakes on the system. The detail sheet C1.01 in Exhibit 1 provides more information on several of these items.

C. TILE SYSTEM DEPTH

Exhibit 1 shows profile views for the proposed tile system. The minimum and maximum depths of cut to the flow line of the pipes are as shown on Table 3.

Table 3: Depth of Proposed Tile

Tile Branch	Minimum Depth	Maximum Depth
Branch Q1	4.7'	18.2'
Branch Q4	4.9'	6.0'
Branch Q5	4.7'	8.6'
Branch Q6	7.0'	11.6'
Branch Q7	5.8'	9.3'
Branch Q8	6.0'	10.6'
Branch Q9	5.0'	7.7'
Branch Q10	5.2'	12.7'
Branch Q11	4.9'	9.4'
Branch Q12	5.1'	11.7'
Branch Q13	5.1'	9.9'
Branch Q14	6.0'	9.8'
Branch Q16	7.4'	17.1'
Branch Q18	5.4'	10.8'
Branch Q25	5.1'	15.8'
Branch Q26	5.3'	13.5'
Branch Q27	4.8'	9.3'
Branch Q28	5.1'	11.8'

D. WATER AND SEDIMENT CONTROL BASINS

Exhibit 1 shows the locations for four proposed water and sediment control basins (WASCOB). From the Agricultural Best Management Practices Handbook for Minnesota, "WASCOBs consist of an embankment across the slope of a field or minor waterway to temporarily detain and release

water through a piped outlet or through infiltration. They are constructed perpendicular to the flow direction. The key benefit of WASCOBs is detaining water from contributing areas, inducing sedimentation, and controlling the release of water, thereby reducing the erosive power of the water downstream."

The proposed basins will temporarily store overland runoff from the watershed. Four WASCOBS are proposed to be constructed by constructing berms across natural draws in the land. Details regarding each basin are as shown in Table 4. The slopes on the berms in the Krumery field will be at 1V:40H or flatter so that the berms can still be farmed. The top width of berm will be 40 feet wide so that it can be easily navigated. The material used to construct these berms will come from the excess tile trench material that is generated by the improvement. The berm in the Schmalz field will be shorter on top and not farmable, as the slope is much greater. The Krumery WASCOB at station 235+80 will create storage for runoff. The series of WASCOBS at station 241.75 is meant to mitigate the erosion that occurs on the slope. The WASCOB in the Schmalz field is meant to mitigate the erosion that occurs on the slope.

Table 4: Proposed WASCOB Summary

Station	Upstream Landowner	Overflow Elevation	Existing Ground Elevation	Storage Created (Acre-feet)	Total Ponding Area (Acres)
235+80	Krumery	1054	1052.3	5.7	11.5
241+75	Krumery	1060 &1057	1059 &1056.5	N/A	N/A
N/A	Schmalz	1062	1060.5	0.15	0.1

Table 5: Estimated Hydraulic Efficiency of Proposed WASCOBs

Upstream Landowner	Storm of Overtopping	Ponding Time				Ponding Time of Overtopping (hrs)	Ratio of Stress (hr/hr)	Individual Hydraulic Efficiency (%)
		1-year	10-year	50-year	100-year			
Krumery 235+80	10-year	6	14	17	20	14	0.29	71%
Krumery 241.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100%
Schmalz	1-year	2	3	3	3	2	0.04	96%

The hydraulic efficiency of the proposed WASCOBs can be seen above in Table 5. To calculate this efficiently the ratio of stress was derived for each of the WASCOBs. This ratio of stress is the ponding time of the WASCOB overtopping divided by 48 hours. 48 hours was chosen based on it being the common recommendation for maximum time water being ponded over vegetation. Hydraulic Efficiency is simply equal to the ratio of stress subtracted from one then multiplied by one hundred percent (to convert it into a percentage). The Hydraulic Efficiency Reduction for these WASCOBs is equal to the Hydraulic Efficiency without the WASCOBs subtracted by the average Hydraulic Efficiency. The hydraulic efficiency is meant to be a guide for the Viewers for their calculations.

The WASCOB's location at the upper end of the system does not provide a noticeable effect on the peak discharge rates at the outlet but will serve to mitigate erosion and sediment transport from their watersheds.

E. STREAM BARBS

Three stream barbs within the JD 15 open ditch near the outlet for Branch Q25 are proposed as a part of this project. The stream barbs are on a curve in the open ditch that is showing signs of erosion and damage along the outside bank of a curve in the open ditch. The stream barbs will act to slow down the velocity of the water in the open ditch, and to redirect the water away from the outside bank and into the middle of the channel. The stream barbs will be constructed with precast concrete blocks and riprap.

V. ALTERNATIVE SOLUTIONS

Several other alternative solutions to the proposed Improvement have been evaluated as part of this study.

A. "DO NOTHING" ALTERNATIVE

The "Do Nothing" Alternative has been discussed. However, the petitioners have experienced poor drainage throughout the drainage system for many years with the excess surface water damaging crops and resulting in frequent crop stress or crop loss. This loss of production equates to an economic loss for Renville County and the State of Minnesota. The loss results in reduced property value for the wet acres, thus affecting the taxing capacity of the County and State. Also, the ability of the landowners to receive a reasonable return on their investment is diminished because of this inadequate drainage.

For these reasons, the "Do Nothing" alternative has been dismissed. Obviously, the economic question of the cost of the Improvement verses the benefits derived still needs to evaluated. However, the "Do Nothing" alternative is not viewed as solving the drainage problem in the watershed.

B. WETLAND RESTORATION

Another alternative would be to restore the typically flooded areas of the watershed to wetland use. This alternative would provide storage in the watershed depressional areas for the water which is currently accumulating in these areas and drowning out agricultural crops. The proposal would also have added benefits for wildlife and possibly water quality.

In order to be effective, this alternative would need to restore sufficient acres to wetland use so that the existing drain tile system could convey the excess runoff. Utilizing NRCS data, it is estimated that about 163 acre-feet of water runs off the watershed during a 5-year storm event. Of this total, about 125 acre-feet of water is not able to be discharged through the existing drainage systems in a 48-hour period following the storm event. If sufficient wetland acres were available to store this runoff at a one-foot depth, approximately 125 acres of wetland restoration would be needed to provide a 5-year storm event protection.

To convert the 125 acres to wetlands, at least twice this many acres would need to be acquired for irregular wetland shapes and marginal damp soils. Thus about 250 acres of land would be needed. This acquisition would likely involve multiple properties who would voluntarily need to agree to the reversion. The estimated cost of acquisition plus reconstructing tile lines would be approximately $13,000 per acre. Applying this price to the estimated 250 acres results in a total cost 2 times more than the estimated Improvement cost.

Wetland restoration remains a viable option for providing some improvement in the functioning of the tile drainage system. If sufficient acres of wetlands could be restored, particularly in the upper part of the watershed, it could reduce the need for as large an outlet tile as is proposed. Finding willing landowners to participate in a restoration project and

locating sufficient funding would be critical in order to make this option viable. As part of the initial submittal of this Final Report, copies will be provided to the SWCD and NRCS so that early coordination can occur for potential funding and technical assistance toward this option.

D. TILE INTAKES

In the JD 15 system intakes are placed at existing intake locations and at low points in the system to collect surface water. Intakes are also placed at the downstream end of properties lines and at either side of roadways. The installation of the intakes at these locations is to allow for easy location and identification of this tile system. This ease of identification allows for a more readily available access for maintenance and connection to private systems.

VI. OTHER CONSIDERATIONS

A. PERMIT REQUIREMENTS

A permit from the Minnesota Pollution Control Agency for stormwater and erosion control for the project would be necessary. This permit requirement, which applies to any project which disturbs more than one acre of land, requires that the contractor and owner secure a permit for the project. The permit process will also require erosion control measures to be taken during the construction. Typical erosion control measures include placing of riprap and grass stabilization on the ditch bank and inlet protection around installed inlet areas. The fee for this permit is currently $400.00. This permit will be applied for shortly before construction is scheduled so that the contractor can also sign the permit application.

A permit from the Buffalo Creek Watershed District will be needed to update and improve drainage within the watershed district.

B. WETLANDS

National Wetland Inventory (NWI) Maps have been reviewed to locate potential wetlands subject to regulations. One wetland is shown on the NWI maps near the Improvement near the connection between BR Q12 and BR Q10. While crossing this area it is required that all piping running directly through must be nonperforated. Along with this all intakes that are within the wetland can be reinstalled at the same nominal size.

Impacts of the potential drainage system on individual land parcels will be evaluated by the Natural Resources Conservation Service upon filing of a Form AD 1026 by landowners. This NRCS process will identify any wetlands and measures which need to be taken in order for the drainage project to avoid impact to these wetlands. Because of federal data privacy requirements, it is not possible for non-landowners to obtain this information. Thus, the obligation for filling out these forms and doing this investigation will rest with individual landowners.

Drainage of non-directly impacted wetlands will be controlled by supplemental drainage systems installed by private owners. Owners are advised that such supplemental drainage may not be permitted under State Wetland Conservation Act, US Army Corps of Engineers and NRCS rules and may affect US Department of Agriculture program eligibility.

C. PUBLIC AND PRIVATE BENEFITS AND COSTS

The estimated cost of the proposed Improvement to JD 15 Branch Q is shown in Exhibit 3 of this report. Benefits for the Improvement, both public and private, will be established by the viewers and a report will be available at the final hearing.

Landowners certainly have other costs associated with construction and maintenance of their individual drainage systems. The proposed Improvement would only serve as an outlet or collector of runoff and drainage flow from the lands within the watershed. Each landowner is responsible to construct and maintain their own drainage system in order to adequately drain their farmlands. Individual benefits for an adequate drainage system are in increased crop production from farmlands.

The estimated cost of the proposed Improvement is included in this report. The public and private benefits and damages will be available at the final hearing.

D. AGRICULTURAL EFFECTS

Once installed, the lands within the improved watershed will be largely dependent on this drainage system for both surface and subsurface drainage flows. Thus it is imperative that the proposed system have adequate capacity in order to allow for modern farming operations.

It should be noted that many of the established ditch systems in Minnesota are now 70 to 100 years old. These systems are approaching the need for complete repair or replacement if the farmland is to remain productive. When feasible, it is economically imperative that these drainage systems be improved to become compatible with present day farming techniques and they be continually maintained. If properly maintained during normal growing seasons, portions of the agricultural lands in the watershed are some of the most productive in the State of Minnesota.

E. ALTERNATIVE MEASURES

Alternative measures, including those identified in the Renville County Water Management Plan and the strategies in the Buffalo Creek Watershed District Water Management Plan, have been considered in conjunction with this project. Specific proposals as part of the project to incorporate these measures include:

1. Measures to conserve, allocate and use drainage waters include the use of non-perforated tiles for the deeper installations so that groundwater is preserved for crop use and the continued infiltration which will occur in depressional areas of the watershed.

2. Measures to reduce downstream peak flows and flooding include the use of hickenbottom risers on intakes which limit the flow capacity of tile intakes, limiting the capacity of the proposed tiles to the minimum recommended standard of the NRCS in order to limit downstream flows, and construction of the proposed water and sediment control basin.

3. Measures to provide adequate drainage system capacity are being accomplished by designing the size of the tile system to meet the recommended standards of the Buffalo Creek Watershed District.

   Measures to reduce erosion and sedimentation include the use of hickenbottom risers on the tile intakes which result in reduced discharge of suspended solids, the restoration of the tile trench as soon as possible so that surface erosion of the disturbed soil is reduced, the use of inlet protection during the construction so that the discharge of suspended solids is reduced and the use of a rock filter at the outlet during construction so that suspended solids are captured. Straw mulch will also be utilized to temporarily stabilize the disturbed areas until they can be turned back over to agricultural production.

4. The inclusion of the WASCOB's will help reduce erosion and sedimentation.

5. Constructing the stream barbs will reduce the potential for ditch bank erosion downstream of the improvement.

F. WATER QUALITY

Little change in measurable water quality is anticipated because of this Improvement. However, there are components of the Improvement that will mitigate erosion and help improve water quality on a micro watershed scale. Tile system velocities are generally low, so that soil from the surrounding envelop is seldom carried into the tile. Thus, the largest source of suspended solids in tile system drainage is from water discharging into open intakes. Although open intakes will still be used on the system, ponding occurs around these intakes for any significant storm events. Thus, solids have time to settle rather than being discharged. The WASCOB's will help mitigate erosion and sediment transport within the tile system, and the stream barbs will mitigate erosion within the open ditch.

As a requirement of the MPCA Erosion Control Permit, the establishment of an erosion control plan is anticipated. Incorporation of such devices as inlet protection, riprap at the outlets and permanent grasses as soon as possible following the construction are anticipated. All of these measures will help to reduce erosion and maintain water quality during the construction of the project.

G. FISH AND WILDLIFE

The federally listed threatened or endangered species having the potential to be in Renville County at the time of this report are the northern long-eared bat, and the prairie bush clover. According to the Minnesota DNR, there are no known northern long-eared bat roost trees or hibernacula in Renville County. Additionally, there are no trees to be removed as a part of the improvement, so there is no anticipated impact to the northern long-eared bat. The prairie bush clover is found within native prairie on well drained soils. The project will take place within agricultural fields, so no impact to the prairie bush clover is anticipated. Bald eagles are present in Renville County and are protected under the Bald and Golden Eagle Protection Act. Again, there are no trees to be removed as a part of the improvement, so there is no impact to the bald eagle.

A request to the state NHIS database is pending at the time of this report.

Field investigation has revealed that the only permanent wildlife habitat in the area of the Improvement is along the road ditches and building sites. These areas will not be impacted by the improvement.

Current wet areas within the project watershed do provide for transitory stop over locations for migratory waterfowl. However, these areas currently dry up following wet periods and are then under cultivation and production. It is anticipated that some of these temporary ponding areas will still exist after the construction of the Improvement although ponding times will likely be reduced. Therefore, the provisions for adequate drainage of these lands will not be of a detrimental nature to local wildlife resources.

H. GROUNDWATER

The purpose of an agricultural drainage system is to maintain the elevation of the shallow groundwater table sufficiently below the surface to provide for efficient production of crops. The level at which the groundwater will be maintained has been and will be determined by the depth of the tile system and private tiles in the area. Although the proposed Improvement is somewhat deeper than the existing tiles in the areas, the depth increase is not significant or unusual for drainage systems. Additionally, tiles that have a depth of 6 feet or greater to the

invert of the pipe will be non-perforated. Therefore, no change in the availability, distribution or use of the shallow groundwater beyond that necessary for the sufficient production of crops within the watershed is anticipated by this construction.

I. ENVIRONMENTAL IMPACT

The adverse effects of the proposed Improvement are of a temporary nature and are listed as follows:

1. Disturbing of the ground surface during construction could result in the loss of one crop within the construction limits.
2. The restored trench area will be less productive for the first few years following construction and will require more fertilizer to be as productive as the undisturbed adjoining farmland. The topsoil in this area will be removed and replaced in an effort to maintain the soil productivity.
3. Temporary noise and dust generation can be expected from the construction operations. These impacts are not viewed as significant since there are few residences near the proposed construction route.
4. Temporary erosion of soil may occur in the construction area until permanent ground cover and ground stabilization occurs. Although these effects need to be considered, they are probably not significantly different than the current topsoil loss that occurs annually from erosion of topsoil due to overland flow in the watershed. This construction erosion will be minimized through the use of inlet protection, riprap and rapid establishment of permanent grass cover.

Numerous beneficial effects are anticipated from the proposed Improvement. Most of these benefits are directly attributable to increased crop production from lands presently damaged through period flooding and ponding. Among the most obvious benefits are:

1. Increased personal farm income.
2. Increased value of benefited farmland.
3. Contribution to the local economy through additional purchases, farm modernization and expansion.

J. LAND USE

The present use of the land in the JD 15 Branch Q watershed is largely agricultural. This use is expected to continue into the future.

K. GUIDANCE TO VIEWERS REGARDING IMPROVEMENT BENEFITS

Discussions with the landowners in the JD 15 Branch Q system has provided evidence of the condition of the existing tile systems. Previous repairs on the tile and televising have shown that the existing tile is badly deteriorated. In addition, years of use and settlement of sections of the tile have reduced the hydraulic capacity of the tile. Even if JD 15 Branch Q had not been petitioned for improvement, a repair is warranted.

Another way to describe this is related to the benefit of avoiding inevitable repair/reconstruction costs on the ditch. Since repair of the system, as required by Minnesota Statue 103E.705, would otherwise be paid for by the entire drainage system in order to restore the system to its as-constructed, and subsequently improved, hydraulic efficiency, the cost of repair may be used to offset a portion of the improvement cost. Thus, the cost of the new tiles may be added as benefit since it avoids costs otherwise required to repair the

system. With this information, it is the intent of the Improvement to replace the existing tile. Thus, a portion of the cost of the new JD 15 Branch Q tiles should be allocated as a Repair cost. The application of this principal is known as Separable Benefits under the ditch statutes.

The amount of the Improvement which can be allocated to Separable Benefits is shown in Exhibit 3 as $1,570,341. It is recommended that the Board apply these Separable Benefits to the Improvement in the further ditch proceedings.

VII. ADEQUACY OF THE OUTLET

A. GENERAL INFORMATION

As mentioned earlier, the outlet for Branch Q is into the open ditch of JD 15 in Section 20 of Preston Lake Township. The Main open ditch of JD 15. JD 15 then becomes Buffalo Creek as it enters McLeod County.

B. OUTLET VELOCITY

The proposed improvements have an outlet velocity of 3.0 ft/s from Branch Q1 and 2.5 ft/s from Branch Q25. The existing conditions had an outlet velocity of 2.6 ft/s from Branch Q1 and 2.5 ft/s from Branch Q25. Branch Q1 has an increase in velocity of 0.4 ft/s, and Branch Q25 has no significant increase in velocity. With the proposed improvements riprap will be installed at the outlet in accordance with MnDot specifications or at a minimum 18" Class III riprap as specified in Exhibit 1. The impact of the outlet velocities within the open ditch will be further mitigated by the construction of the stream barbs.

C. ADEQUACY OF THE OUTLET

The adequacy of the open ditch of JD 15 to accept the additional flow resulting from the Improvement has been evaluated as required by the ditch statutes. This evaluation has been performed in the following manner:

1. The watershed contributing flow to the open ditch of JD 15 at the outlet for JD 15 Lateral Q has been delineated using the US Geological Survey "StreamStats" program. The StreamStats program has been used to generate peak flow rates for 2 to 100-year storm events.
2. The increase in the design flow of the proposed tile of approximately 11.3 cfs. This additional flow was then added to the existing flow to represent the proposed flow.
3. The additional flow because of the new lateral has been added to the flow in the JD 15 open ditch, assuming that the peak flow from the new lateral would reach the open ditch at the same time as the flow is peaking in the ditch. This is a "worst case" scenario, in that the flow from the tile would likely peak well before the flow in JD 15 will peak. Resultant flow rates have been used to estimate the "before project" and "after project" depths of flow in the open ditch using Manning's equation for open channel flow assuming normal depth flow.

Table 6: Calculation of Additional Flow						
Runoff Event	Existing Peak Flow (CFS)	Proposed Peak Flow (CFS)	Change in Peak Flow (CFS)	Existing Peak Depth in JD 15	Proposed Peak Depth in JD 15	Change in Peak Depth in JD 15 (ft)
2-Year	369	380	11.3	5.2	5.2	0.0
5-Year	813	824	11.3	7.8	7.9	0.1
10-Year	1,220	1,231	11.3	9.6	9.7	0.1
25-Year	1,860	1,871	11.3	11.9	11.9	0.0
50-Year	2,430	2,441	11.3	13.5	13.6	0.1
100-Year	3,090	3,101	11.3	15.2	15.2	0.0

As can be seen from Table 6, the construction of the Improvement will increase flows to the JD 15 open ditch because of the larger pipe outlet. The increase in flow will cause an increase in the depth in the JD 15 open ditch of 0.1 feet to 0.0 feet. Both the existing and proposed flows will be contained within the existing open ditch. These impacts will be lessened farther downstream of the new lateral, as more flow is added to the system. The construction of the stream barbs downstream will reduce velocities within the open ditch and help prevent ditch bank erosion. The Improvement will have minimal impact on the peak flow rate or depth in the Main open ditch of JD 15. It is therefore our opinion that the outlet is adequate for the proposed Improvement.

There have been other improvements on the JD 15 system, but because of the distance between this improvement and the other improvements there is no anticipated cumulative negative effect on the overall system.

VIII. ESTIMATE OF COST

The preliminary cost estimate to construct the proposed Improvement, is described in this report is shown in Exhibit 3. The total estimated cost is $1,784,245.00. Included in the construction cost estimate are the approximate 61.6 acres of agricultural land which will be temporarily taken out of production by the construction. The individual landowners will be compensated for this loss through the damage process of the further ditch proceedings.

IX. RECOMMENDATIONS

The proposed Improvement of JD 15 Branch Q in Renville County, as described in this report, is feasible and practical and is necessary to provide drainage for the cultivation of crops in this watershed area. The existing tile system is inadequate to provide proper drainage for current agricultural practices. The outlet is adequate in order to convey the discharge.

It is the recommendation of your engineer that the Final Engineer's Report be approved and that the Board order the preparation Final Plans and Specifications and order the Improvement.

Exhibit 1: Final Plans and Profiles

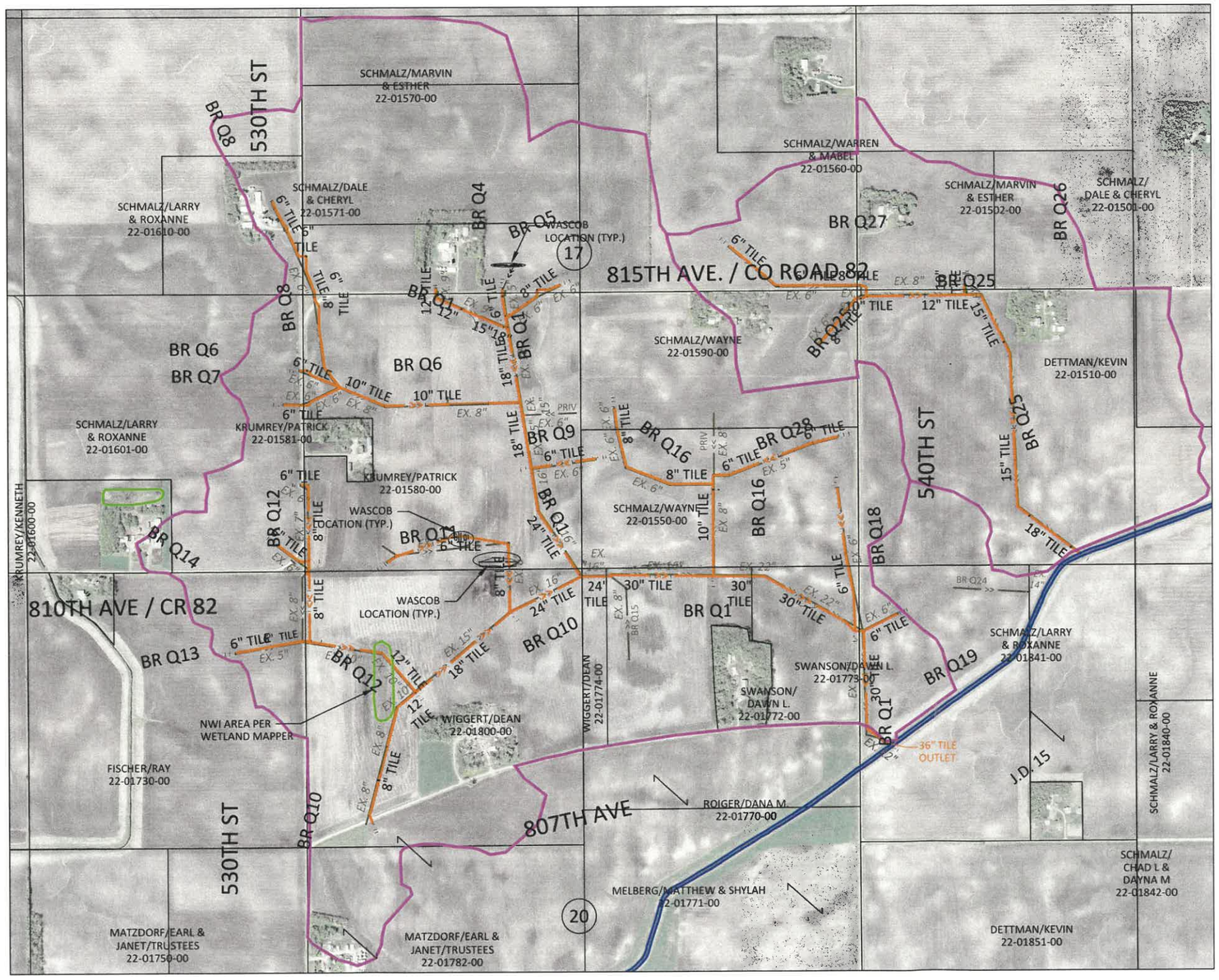
RENVILLE COUNTY, MINNESOTA

PRELIMINARY CONSTRUCTION PLANS FOR

JUDICIAL DITCH 15 BRANCH Q IMPROVEMENT PROJECT

PRESTON LAKE TOWNSHIP

NOVEMBER, 2022



MAP OF RENVILLE COUNTY, MN

N

0 600 1200

SCALE FEET

SHEET NUMBER	SHEET TITLE
GENERAL	
G0.01	TITLE SHEET
G1.01	LEGEND, GENERAL NOTES
DETAILS & EROSION CONTROL PLAN	
C1.01 - C1.02	DETAILS
C2.01 - C2.05	EROSION CONTROL PLAN, SWPPP
GRADING PLAN	
C3.01 - C3.02	GRADING PLAN - WASCOBS
C3.03	GRADING PLAN-STREAM BARBS
TILE PLAN & PROFILE	
C5.01-C5.03	JD 15 BR Q1 MAIN TILE
C5.04	LATERALS Q18 & Q19
C5.05	LATERAL Q16
C5.06	LATERALS Q28 & Q9
C5.07-C5.08	LATERALS Q10 & Q11
C5.09	LATERAL Q12
C5.10	LATERALS Q13 & Q14
C5.11	LATERAL Q6
C5.12	LATERALS Q7 & Q8
C5.13	LATERALS Q4 & Q5
C5.14-C5.15	LATERAL Q25
C5.16	LATERALS Q26 & Q27
THIS PLAN SET CONTAINS 28 SHEETS.	

LEGEND

- NWI WETLAND
- PROPOSED TILE ALIGNMENTS
- PARCEL LINES
- EXISTING OPEN DITCH
- WATERSHED BOUNDARY
- EXISTING TILE

NOTE: EXISTING UTILITY INFORMATION SHOWN ON THIS PLAN HAS BEEN PROVIDED BY THE UTILITY OWNER. THE CONTRACTOR SHALL FIELD VERIFY EXACT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION AS REQUIRED BY STATE LAW. NOTIFY GOPHER STATE ONE CALL, 1-800-252-1166 OR 651-454-0002.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D UNLESS OTHERWISE NOTED. THIS UTILITY 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."

⌖ BM=1058.046
GSID STA 103539, RUN 444338.58 LAT, 943444.78 LON ALUM ALLOY ROD, 1.9MI E/SE OF BUFFALO LK, 1.9MI E ALONG Hwy 212

PROJECT DATUM:
HORIZONTAL: NAD83 (2011), RENVILLE COUNTY
VERTICAL: NAVD88

RECORD DRAWING INFORMATION
OBSERVER:
CONTRACTOR:
DATE:

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 MINNESOTA.

PRELIMINARY
NOT FOR CONSTRUCTION
SHAUN P. LUKER
48756
MM/DD/YYYY

BOLTON & MENK
1243 CEDAR STREET NE
SLEEPY EYE, MINNESOTA 56085
Phone: (507) 794-5541
Email: SleepyEye@bolton-menk.com
www.bolton-menk.com

DESIGNED: SPL
DRAWN: JB, sml
CHECKED: SPL
APPROVED: S15.120831

RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
TITLE SHEET

SHEET G0.01

EXISTING TOPOGRAPHIC SYMBOLS

- ACCESS GRATE
- AIR CONDITION UNIT
- ANTENNA
- AUTO SPRINKLER CONNECTION
- BARRICADE PERMANENT
- BASKETBALL POST
- BENCH
- BIRD FEEDER
- BOLLARD
- BUSH
- CATCH BASIN RECTANGULAR CASTING
- CATCH BASIN CIRCULAR CASTING
- CURB STOP
- CLEAN OUT
- CULVERT END
- DRINKING FOUNTAIN
- DOWN SPOUT
- FILL PIPE
- FIRE HYDRANT
- FLAG POLE
- FLARED END / APRON
- FUEL PUMP
- GRILL
- GUY WIRE ANCHOR
- HANDHOLE
- HANDICAP SPACE
- IRRIGATION SPRINKLER HEAD
- IRRIGATION VALVE BOX
- LIFT STATION CONTROL PANEL
- LIFT STATION
- LIGHT ON POLE
- LIGHT-GROUND
- MAILBOX
- MANHOLE-COMMUNICATION
- MANHOLE-ELECTRIC
- MANHOLE-GAS
- MANHOLE-HEAT
- MANHOLE-SANITARY SEWER
- MANHOLE-STORM SEWER
- MANHOLE-UTILITY
- MANHOLE-WATER
- METER
- ORDER MICROPHONE
- PARKING METER
- PAVEMENT MARKING
- PEDESTAL-COMMUNICATION
- PEDESTAL-ELECTRIC
- PEDESTRIAN PUSH BUTTON
- PICNIC TABLE
- POLE-UTILITY
- POLE-BRACE
- POST
- RAILROAD SIGNAL POLE
- REGULATION STATION GAS
- SATELLITE DISH
- SIGN NON TRAFFIC
- SIGN TRAFFIC
- SIGNAL CONTROL CABINET
- SOIL BORING
- SIREN
- TELEPHONE BOOTH
- TILE INLET
- TILE OUTLET
- TILE RISER
- TRANSFORMER-ELECTRIC
- TREE-CONIFEROUS
- TREE-DEAD
- TREE-DECIDUOUS
- TREE STUMP
- TRAFFIC ARM BARRIER
- TRAFFIC SIGNAL
- TRASH CAN
- UTILITY MARKER
- VALVE
- VALVE POST INDICATOR
- VALVE VAULT
- VAULT
- VENT PIPE
- WATER SPIGOT
- WELL
- WETLAND DELINEATED MARKER
- WETLAND
- WET WELL
- YARD HYDRANT

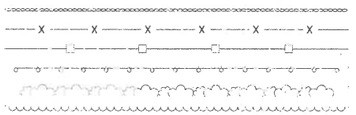
PROPOSED TOPOGRAPHIC SYMBOLS

- CLEANOUT
- MANHOLE
- LIFT STATION
- STORM SEWER CIRCULAR CASTING
- STORM SEWER RECTANGULAR CASTING
- STORM SEWER FLARED END / APRON
- STORM SEWER OUTLET STRUCTURE
- STORM SEWER OVERFLOW STRUCTURE
- CURB BOX
- FIRE HYDRANT
- WATER VALVE
- WATER REDUCER
- WATER BEND
- WATER TEE
- WATER CROSS
- WATER SLEEVE
- WATER CAP / PLUG
- RIP RAP
- DRAINAGE FLOW
- TRAFFIC SIGNS

SURVEY SYMBOLS

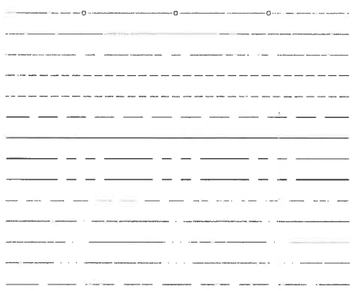
- BENCHMARK LOCATION
- CONTROL POINT
- MONUMENT FOUND
- CAST IRON MONUMENT
- STONE MONUMENT

EXISTING TOPOGRAPHIC LINES



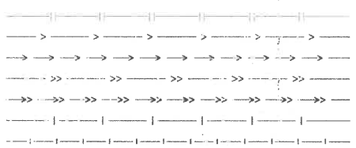
- RETAINING WALL
- FENCE
- FENCE-DECORATIVE
- GUARD RAIL
- TREE LINE
- BUSH LINE

SURVEY LINES



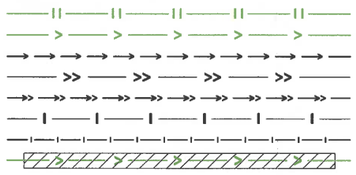
- CONTROLLED ACCESS
- BOUNDARY
- CENTERLINE
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING LOT LINE
- PROPOSED LOT LINE
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- SETBACK LINE
- SECTION LINE
- QUARTER LINE
- SIXTEENTH LINE
- TEMPORARY EASEMENT

EXISTING UTILITY LINES



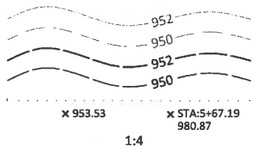
- FORCEMAIN
- SANITARY SEWER
- SANITARY SERVICE
- STORM SEWER
- STORM SEWER DRAIN TILE
- WATERMAIN
- WATER SERVICE

PROPOSED UTILITY LINES



- FORCEMAIN
- SANITARY SEWER
- SANITARY SERVICE
- STORM SEWER
- STORM SEWER DRAIN TILE
- WATERMAIN
- WATER SERVICE
- PIPE CASING

GRADING INFORMATION



- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- PROPOSED CONTOUR MAJOR
- PROPOSED GRADING LIMITS / SLOPE LIMITS
- PROPOSED SPOT ELEVATION
- RISE:RUN (SLOPE)

HATCH PATTERNS

- BITUMINOUS
- CONCRETE
- GRAVEL

EXISTING PRIVATE UTILITY LINES

NOTE:
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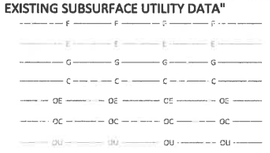

- UNDERGROUND FIBER OPTIC
- UNDERGROUND ELECTRIC
- UNDERGROUND GAS
- UNDERGROUND COMMUNICATION
- OVERHEAD ELECTRIC
- OVERHEAD COMMUNICATION
- OVERHEAD UTILITY

UTILITIES IDENTIFIED WITH A QUALITY LEVEL :

LINE TYPES FOLLOW THE FORMAT: UTILITY TYPE - QUALITY LEVEL
EXAMPLE: G-A G-A UNDERGROUND GAS, QUALITY LEVEL A
UTILITY QUALITY LEVEL (A,B,C,D) DEFINITIONS CAN BE FOUND IN CI/ASCE 38-02.

UTILITY QUALITY LEVELS:

QUALITY LEVEL D: PROVIDES THE MOST BASIC LEVEL OF INFORMATION. IT INVOLVES COLLECTING DATA FROM EXISTING UTILITY RECORDS. RECORDS MAY INCLUDE AS-BUILT DRAWINGS, DISTRIBUTION AND SERVICES MAPS, EXISTING GEOGRAPHIC INFORMATION SYSTEM DATABASES, CONSTRUCTION PLANS, ETC.

QUALITY LEVEL C: INVOLVES SURVEYING VISIBLE SUBSURFACE UTILITY STRUCTURES SUCH AS MANHOLES, HAND-HOLES, UTILITY VALVES AND METERS, FIRE HYDRANTS, PEDESTALS AND UTILITY MARKERS, AND THEN CORRELATING THE INFORMATION WITH EXISTING UTILITY RECORDS TO CREATE COMPOSITE DRAWINGS. INCLUDES QUALITY LEVEL D ACTIVITIES.

QUALITY LEVEL B: INVOLVES DESIGNATING THE HORIZONTAL POSITION OF SUBSURFACE UTILITIES THROUGH SURFACE DETECTION METHODS AND COLLECTING THE INFORMATION THROUGH A SURVEY METHOD. INCLUDES QUALITY LEVEL C AND D TASKS.

QUALITY LEVEL A: PROVIDES THE HIGHEST LEVEL OF ACCURACY. IT INVOLVES LOCATING OR POTHOLING UTILITIES AS WELL AS ACTIVITIES IN QUALITY LEVELS B, C, AND D. THE LOCATED FACILITY INFORMATION IS SURVEYED AND MAPPED AND THE DATA PROVIDES PRECISE PLAN AND PROFILE INFORMATION.

ABBREVIATIONS

A	ALGEBRAIC DIFFERENCE	GRAV	GRAVEL	RSC	RIGID STEEL CONDUIT
ADJ	ADJUST	GU	GUTTER	RT	RIGHT
ALT	ALTERNATE	GV	GATE VALVE	SAN	SANITARY SEWER
B-B	BACK TO BACK	HDPE	HIGH DENSITY POLYETHYLENE	SCH	SCHEDULE
BIT	BITUMINOUS	HH	HANDHOLE	SERV	SERVICE
BLDG	BUILDING	HP	HIGH POINT	SHLD	SHOULDER
BMP	BEST MANAGEMENT PRACTICE	HWL	HIGH WATER LEVEL	STA	STATION
BR	BEGIN RADIUS	HYD	HYDRANT	STD	STANDARD
BV	BUTTERFLY VALVE	I	INVERT	STM	STORM SEWER
CB	CATCH BASIN	K	CURVE COEFFICIENT	TC	TOP OF CURB
C&G	CURB AND GUTTER	L	LENGTH	TE	TEMPORARY EASEMENT
CIP	CAST IRON PIPE	LO	LOWEST OPENING	TEMP	TEMPORARY
CIPP	CURED-IN-PLACE PIPE	LP	LOW POINT	TNH	TOP NUT HYDRANT
CL	CENTER LINE	LT	LEFT	TP	TOP OF PIPE
CL.	CLASS	MAX	MAXIMUM	TYP	TYPICAL
CLVT	CULVERT	MH	MANHOLE	VCP	VITRIFIED CLAY PIPE
CMP	CORRUGATED METAL PIPE	MIN	MINIMUM	VERT	VERTICAL
C.O.	CHANGE ORDER	MR	MID RADIUS	VPC	VERTICAL POINT OF CURVE
COMM	COMMUNICATION	NIC	NOT IN CONTRACT	VPI	VERTICAL POINT OF INTERSECTION
CON	CONCRETE	NMC	NON-METALLIC CONDUIT	VPT	VERTICAL POINT OF TANGENT
CSP	CORRUGATED STEEL PIPE	NTS	NOT TO SCALE	WM	WATERMAIN
DIA	DIAMETER	NWL	NORMAL WATER LEVEL		
DIP	DUCTILE IRON PIPE	OHW	ORDINARY HIGH WATER LEVEL		
DWY	DRIVEWAY	PC	POINT OF CURVE	AC	ACRES
E	EXTERNAL CURVE DISTANCE	PCC	POINT OF COMPOUND CURVE	CF	CUBIC FEET
ELEC	ELECTRIC	PE	PERMANENT EASEMENT	CV	COMPACTED VOLUME
ELEV	ELEVATION	PED	PEDESTRIAN, PEDESTAL	CY	CUBIC YARD
EOF	EMERGENCY OVERFLOW	PERF	PERFORATED PIPE	EA	EACH
ER	END RADIUS	PERM	PERMANENT	EV	EXCAVATED VOLUME
ESMT	EASEMENT	PI	POINT OF INTERSECTION	LB	POUND
EX	EXISTING	PL	PROPERTY LINE	LF	LINEAR FEET
FES	FLARED END SECTION	PRC	POINT OF REVERSE CURVE	LS	LUMP SUM
F-F	FACE TO FACE	PT	POINT OF TANGENT	LV	LOOSE VOLUME
FF	FINISHED FLOOR	PVC	POLYVINYL CHLORIDE PIPE	SF	SQUARE FEET
F&I	FURNISH AND INSTALL	PVMT	PAVEMENT	SV	STOCKPILE VOLUME
FM	FORCEMAIN	R	RADIUS	SY	SQUARE YARD
FO	FIBER OPTIC	R/W	RIGHT-OF-WAY		
F.O.	FIELD ORDER	RCP	REINFORCED CONCRETE PIPE		
GRAN	GRANULAR	RET	RETAINING		

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 MINNESOTA.

PRELIMINARY
NOT FOR CONSTRUCTION

SHAUN P. LUKER
LIC. NO. 48756 DATE MM/DD/YYYY

BOLTON & MENK

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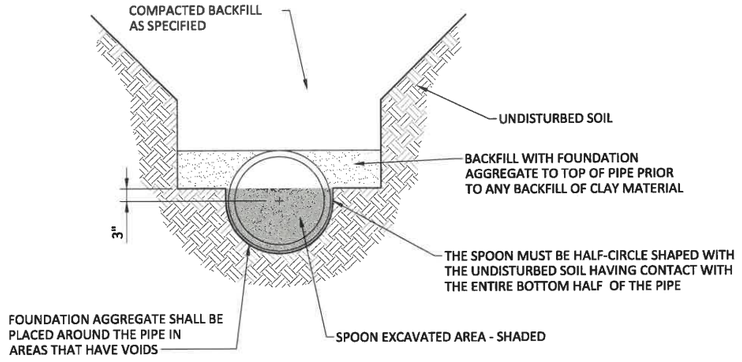
DESIGNED SPL
DRAWN JB, sml
CHECKED SPL
CURRENT PROJ. NO. S15.120831

NO.	ISSUED FOR	DATE

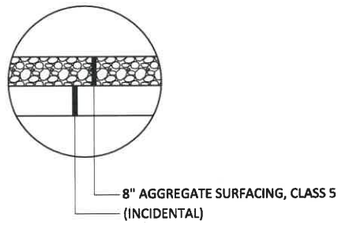
RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
LEGEND, GENERAL NOTES

SHEET G1.01



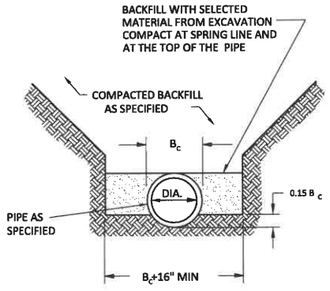
HDPE "SPOON" TRENCH BEDDING DETAIL

NOT TO SCALE



TOWNSHIP ROAD RESTORATION

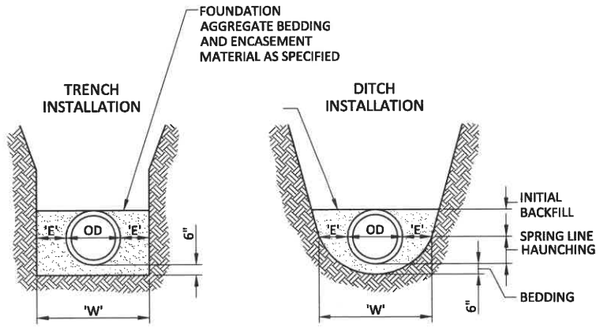
NOT TO SCALE



PIPE DIA.	B
36" OR LESS	B_c + 24"
42" TO 54"	1.5 x B_c
60" OR OVER	B_c + 36"

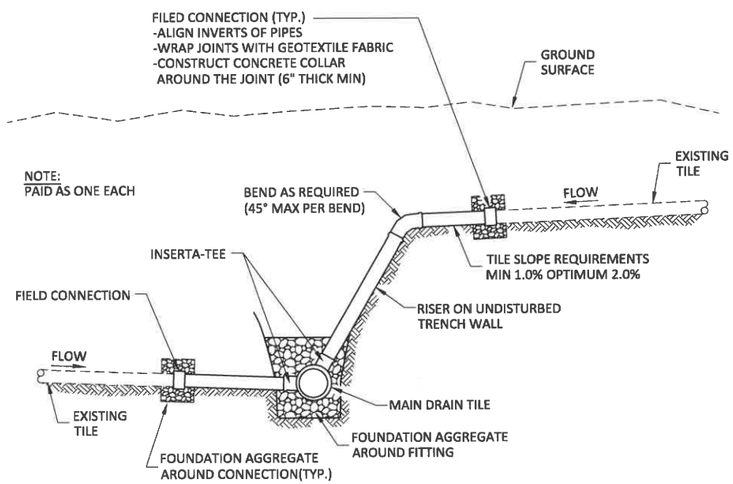
TRENCH DETAIL
REINFORCED CONCRETE PIPE
CLASS "C" BEDDING CONDITION

NOT TO SCALE



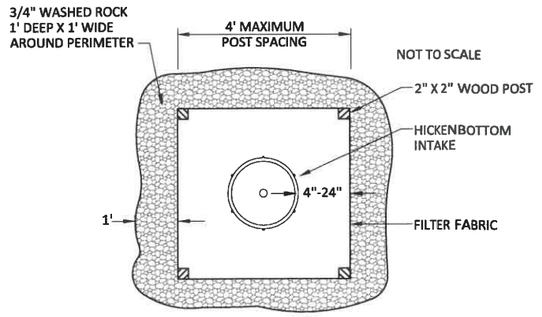
PIPE SIZE	PIPE OD (Nominal)	'E' ENVELOPE WIDTH (Minimum)	MINIMUM TRENCH WIDTH (OD+2E)
4"	4.6"	3"-4"	10"
6"	6.8"	4"-6"	14"
8"	9.5"	4"-6"	20"
10"	11.6"	5"-8"	24"
12"	14.2"	5"-8"	30"
15"	17.7"	5"-8"	34"
18"	22.0"	6"-10"	38"
24"	29.5"	8"-12"	46"
30"	35.4"	8"-12"	60"
36"	41.0"	8"-12"	65"
42"	47.4	12"-14"	74"

DUAL WALL POLYETHYLENE TRENCH

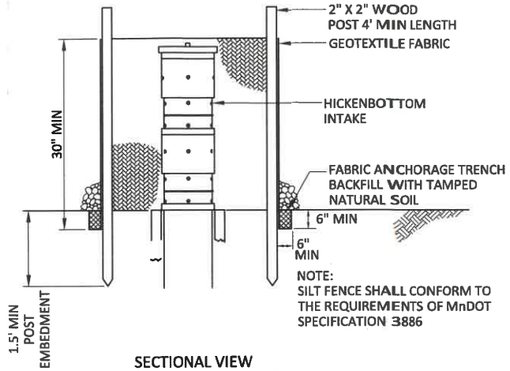


DRAIN TILE CONNECTION

NOT TO SCALE



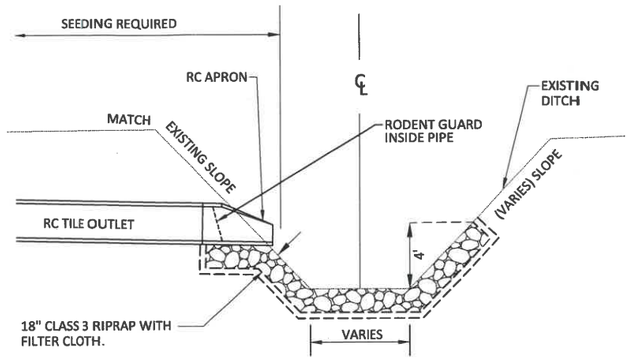
PLAN VIEW



SECTIONAL VIEW

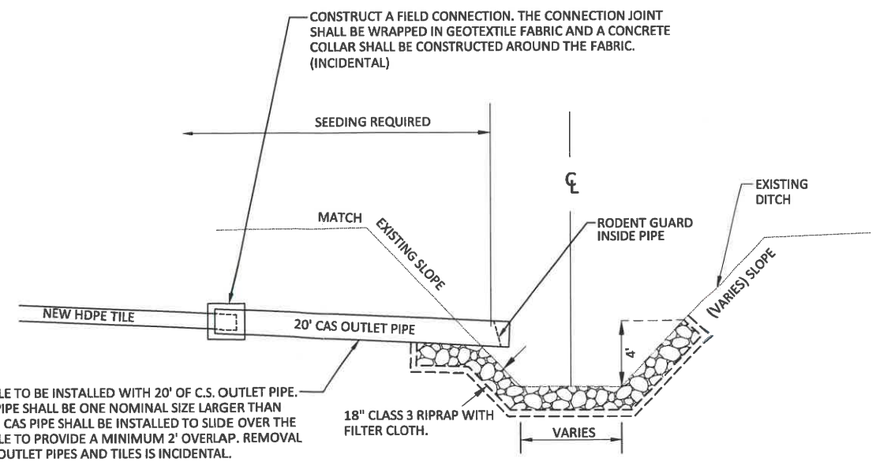
INLET PROTECTION
PREASSEMBLED SILT FENCE

NOT TO SCALE



TYPICAL SECTION AT OPEN DITCH FOR RC PIPE

NOT TO SCALE



TYPICAL SECTION AT OPEN DITCH FOR HDPE TILE

NOT TO SCALE

NOTE: DETAILS ARE NOT TO SCALE

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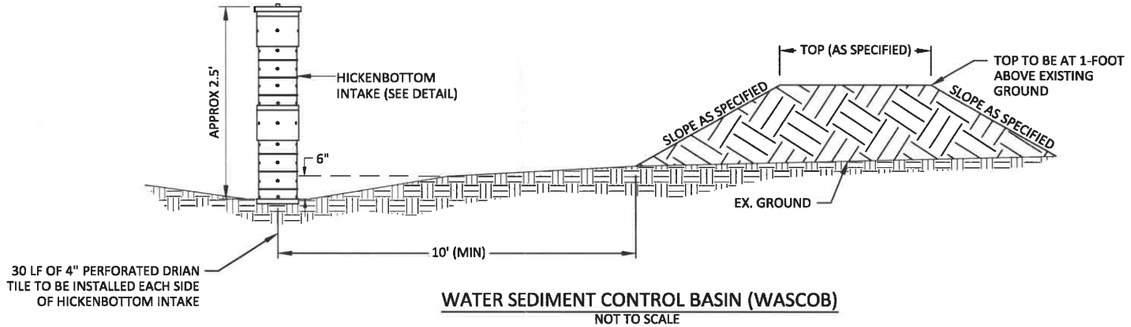
DESIGNED SPL
DRAWN JB, smL
CHECKED SPL
CLIENT PROJ. NO. 515.120831

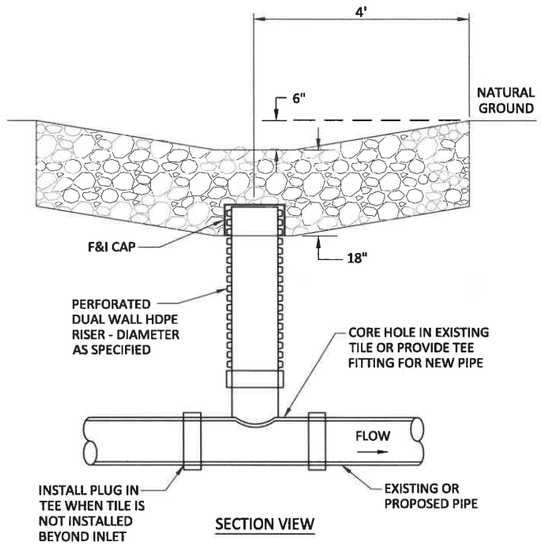
NO.	ISSUED FOR	DATE

RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
DETAILS

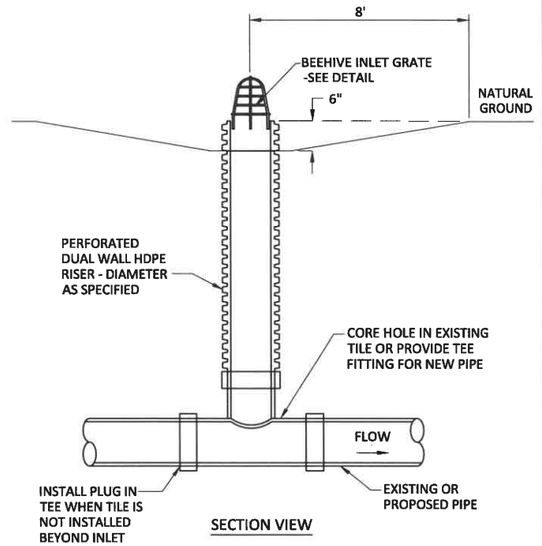
SHEET C1.01



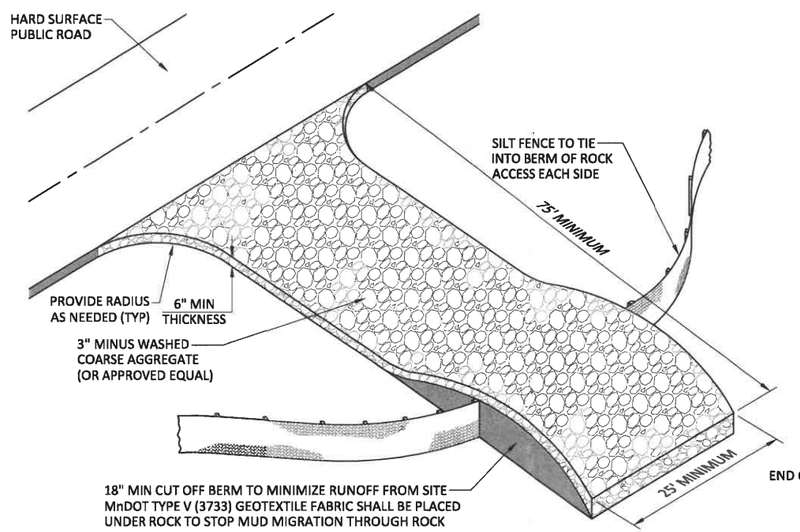
WATER SEDIMENT CONTROL BASIN (WASCOB)
NOT TO SCALE



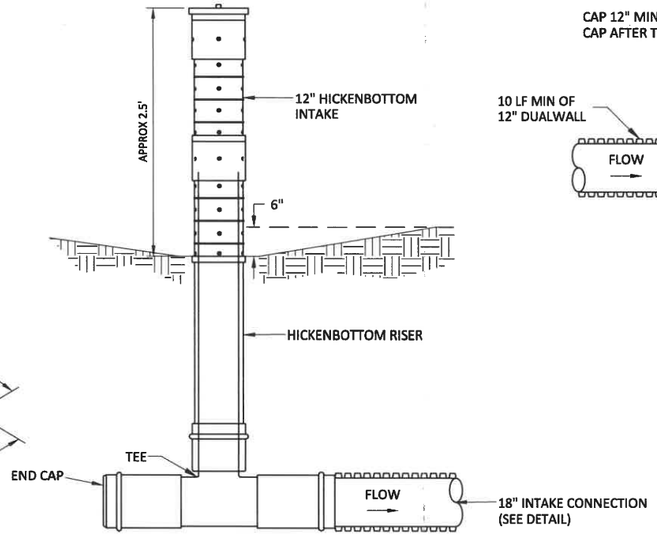
BLIND/ROCK INTAKE - IN FIELDS
NOT TO SCALE



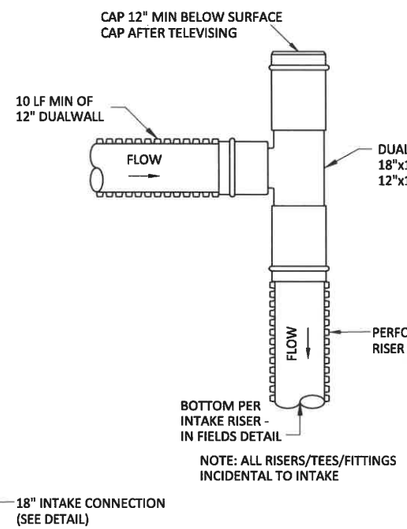
INTAKE RISER - IN FIELDS
NOT TO SCALE



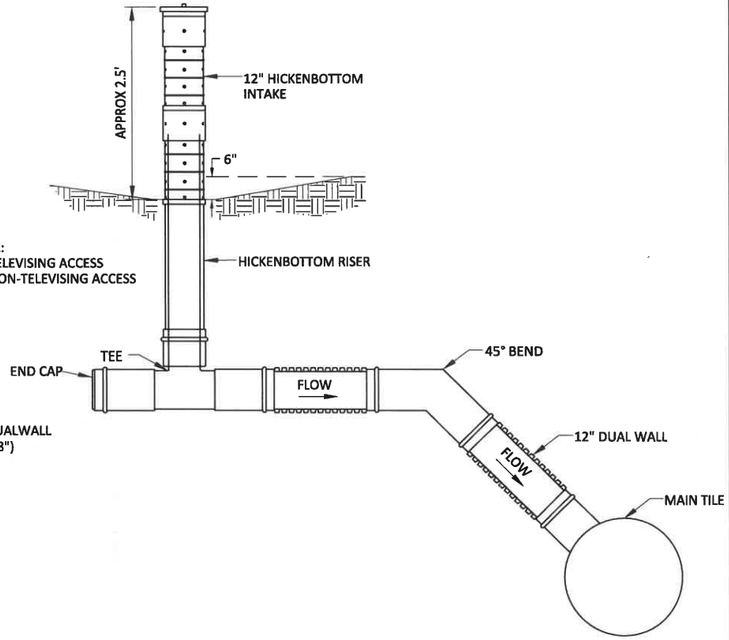
ROCK CONSTRUCTION ENTRANCE
NOT TO SCALE



18" SURFACE WATER INTAKE - IN ROADSIDE DITCHES
NOT TO SCALE



18" INTAKE CONNECTION
NOT TO SCALE



12" SURFACE WATER INTAKE - IN ROADSIDE DITCHES
NOT TO SCALE

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www.bolton-menk.com

DESIGNED	SPL
DRAWN	JB, smL
CHECKED	SPL
CLIENT PROJ. NO.	S15.120831

NO.	ISSUED FOR	DATE

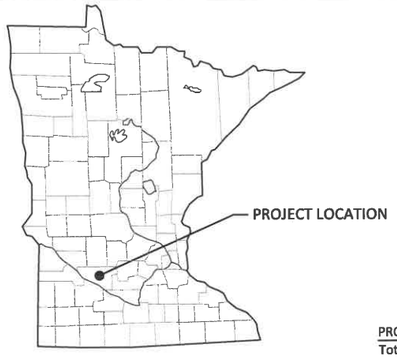
RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
DETAILS

SHEET
C1.02

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

JD 15 BR Q IMPROVEMENT 2022

RENVILLE COUNTY, MINNESOTA



LEGEND

- 1-MILE BOUNDARY
- PROJECT BOUNDARY
- OR — IMPAIRED, SPECIAL OR PROTECTED WATERS
- NATIONAL WETLANDS INVENTORY
- CALCAREOUS FEN
- RECEIVING WATERS

RESPONSIBLE PARTIES:
The Contractor and Owner will be joint applicants under the MPCA's General Stormwater Permit for Construction Activity as required by the National Pollutant Discharge Elimination System (NPDES) Phase II program.

The Contractor shall provide one or more trained Construction SWPPP Manager(s) knowledgeable and experienced in the application of erosion prevention and sediment control BMPs that will oversee the implementation of the SWPPP, and the installation, inspection and maintenance of the erosion prevention and sediment control BMPs.

A Construction SWPPP Manager must be available for an on-site inspection within 72 hours upon request by the MPCA.

	COMPANY	CONTACT PERSON	PHONE
OWNER:	RENVILLE COUNTY	SETH SPARKS	320-523-3746
SWPPP DESIGNER:	Bolton & Menk, Inc.	SHAUN LUKER	507-794-5541
CONTRACTOR:	TBD	TBD	TBD
CONSTRUCTION SWPPP MANAGER:	TBD	TBD	TBD
PARTY RESPONSIBLE FOR LONG TERM O&M:	RENVILLE COUNTY	SETH SPARKS	320-523-3746

The SWPPP Designer, Construction SWPPP Manager, and BMP Installer must have appropriate training. Documentation showing training commensurate with the job duties and responsibilities is required to be included in the SWPPP prior to any work beginning on the site. Training documentation for the SWPPP Designer is included on the Narrative sheet. The Contractor shall attach training documentation to this SWPPP for the Construction SWPPP Manager and BMP Installer prior to the start of construction. This information shall be kept up to date until the project NOT is filed.

ADDITIONAL COMPENSATION
Payment for all work associated with Erosion and Sediment Control shall be as described in the Project Manual. Unless otherwise authorized by the Owner no additional payment shall be made for any work required to administer and maintain the site erosion and sediment control in compliance with the Minnesota Pollution Control Agency (MPCA) - General Stormwater Permit for Construction Activity (MN R100001) including but not limited to inspection, maintenance, and removal of BMPs or addition of BMPs to accommodate Contractor phasing.

DOCUMENT RETENTION
Permittees must make the SWPPP, including all inspection reports, maintenance records, training records and other information required by this permit, available to federal, state, and local officials within three (3) days upon request for the duration of the permit and for three (3) years following the NOT.

GENERAL STORMWATER DISCHARGE REQUIREMENTS
All requirements listed in Section 5.1 of the Permit for the design of the permanent stormwater management system and discharge have been included in the preparation of this SWPPP. These include but are not limited to:

1. The expected amount, frequency, intensity, and duration of precipitation.
2. The nature of stormwater runoff and run-on at the site
3. Peak flow rates and stormwater volumes to minimize erosion at outlets and downstream channel and stream bank erosion.
4. The range of soil particle sizes expected to be present on the site.

Permanent stormwater treatment systems for this project have been designed in accordance with the guidance in the MN Stormwater Manual in place at the time of bidding. Copies of the design information and calculations are part of this SWPPP and will be provided in digital format upon written request to the Engineer.

PROJECT AREAS:

Total Project Size (disturbed area) =	63.9	ACRES
Existing area of impervious surface =	0.1	ACRES
Post construction area of impervious surface =	0.1	ACRES
Total new impervious surface area created =	0.0	ACRES
Planned Construction Start Date:	TBD	
Estimated Construction Completion Date:	TBD	

PERMANENT STORMWATER MANAGEMENT SYSTEM:
Type of storm water management used if more than 1 acre of new impervious surface is created:

	Wet Sedimentation Basin
	Infiltration/Filtration
	Regional Pond
X	Permanent Stormwater Management Not Required
X	Less than 1 acre of impervious surface area created

PROJECT LOCATION:

COUNTY	TOWNSHIP	RANGE	SECTION	LATITUDE	LONGITUDE
RENVILLE	T115N	R31W	16, 17, 18, 19, 20, 21	44.7629°	-44.7629°

BMP SUMMARY	QUANTITY	UNIT
RAPID STABILIZATION, METHOD 4	10280	SQ YD
TYPE 1 MULCH	134	TON
INLET PROTECTION	140	EACH
STABILIZED CONSTRUCTION EXIT	1	LUMP SUM

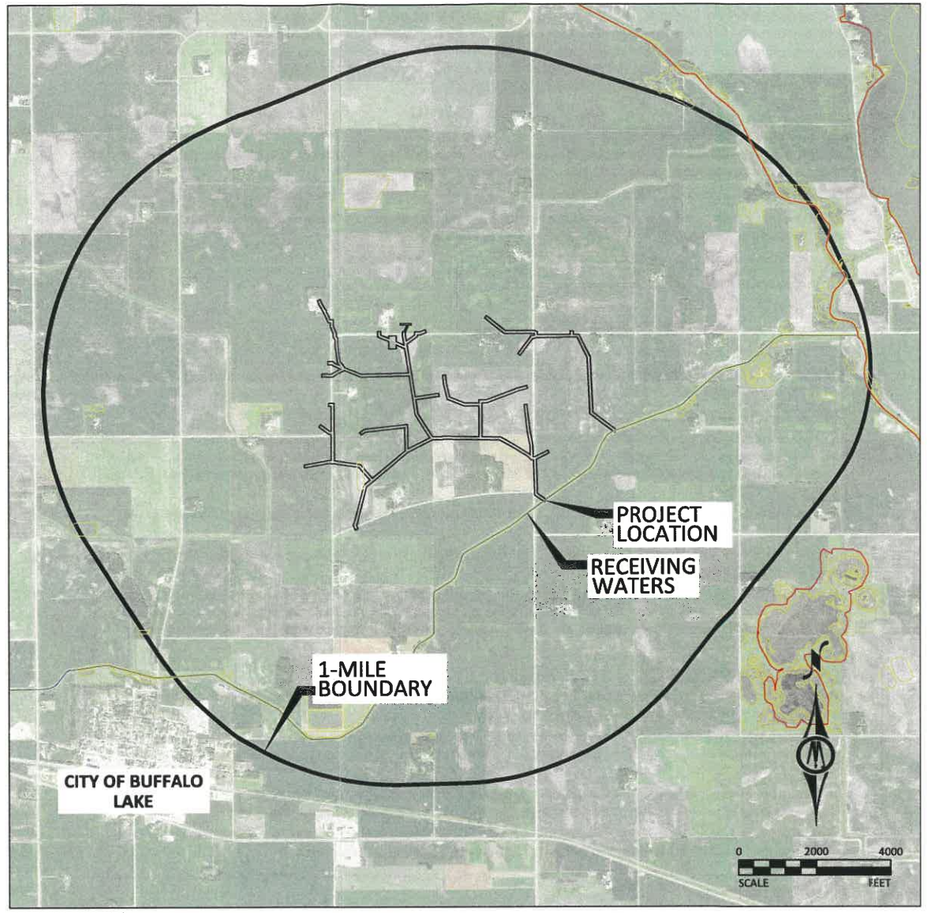
DESCRIPTION OF CONSTRUCTION ACTIVITIES AND STORMWATER MANAGEMENT:
Construction activities include: Site grading, sanitary sewer and water main extensions, temporary erosion and sediment control, and permanent stabilization.

Stormwater currently flows overland in agricultural fields, through various tiles, and then to the existing JD 15 open ditch.

After construction is complete stormwater will continue to flow overland and through the updated tile system.

This project includes the following stormwater management BMPs

- Rapid Stabilization, Method 4
- Type 1 Mulch
- Inlet Protection
- Stabilized Construction Exit



RECEIVING WATERS:
Receiving waters, including surface water, wetlands, Public Waters, and stormwater ponds, within 1-mile of the project boundary are identified on the USGS 7.5 min quad map above. Receiving waters that are impaired, the impairment, and WLA are listed as follows. All specific BMPs relative to construction activities listed in the permit for special, prohibited, restricted, or impaired have been incorporated into this plan. All specific BMPs listed in approved TMDLs and those BMPs listed for construction related waste load allocations have also been incorporated.

NAME OF WATER BODY	TYPE (ditch, pond, wetland, lake, etc.)	Special, Prohibited, Restricted Water [1]	Flows to Impaired Water Within 1-Mile [2]	USEPA Approved Construction Related TMDL [3]
JD 15 OPEN DITCH	DITCH	YES	YES	NO

[1] Special, prohibited, and restricted waters are listed in Section 23 of the MN Construction Stormwater General Permit (MNR100001).
[2] Identified as impaired under section 303 (d) of the federal Clean Water Act for phosphorus, turbidity, TSS, dissolved oxygen, and/or aquatic biota.
[3] Construction Related TMDLs include those related to: phosphorus, turbidity, TSS, dissolved oxygen, and/or aquatic biota.

IMPLEMENTATION SCHEDULE AND PHASING: The Contractor is required to provide an updated schedule and site management plan meeting the minimum requirements of Section 1717 of the Minnesota Standard Specifications for Construction.

1) Submit SWPPP Updates to Engineer. Submittal shall include any requested changes to the SWPPP, including but not limited to: Trained Personnel, Locations for Stockpiles, Concrete Washout, Sanitation Facilities, Types and Locations of Erosion & Sediment Control. Failure to submit updates shall be considered acceptance of the SWPPP as designed with no changes.
2) Install perimeter sediment control, inlet protection, and construction exit.
3) Install drain tile.
4) Backfilling and final grading.
5) Add additional temporary BMPs as necessary during construction based on inspection reports.
6) Ensure final stabilization measures are complete.
7) Provide digital copy of all Field SWPPP Documentation including Inspection Reports and SWPPP Revisions to the Owner.
8) Submit Notice of Termination (NOT) to MPCA. NOTE: The NOT must be submitted to MPCA before Final Stabilization is considered complete.

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 MINNESOTA.
Shaun P. Luker
SHAUN P. LUKER, P.E.
LIC NO. 48756 DATE 05/02/2022

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DESIGNED SPL
DRAWN sml
CHECKED SPL
CURRENT PROJ. NO. S12.105233

NO.	ISSUED FOR	DATE

HIGH ISLAND WATERSHED DISTRICT, RENVILLE COUNTY, MINNESOTA
JUDICIAL DITCH #11 & COUNTY DITCH #26
STORMWATER POLLUTION PREVENTION PLAN
SWPPP PLAN

SHEET C2.01

Information contained in this SWPPP narrative sheet summarizes requirements of the GENERAL PERMIT AUTHORIZATION TO DISCHARGE STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM/STATE DISPOSAL SYSTEM PROGRAM - Permit No: MN RI0000I (Permit) as they apply to this project. All provisions of the Permit including those not specifically cited herein shall apply to this project. The Contractor is responsible to be familiar with and comply with all conditions of the permit. The full text of the Permit is available at: https://www.pca.state.mn.us/sites/default/files/wq-strm2-80a.pdf

SWPPP AMENDMENTS AND SUBMITTALS

Contractor must prepare and submit to the Engineer a SWPPP amendment as necessary to include additional Best Management Practices (BMPs) to correct problems identified or address the following situations.

1. Contact information and training documentation for Construction SWPPP Manager and BMP Installer,
2. There is a change in construction method of phasing, operation, maintenance, weather or seasonal conditions not anticipated during the design of the SWPPP including but not limited to:
   a. Types and/or Locations of BMPs
   b. Material Storage and Spill Response
   c. Fueling Plans
   d. Locations for Stockpiles, Concrete Washout, and Sanitation Facilities and
   e. Project Phasing
3. It is determined that the SWPPP is not achieving objectives of minimizing pollutants in stormwater discharges associated with construction activity, or
4. The SWPPP is not consistent with the terms and conditions of the permit.

The Contractor may implement SWPPP amendments immediately and is not required to wait for Engineer review of the submittal. The responsibility for completeness of SWPPP amendments and compliance with the Permit lies with the Contractor. Review, comment, or lack of comment by the Engineer on a SWPPP amendment shall not absolve the responsibilities of the Contractor in any way.

If a change order is issued for a design change the SWPPP amendment will be prepared by the Engineer and included in the change order.

In addition to SWPPP amendments, the Contractor shall submit to the Engineer Weekly Erosion and Sediment Control Schedule meeting the requirements of MnDOT 1717.

The Contractor shall keep copies of all SWPPP amendments, Weekly Erosion and Sediment Control Schedules, inspection logs, and maintenance logs with the field copy of the SWPPP. A PDF copy of these documents will be provided along with a copy of the final Field Copy of the SWPPP to the Engineer along with the signed Notice of Termination when final stabilization is complete.

EROSION PREVENTION PRACTICES

Stormwater conveyance channels shall be routed around unstabilized areas. Erosion controls and velocity dissipation devices shall be used at outlets within and along the length of any constructed conveyance channel.

The normal wetted perimeter of all ditches or swales, including storm water management pond slopes, that drain waters from the site must be stabilized within 200' of any property edge or discharge point, including storm sewer inlets, within 24 hours of connection.

Temporary or permanent ditches or swales used as sediment containment during construction do not need to be stabilized during temporary period of use and shall be stabilized within 24 hours after no longer used as sediment containment.

Mulch, hydromulch, tackifier, or similar practice shall not be used in any portion of the wetted perimeter of a temporary or permanent drainage ditch or swale section with a continuous slope of greater than 2 percent.

Energy dissipation shall be installed at all temporary or permanent pipe outlets within 24 hours of connection to a surface water or permanent stormwater treatment system.

The Contractor shall phase construction and use construction methods to the extent practical to minimize exposed soils. The project phasing shall be documented in the Weekly Erosion and Sediment Control Schedule.

SEDIMENT CONTROL PRACTICES

Down gradient BMPs including perimeter BMPs must be in place before up gradient land- disturbing activities begin and shall remain in place until final stabilization.

All BMPs that have been adjusted or removed to accommodate short-term activities shall be re-installed or replaced the earlier of the end of the work day or before the next precipitation event even if the activity is not complete.

Inlet BMPs may be removed for specific safety concerns. The BMPs shall be replaced as soon as the safety concern is resolved. The removal shall be documented in the SWPPP as a SWPPP amendment.

Temporary stockpiles must have sediment control BMPs. The Contractor shall prepare and submit to the Engineer a SWPPP amendment showing the location of temporary stockpiles and the BMPs for each stockpile. The SWPPP amendment must meet the minimum requirements of Section 9 of the Permit.

Soil compaction shall be minimized and topsoil shall be preserved, unless infeasible or if construction activities dictate soil compaction or topsoil stripping.

The use of polymers, flocculants, or other sedimentation treatment chemicals are not proposed as part of this SWPPP as designed by the Engineer. If methods or phasing of construction require the use of any of these chemicals, the Contractor shall prepare and submit to the Engineer a SWPPP amendment that meets the minimum requirements of Section 9 of the Permit.

TEMPORARY SEDIMENTATION BASINS

A temporary sedimentation basin has not been included in this SWPPP as designed by the Engineer. If a basin is later determined to be desirable or necessary the Contractor shall prepare and submit to the Engineer a SWPPP amendment. Temporary sedimentation basins shall meet or exceed the minimum requirements of Section 14 of the Permit and shall include a basin draining plan meeting or exceeding the minimum requirements of Section 10 of the Permit. Where the site discharges to Special and/or Impaired Waters the SWPPP amendment shall also meet or exceed the minimum requirements of Section 23 of the permit.

DEWATERING

A dewatering plan has not been included in this SWPPP as designed by the Engineer. If dewatering is required for this project, the Contractor shall prepare and submit to the Engineer a SWPPP amendment. All dewatering shall meet or exceed the minimum requirements of Section 10 of the Permit.

POLLUTION PREVENTION

Products and materials that have the potential to leach pollutants that are stored on the site must be stored in a manner designed to minimize contact with stormwater. Materials that are not a source of potential contamination to stormwater or that are designed for exposure to stormwater are not required to be covered.

Hazardous materials including but not limited to pesticides, fertilizer, petroleum products, curing compounds and toxic waste must be properly stored and protected from stormwater exposure as recommended by the manufacturer in an access restricted area.

Solid waste must be stored, collected and disposed of in compliance with Minnesota Administrative Rules Chapter 7035.

Portable toilets must be positioned so that they are secure and will not be tipped or knocked over. Sanitary waste must be disposed of properly in accordance with Minn. R. CH 7041.

Exterior vehicle or equipment washing on the project site shall be limited to a defined area of the site. No engine degreasing is allowed on site. A sign must be installed adjacent to each washout facility that requires site personnel to utilize the proper facilities for disposal of concrete and other washout wastes.

The Contractor shall prepare and submit a SWPPP amendment detailing the location and BMPs proposed for storage of materials, solid waste, portable toilets, and exterior vehicle or equipment washing on the site. The SWPPP amendment shall include a spill prevention and response plan that is appropriate for the materials proposed to be on the site. The SWPPP amendment shall meet or exceed the minimum requirements of Section 12 of the Permit.

INSPECTION & MAINTENANCE

A trained person shall routinely inspect the entire construction site at the time interval indicated on this sheet of the SWPPP during active construction and within 24-hours after a rainfall event greater than 0.5 inches in 24 hours. Following an inspection that occurs within 24-hours after a rainfall event, the next inspection must be conducted at the time interval indicated in the Receiving Waters Table found on the SITE PLAN AND INFORMATION SHEET of the SWPPP.

All inspections and maintenance conducted during construction must be recorded on the day it is completed and must be retained with the SWPPP. Inspection report forms are available in the Project Specifications. Inspection report forms other than those provided shall be approved by the engineer.

The Contractor may request a change in inspection schedule for the following conditions:

a. Inspections of areas with permanent cover to be reduced to once per month,
b. Inspections of areas that have permanent cover and have had no construction activity for 12 months to be suspended until construction resumes,
c. Inspections of areas where construction is suspended due to frozen ground conditions, inspections to be suspended until the earlier of within 24 hours of runoff occurring, or upon resuming construction.

No change in inspection schedule shall occur until authorized by the Engineer.

Inspections must include:

1. All erosion prevention and sediment control BMPs and Pollution Prevention Management Measures to ensure integrity and effectiveness.
2. Surface waters, including drainage ditches and conveyance systems for evidence of erosion and sediment deposition.
3. Construction site vehicle exit locations, streets and curb and gutter systems within and adjacent to the project for sedimentation from erosion or tracked sediment from vehicles.
4. Infiltration areas to ensure that no sediment from ongoing construction activity is reaching the infiltration area and that equipment is not being driven across the infiltration area.

All non-functioning BMPs and those BMPs where sediment reaches one-half (1/2) of the depth of the BMP, or in the case of sediment basins one-half (1/2) of the storage volume, must be repaired, replaced, or supplemented by the end of the next business day after discovery, or as soon as field conditions allow.

Permittees must repair, replace or supplement all nonfunctional BMPs with functional BMPs by the end of the next business day after discovery, or as soon as field conditions allow.

Any sediment that escapes the site must be removed and the area stabilized within 7 calendar days of discovery unless precluded by legal, regulatory, or physical access in which case the work shall be completed within 7 calendar days of authorization. Paved surfaces such as streets shall have any escaped or tracked sediment removed by the end of the day that it is discovered. Sediment release, other than paved surfaces that can be cleaned up with street sweeping shall be reported immediately upon discovery to the Engineer.

PUBLIC WATER RESTRICTIONS:

For public waters that have been promulgated "work in water restrictions" during fish spawning time frames, all exposed soil areas that are within 200 feet of the water's edge, and drain to these waters must complete stabilization within 24-hours during the time period. MN DNR permits are not valid for work in waters that are designated as infested waters unless accompanied by an Infested Waters Permit or written notification has been obtained from MN DNR stating that such permit is not required. There is no exception for pre-existing permits. If a MN DNR Permit has been issued for the project and the water is later designated as infested, the Contractor shall halt all work covered by the MN DNR Permit until an Infested Waters Permit is obtained or that written notification is obtained stating that such permit is not required.

FINAL STABILIZATION

Final Stabilization is not complete until all the following requirements have been met:

1. Substantial Completion has been reached and no ground disturbing activities are anticipated.
2. Permanent cover has been installed with an established minimum uniform perennial vegetation density of 70 percent of its expected final growth. Vegetation is not required in areas where no vegetation is proposed by this project such as impervious surfaces or the base of a sand filter.
3. Accumulated sediment has been removed from all permanent stormwater treatment systems as necessary to ensure the system is operating as designed.
4. All sediment has been removed from conveyance systems
5. All temporary synthetic erosion prevention and sediment control BMPs have been removed. BMPs designated on the SWPPP to remain to decompose on-site may remain.
6. For residential construction only, permit coverage terminates on individual lots if the structures are finished and temporary erosion prevention and downgradient perimeter control is complete, the residence sells to the homeowner, and the permittee distributes the MPCA's "Homeowner Fact Sheet" to the homeowner.
7. For agricultural land only (e.g., pipelines across cropland), the disturbed land must be returned to its preconstruction agricultural use prior to submitting the NOT.

SITE STABILIZATION COMPLETION:

Stabilization of exposed soils shall begin immediately and shall be completed after the construction activity has temporarily or permanently ceased no later than:	14 calendar days

SITE INSPECTION INTERVAL:

A trained person shall routinely inspect the entire construction site during active construction at an interval of no more than:	7 calendar days

SPECIAL ENVIRONMENTAL CONSIDERATIONS AND PERMITS:

1)	Was an environmental review required for this project or any part of a common plan of development or sale that includes all or any portion of this project?	NO
2)	Does any portion of the site have the potential to affect threatened or endangered species or their critical habitat?	NO
3)	Does any portion of this site discharge to a Calcareous fen.	NO
4)	Will any portion of the site potentially affect properties listed on the National Register of Historic Places or a known or discovered archeological site?	NO
5)	Have any Karst features have been identified in the project vicinity?	NO
6)	Is compliance with temporary or permanent stormwater management design requirements infeasible for this project?	NO
7)	Has the MN DNR promulgated "work in water restrictions" for any Public Water this site disharges to during fish spawning?	NO

TYPE OF PERMIT	PERMITTING AGENCY	PERMIT STATUS AND CONDITIONS
Construction Stormwater NPDES	MPCA	

SWPPP DESIGNER TRAINING DOCUMENTATION:

UNIVERSITY OF MINNESOTA

Shaun Luker

Construction Site Management (May 31 2020)
Design of Construction SWPPP (May 31 2019)

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Shaun P. Luker
SHAUN P. LUKER, P.E.
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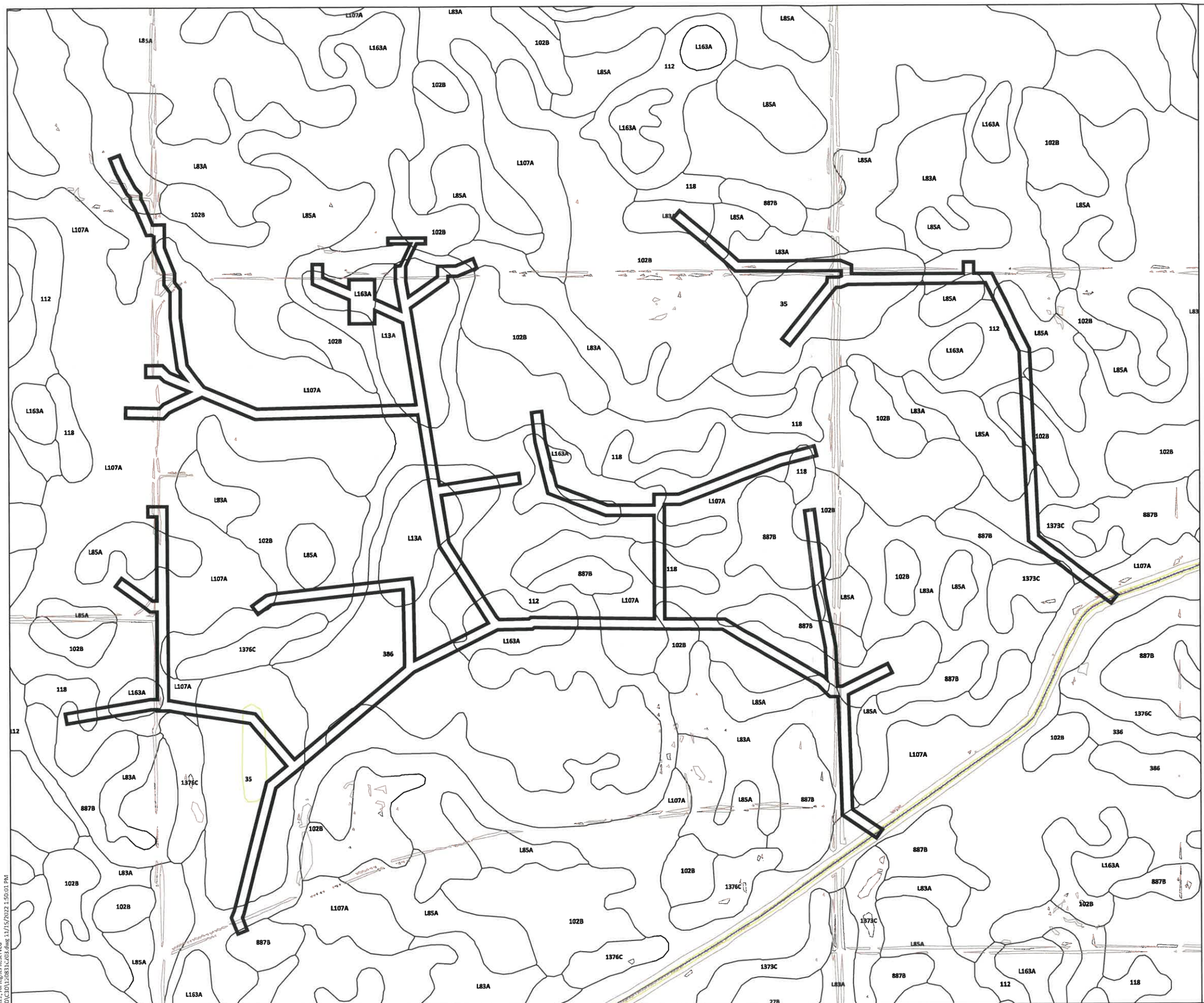
ORIGINAL NO. S12.105233

NO.	ISSUED FOR	DATE

HIGH ISLAND WATERSHED DISTRICT, RENVILLE COUNTY, MINNESOTA
JUDICIAL DITCH #11 & COUNTY DITCH #26
STORMWATER POLLUTION PREVENTION PLAN
SWPPP NARRATIVE

SHEET C2.02



LEGEND

- PROJECT BOUNDARY
- SOIL TYPE
- IMPAIRED, SPECIAL OR PROTECTED WATERS
- NATIONAL WETLANDS INVENTORY
- DWSMA, LOW VULNERABILITY
- STEEP SLOPES (>33.3%)
- RECEIVING WATERS

N

0 400 800
SCALE FEET

SOIL TYPE SUMMARY

Map Unit Symbol	Soil Name	Hyd. Soil Group
102B	CLARION	C
112	HARPS	B/D
118	CRIPPIN	B/D
1373C	HAWICK	A
1376C	OMSRUD	B
1389	HAVELOCK	B/D
1900	OKOBOJI	C/D
27B	DICKINSON	A
336	DELFT	B/D
35	BLUE EARTH	B/D
386	OKOBOJI	C/D
86	CANISTEO	B/D
887B	SWANLAKE	B
920B	HAWICK	A
L107A	GLENCOE	B/D
L13A	KLOSSNER	C/D
L163A	OKOBOJI	C/D
L83A	WEBSTER	B/D
L85A	NICOLLET	B/D

LOCATION OF SWPPP REQUIREMENTS IN PROJECT PLAN

DESCRIPTION	SHEET NO.
SITE MAP	C2.01
FINAL STABILIZATION	C2.04 - C2.05
SOILS	C2.03
EROSION & SEDIMENT CONTROL DETAILS	C1.01 - C1.02
EROSION CONTROL TABULATION	C2.01
TURF ESTABLISHMENT TABULATION	C2.01
NARRATIVE & NOTES	C2.01 - C2.02

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Shaun P. Luker

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HIGH ISLAND WATERSHED DISTRICT, RENVILLE COUNTY, MINNESOTA
JUDICIAL DITCH #11 & COUNTY DITCH #26
STORMWATER POLLUTION PREVENTION PLAN
SWPPP SOILS

SHEET C2.03

EROSION CONTROL LEGEND

- STORM DRAIN INLET PROTECTION
- MULCH TYPE 1
- RAPID STABILIZATION, METHOD 4
- STABILIZED CONSTRUCTION EXIT (TO BE DETERMINED BY CONTRACTOR & MARKED ON PLANS)

0 200 400
HORZ. SCALE FEET

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RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
STORMWATER POLLUTION PREVENTION PLAN
EROSION CONTROL & SEEDING

SHEET C2.04

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EROSION CONTROL LEGEND

- STORM DRAIN INLET PROTECTION
- MULCH TYPE 1
- RAPID STABILIZATION, METHOD 4
- STABILIZED CONSTRUCTION EXIT (TO BE DETERMINED BY CONTRACTOR & MARKED ON PLANS)

HORZ. SCALE 0 200 400 FEET

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RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
STORMWATER POLLUTION PREVENTION PLAN
EROSION CONTROL & SEEDING

SHEET C2.05

F&I:
6" HICKENBOTTOM INTAKE
60 LF - 4" PERFORATED DRAIN TILE

F&I:
6" HICKENBOTTOM INTAKE
60 LF - 4" PERFORATED DRAIN TILE

F&I:
6" HICKENBOTTOM INTAKE
60 LF - 4" PERFORATED DRAIN TILE

1060
1059
1058
5.0%
20' TOP
1060
5.0%
1057
1056
1057
5.0%
20' TOP
6" TILE
BR Q11
EX 5" TILE
1053
2.5%
1054
40' TOP
1054
2.5%

HORZ. 0 25 50 SCALE FEET
VERT. 0 5 10 SCALE FEET

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RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
GRADING PLAN

SHEET C3.01

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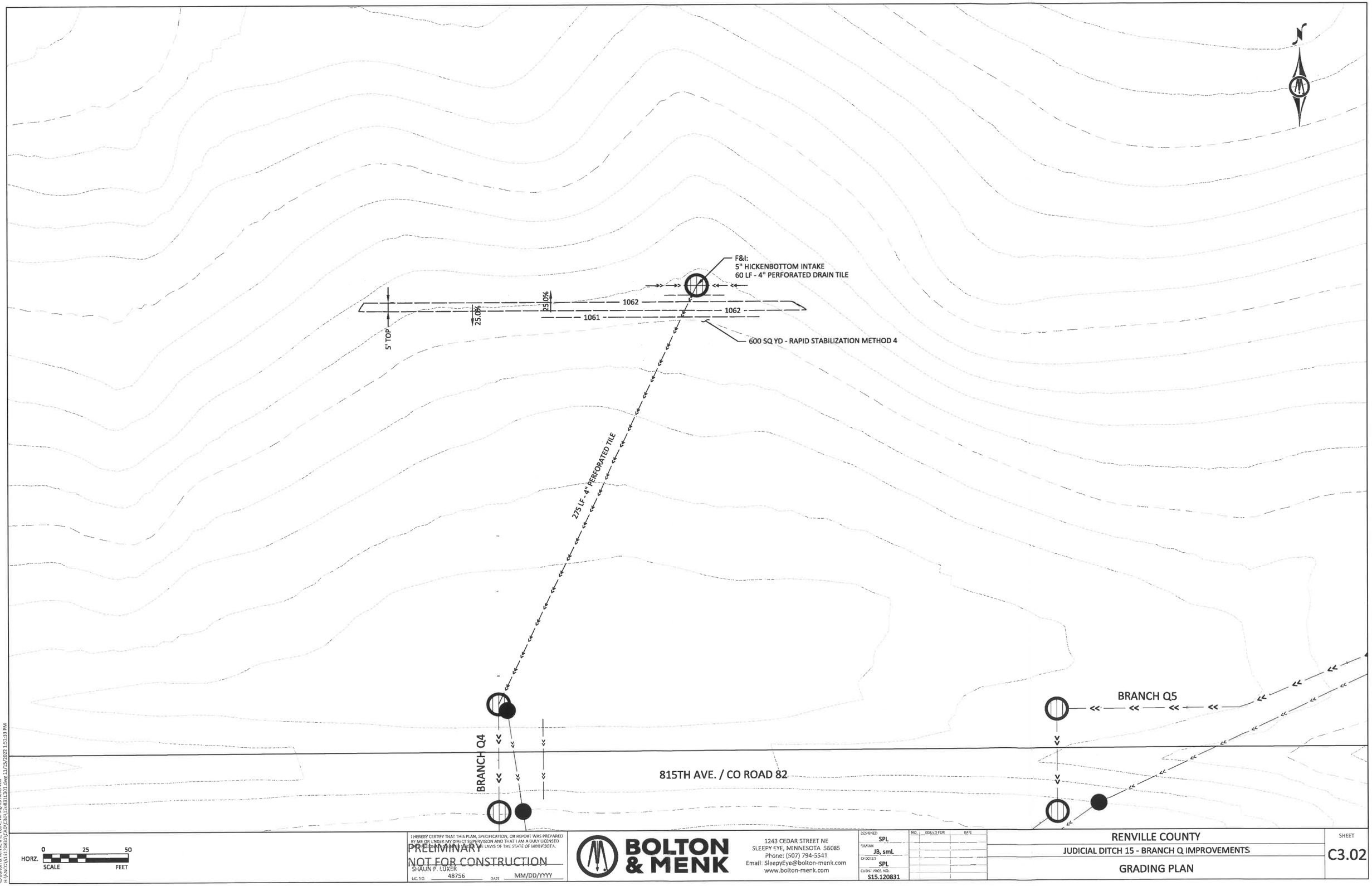

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RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
GRADING PLAN

SHEET C3.02

BRANCH Q25

3'
20'
70'

3'
25'
65'

3'
25'
40'

JD 15

EXISTING GROUND

CLASS III RIPRAP WITH FILTER CLOTH

5'
1V:1.5H

EXISTING GROUND

EXISTING GROUND

CLASS III RIPRAP WITH FILTER CLOTH

1.5' TOP (MIN)

5'
1V:1.5H

PRECAST CONCRETE WALL AS SPECIFIED

EXISTING GROUND

STREAM BARB
NOT TO SCALE

HORZ. 0 25 50
SCALE FEET

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RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
GRADING PLAN
STREAM BARBS

SHEET C3.03

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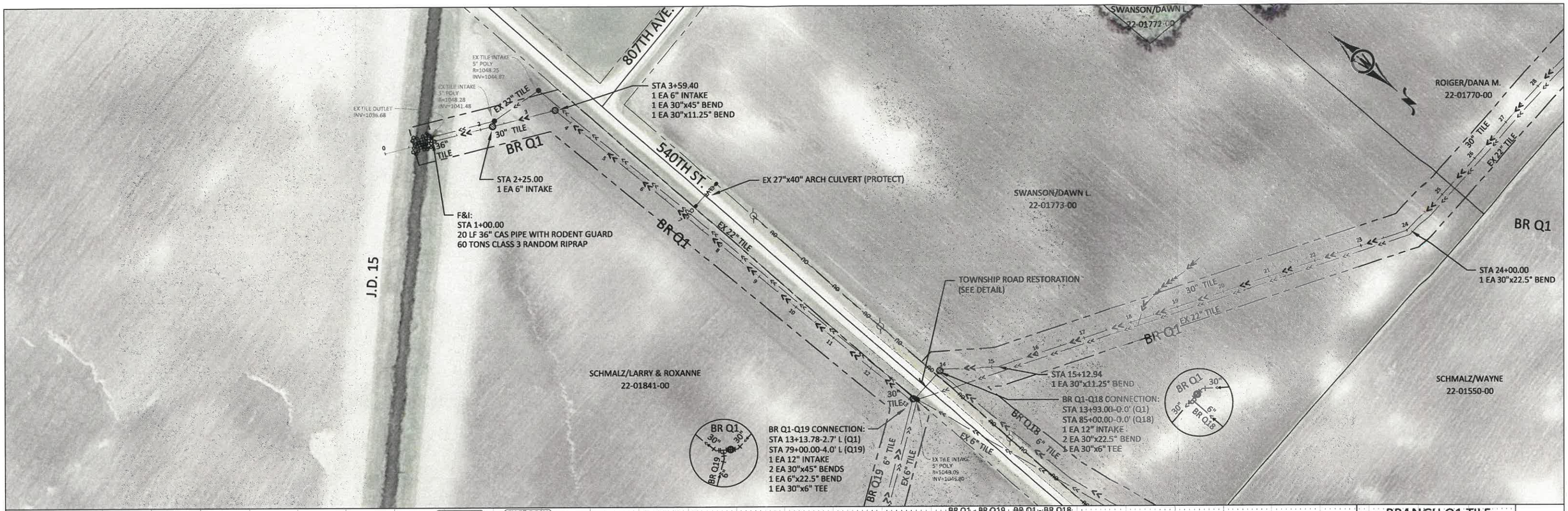

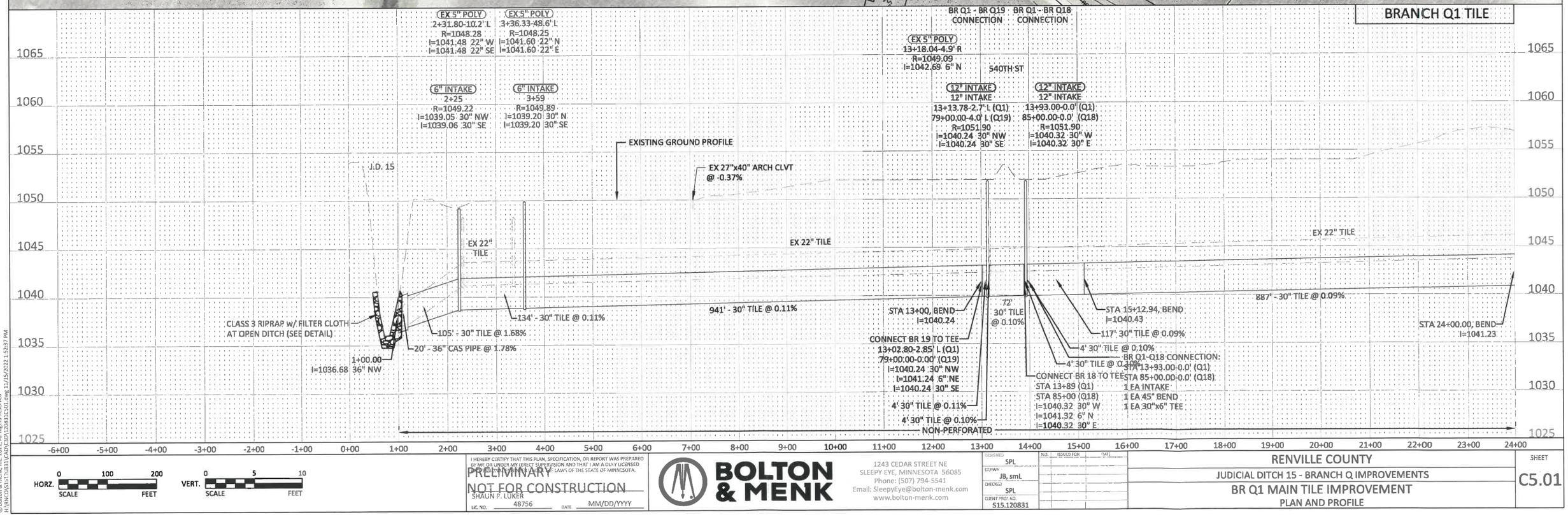

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VERT. SCALE 0 5 10 FEET

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RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
BR Q1 MAIN TILE IMPROVEMENT
PLAN AND PROFILE

SHEET C5.01

ROIGER/DANA M.
22-01770-00

WIGGERT/DEAN
22-01774-00

SWANSON/DAWN L
22-01773-00

KRUMREY/PATRICK
22-01580-00

SCHMALZ/WAYNE
22-01550-00

BR Q15 8" 24" 30" BR Q1

BR Q1-EX. Q15 CONNECTION:
STA 38+93.57
1 EA 6" INTAKE
STA 38+80.34
2 EA 30"x22.5° BEND
STA 39+00.34
2 EA 24"x22.5° BEND
1 EA 30"x24" REDUCER

TILE INTAKE
6' CONC
R=1054.21
INV=1050.90

TILE INTAKE
6' CONC
R=1053.26
INV=1046.91

STA 36+99.43
2 EA 30"x22.5° BEND

BR Q1-Q10 CONNECTION:
STA 41+67.64 (Q1)
STA 148+00.00 (Q10)
1 EA 24"x24" TEE
STA 41+67.64
2 EA 30"x22.5° BEND
STA 41+62.64
1 EA 6" INTAKE

BR Q10 24" 24" 24" BR Q1

STA 42+13
DEFLECT PIPE
TO INTAKE

BR Q1-Q16 CONNECTION:
STA 28+95.99 (Q1)
STA 101+00 (Q16)
1 EA 30"x12" TEE

STA 24+00.00
1 EA 30"x22.5° BEND

STA 49+21.19
1 EA 6" INTAKE
1 EA 18"x22.5° BEND
1 EA 24"x18" REDUCER

TILE PLAN CANT FIND INTAKE

BR Q1 BR Q15 BR Q10 BR Q11 BR Q16

EX 8" TILE 12" TILE 24" TILE EX 16" TILE 30" TILE EX 22" TILE 6" TILE EX 5" TILE

BRANCH Q1 TILE

BR Q1 - BR Q15 CONNECTION

6" INTAKE
38+94
R=1056.00
I=1042.71 30" SW
I=1042.72 30" NE

BR Q1 - BR Q10 CONNECTION

EX 6" INTAKE
41+69.71-7.1' R
R=1053.26
I=1046.01 16" SW

6" INTAKE
41+79
R=1055.87
I=1043.44 24" NW
I=1043.44 24" SE

6" INTAKE
49+21
R=1053.57
I=1044.69 18" N
I=1044.45 24" SE

EXISTING GROUND PROFILE

CONNECT BR Q16 TILE

CONNECT EX BR Q15 TILE

EX 16" TILE

496' - 30" TILE @ 0.09%

984' - 30" TILE @ 0.08%

262' - 24" TILE @ 0.17%

709' - 24" TILE @ 0.13%

422' - 18" TILE @ 0.25%

CONNECT BR 9 TILE
53+43 (Q1)
337+00.00 (Q9)
I=1046.25 6" E
I=1045.75 18" N
I=1045.75 18" S

42+12.65, DEFLECTION
I=1043.50 24" NW
I=1043.50 24" SE

34' - 24" TILE @ 0.17%

11' 24" TILE @ 0.17%

STA 28+95.99
I=1041.92 30" W
I=1042.67 12" N
I=1041.92 30" E

STA 38+88.57, TEE
I=1042.71

5' 30" TILE @ 0.08%

STA 39+00.34, BEND
& REDUCER
I=1042.97

7' 30" TILE @ 0.08%

41+67.64
CONNECT BR Q10
30"X18" TEE
I=1043.42 24" NW
I=1043.42 24" SW
I=1043.42 24" SE

NON-PERFORATED TILE

1065 1060 1055 1050 1045 1040 1035 1030 1025

24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00 39+00 40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00 48+00 49+00 50+00 51+00 52+00 53+00 54+00

HORZ. 0 100 200 SCALE FEET

VERT. 0 5 10 SCALE FEET

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CLIENT PROJ. NO. S15.120831

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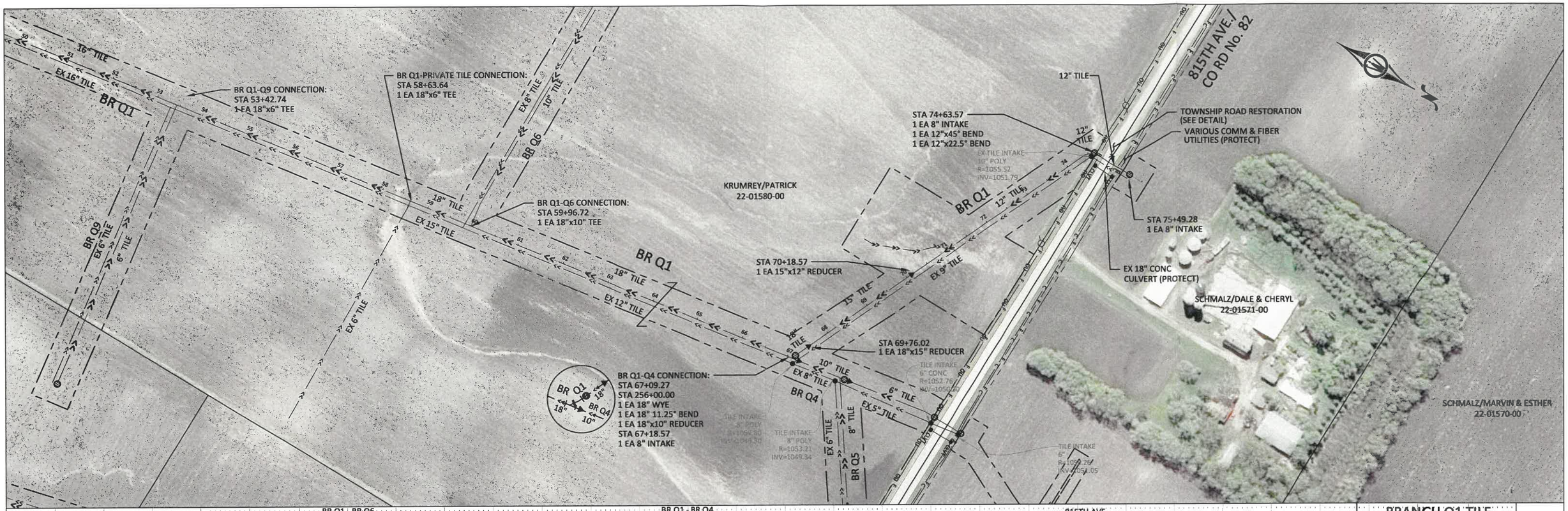
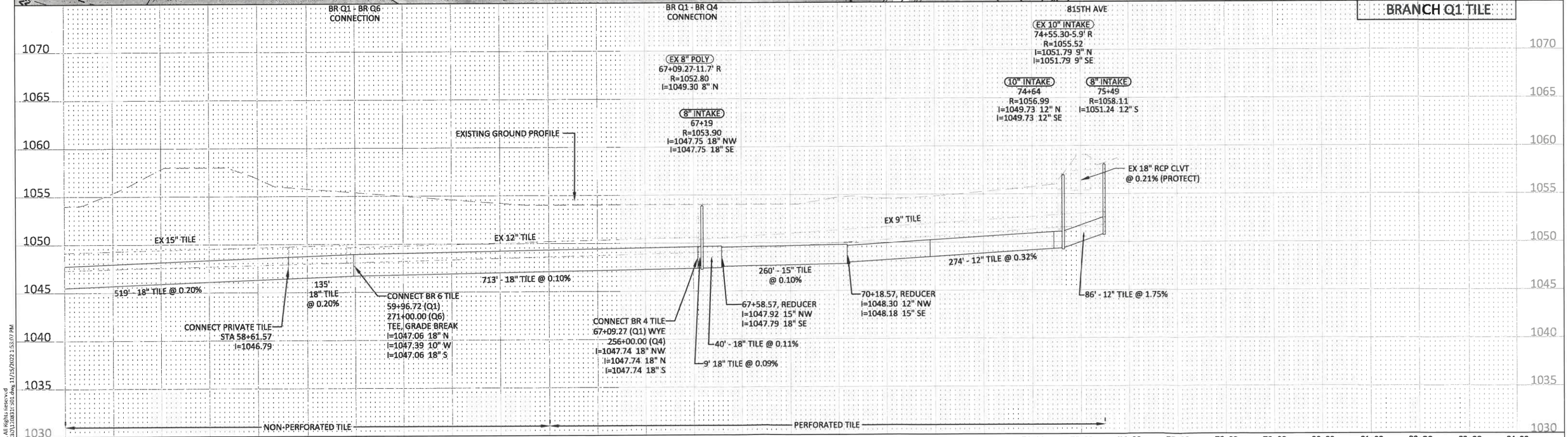
RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
BR Q1 MAIN TILE IMPROVEMENT
PLAN AND PROFILE

SHEET C5.02





HORZ. 0 100 200 SCALE FEET
VERT. 0 5 10 SCALE FEET

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SHAUN P. LUKER
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RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
BR Q1 MAIN TILE IMPROVEMENT
PLAN AND PROFILE

SHEET C5.03

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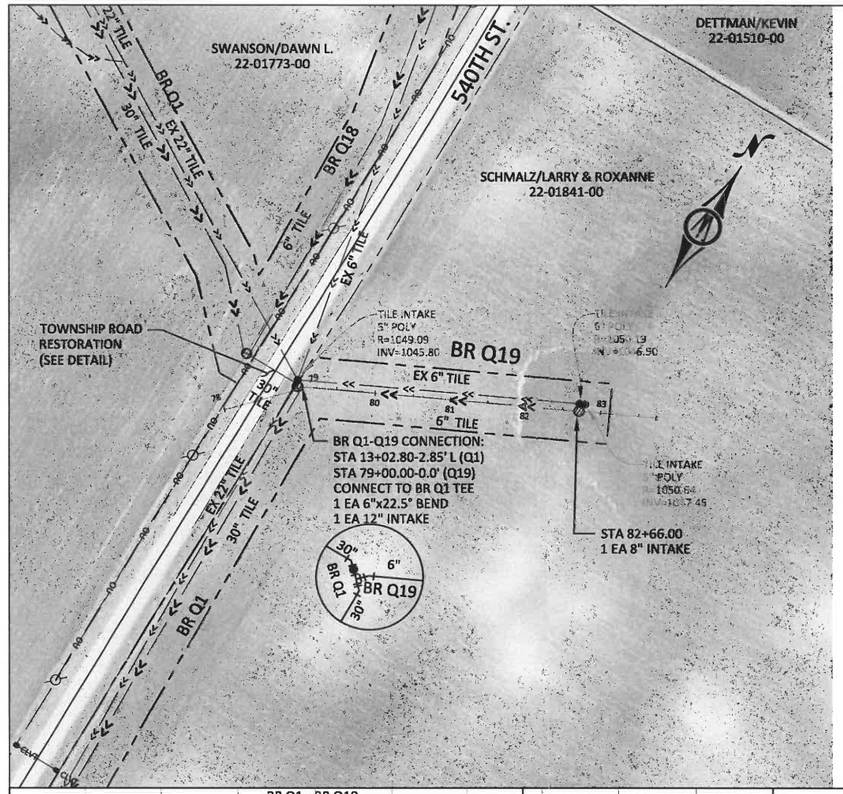
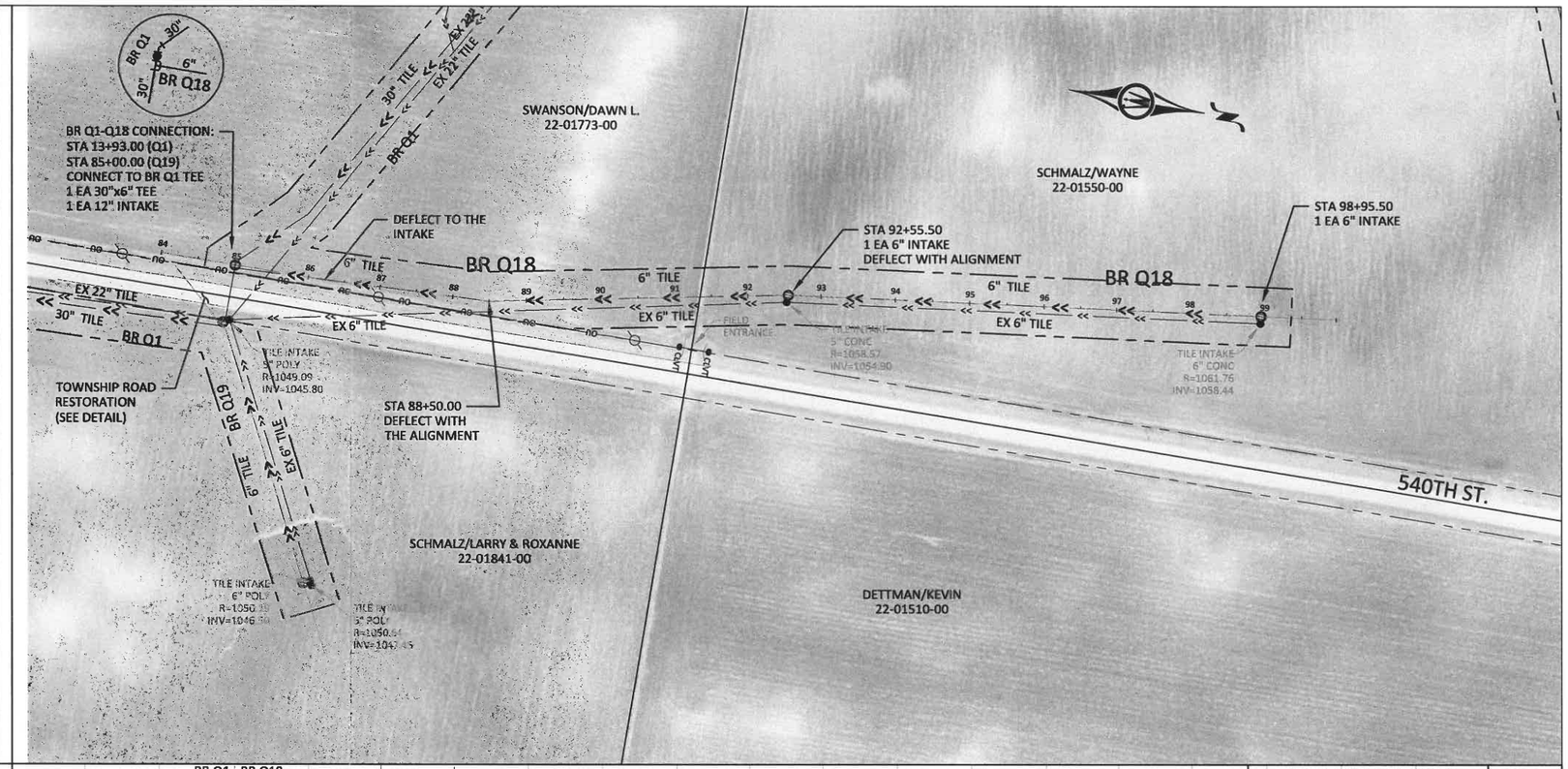
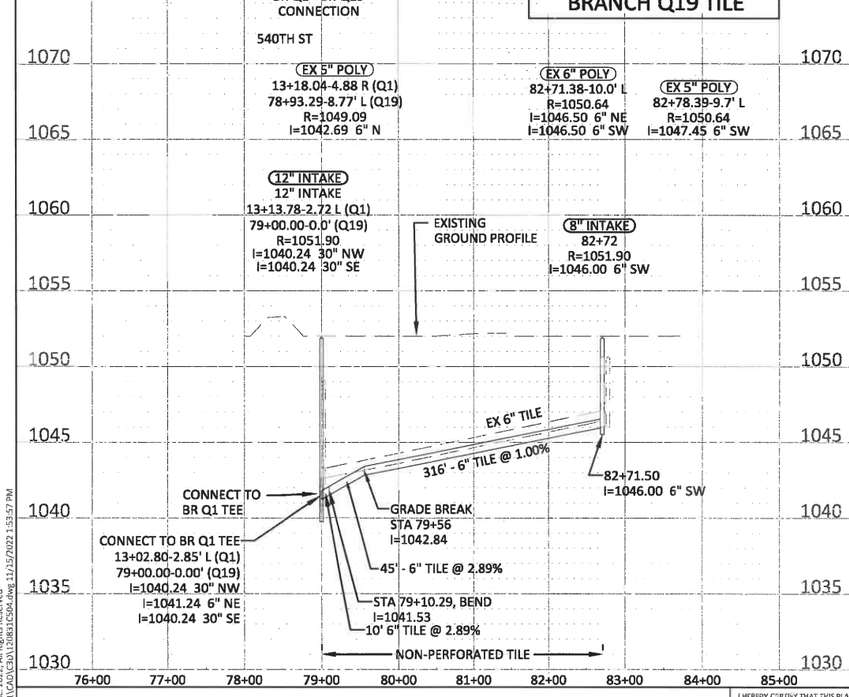
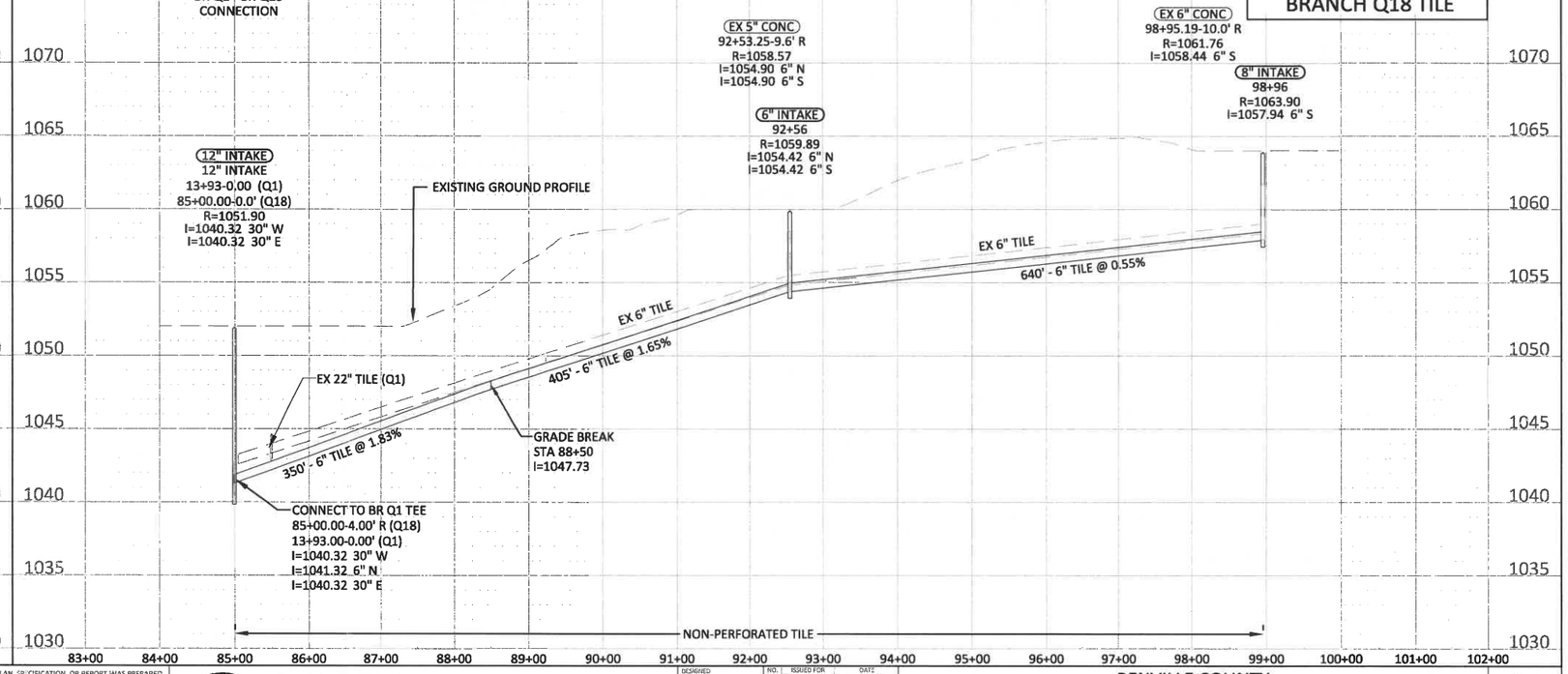




BRANCH Q19 TILE



BRANCH Q18 TILE



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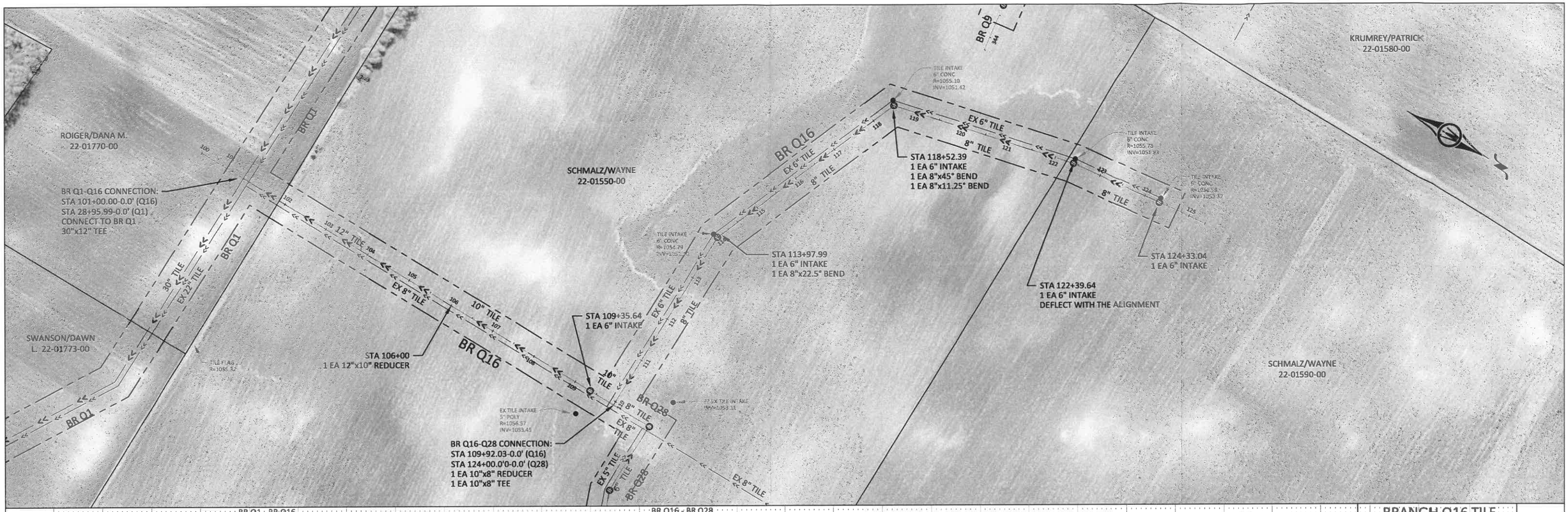
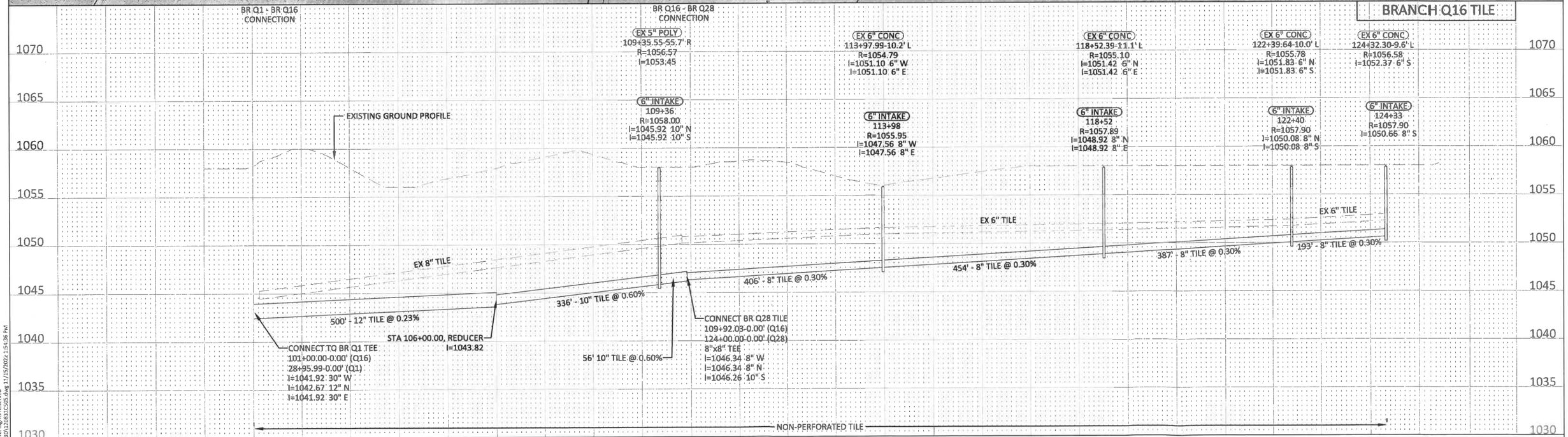
RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
BR Q18 & 19 TILE IMPROVEMENT
PLAN AND PROFILE

SHEET C5.04





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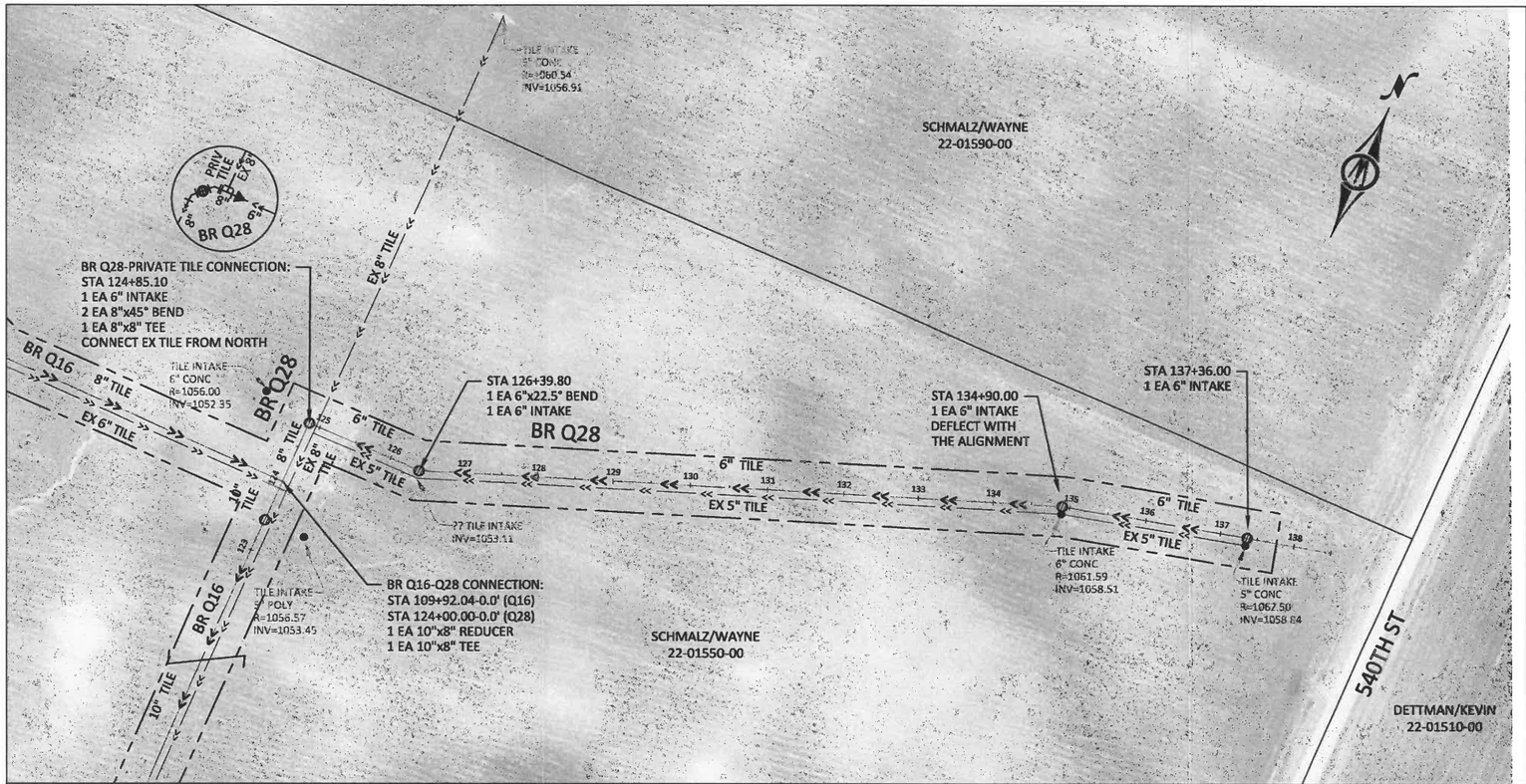
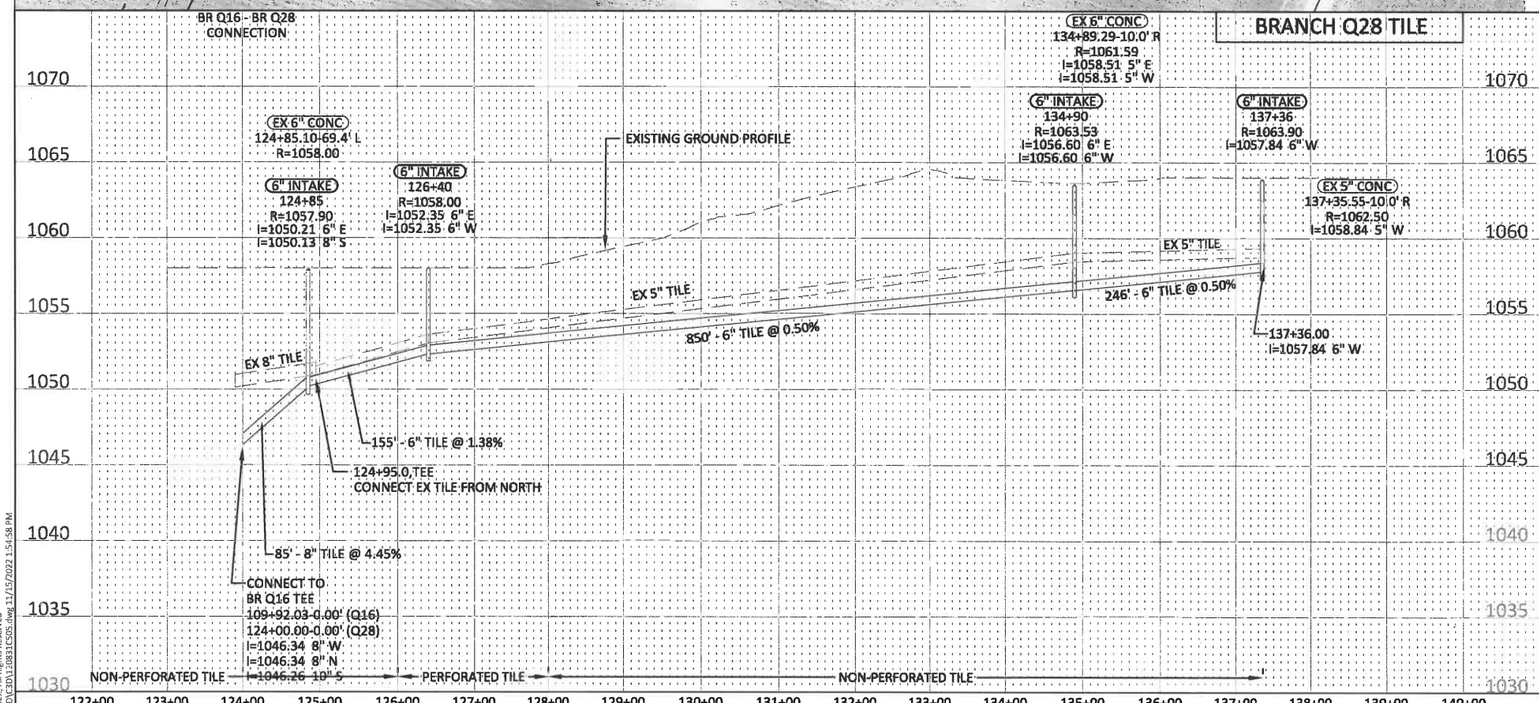
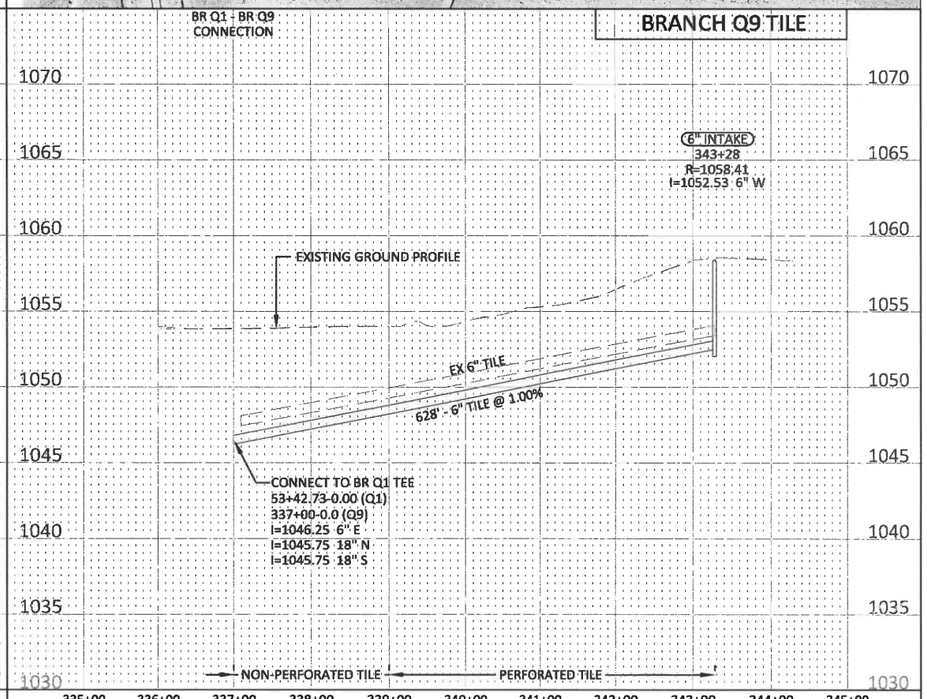
RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
BR Q16 TILE IMPROVEMENT
PLAN AND PROFILE

SHEET C5.05







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RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
BR Q28 & Q9 TILE IMPROVEMENT
PLAN AND PROFILE

SHEET C5.06

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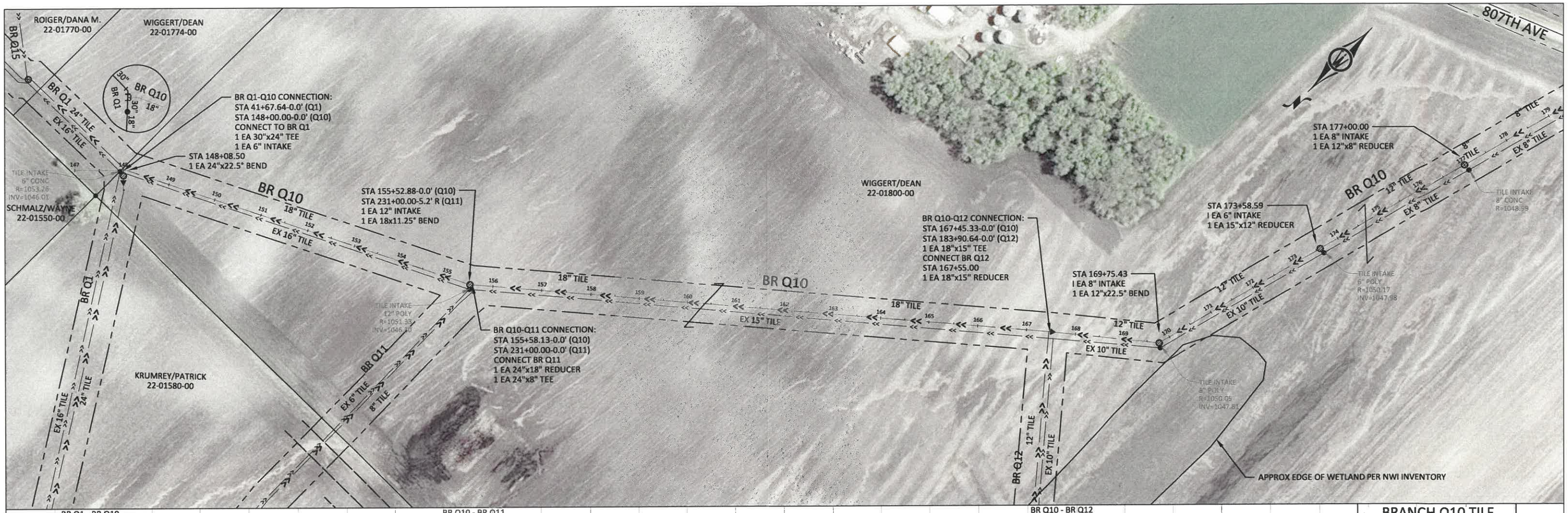
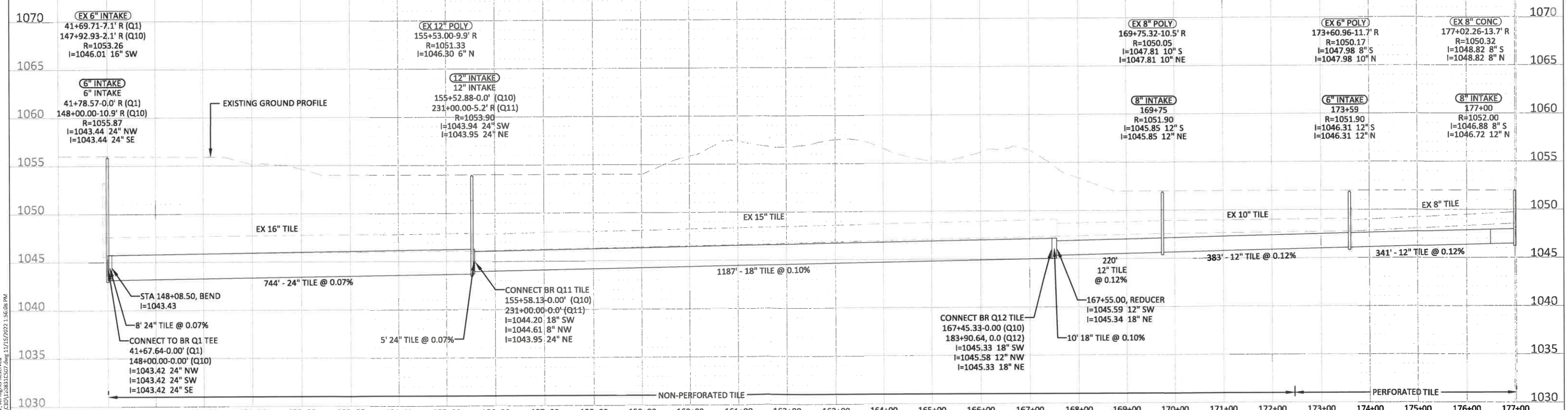


BR Q1 - BR Q10 CONNECTION

BR Q10 - BR Q11 CONNECTION

BR Q10 - BR Q12 CONNECTION

BRANCH Q10 TILE



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RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
BR Q10 TILE IMPROVEMENT
PLAN AND PROFILE

SHEET C5.07

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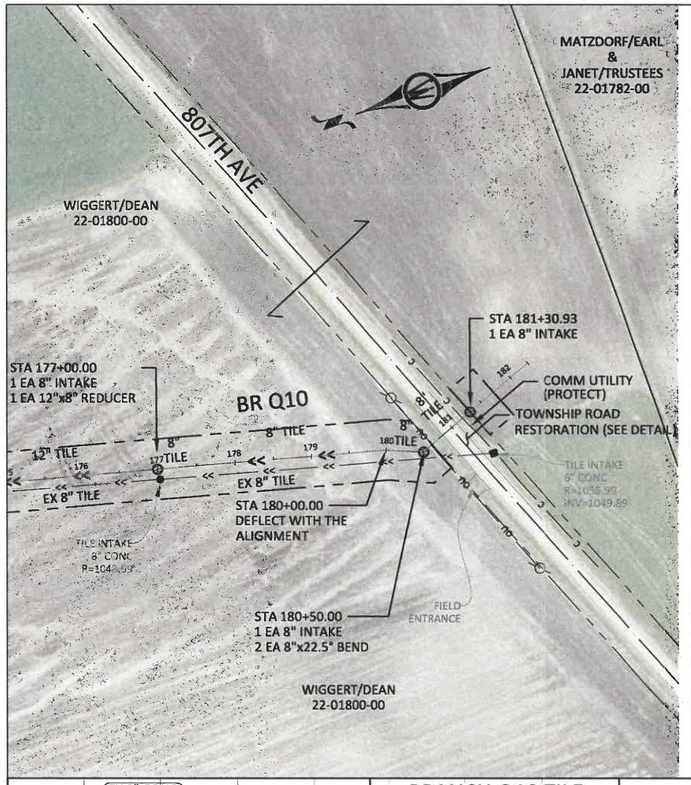
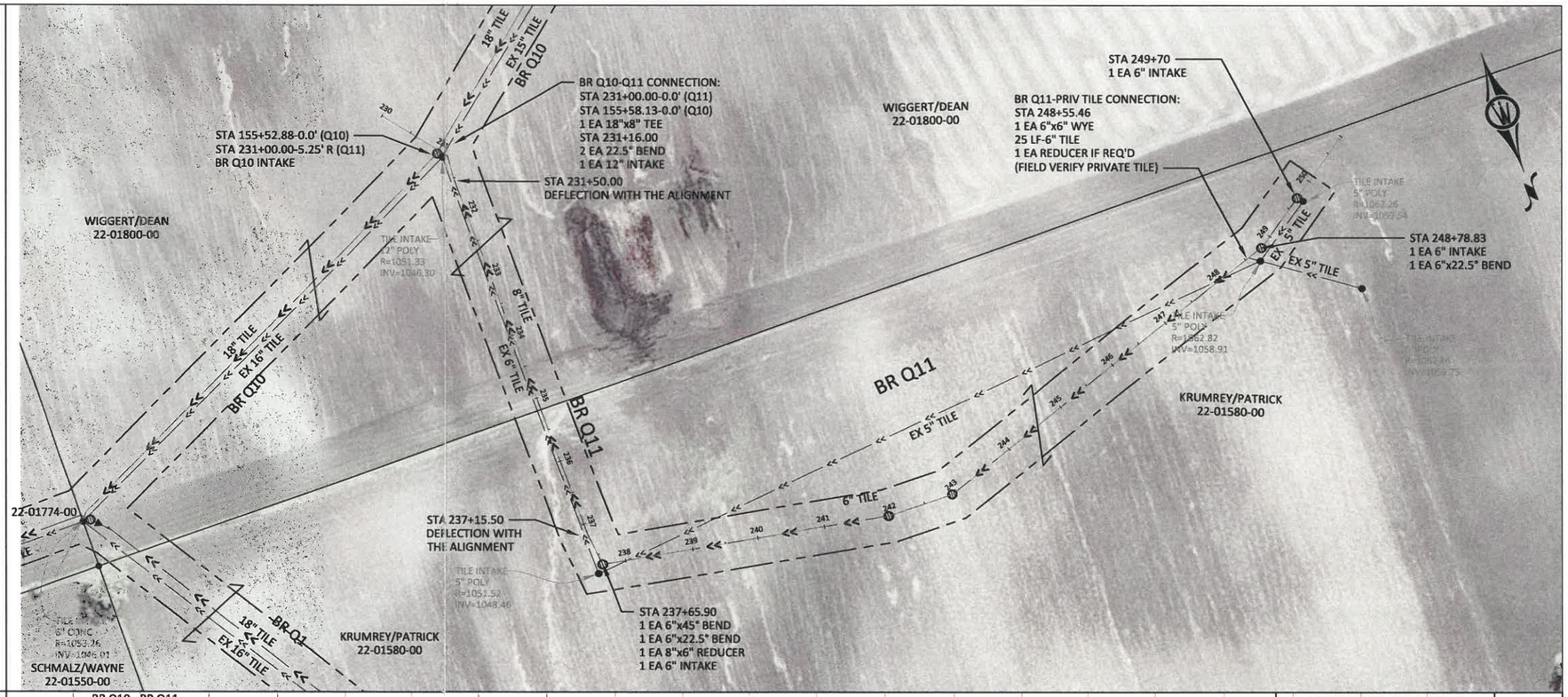
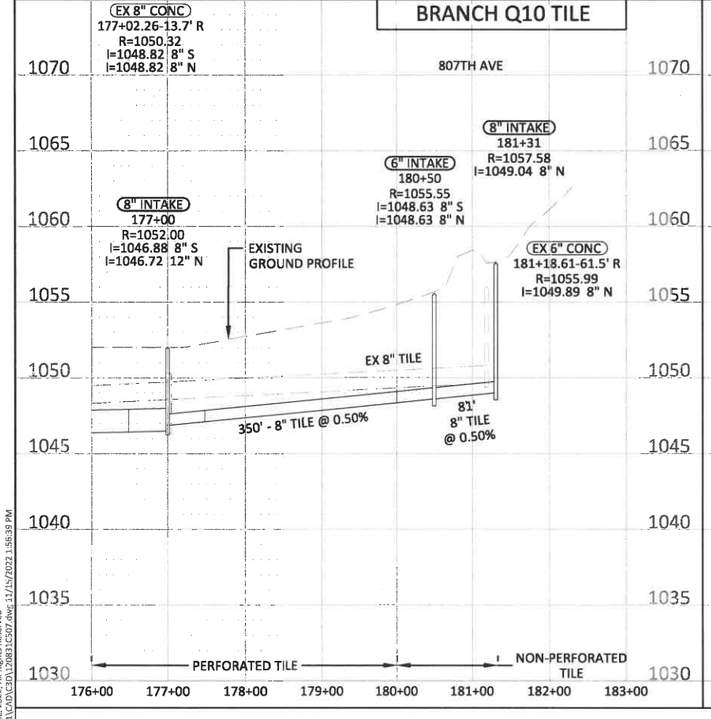
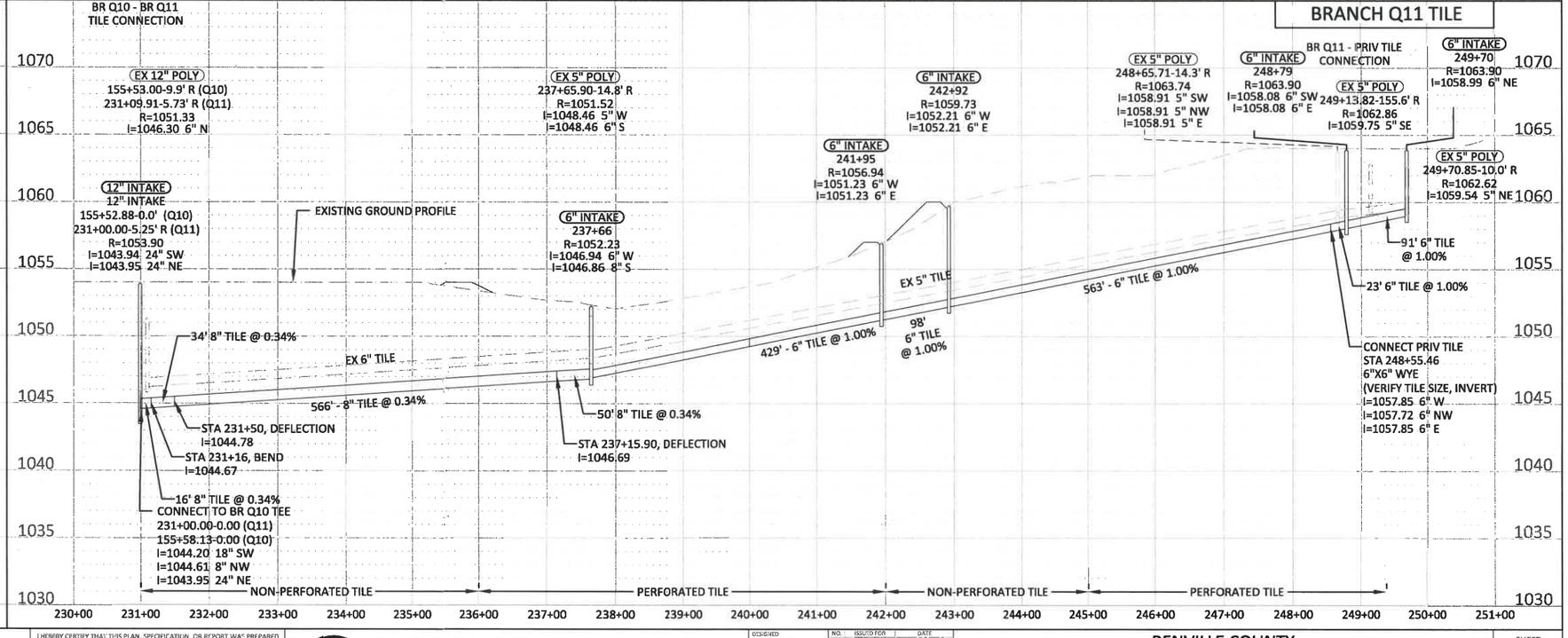




BRANCH Q10 TILE



BR Q10 - BR Q11 TILE CONNECTION



BRANCH Q11 TILE

HORZ. 0 100 200 SCALE FEET
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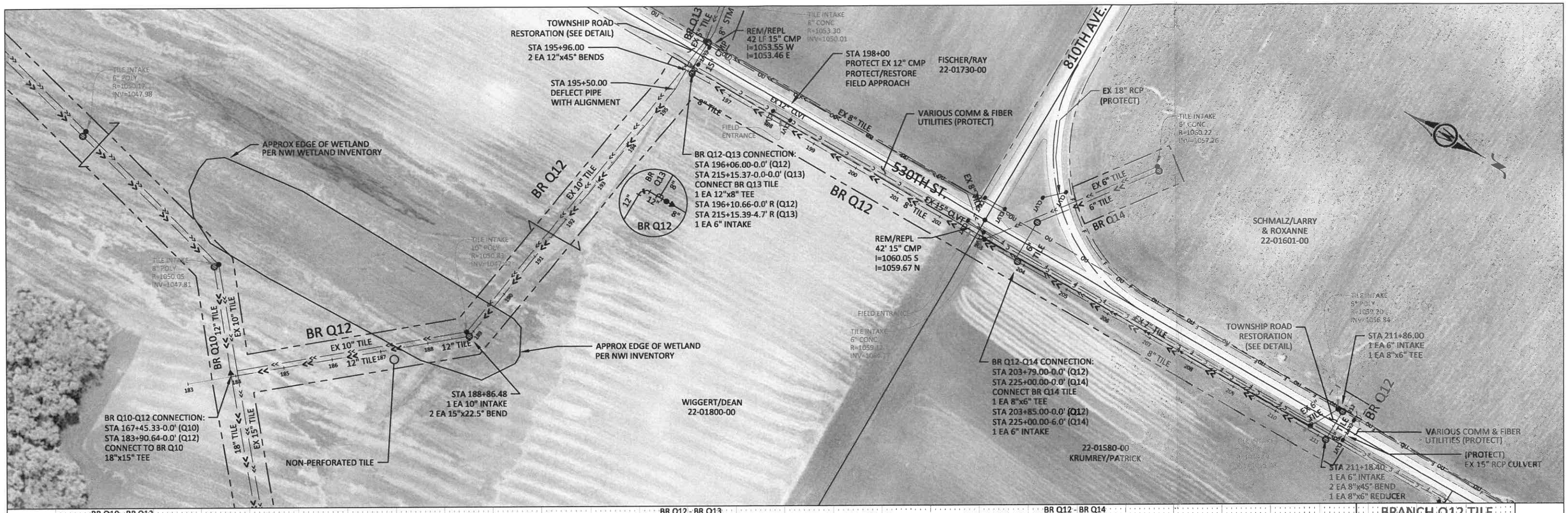
RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
BR Q10 & Q11 TILE IMPROVEMENT
PLAN AND PROFILE

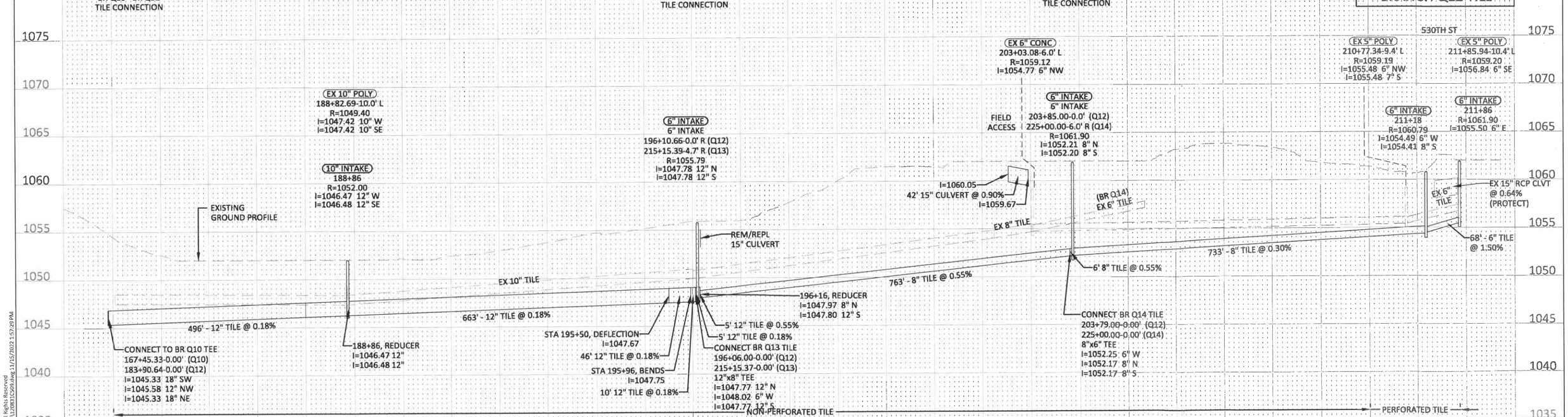
SHEET C5.08



BR Q10 - BR Q12 TILE CONNECTION

BR Q12 - BR Q13 TILE CONNECTION

BR Q12 - BR Q14 TILE CONNECTION



HORZ. SCALE 0 100 200 FEET

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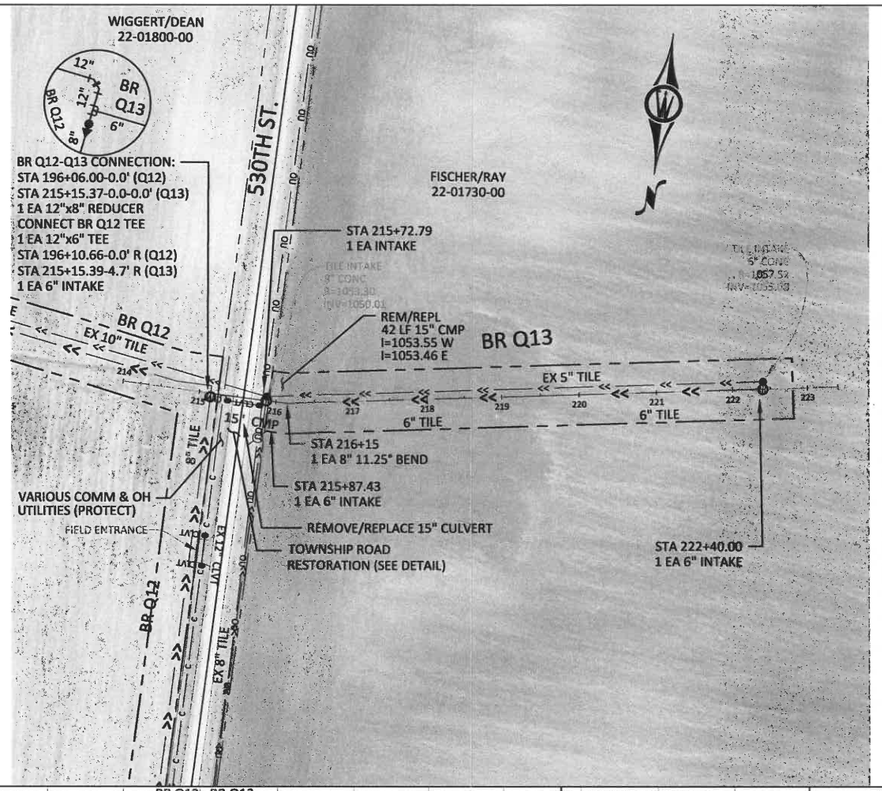
RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
BR Q12 TILE IMPROVEMENT
PLAN AND PROFILE

SHEET C5.09

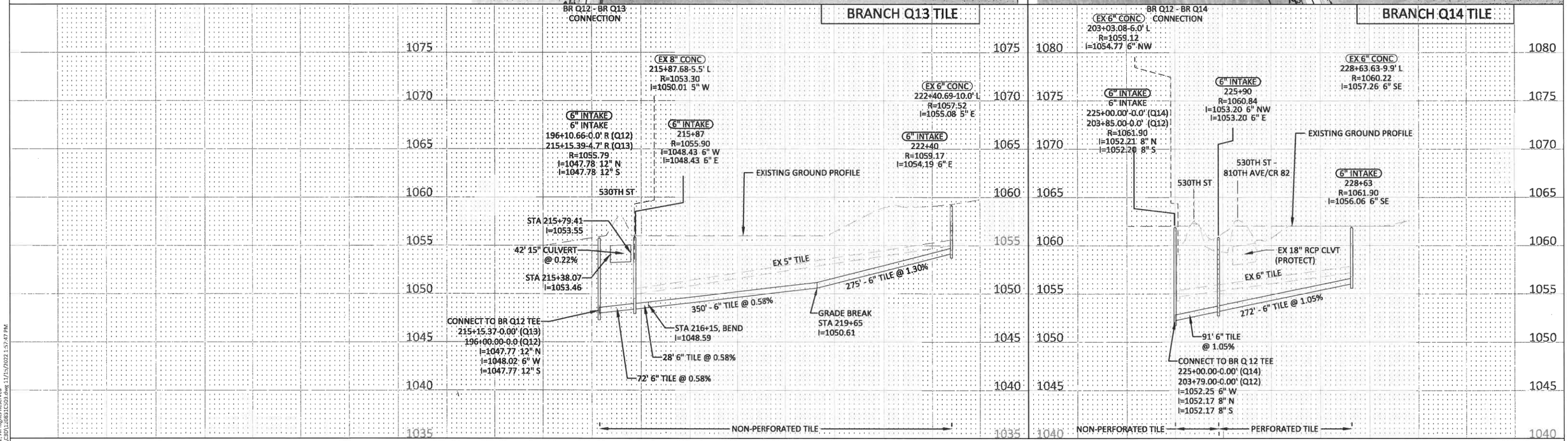


BR Q12 - BR Q13 CONNECTION

BRANCH Q13 TILE

BR Q12 - BR Q14 CONNECTION

BRANCH Q14 TILE



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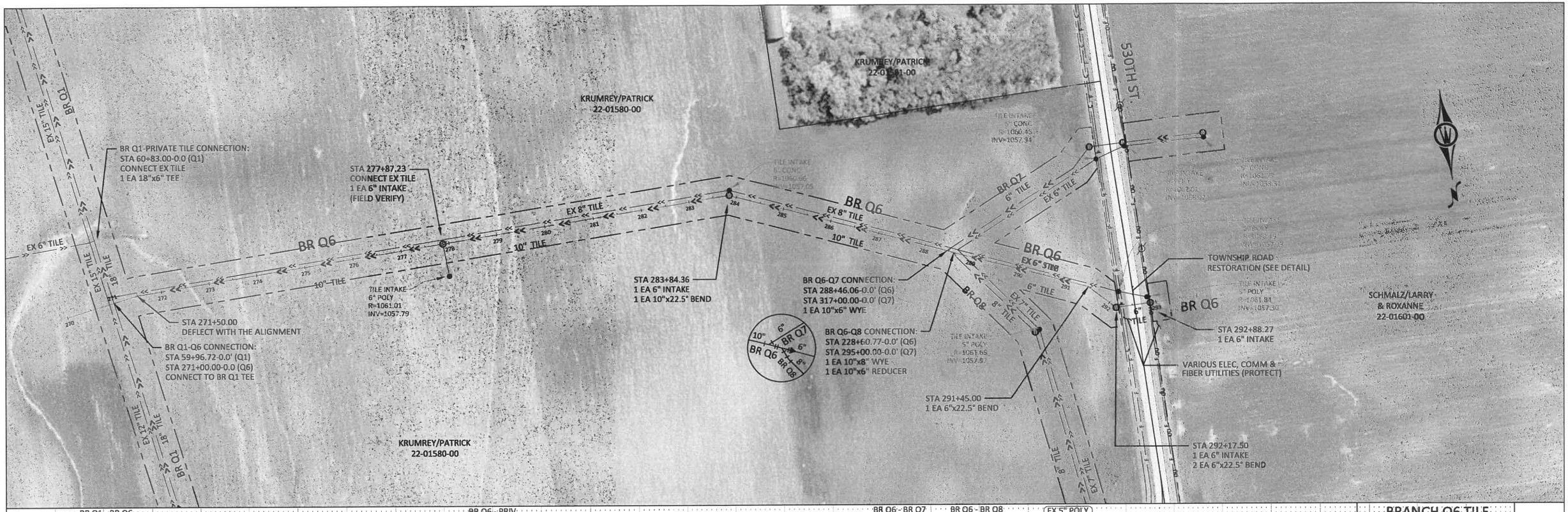
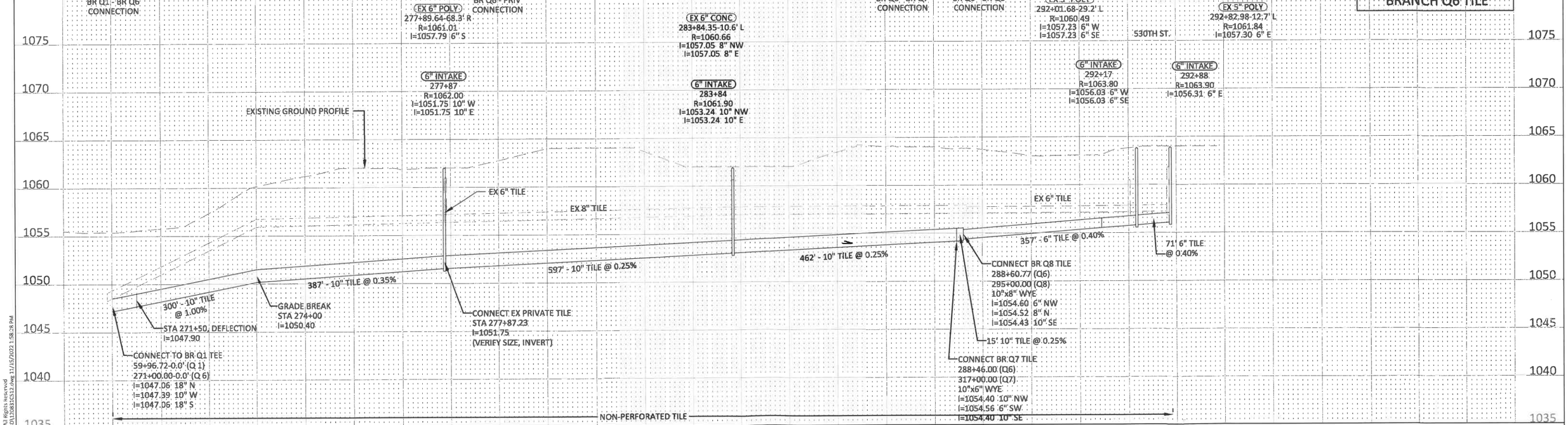
RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
BR Q13 & Q14 TILE IMPROVEMENT
PLAN AND PROFILE

SHEET C5.10



BRANCH Q6 TILE

BR Q1 - BR Q6 CONNECTION	EX 6" POLY 277+89.64-68.3' R R=1061.01 I=1057.79 6" S	BR Q6 - PRIV CONNECTION	EX 6" CONC 283+84.35-10.6' L R=1060.66 I=1057.05 8" NW I=1057.05 8" E	BR Q6 - BR Q7 CONNECTION	BR Q6 - BR Q8 CONNECTION	EX 5" POLY 292+01.68-29.2' L R=1060.49 I=1057.23 6" W I=1057.23 6" SE	530TH ST.	EX 5" POLY 292+82.98-12.7' L R=1061.84 I=1057.30 6" E
	6" INTAKE 277+87 R=1062.00 I=1051.75 10" W I=1051.75 10" E		6" INTAKE 283+84 R=1061.90 I=1053.24 10" NW I=1053.24 10" E			6" INTAKE 292+17 R=1063.80 I=1056.03 6" W I=1056.03 6" SE		6" INTAKE 292+88 R=1063.90 I=1056.31 6" E



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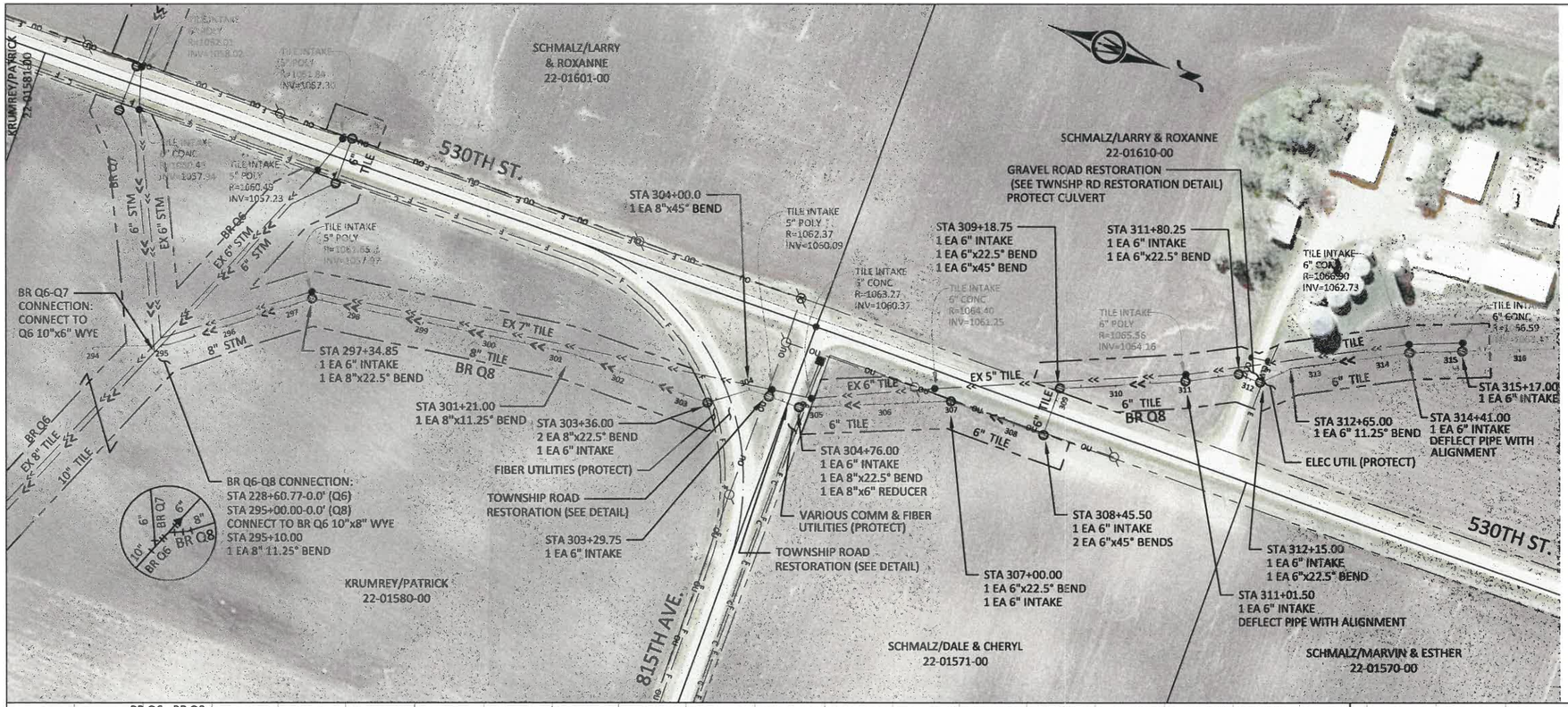
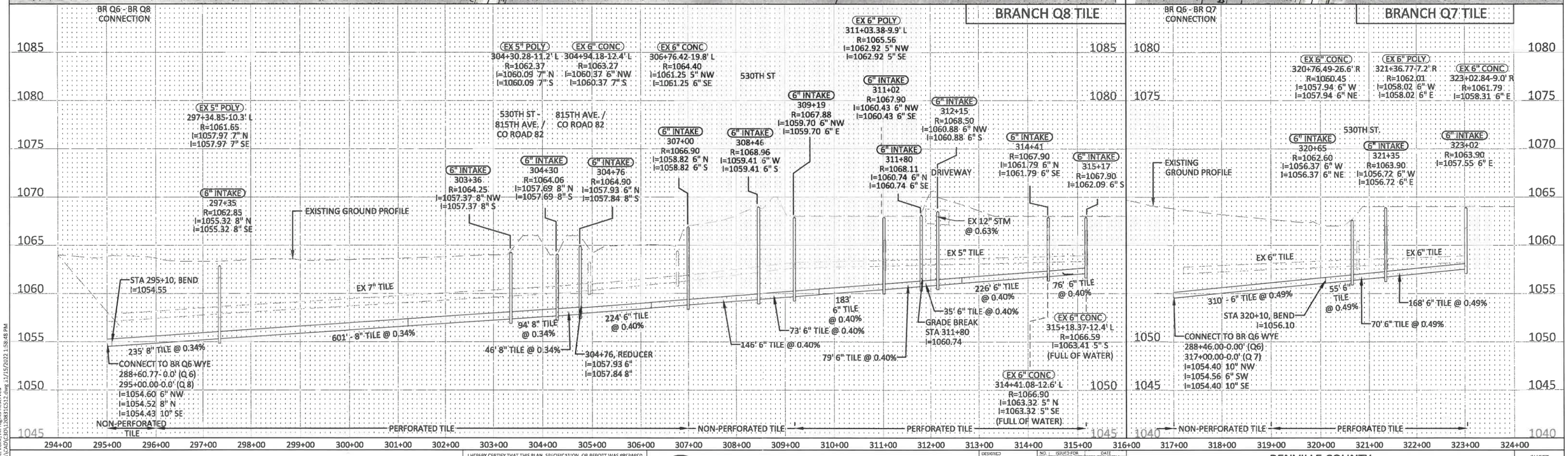
RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
BR Q6 TILE IMPROVEMENT
PLAN AND PROFILE

SHEET C5.11





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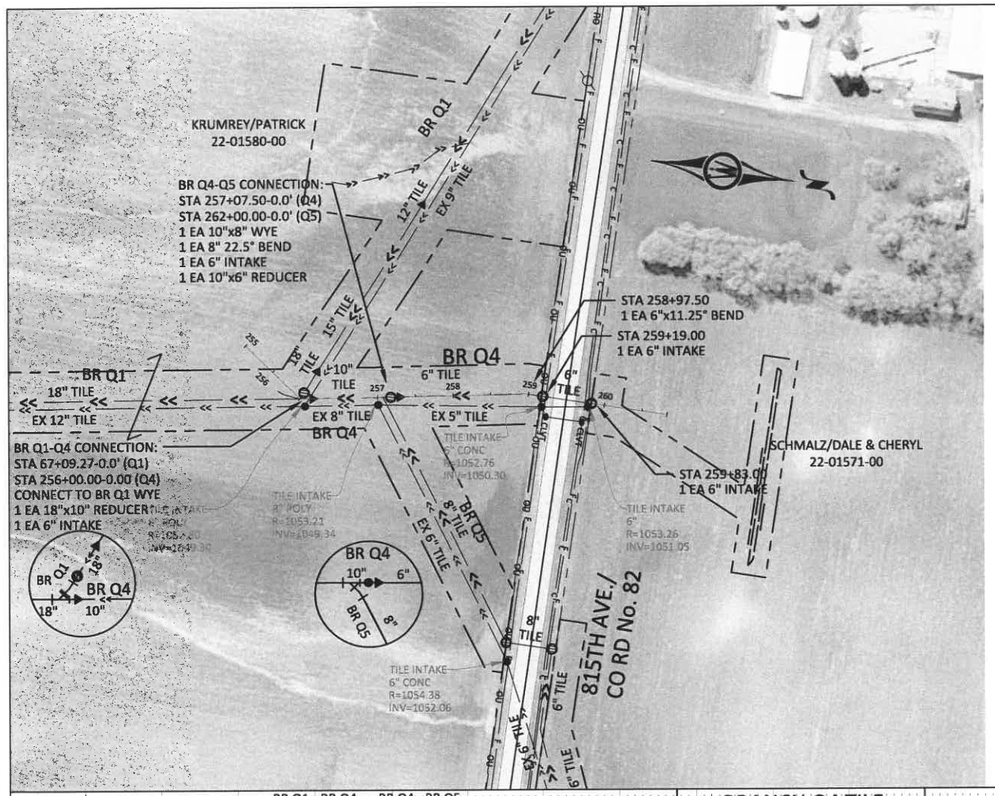
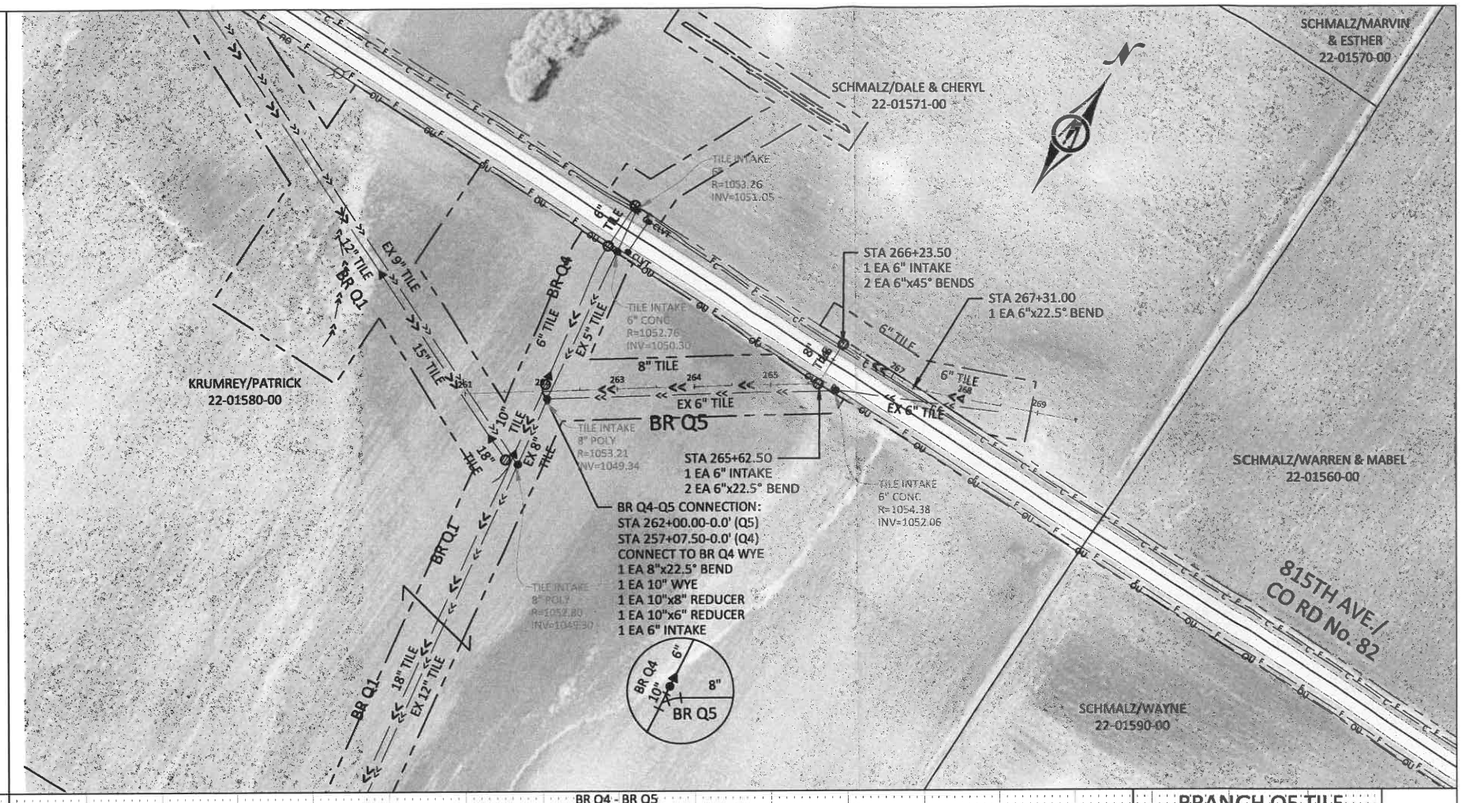
RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
BR Q7 & Q8 TILE IMPROVEMENT
PLAN AND PROFILE

SHEET C5.12

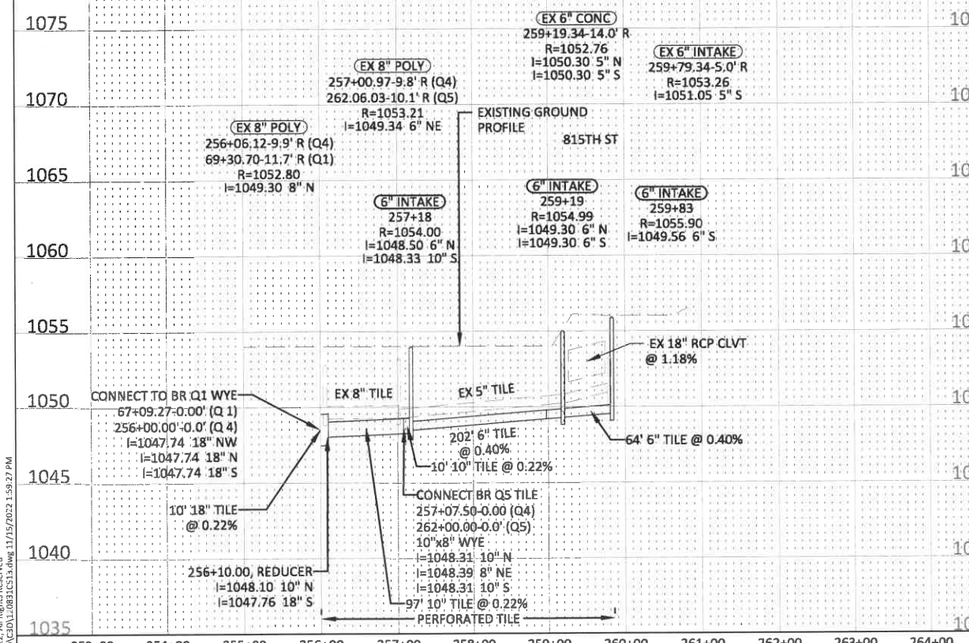




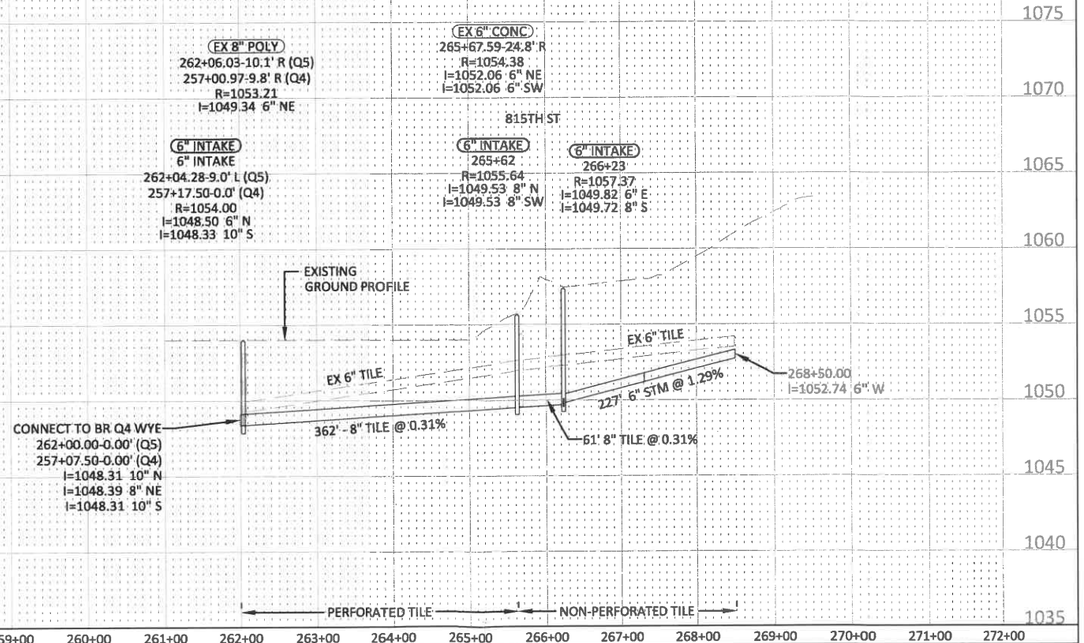
BRANCH Q4 TILE

BR Q1 - BR Q4 CONNECTION

BR Q4 - BR Q5 CONNECTION



BRANCH Q5 TILE



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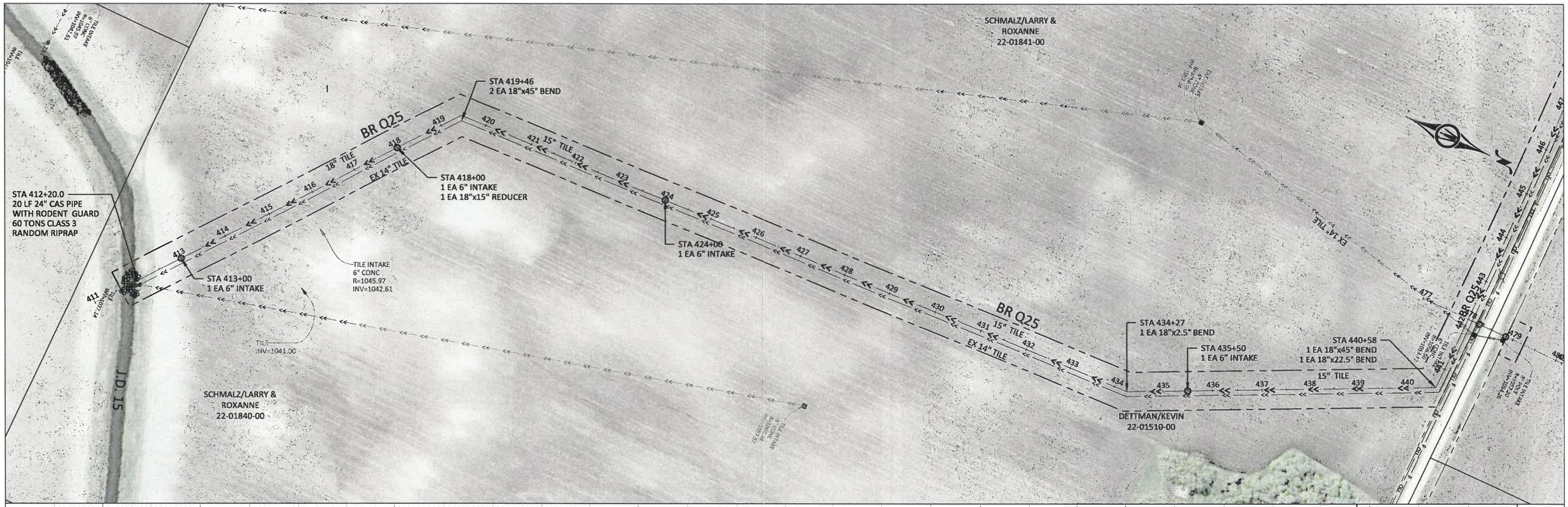
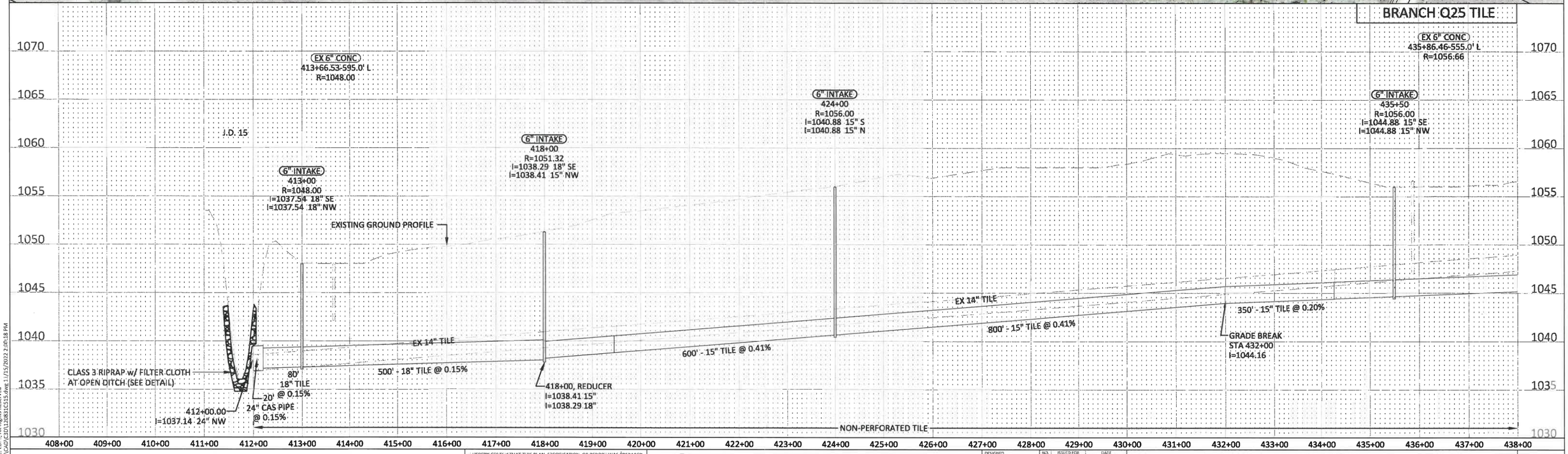
RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
BR Q4 & Q5 TILE IMPROVEMENT
PLAN AND PROFILE

SHEET C5.13





HORZ. 0 100 200 SCALE FEET

VERT. 0 5 10 SCALE FEET

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 MINNESOTA.

PRELIMINARY

NOT FOR CONSTRUCTION

SHAUN P. LUKER
LIC. NO. 48756 DATE MM/DD/YYYY

BOLTON & MENK

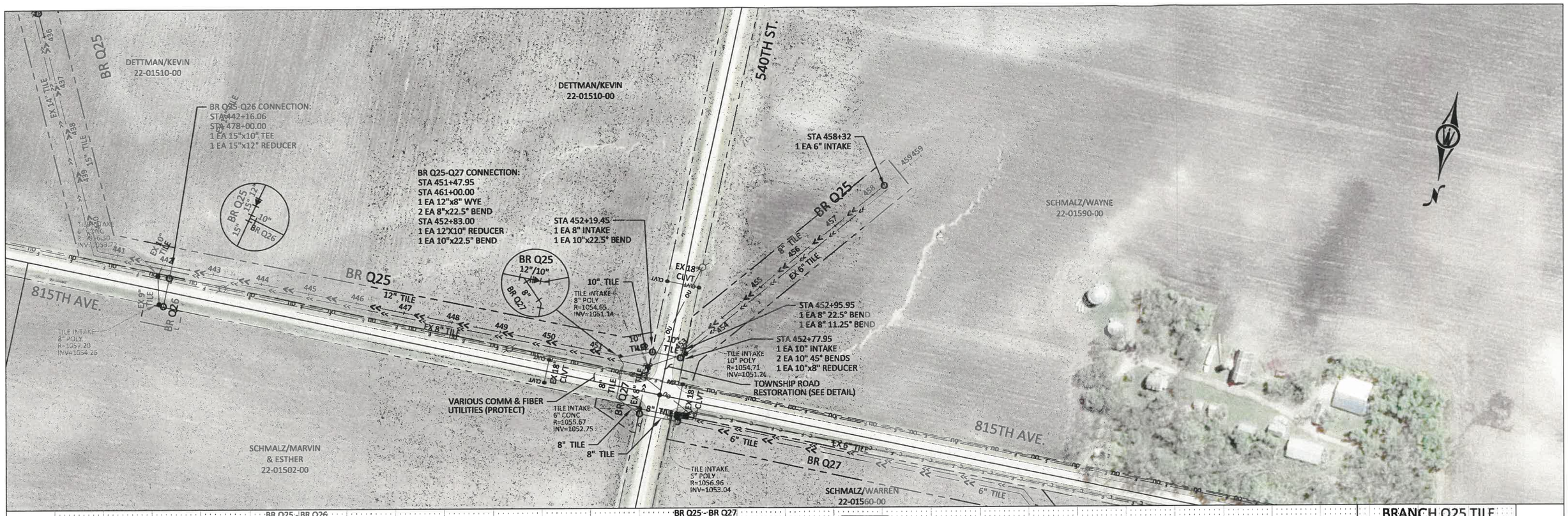
1243 CEDAR STREET NE
SLEEPY EYE, MINNESOTA 56085
Phone: (507) 794-5541
Email: SleepyEye@bolton-menk.com
www.bolton-menk.com

DESIGNED SPL
DRAWN JB, smL
CHECKED SPL
CLIENT PROJ. NO. S15.120831

NO.	ISSUED FOR	DATE

RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
BR Q25 TILE IMPROVEMENT
PLAN AND PROFILE

SHEET C5.14



HORZ. SCALE 0 100 200 FEET

VERT. SCALE 0 5 10 FEET

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 MINNESOTA.

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NOT FOR CONSTRUCTION

SHAUN P. LUKER
LIC. NO. 48756 DATE MM/DD/YYYY

BOLTON & MENK
1243 CEDAR STREET NE
SLEEPY EYE, MINNESOTA 56085
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Email: SleepyEye@bolton-menk.com
www.bolton-menk.com

DESIGNED SPL
DRAWN JB, smL
CHECKED SPL
CLIENT PROJ. NO. S15.120831

NO	ISSUED FOR	DATE

RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
BR Q25 TILE IMPROVEMENT
PLAN AND PROFILE

SHEET C5.15

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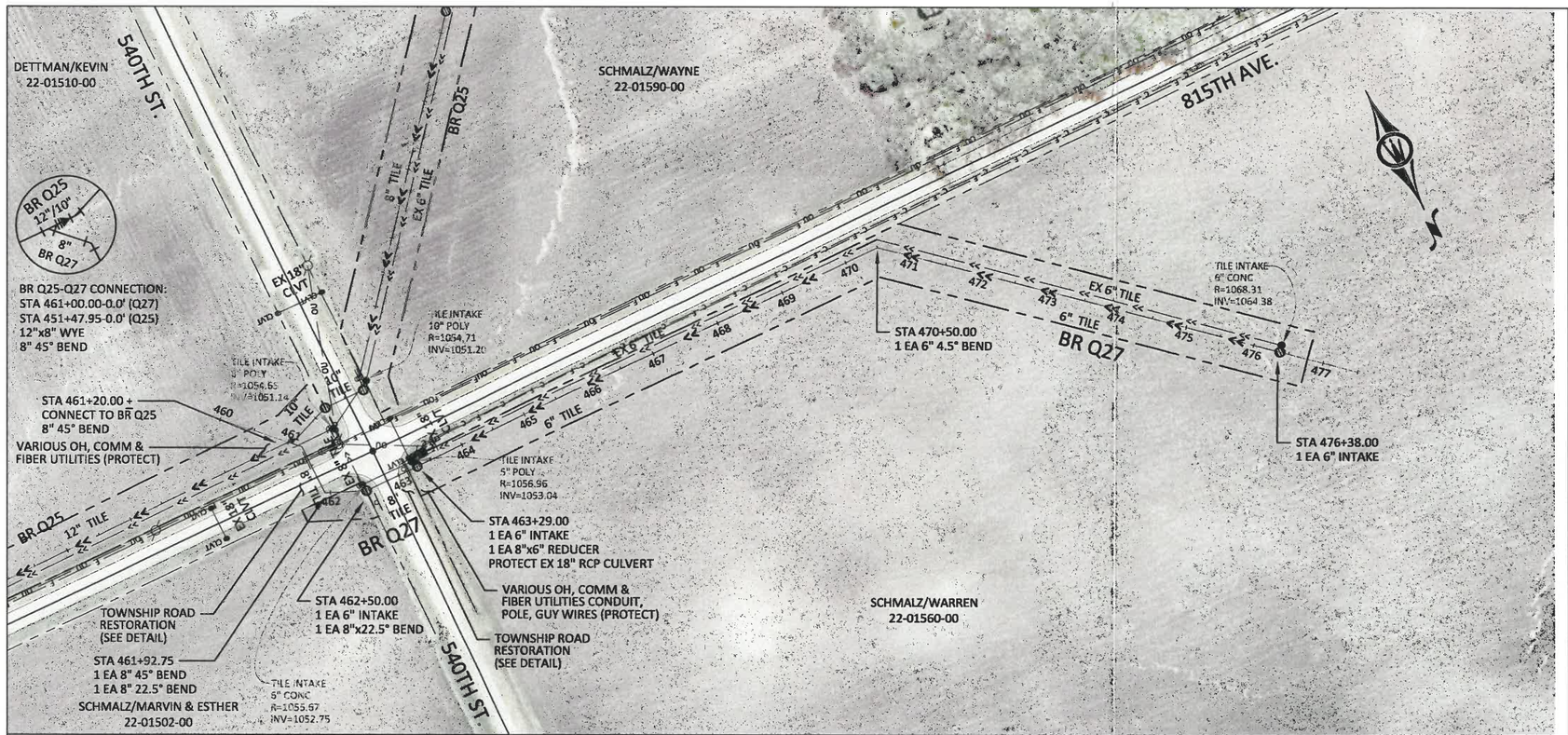
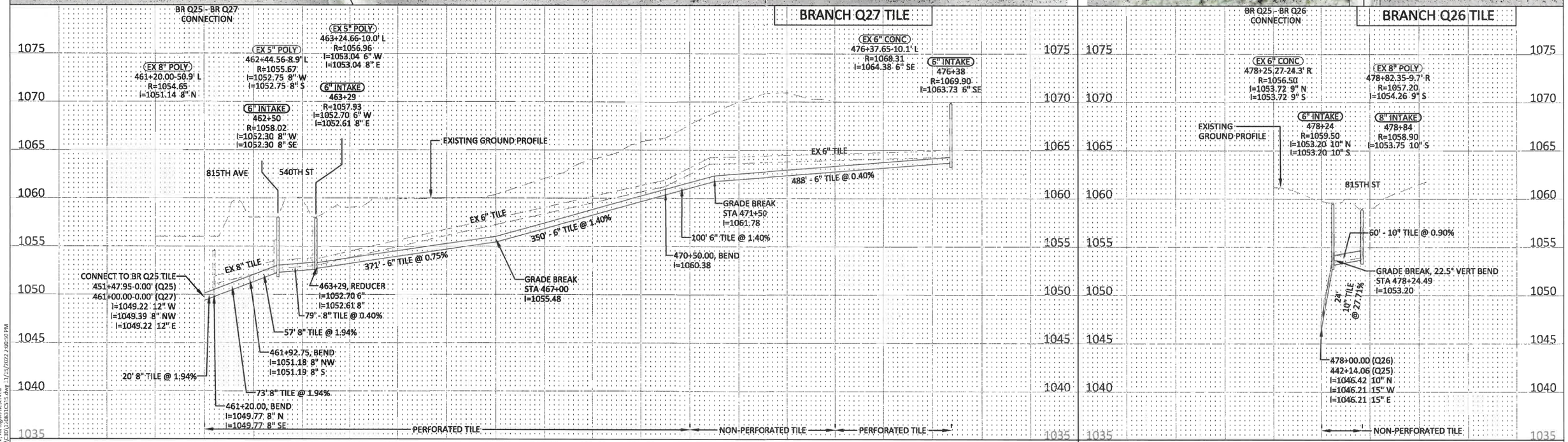




HORZ. SCALE 0 100 200 FEET
VERT. SCALE 0 5 10 FEET

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 MINNESOTA.

PRELIMINARY
NOT FOR CONSTRUCTION

SHAUN P. LUKER
LIC. NO. 48756 DATE MM/DD/YYYY

BOLTON & MENK
1243 CEDAR STREET NE
SLEEPY EYE, MINNESOTA 56085
Phone: (507) 794-5541
Email: SleepyEye@bolton-menk.com
www.bolton-menk.com

DESIGNED SPL
DRAWN JB, sml
CHECKED SPL
QUEY. PROJ. NO. S15.120831

NO.	ISSUED FOR	DATE

RENVILLE COUNTY
JUDICIAL DITCH 15 - BRANCH Q IMPROVEMENTS
BR Q26 & Q27 TILE IMPROVEMENT
PLAN AND PROFILE

SHEET C5.16

Exhibit 2: Petition for JD 15 Branch Q Improvement

PETITION FOR IMPROVEMENT OF DRAINAGE SYSTEM

TO: THE BOARD OF MANAGERS OF THE BUFFALO CREEK WATERSHED DISTRICT AS THE DRAINAGE AUTHORITY FOR JUDICIAL DITCH NO. 15 (RENVILLE COUNTY, MINNESOTA)

Petitioners respectfully represent, state and request the following:

1. Jurisdiction.

The undersigned Petitioners constitute: (1) at least 26% of the owners of the property affected by the proposed improvement; (2) at least 26% of the owners of property that the proposed improvement passes over; (3) the owners of at least 26% of the property area affected by the proposed improvement; or (4) the owners of at least 26% of the property area that the proposed improvement passes over.

2. Designation of Drainage System.

This Petition requests the improvement of the drainage system known by and designated as Judicial Ditch No. 15 located in Renville County, Minnesota.

3. Need for Improvement.

The drainage system has insufficient capacity or needs enlarging or extending to furnish sufficient capacity or a better outlet. The drainage system is out of repair and the improvement petitioned for herein is for a separable portion of the drainage system. Therefore, a portion of the cost may be assessed as a repair.

4. Description of Proposed Improvement.

The proposed improvement would consist of improving Branch Q1 of JD 15, along with certain tributary branches of Brach Q1 of JD 15; and Branch Q2 of JD 15, along with certain tributary branches of Branch Q25 of JD 15. These branches currently consist of buried tile. These branches would be enlarged and their capacity increased to meet the maximum permitted drainage coefficient currently in effect, which Petitioners understand to be 3/8th of an inch drainage coefficient. The improvement would occur along Branches Q1, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q13, Q14, Q16, Q18, Q19, and Q28 (all tributaries of Branch Q1 of JD 15) along the entire length of such branches to the points where such Branch Q1 outlets into the open ditch portion of JD 15; and Branches Q25, Q26, and Q27 (all of the tributaries of Branch Q25 of JD 15), along the entire length of such branches to the points where such Branch Q25 outlets into the open ditch portion of JD 15.

Set forth below is a list of the 40-acre tracts or government lots that the proposed improvement would pass over, together with the names and addresses of the owners of those tracts; to-wit:

	Owner	Address	PID	Description	Sec	Twp	Rge	County
1	Roxanne & Larry Schmalz	81635 530th St. Buffalo Lake, MN	22-01841-00	SW¼ NW¼	21	115	31	Renville
2	Roxanne & Larry Schmalz	81635 530th St. Buffalo Lake, MN	22-01841-00	NW¼ NW¼	21	115	31	Renville
4	Kevin Dettman	80080 540th St. Buffalo Lake, MN	22-01510-00	SW¼ SW¼	16	115	31	Renville
5	Kevin Dettman	80080 540th St. Buffalo Lake, MN	22-01510-00	SE¼ SW¼	16	115	31	Renville
6	Kevin Dettman	80080 540th St. Buffalo Lake, MN	22-01510-00	NW¼ SW¼	16	115	31	Renville
7	Marvin & Esther Schmalz	81610 540th St. Buffalo Lake, MN	22-01502-00	SW¼ NW¼	16	115	31	Renville
8	Warren & Mabel Schmalz	PO Box 225 Buffalo Lake, MN	22-01560-00	SE¼ NE¼	17	115	31	Renville
9	Dale & Cheryl Schmalz	55283 Co. Rd. 38 Buffalo Lake, MN	22-01571-00	SE¼ NW¼	17	115	31	Renville
10	Dale & Cheryl Schmalz	55283 Co. Rd. 38 Buffalo Lake, MN	22-01571-00	SW¼ NW¼	17	115	31	Renville
11	Wayne Schmalz	53475 815th Ave. Buffalo Lake, MN	22-01590-00	NW¼ SE¼	17	115	31	Renville
12	Wayne Schmalz	53475 815th Ave. Buffalo Lake, MN	22-01590-00	NE¼ SE¼	17	115	31	Renville
13	Patrick Krumrey	81220 530th St. Buffalo Lake, MN	22-01580-00	NE¼ SW¼	17	115	31	Renville
14	Patrick Krumrey	81220 530th St. Buffalo Lake, MN	22-01580-00 22-01581-00	NW¼ SW¼	17	115	31	Renville
15	Patrick Krumrey	81220 530th St. Buffalo Lake, MN	22-01580-00	SE¼ SW¼	17	115	31	Renville
16	Patrick Krumrey	81220 530th St. Buffalo Lake, MN	22-01580-00 22-01581-00	SW¼ SW¼	17	115	31	Renville
17	Wayne Schmalz	53475 815th Ave. Buffalo Lake, MN	22-01550-00	SW¼ SE¼	17	115	31	Renville
18	Wayne Schmalz	53475 815th Ave. Buffalo Lake, MN	22-01550-00	SE¼ SE¼	17	115	31	Renville
19	Dawn Swanson	53770 807th Ave. Buffalo Lake, MN	22-01773-00 22-01772-00	NE¼ NE¼	20	115	31	Renville
20	Dana Roiger	51325 US Hwy 212 Buffalo Lake, MN	22-01770-00	NE¼ NE¼	20	115	31	Renville
21	Dana Roiger	51325 US Hwy 212 Buffalo Lake, MN	22-01770-00	NW¼ NE¼	20	115	31	Renville
22	Dean Wiggert	PO Box 183 Buffalo Lake, MN	22-01774-00	NW¼ NE¼	20	115	31	Renville
23	Dean Wiggert	PO Box 183 Buffalo Lake, MN	22-01800-00	NE¼ NW¼	20	115	31	Renville
24	Dean Wiggert	PO Box 183 Buffalo Lake, MN	22-01800-00	NW¼ NW¼	20	115	31	Renville
25	Dean Wiggert	PO Box 183 Buffalo Lake, MN	22-01800-00	SW¼ NW¼	20	115	31	Renville
26	Earl & Janet Matzdorf Trust	80290 530th Street Buffalo Lake, MN	22-01782-00	NW¼ SW¼	20	115	31	Renville
27	Estate of Ray Fischer	1085 Dale St. SW Apt #113 Hutchinson, MN	22-01730-00	NE¼ NE¼	19	115	31	Renville

	Owner	Address	PID	Description	Sec	Twp	Rge	County
28	Roxanne & Larry Schmalz	81635 530th St. Buffalo Lake, MN	22-01601-00	SE¼ SE¼	18	115	31	Renville
29	Roxanne & Larry Schmalz	81635 530th St. Buffalo Lake, MN	22-01601-00	NE¼ SE¼	18	115	31	Renville
30	Roxanne & Larry Schmalz	81635 530th St. Buffalo Lake, MN	22-01610-00	SE¼ NE¼	18	115	31	Renville

5. Public Utility and Health.

The proposed improvement will be of public utility and will promote the public health.

6. Agreement by Petitioners.

The undersigned Petitioners have been informed and understand that they may not withdraw as a petitioner at any time after this Petition is accepted by the drainage authority, except with the written consent of all other Petitioners on the filed Petition. Also, the undersigned Petitioners acknowledge and agree that they will pay all costs and expenses that may be incurred if the improvement proceedings are dismissed.

7. Cost Bond.

One or more petitioners shall cause a bond to be filed or a check to be delivered in the amount of at least $10,000.00 payable to the drainage authority. The bond or payment will be conditioned to pay the costs incurred if the proceedings are dismissed or if a contract is not awarded to construct the proposed improvement described in the petition.

WHEREFORE, the Petitioners respectfully request the following:

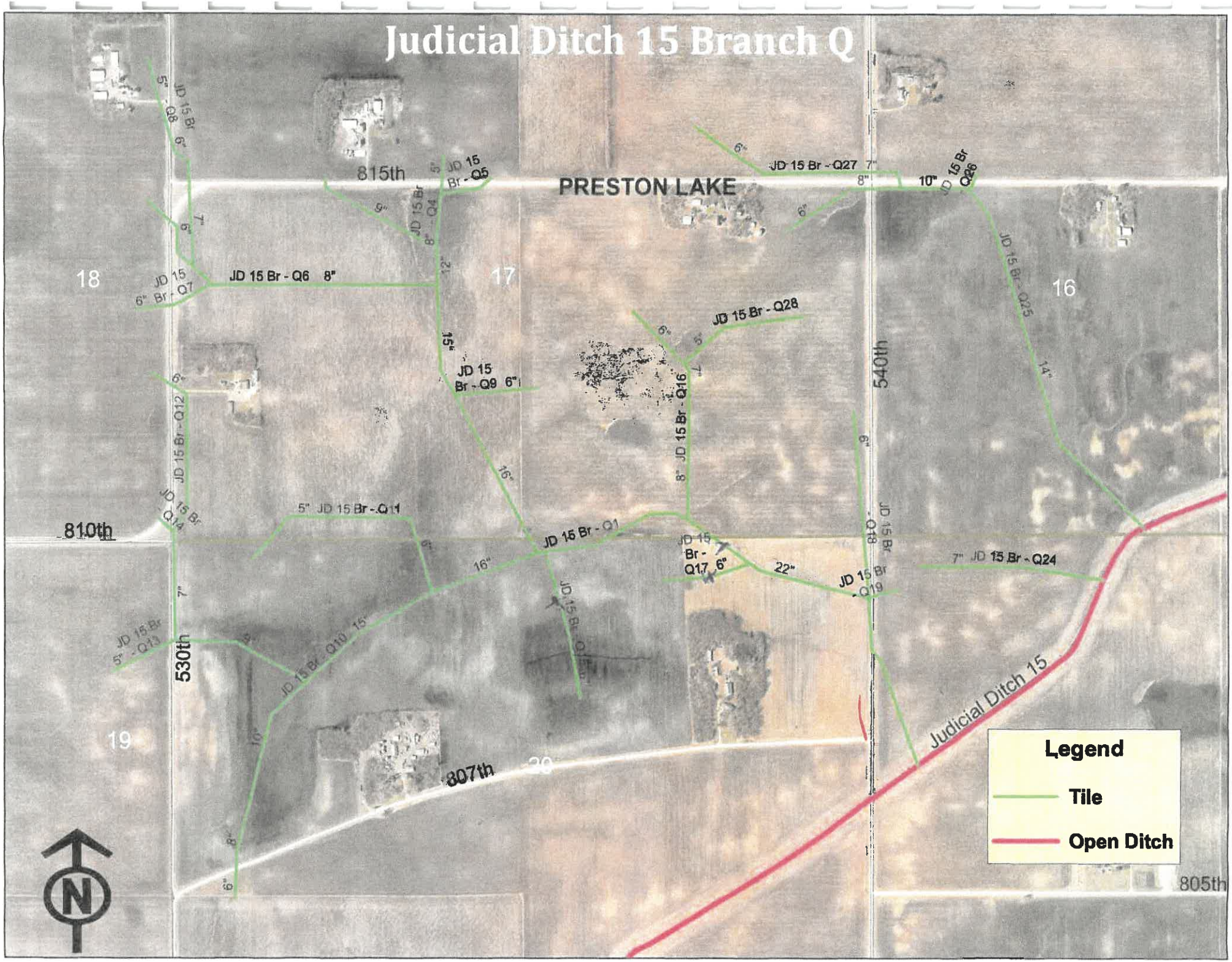
a. That the drainage authority accept this Petition, review it and determine that it is legally adequate; and

b. That the drainage authority appoint an engineer for purposes of the proposed improvement and direct the engineer to prepare an engineer's preliminary report for the proposed improvement, including allowing the engineer to analyze other potential routes for the proposed improvement and whether separable maintenance may be employed.

Dated this _____ day of _____, 2020.

Jeff C. Braegelmann #174701
jbraegelmann@gislason.com
Dean M. Zimmerli #0396791
dzimmerli@gislason.com
GISLASON & HUNTER LLP
Attorneys for Petitioners
2700 South Broadway
P. O. Box 458
New Ulm, MN 56073-0458
Phone: 507-354-3111
Fax: 507-354-8447

[Signature pages to follow]


Judicial Ditch 15 Branch Q
815th
PRESTON LAKE
JD 15 Br - Q27
JD 15 Br - Q26
JD 15 Br - Q5
JD 15 Br - Q4
JD 15 Br - Q6 8"
JD 15 Br - Q7
JD 15 Br - Q28
JD 15 Br - Q25
JD 15 Br - Q9 6"
JD 15 Br - Q16
JD 15 Br - Q12
JD 15 Br - Q14
5" JD 15 Br - Q11
JD 15 Br - Q1
JD 15 Br - Q17 6"
JD 15 Br - Q18
JD 15 Br - Q19
7" JD 15 Br - Q24
JD 15 Br - Q13
JD 15 Br - Q10 15"
JD 15 Br - Q15
810th
530th
807th
540th
805th
Judicial Ditch 15
18
17
16
19
20
Legend
Tile
Open Ditch
N

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO JUDICIAL DITCH NO. 15
(RENVILLE COUNTY AND SIBLEY COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

LARRY SCHMALZ

ROZANNE SCHMALZ

Ownership (check one):

_____ Individual
_____ Co-Owners (# of co-owners: 1)
_____ Partner (name of partnership: _____)
_____ Corporation or limited liability company (name of corporation or LLC: _____)
_____ Trust (complete name of trust: _____)
_____ Other (explanation: _____)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description	Section	Township	Range	County
~~NE¼~~ SE¼ SE¼	18	115	31	Renville
NE¼ SE¼	18	115	31	Renville
SE¼ NE¼	18	115	31	Renville
SW¼ NW¼	21	115	31	Renville
N W¼ NW¼	21	115	31	Renville
NE¼ NW¼	21	115	31	Renville

Dated: _____

_____
(signature)

Dated: Jan 23-20

Larry Schmalz
(signature)

Dated: Jan 23-20

Rozanne Schmalz
(signature)

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO JUDICIAL DITCH NO. 15
(RENVILLE COUNTY AND SIBLEY COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

DEAN WIGERT

Ownership (check one):

- X Individual
- _____ Co-Owners (# of co-owners: _____)
- _____ Partner (name of partnership: _____)
- _____ Corporation or limited liability company (name of corporation or LLC: _____)
- _____ Trust (complete name of trust: _____)
- _____ Other (explanation: _____)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description	Section	Township	Range	County
22-01774-00	20	115	31	Ren
22-01800-00	20	115	31	Ren
22-01800-00	20	115	31	Ren
	20	115	31	Ren

Dated: 9-21-20

_____
(signature)

Dated: _____

_____
(signature)

Dated: _____

_____
(signature)

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO JUDICIAL DITCH NO. 15
(RENVILLE COUNTY AND SIBLEY COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

DANA Roiser

Ownership (check one):

- X Individual
- ____ Co-Owners (# of co-owners: ____)
- ____ Partner (name of partnership: ____)
- ____ Corporation or limited liability company (name of corporation or LLC: ____)
- ____ Trust (complete name of trust: ____)
- ____ Other (explanation: ____)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description	Section	Township	Range	County
22 0770-00	20	115	31	Ren

Dated: 1/24/2020

(signature)

Dated: ____

(signature)

Dated: ____

(signature)

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO JUDICIAL DITCH NO. 15
(RENVILLE COUNTY AND SIBLEY COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

Wayne Schmalz

Ownership (check one):

- ✓ Individual
- _____ Co-Owners (# of co-owners: _____)
- _____ Partner (name of partnership: _____)
- _____ Corporation or limited liability company (name of corporation or LLC: _____)
- _____ Trust (complete name of trust: _____)
- _____ Other (explanation: _____)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description	Section	Township	Range	County
NW4 of SE4) NW 2 of N2 of SE4	17	115	31	Renville
NE4 of SE4) NE 2 of N2 of SE4	17	115	31	Renville
SW 4 of SE4) NW 2 of S2 of SE4	17	115	31	Renville
SE 4 of SE4) NE 2 of S2 of SE4	17	115	31	Renville

Dated: 1-23-20

Wayne Schmalz
(signature)

Dated: _____

_____
(signature)

Dated: _____

_____
(signature)

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO JUDICIAL DITCH NO. 15
(RENVILLE COUNTY AND SIBLEY COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

Patrick Krumney

Ownership (check one):

x Individual
_____ Co-Owners (# of co-owners: _____)
_____ Partner (name of partnership: _____)
_____ Corporation or limited liability company (name of corporation or LLC: _____)
_____ Trust (complete name of trust: _____)
_____ Other (explanation: _____)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description		Section	Township	Range	County
22-01580-00	NE ¼ SW ¼	17	115	31	Renville
22-01581-00	NW ¼ SW ¼	17	115	31	Renville
22-01580-00	SE ¼ SW ¼	17	115	31	Renville
22-01581-00	SW ¼ SW ¼	17	115	31	Renville

Dated: 1-16-2020 Patrick Krumney
(signature)

Dated: _____
_____
(signature)

Dated: _____
_____
(signature)

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO JUDICIAL DITCH NO. 15
(RENVILLE COUNTY AND SIBLEY COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

Kevin Dettman

Ownership (check one):

X Individual
_____ Co-Owners (# of co-owners: _____)
_____ Partner (name of partnership: _____)
_____ Corporation or limited liability company (name of corporation or LLC: _____)
_____ Trust (complete name of trust: _____)
_____ Other (explanation: _____)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description	Section	Township	Range	County
22-01510-00 SW¼ SW¼	16	115	31	Renville
22-01510-00 SE¼ SW¼	16	115	31	Renville
22-01510-00 NW¼ SW¼	16	115	31	Renville

Dated: 1-24-2020

Kevin Dettman
(signature)

Dated: _____

_____
(signature)

Dated: _____

_____
(signature)

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO JUDICIAL DITCH NO. 15
(RENVILLE COUNTY AND SIBLEY COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

Dale Schmalz
Cheryl Schmalz

Ownership (check one):

____ Individual
X Co-Owners (# of co-owners: 2)
____ Partner (name of partnership: _____)
____ Corporation or limited liability company (name of corporation or LLC: _____)
____ Trust (complete name of trust: _____)
____ Other (explanation: _____)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description	Section	Township	Range	County
SE1/4 NW1/4	17	115	31	Renville
SW1/4 NW1/4	17	115	31	Renville

Dated: 1-26-2020 Dale Schmalz (signature)

Dated: 1-26-2020 Cheryl Schmalz (signature)

Dated: _____ _____ (signature)

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO JUDICIAL DITCH NO. 15
(RENVILLE COUNTY AND SIBLEY COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

DAWN Swanson

Ownership (check one):

- X Individual
- _____ Co-Owners (# of co-owners: _____)
- _____ Partner (name of partnership: _____)
- _____ Corporation or limited liability company (name of corporation or LLC: _____)
- _____ Trust (complete name of trust: _____)
- _____ Other (explanation: _____)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description	Section	Township	Range	County
22-01783-00	20	115	31	Ren
22 01772-00	20	115	31	Ren

Dated: 1/26/2020

Dawn Swans
(signature)

Dated: _____

_____
(signature)

Dated: _____

_____
(signature)

Exhibit 3: Final Cost Estimate

ENGINEER'S ESTIMATE

JUDICIAL DITCH #15 BRANCH Q IMPROVEMENTS
RENVILLE COUNTY
BMI PROJECT NO: S15.116846

BOLTON & MENK
Real People. Real Solutions.

Date: 11/15/2022

Item No.	Item	Estimated Quantity	Unit	Unit Price	Total Amount
BASE BID					
1	Mobilization	1	Lump Sum	$45,000.00	$45,000.00
2	Common Embankment (CV)	1220	Cubic Yard	$20.00	$24,400.00
3	Aggregate Surfacing, Class 5	800	Ton	$30.00	$24,000.00
4	Exploratory Excavation	90	Hour	$225.00	$20,250.00
5	15" Alumanized CM Pipe Culvert	84	Linear Foot	$100.00	$8,400.00
6	24" Alumanized CM Pipe Culvert	20	Linear Foot	$150.00	$3,000.00
7	36" Alumanized CM Pipe Culvert	20	Linear Foot	$200.00	$4,000.00
8	5" Intake	1	Each	$725.00	$725.00
9	6" Intake	65	Each	$750.00	$48,750.00
10	8" Intake	11	Each	$800.00	$8,800.00
11	10" Intake	4	Each	$900.00	$3,600.00
12	12" Intake	4	Each	$1,000.00	$4,000.00
13	4" Single Wall Drain Tile (PERFORATED)	400	Linear Foot	$15.00	$6,000.00
14	6" Drain Tile (NON-PERFORATED)	5610	Each	$18.00	$100,980.00
15	6" Drain Tile (PERFORATED)	4420	Each	$18.00	$79,560.00
16	8" Drain Tile (NON-PERFORATED)	3730	Linear Foot	$20.00	$74,600.00
17	8" Drain Tile (PERFORATED)	2630	Linear Foot	$20.00	$52,600.00
18	10" Drain Tile (NON-PERFORATED)	2260	Linear Foot	$21.00	$47,460.00
19	10" Drain Tile (PERFORATED)	140	Linear Foot	$21.00	$2,940.00
20	12" Drain Tile (NON-PERFORATED)	3160	Linear Foot	$22.00	$69,520.00
21	12" Drain Tile (PERFORATED)	980	Linear Foot	$22.00	$21,560.00
22	15" Drain Tile (NON-PERFORATED)	2430	Linear Foot	$25.00	$60,750.00
23	15" Drain Tile (PERFORATED)	260	Linear Foot	$25.00	$6,500.00
24	18" Drain Tile (NON-PERFORATED)	3600	Linear Foot	$32.00	$115,200.00
25	18" Drain Tile (PERFORATED)	320	Linear Foot	$32.00	$10,240.00
26	24" Drain Tile (NON-PERFORATED)	1790	Linear Foot	$38.00	$68,020.00
27	30" Drain Tile (NON-PERFORATED)	3780	Linear Foot	$52.00	$196,560.00
28	Drain Tile Connection	100	Each	$800.00	$80,000.00
29	Stream Barb	3	Each	$5,000.00	$15,000.00
30	Random Riprap, Class III	120	Ton	$110.00	$13,200.00
31	Silt Fence, Type MS or HI	1250	Linear Foot	$4.00	$5,000.00
32	Inlet Protection	140	Each	$150.00	$21,000.00
33	Ditch Check - Bioroll	1200	Linear Foot	$4.00	$4,800.00
34	Seeding	0.6	Acre	$2,500.00	$1,500.00
35	Mulch Material, Type 1	134	Ton	$275.00	$36,850.00
36	Rapid Stabilization Method 4	10280	Square Yard	$3.00	$30,840.00
37	Stabilized Construction Exit	1	Lump Sum	$2,500.00	$2,500.00
	SUBTOTAL:				$1,318,105.00
	10% CONTINGENCY:				$131,810.00
	TEMPORARY CROP DAMAGES:	61.6	Acres	600	$36,960.00
	TOTAL ESTIMATED CONSTRUCTION COST:				**$1,486,875.00**
	DESIGN, ADMINISTRATION AND CONSTRUCTION ENGINEERING:				$297,370.00
	TOTAL ESTIMATED PROJECT COST:				**$1,784,245.00**

ENGINEER'S ESTIMATE

JUDICIAL DITCH #15 BRANCH Q IMPROVEMENTS
RENVILLE COUNTY
BMI PROJECT NO: S15.116846

BOLTON & MENK
Real People. Real Solutions.

Date: 11/15/2022

Item No.	Item	Estimated Quantity	Unit	Unit Price	Total Amount	BRANCH Q1		BRANCH Q4		BRANCH Q5		BRANCH Q6		BRANCH Q7		BRANCH Q8		BRANCH Q9		BRANCH Q10	
						Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price
BASE BID																					
1	Mobilization	1	Lump Sum	$45,000.00	$45,000.00	0.3	$13,500.00	0.01	$450.00	0.02	$900.00	0.05	$2,250.00	0.02	$900.00	0.05	$2,250.00	0.01	$450.00	0.1	$4,500.00
2	Common Embankment (CV)	1220	Cubic Yard	$20.00	$24,400.00	1150	$23,000.00	70	$1,400.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
3	Aggregate Surfacing, Class 5	800	Ton	$30.00	$24,000.00	75	$2,250.00	45	$1,350.00	45	$1,350.00	50	$1,500.00	35	$1,050.00	100	$3,000.00	0	$0.00	70	$2,100.00
4	Exploratory Excavation	90	Hour	$225.00	$20,250.00	20.1	$4,522.50	1.1	$247.50	1.7	$382.50	5.5	$1,237.50	1.6	$360.00	5.3	$1,192.50	1.7	$382.50	8.5	$1,912.50
5	15" Alumanized CM Pipe Culvert	84	Linear Foot	$100.00	$8,400.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
6	24" Alumanized CM Pipe Culvert	20	Linear Foot	$150.00	$3,000.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
7	36" Alumanized CM Pipe Culvert	20	Linear Foot	$200.00	$4,000.00	20	$4,000.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
8	5" Intake	1	Each	$725.00	$725.00	0	$0.00	1	$725.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
9	6" Intake	65	Each	$750.00	$48,750.00	5	$3,750.00	3	$2,250.00	5	$3,750.00	4	$3,000.00	3	$2,250.00	12	$9,000.00	1	$750.00	2	$1,500.00
10	8" Intake	11	Each	$800.00	$8,800.00	2	$1,600.00	0	$0.00	1	$800.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	4	$3,200.00
11	10" Intake	4	Each	$900.00	$3,600.00	1	$900.00	0	$0.00	1	$900.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
12	12" Intake	4	Each	$1,000.00	$4,000.00	3	$3,000.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	1	$1,000.00
13	4" Single Wall Drain Tile (PERFORATE	400	Linear Foot	$15.00	$6,000.00	60	$900.00	340	$5,100.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
14	6" Drain Tile (NON-PERFORATED)	5610	Linear Foot	$18.00	$100,980.00	0	$0.00	0	$0.00	230	$4,140.00	430	$7,740.00	200	$3,600.00	220	$3,960.00	200	$3,600.00	0	$0.00
15	6" Drain Tile (PERFORATED)	4420	Linear Foot	$18.00	$79,560.00	0	$0.00	380	$6,840.00	0	$0.00	0	$0.00	410	$7,380.00	830	$14,940.00	430	$7,740.00	0	$0.00
16	8" Drain Tile (NON-PERFORATED)	3730	Linear Foot	$20.00	$74,600.00	0	$0.00	0	$0.00	60	$1,200.00	0	$0.00	0	$0.00	100	$2,000.00	0	$0.00	140	$2,800.00
17	8" Drain Tile (PERFORATED)	2630	Linear Foot	$20.00	$52,600.00	0	$0.00	0	$0.00	370	$7,400.00	0	$0.00	0	$0.00	880	$17,600.00	0	$0.00	300	$6,000.00
18	10" Drain Tile (NON-PERFORATED)	2260	Linear Foot	$21.00	$47,460.00	0	$0.00	0	$0.00	0	$0.00	1770	$37,170.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
19	10" Drain Tile (PERFORATED)	140	Linear Foot	$21.00	$2,940.00	0	$0.00	10	$210.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
20	12" Drain Tile (NON-PERFORATED)	3160	Linear Foot	$22.00	$69,520.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	500	$11,000.00
21	12" Drain Tile (PERFORATED)	980	Linear Foot	$22.00	$21,560.00	530	$11,660.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	450	$9,900.00
22	15" Drain Tile (NON-PERFORATED)	2430	Linear Foot	$25.00	$60,750.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
23	15" Drain Tile (PERFORATED)	260	Linear Foot	$25.00	$6,500.00	260	$6,500.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
24	18" Drain Tile (NON-PERFORATED)	3600	Linear Foot	$32.00	$115,200.00	1820	$58,240.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	1200	$38,400.00
25	18" Drain Tile (PERFORATED)	320	Linear Foot	$32.00	$10,240.00	320	$10,240.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
26	24" Drain Tile (NON-PERFORATED)	1790	Linear Foot	$38.00	$68,020.00	1030	$39,140.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	760	$28,880.00
27	30" Drain Tile (NON-PERFORATED)	3780	Linear Foot	$52.00	$196,560.00	3780	$196,560.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
28	Drain Tile Connection	100	Each	$800.00	$80,000.00	22	$17,600.00	5	$4,000.00	4	$3,200.00	6	$4,800.00	2	$1,600.00	6	$4,800.00	2	$1,600.00	5	$4,000.00
29	Stream Barb	3	Each	$5,000.00	$15,000.00	3	$15,000.00														
30	Random Riprap, Class III	120	Ton	$110.00	$13,200.00	60	$6,600.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
31	Silt Fence, Type MS or HI	1250	Linear Foot	$4.00	$5,000.00	200	$800.00	50	$200.00	50	$200.00	50	$200.00	50	$200.00	200	$800.00	0	$0.00	100	$400.00
32	Inlet Protection	140	Each	$150.00	$21,000.00	18	$2,700.00	7	$1,050.00	4	$600.00	10	$1,500.00	6	$900.00	20	$3,000.00	1	$150.00	11	$1,650.00
33	Ditch Check - Bioroll	1200	Linear Foot	$4.00	$4,800.00	200	$800.00	50	$200.00	50	$200.00	50	$200.00	50	$200.00	200	$800.00	0	$0.00	100	$400.00
34	Seeding	0.6	Acre	$2,500.00	$1,500.00	0.3	$750.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0.15	$375.00	0	$0.00	0	$0.00
35	Mulch Material, Type 1	134	Ton	$275.00	$36,850.00	30	$8,250.00	2	$550.00	2	$550.00	8	$2,200.00	3	$825.00	9	$2,475.00	3	$825.00	13	$3,575.00
36	Rapid Stabilization Method 4	10280	Square Yard	$3.00	$30,840.00	1350	$4,050.00	900	$2,700.00	630	$1,890.00	425	$1,275.00	800	$2,400.00	2025	$6,075.00	0	$0.00	300	$900.00
37	Stabilized Construction Exit	1	Lump Sum	$2,500.00	$2,500.00	0.2	$500.00	0	$0.00	0	$0.00	0.2	$500.00	0	$0.00	0	$0.00	0	$0.00	0.2	$500.00
	ESTIMATED CONSTRUCTION SUBTOTAL:				**$1,318,105.00**		**$436,812.50**		**$27,272.50**		**$27,462.50**		**$63,572.50**		**$21,665.00**		**$72,267.50**		**$15,497.50**		**$122,617.50**
	10% CONTINGENCY:				$131,810.00		$43,680.00		$2,720.00		$2,740.00		$6,360.00		$2,170.00		$7,230.00		$1,550.00		$12,260.00
	TEMPORARY CROP DAMAGES:	61.6	Acres	$600.00	$36,960.00	14.58	$8,748.00	1.05	$630.00	1.36	$816.00	3.90	$2,340.00	0.96	$576.00	3.08	$1,848.00	1.15	$690.00	5.99	$3,594.00
	TOTAL ESTIMATED CONSTRUCTION COST:				**$1,486,875.00**		**$489,240.50**		**$30,622.50**		**$31,018.50**		**$72,272.50**		**$24,411.00**		**$81,345.50**		**$17,737.50**		**$138,471.50**
	DESIGN, ADMINISTRATION AND CONSTRUCTION ENGINEERING:				$297,370.00		$97,850.00		$6,130.00		$6,200.00		$14,450.00		$4,880.00		$16,270.00		$3,550.00		$27,690.00
	TOTAL ESTIMATED PROJECT COST:				**$1,784,245.00**		**$587,090.50**		**$36,752.50**		**$37,218.50**		**$86,722.50**		**$29,291.00**		**$97,615.50**		**$21,287.50**		**$166,161.50**

ENGINEER'S ESTIMATE

JUDICIAL DITCH #15 BRANCH Q IMPROVEMENTS
RENVILLE COUNTY
BMI PROJECT NO: S15.116846

BOLTON & MENK
Real People. Real Solutions.

Date: 11/15/2022

Item No.	Item	Estimated Quantity	Unit	Unit Price	BRANCH Q11		BRANCH Q12		BRANCH Q13		BRANCH Q14		BRANCH Q16		BRANCH Q18		BRANCH Q19		BRANCH Q25		BRANCH Q26	
					Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price
BASE BID																						
1	Mobilization	1	Lump Sum	$45,000.00	0.04	$1,800.00	0.07	$3,150.00	0.02	$900.00	0.01	$450.00	0.04	$1,800.00	0.03	$1,350.00	0.01	$450.00	0.15	$6,750.00	0.01	$450.00
2	Common Embankment (CV)	1220	Cubic Yard	$20.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
3	Aggregate Surfacing, Class 5	800	Ton	$30.00	0	$0.00	60	$1,800.00	60	$1,800.00	110	$3,300.00	0	$0.00	0	$0.00	0	$0.00	40	$1,200.00	40	$1,200.00
4	Exploratory Excavation	90	Hour	$225.00	4.7	$1,057.50	7.2	$1,620.00	1.9	$427.50	1	$225.00	5.2	$1,170.00	3.7	$832.50	1	$225.00	11.9	$2,677.50	0.5	$112.50
5	15" Alumanized CM Pipe Culvert	84	Linear Foot	$100.00	0	$0.00	42	$4,200.00	42	$4,200.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
6	24" Alumanized CM Pipe Culvert	20	Linear Foot	$150.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	20	$3,000.00	0	$0.00
7	36" Alumanized CM Pipe Culvert	20	Linear Foot	$200.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
8	5" Intake	1	Each	$725.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
9	6" Intake	65	Each	$750.00	3	$2,250.00	4	$3,000.00	2	$1,500.00	2	$1,500.00	5	$3,750.00	1	$750.00	0	$0.00	5	$3,750.00	1	$750.00
10	8" Intake	11	Each	$800.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	1	$800.00	1	$800.00	1	$800.00	1	$800.00
11	10" Intake	4	Each	$900.00	0	$0.00	1	$900.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	1	$900.00	0	$0.00
12	12" Intake	4	Each	$1,000.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
13	4" Single Wall Drain Tile (PERFORATE	400	Linear Foot	$15.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
14	6" Drain Tile (NON-PERFORATED)	5610	Linear Foot	$18.00	300	$5,400.00	70	$1,260.00	730	$13,140.00	90	$1,620.00	0	$0.00	1400	$25,200.00	380	$6,840.00	0	$0.00	0	$0.00
15	6" Drain Tile (PERFORATED)	4420	Linear Foot	$18.00	880	$15,840.00	0	$0.00	0	$0.00	280	$5,040.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
16	8" Drain Tile (NON-PERFORATED)	3730	Linear Foot	$20.00	500	$10,000.00	1390	$27,800.00	0	$0.00	0	$0.00	1450	$29,000.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
17	8" Drain Tile (PERFORATED)	2630	Linear Foot	$20.00	170	$3,400.00	120	$2,400.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	560	$11,200.00	0	$0.00
18	10" Drain Tile (NON-PERFORATED)	2260	Linear Foot	$21.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	400	$8,400.00	0	$0.00	0	$0.00	0	$0.00	90	$1,890.00
19	10" Drain Tile (PERFORATED)	140	Linear Foot	$21.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	130	$2,730.00	0	$0.00
20	12" Drain Tile (NON-PERFORATED)	3160	Linear Foot	$22.00	0	$0.00	1220	$26,840.00	0	$0.00	0	$0.00	500	$11,000.00	0	$0.00	0	$0.00	940	$20,680.00	0	$0.00
21	12" Drain Tile (PERFORATED)	980	Linear Foot	$22.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
22	15" Drain Tile (NON-PERFORATED)	2430	Linear Foot	$25.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	2430	$60,750.00	0	$0.00
23	15" Drain Tile (PERFORATED)	260	Linear Foot	$25.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
24	18" Drain Tile (NON-PERFORATED)	3600	Linear Foot	$32.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	580	$18,560.00	0	$0.00
25	18" Drain Tile (PERFORATED)	320	Linear Foot	$32.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
26	24" Drain Tile (NON-PERFORATED)	1790	Linear Foot	$38.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
27	30" Drain Tile (NON-PERFORATED)	3780	Linear Foot	$52.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
28	Drain Tile Connection	100	Each	$800.00	5	$4,000.00	7	$5,600.00	2	$1,600.00	1	$800.00	6	$4,800.00	3	$2,400.00	2	$1,600.00	12	$9,600.00	2	$1,600.00
29	Stream Barb	3	Each	$5,000.00																		
30	Random Riprap, Class III	120	Ton	$110.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	60	$6,600.00	0	$0.00
31	Silt Fence, Type MS or HI	1250	Linear Foot	$4.00	0	$0.00	100	$400.00	50	$200.00	100	$400.00	0	$0.00	0	$0.00	0	$0.00	100	$400.00	100	$400.00
32	Inlet Protection	140	Each	$150.00	6	$900.00	9	$1,350.00	4	$600.00	3	$450.00	10	$1,500.00	4	$600.00	3	$450.00	8	$1,200.00	4	$600.00
33	Ditch Check - Bioroll	1200	Linear Foot	$4.00	0	$0.00	100	$400.00	50	$200.00	50	$200.00	0	$0.00	0	$0.00	0	$0.00	100	$400.00	100	$400.00
34	Seeding	0.6	Acre	$2,500.00	0	$0.00	0	$0.00	0	$0.00	0.15	$375.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
35	Mulch Material, Type 1	134	Ton	$275.00	7	$1,925.00	10	$2,750.00	3	$825.00	1	$275.00	8	$2,200.00	6	$1,650.00	0	$0.00	17	$4,675.00	1	$275.00
36	Rapid Stabilization Method 4	10280	Square Yard	$3.00	0	$0.00	350	$1,050.00	500	$1,500.00	1150	$3,450.00	0	$0.00	0	$0.00	0	$0.00	700	$2,100.00	450	$1,350.00
37	Stabilized Construction Exit	1	Lump Sum	$2,500.00	0	$0.00	0.2	$500.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0.2	$500.00	0	$0.00
	ESTIMATED CONSTRUCTION SUBTOTAL:					**$46,572.50**		**$85,020.00**		**$26,892.50**		**$18,085.00**		**$63,620.00**		**$33,582.50**		**$10,365.00**		**$158,472.50**		**$9,827.50**
	10% CONTINGENCY:					$4,660.00		$8,500.00		$2,690.00		$1,810.00		$6,360.00		$3,360.00		$1,040.00		$15,850.00		$980.00
	TEMPORARY CROP DAMAGES:	61.6	Acres	$600.00	3.37	$2,022.00	3.94	$2,364.00	1.27	$762.00	0.41	$246.00	4.29	$2,574.00	2.37	$1,422.00	0.67	$402.00	8.54	$5,124.00	0.07	$42.00
	TOTAL ESTIMATED CONSTRUCTION COST:					**$53,254.50**		**$95,884.00**		**$30,344.50**		**$20,141.00**		**$72,554.00**		**$38,364.50**		**$11,807.00**		**$179,446.50**		**$10,849.50**
	DESIGN, ADMINISTRATION AND CONSTRUCTION ENGINEERING:					$10,650.00		$19,180.00		$6,070.00		$4,030.00		$14,510.00		$7,670.00		$2,360.00		$35,890.00		$2,170.00
	TOTAL ESTIMATED PROJECT COST:					**$63,904.50**		**$115,064.00**		**$36,414.50**		**$24,171.00**		**$87,064.00**		**$46,034.50**		**$14,167.00**		**$215,336.50**		**$13,019.50**

ENGINEER'S ESTIMATE

JUDICIAL DITCH #15 BRANCH Q IMPROVEMENTS
RENVILLE COUNTY
BMI PROJECT NO: S15.116846

BOLTON & MENK
Real People. Real Solutions.

Date: 4/13/2021

Item No.	Item	Estimated Quantity	Unit	Unit Price	BRANCH Q27 Qty.	BRANCH Q27 Price	BRANCH Q28 Qty.	BRANCH Q28 Price
BASE BID								
1	Mobilization	1	Lump Sum	$45,000.00	0.03	$1,350.00	0.03	$1,350.00
2	Common Embankment (CV)	1220	Cubic Yard	$20.00	0	$0.00	0	$0.00
3	Aggregate Surfacing, Class 5	800	Ton	$30.00	70	$2,100.00	0	$0.00
4	Exploratory Excavation	90	Hour	$225.00	4	$900.00	3.4	$765.00
5	15" Alumanized CM Pipe Culvert	84	Linear Foot	$100.00	0	$0.00	0	$0.00
6	24" Alumanized CM Pipe Culvert	20	Linear Foot	$150.00	0	$0.00	0	$0.00
7	36" Alumanized CM Pipe Culvert	20	Linear Foot	$200.00	0	$0.00	0	$0.00
8	5" Intake	1	Each	$725.00	0	$0.00	0	$0.00
9	6" Intake	65	Each	$750.00	3	$2,250.00	4	$3,000.00
10	8" Intake	11	Each	$800.00	0	$0.00	0	$0.00
11	10" Intake	4	Each	$900.00	0	$0.00	0	$0.00
12	12" Intake	4	Each	$1,000.00	0	$0.00	0	$0.00
13	4" Single Wall Drain Tile (PERFORATE	400	Linear Foot	$15.00	0	$0.00	0	$0.00
14	6" Drain Tile (NON-PERFORATED)	5610	Linear Foot	$18.00	300	$5,400.00	1060	$19,080.00
15	6" Drain Tile (PERFORATED)	4420	Linear Foot	$18.00	1010	$18,180.00	200	$3,600.00
16	8" Drain Tile (NON-PERFORATED)	3730	Linear Foot	$20.00	0	$0.00	90	$1,800.00
17	8" Drain Tile (PERFORATED)	2630	Linear Foot	$20.00	230	$4,600.00	0	$0.00
18	10" Drain Tile (NON-PERFORATED)	2260	Linear Foot	$21.00	0	$0.00	0	$0.00
19	10" Drain Tile (PERFORATED)	140	Linear Foot	$21.00	0	$0.00	0	$0.00
20	12" Drain Tile (NON-PERFORATED)	3160	Linear Foot	$22.00	0	$0.00	0	$0.00
21	12" Drain Tile (PERFORATED)	980	Linear Foot	$22.00	0	$0.00	0	$0.00
22	15" Drain Tile (NON-PERFORATED)	2430	Linear Foot	$25.00	0	$0.00	0	$0.00
23	15" Drain Tile (PERFORATED)	260	Linear Foot	$25.00	0	$0.00	0	$0.00
24	18" Drain Tile (NON-PERFORATED)	3600	Linear Foot	$32.00	0	$0.00	0	$0.00
25	18" Drain Tile (PERFORATED)	320	Linear Foot	$32.00	0	$0.00	0	$0.00
26	24" Drain Tile (NON-PERFORATED)	1790	Linear Foot	$38.00	0	$0.00	0	$0.00
27	30" Drain Tile (NON-PERFORATED)	3780	Linear Foot	$52.00	0	$0.00	0	$0.00
28	Drain Tile Connection	100	Each	$800.00	4	$3,200.00	4	$3,200.00
29	Stream Barb	3	Each	$5,000.00				
30	Random Riprap, Class III	120	Ton	$110.00	0	$0.00	0	$0.00
31	Silt Fence, Type MS or HI	1250	Linear Foot	$4.00	100	$400.00	0	$0.00
32	Inlet Protection	140	Each	$150.00	6	$900.00	6	$900.00
33	Ditch Check - Bioroll	1200	Linear Foot	$4.00	100	$400.00	0	$0.00
34	Seeding	0.6	Acre	$2,500.00	0	$0.00	0	$0.00
35	Mulch Material, Type 1	134	Ton	$275.00	6	$1,650.00	5	$1,375.00
36	Rapid Stabilization Method 4	10280	Square Yard	$3.00	700	$2,100.00	0	$0.00
37	Stabilized Construction Exit	1	Lump Sum	$2,500.00	0	$0.00	0	$0.00
	ESTIMATED CONSTRUCTION SUBTOTAL:					**$43,430.00**		**$35,070.00**
	10% CONTINGENCY:					$4,340.00		$3,510.00
	TEMPORARY CROP DAMAGES:	61.6	Acres	$600.00	2.22	$1,332.00	2.38	$1,428.00
	TOTAL ESTIMATED CONSTRUCTION COST:					**$49,102.00**		**$40,008.00**
	DESIGN, ADMINISTRATION AND CONSTRUCTION ENGINEERING:					$9,820.00		$8,000.00
	TOTAL ESTIMATED PROJECT COST:					**$58,922.00**		**$48,008.00**

Exhibit 4: Separable Maintenance

SEPERABLE MAINTENANCE

JUDICIAL DITCH #15 BRANCH Q IMPROVEMENTS
RENVILLE COUNTY
BMI PROJECT NO: S15.116846

Real Pe

Date:

Item No.	Item	Estimated Quantity	Unit	Unit Price	Total Amount	BRANCH Q1 Qty.	BRANCH Q1 Price	BRANCH Q4 Qty.	BRANCH Q4 Price	BRANCH Q5 Qty.	BRANCH Q5 Price	BRANCH Q6 Qty.	BRANCH Q6 Price	BRANCH Q7 Qty.	BRANCH Q7 Price
BASE BID															
1	Mobilization	1	Lump Sum	$45,000.00	$45,000.00	0.3	$13,500.00	0.01	$450.00	0.02	$900.00	0.05	$2,250.00	0.02	$900.00
2	Aggregate Surfacing, Class 5	800	Ton	$30.00	$24,000.00	70	$2,100.00	50	$1,500.00	50	$1,500.00	50	$1,500.00	40	$1,200.00
3	Exploratory Excavation	89.8	Hour	$225.00	$20,205.00	20.45	$4,601.25	1	$225.00	1.5	$337.50	5.55	$1,248.75	2.45	$551.25
4	15" Alumanized CM Pipe Culvert	84	Linear Foot	$100.00	$8,400.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
5	24" Alumanized CM Pipe Culvert	20	Linear Foot	$150.00	$3,000.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
6	36" Alumanized CM Pipe Culvert	20	Linear Foot	$200.00	$4,000.00	20	$4,000.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
7	6" Intake	60	Each	$750.00	$45,000.00	5	$3,750.00	3	$2,250.00	3	$2,250.00	4	$3,000.00	3	$2,250.00
8	8" Intake	15	Each	$800.00	$12,000.00	5	$4,000.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
9	10" Intake	10	Each	$900.00	$9,000.00	1	$900.00	1	$900.00	1	$900.00	1	$900.00	0	$0.00
10	12" Intake	10	Each	$1,000.00	$10,000.00	4	$4,000.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
11	6" Drain Tile	12350	Each	$18.00	$222,300.00	0	$0.00	300	$5,400.00	600	$10,800.00	420	$7,560.00	580	$10,440.00
12	8" Drain Tile	7200	Linear Foot	$20.00	$144,000.00	0	$0.00	100	$2,000.00	0	$0.00	1800	$36,000.00	0	$0.00
13	10" Drain Tile	2750	Linear Foot	$21.00	$57,750.00	850	$17,850.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
14	12" Drain Tile	750	Linear Foot	$22.00	$16,500.00	750	$16,500.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
15	15" Drain Tile	5000	Linear Foot	$25.00	$125,000.00	680	$17,000.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
16	18" Drain Tile	3300	Linear Foot	$32.00	$105,600.00	2530	$80,960.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
17	24" Drain Tile	2970	Linear Foot	$38.00	$112,860.00	2970	$112,860.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
18	Drain Tile Connection	100	Linear Foot	$800.00	$80,000.00	21	$16,800.00	5	$4,000.00	4	$3,200.00	6	$4,800.00	3	$2,400.00
19	Stream Barb	3	Each	$5,000.00	$15,000.00	3	$15,000.00								
20	Random Riprap, Class III	120	Each	$110.00	$13,200.00	60	$6,600.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
21	Silt Fence, Type MS or HI	1250	Ton	$4.00	$5,000.00	200	$800.00	50	$200.00	50	$200.00	50	$200.00	50	$200.00
22	Inlet Protection	140	Linear Foot	$150.00	$21,000.00	19	$2,850.00	7	$1,050.00	4	$600.00	9	$1,350.00	6	$900.00
23	Ditch Check - Bioroll	1200	Each	$4.00	$4,800.00	200	$800.00	50	$200.00	50	$200.00	50	$200.00	50	$200.00
24	Seeding	0.6	Linear Foot	$2,500.00	$1,500.00	0.3	$750.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
25	Mulch Material, Type 1	132	Acre	$275.00	$36,300.00	28	$7,700.00	2	$550.00	2	$550.00	8	$2,200.00	3	$825.00
26	Rapid Stabilization Method 4	5200	Ton	$3.00	$15,600.00	300	$900.00	280	$840.00	280	$840.00	280	$840.00	250	$750.00
	ESTIMATED CONSTRUCTION SUBTOTAL:				**$1,157,015.00**		**$334,221.25**		**$19,565.00**		**$22,277.50**		**$62,048.75**		**$20,616.25**
	10% CONTINGENCY:				$115,690.00		$33,420.00		$1,960.00		$2,230.00		$6,200.00		$2,060.00
	TEMPORARY CROP DAMAGES:	59.86	Acres	$600.00	$35,916.00	13.32	$7,992.00	0.57	$342.00	1.36	$816.00	3.90	$2,340.00	0.96	$576.00
	TOTAL ESTIMATED CONSTRUCTION COST:				**$1,308,621.00**		**$375,633.25**		**$21,867.00**		**$25,323.50**		**$70,588.75**		**$23,252.25**
	DESIGN, ADMINISTRATION AND CONSTRUCTION ENGINEERING:				$261,720.00		$75,130.00		$4,370.00		$5,060.00		$14,120.00		$4,650.00
	TOTAL ESTIMATED PROJECT COST:				**$1,570,341.00**		**$450,763.25**		**$26,237.00**		**$30,383.50**		**$84,708.75**		**$27,902.25**

SEPERABLE MAINTENANCE

JUDICIAL DITCH #15 BRANCH Q IMPROVEMENTS
RENVILLE COUNTY
BMI PROJECT NO: S15.116846

BOLTON & MENK

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Date: 11/15/2022

Item No.	Item	Estimated Quantity	Unit	Unit Price	BRANCH Q8		BRANCH Q9		BRANCH Q10		BRANCH Q11		BRANCH Q12		BRANCH Q13		BRANCH Q14	
					Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price
BASE BID																		
1	Mobilization	1	Lump Sum	$45,000.00	0.05	$2,250.00	0.01	$450.00	0.1	$4,500.00	0.04	$1,800.00	0.07	$3,150.00	0.02	$900.00	0.01	$450.00
2	Aggregate Surfacing, Class 5	800	Ton	$30.00	100	$3,000.00	0	$0.00	60	$1,800.00	0	$0.00	60	$1,800.00	60	$1,800.00	110	$3,300.00
3	Exploratory Excavation	89.8	Hour	$225.00	5	$1,125.00	1.55	$348.75	9.65	$2,171.25	4.65	$1,046.25	7.15	$1,608.75	1.65	$371.25	1	$225.00
4	15" Alumanized CM Pipe Culvert	84	Linear Foot	$100.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	42	$4,200.00	42	$4,200.00	0	$0.00
5	24" Alumanized CM Pipe Culvert	20	Linear Foot	$150.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
6	36" Alumanized CM Pipe Culvert	20	Linear Foot	$200.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
7	6" Intake	60	Each	$750.00	12	$9,000.00	0	$0.00	2	$1,500.00	3	$2,250.00	5	$3,750.00	2	$1,500.00	2	$1,500.00
8	8" Intake	15	Each	$800.00	0	$0.00	0	$0.00	5	$4,000.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
9	10" Intake	10	Each	$900.00	0	$0.00	0	$0.00	0	$0.00	1	$900.00	2	$1,800.00	1	$900.00	1	$900.00
10	12" Intake	10	Each	$1,000.00	0	$0.00	0	$0.00	3	$3,000.00	0	$0.00	1	$1,000.00	1	$1,000.00	1	$1,000.00
11	6" Drain Tile	12350	Each	$18.00	1000	$18,000.00	620	$11,160.00	0	$0.00	1860	$33,480.00	100	$1,800.00	660	$11,880.00	400	$7,200.00
12	8" Drain Tile	7200	Linear Foot	$20.00	1000	$20,000.00	0	$0.00	790	$15,800.00	0	$0.00	1500	$30,000.00	0	$0.00	0	$0.00
13	10" Drain Tile	2750	Linear Foot	$21.00	0	$0.00	0	$0.00	640	$13,440.00	0	$0.00	1260	$26,460.00	0	$0.00	0	$0.00
14	12" Drain Tile	750	Linear Foot	$22.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
15	15" Drain Tile	5000	Linear Foot	$25.00	0	$0.00	0	$0.00	1260	$31,500.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
16	18" Drain Tile	3300	Linear Foot	$32.00	0	$0.00	0	$0.00	770	$24,640.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
17	24" Drain Tile	2970	Linear Foot	$38.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
18	Drain Tile Connection	100	Linear Foot	$800.00	6	$4,800.00	2	$1,600.00	5	$4,000.00	5	$4,000.00	7	$5,600.00	2	$1,600.00	1	$800.00
19	Stream Barb	3	Each	$5,000.00														
20	Random Riprap, Class III	120	Each	$110.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
21	Silt Fence, Type MS or HI	1250	Ton	$4.00	200	$800.00	0	$0.00	100	$400.00	0	$0.00	100	$400.00	50	$200.00	100	$400.00
22	Inlet Protection	140	Linear Foot	$150.00	20	$3,000.00	1	$150.00	11	$1,650.00	6	$900.00	9	$1,350.00	4	$600.00	3	$450.00
23	Ditch Check - Bioroll	1200	Each	$4.00	200	$800.00	0	$0.00	100	$400.00	0	$0.00	100	$400.00	50	$200.00	50	$200.00
24	Seeding	0.6	Linear Foot	$2,500.00	0.15	$375.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0.15	$375.00
25	Mulch Material, Type 1	132	Acre	$275.00	9	$2,475.00	3	$825.00	13	$3,575.00	7	$1,925.00	10	$2,750.00	3	$825.00	1	$275.00
26	Rapid Stabilization Method 4	5200	Ton	$3.00	1120	$3,360.00	0	$0.00	450	$1,350.00	0	$0.00	620	$1,860.00	350	$1,050.00	300	$900.00
	ESTIMATED CONSTRUCTION SUBTOTAL:					**$68,985.00**		**$14,533.75**		**$113,726.25**		**$46,301.25**		**$87,928.75**		**$27,026.25**		**$17,975.00**
	10% CONTINGENCY:					$6,900.00		$1,450.00		$11,370.00		$4,630.00		$8,790.00		$2,700.00		$1,800.00
	TEMPORARY CROP DAMAGES:	59.86	Acres	$600.00	3.08	$1,848.00	1.15	$690.00	5.99	$3,594.00	3.37	$2,022.00	3.94	$2,364.00	1.27	$762.00	0.41	$246.00
	TOTAL ESTIMATED CONSTRUCTION COST:					**$77,733.00**		**$16,673.75**		**$128,690.25**		**$52,953.25**		**$99,082.75**		**$30,488.25**		**$20,021.00**
	DESIGN, ADMINISTRATION AND CONSTRUCTION ENGINEERING:					$15,550.00		$3,330.00		$25,740.00		$10,590.00		$19,820.00		$6,100.00		$4,000.00
	TOTAL ESTIMATED PROJECT COST:					**$93,283.00**		**$20,003.75**		**$154,430.25**		**$63,543.25**		**$118,902.75**		**$36,588.25**		**$24,021.00**

SEPERABLE MAINTENANCE

JUDICIAL DITCH #15 BRANCH Q IMPROVEMENTS
RENVILLE COUNTY
BMI PROJECT NO: S15.116846

BOLTON & MENK
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11/15/2022

BOLTON & MENK
Real People. Real Solutions.

Date: 11/15/2022

Item No.	Item	Estimated Quantity	Unit	Unit Price	BRANCH Q16 Qty.	BRANCH Q16 Price	BRANCH Q18 Qty.	BRANCH Q18 Price	BRANCH Q19 Qty.	BRANCH Q19 Price	BRANCH Q25 Qty.	BRANCH Q25 Price	BRANCH Q26 Qty.	BRANCH Q26 Price	BRANCH Q27 Qty.	BRANCH Q27 Price	BRANCH Q28 Qty.	BRANCH Q28 Price
BASE BID																		
1	Mobilization	1	Lump Sum	$45,000.00	0.04	$1,800.00	0.03	$1,350.00	0.01	$450.00	0.15	$6,750.00	0.01	$450.00	0.03	$1,350.00	0.03	$1,350.00
2	Aggregate Surfacing, Class 5	800	Ton	$30.00	0	$0.00	0	$0.00	0	$0.00	40	$1,200.00	40	$1,200.00	70	$2,100.00	0	$0.00
3	Exploratory Excavation	89.8	Hour	$225.00	4.38	$984.38	3.5	$787.50	0.95	$213.75	11.9	$2,671.88	1.25	$281.25	3.75	$843.75	2.5	$562.50
4	15" Alumanized CM Pipe Culvert	84	Linear Foot	$100.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
5	24" Alumanized CM Pipe Culvert	20	Linear Foot	$150.00	0	$0.00	0	$0.00	0	$0.00	20	$3,000.00	0	$0.00	0	$0.00	0	$0.00
6	36" Alumanized CM Pipe Culvert	20	Linear Foot	$200.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
7	6" Intake	60	Each	$750.00	5	$3,750.00	1	$750.00	0	$0.00	2	$1,500.00	1	$750.00	3	$2,250.00	4	$3,000.00
8	8" Intake	15	Each	$800.00	0	$0.00	2	$1,600.00	1	$800.00	1	$800.00	1	$800.00	0	$0.00	0	$0.00
9	10" Intake	10	Each	$900.00	0	$0.00	0	$0.00	0	$0.00	1	$900.00	0	$0.00	0	$0.00	0	$0.00
10	12" Intake	10	Each	$1,000.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
11	6" Drain Tile	12350	Each	$18.00	1050	$18,900.00	1400	$25,200.00	380	$6,840.00	550	$9,900.00	100	$1,800.00	1330	$23,940.00	1000	$18,000.00
12	8" Drain Tile	7200	Linear Foot	$20.00	700	$14,000.00	0	$0.00	0	$0.00	1140	$22,800.00	0	$0.00	170	$3,400.00	0	$0.00
13	10" Drain Tile	2750	Linear Foot	$21.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
14	12" Drain Tile	750	Linear Foot	$22.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
15	15" Drain Tile	5000	Linear Foot	$25.00	0	$0.00	0	$0.00	0	$0.00	3060	$76,500.00	0	$0.00	0	$0.00	0	$0.00
16	18" Drain Tile	3300	Linear Foot	$32.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
17	24" Drain Tile	2970	Linear Foot	$38.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
18	Drain Tile Connection	100	Linear Foot	$800.00	6	$4,800.00	3	$2,400.00	2	$1,600.00	12	$9,600.00	2	$1,600.00	4	$3,200.00	4	$3,200.00
19	Stream Barb	3	Each	$5,000.00														
20	Random Riprap, Class III	120	Each	$110.00	0	$0.00	0	$0.00	0	$0.00	60	$6,600.00	0	$0.00	0	$0.00	0	$0.00
21	Silt Fence, Type MS or HI	1250	Ton	$4.00	0	$0.00	0	$0.00	0	$0.00	100	$400.00	100	$400.00	100	$400.00	0	$0.00
22	Inlet Protection	140	Linear Foot	$150.00	10	$1,500.00	4	$600.00	3	$450.00	8	$1,200.00	4	$600.00	6	$900.00	6	$900.00
23	Ditch Check - Bioroll	1200	Each	$4.00	0	$0.00	0	$0.00	0	$0.00	100	$400.00	100	$400.00	100	$400.00	0	$0.00
24	Seeding	0.6	Linear Foot	$2,500.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00
25	Mulch Material, Type 1	132	Acre	$275.00	8	$2,200.00	6	$1,650.00	0	$0.00	17	$4,675.00	1	$275.00	6	$1,650.00	5	$1,375.00
26	Rapid Stabilization Method 4	5200	Ton	$3.00	0	$0.00	230	$690.00	0	$0.00	140	$420.00	150	$450.00	450	$1,350.00	0	$0.00
	ESTIMATED CONSTRUCTION SUBTOTAL:					**$47,934.38**		**$35,027.50**		**$10,353.75**		**$149,316.88**		**$9,006.25**		**$41,783.75**		**$28,387.50**
	10% CONTINGENCY:					$4,790.00		$3,500.00		$1,040.00		$14,930.00		$900.00		$4,180.00		$2,840.00
	TEMPORARY CROP DAMAGES:	59.86	Acres	$600.00	4.29	$2,574.00	2.37	$1,422.00	0.67	$402.00	8.54	$5,124.00	0.07	$42.00	2.22	$1,332.00	2.38	$1,428.00
	TOTAL ESTIMATED CONSTRUCTION COST:					**$55,298.38**		**$39,949.50**		**$11,795.75**		**$169,370.88**		**$9,948.25**		**$47,295.75**		**$32,655.50**
	DESIGN, ADMINISTRATION AND CONSTRUCTION ENGINEERING:					$11,060.00		$7,990.00		$2,360.00		$33,870.00		$1,990.00		$9,460.00		$6,530.00
	TOTAL ESTIMATED PROJECT COST:					**$66,358.38**		**$47,939.50**		**$14,155.75**		**$203,240.88**		**$11,938.25**		**$56,755.75**		**$39,185.50**

Exhibit 5: ROW Table

Judicial Ditch No. 15 Branch Q Improvement

Renville County, MN

Right-of-way Table

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			Improvement Right-of-Way					Amount/Ac
Parcel No.	Property Owner	Legal Description	Station to Station		Length	Width	Area (Acres)	$600
Branch Q1								
22-01841-00	SCHMALZ/LARRY & ROXANNE	NW 1/4, SW 1/4	0+60	6+00	540	75	0.93	$558.00
		NW 1/4, NW 1/4	6+00	13+50	750	65	1.12	$672.00
22-01773-00	SWANSON/DAWN L.	NE 1/4, NE 1/4	13+80	25+26	1146	80	2.10	$1,260.00
					0			
22-01779-00	ROIGER/DANNA M.	NE 1/4, NE 1/4	25+26	39+26	1400	80	2.57	$1,542.00
22-01774-00	WIGGERT/DEAN	NE 1/4, NW 1/4	39+26	41+60	234	80	0.43	$258.00
22-01800-00	WIGGERT/DEAN	NW 1/4, NE 1/4	41+60	42+71	111	80	0.20	$120.00
22-01580-00	KRUMREY/PATRICK	SW 1/4, SE 1/4	42+71	57+13	1442	80	2.65	$1,590.00
		SW 1/4, NE 1/4	57+13	70+31	1318	80	2.42	$1,452.00
	WASCOB	SW 1/4, NE 1/4	70+31	71+86	195	345	1.54	$924.00
		SW 1/4, NE 1/4	71+86	74+67	281	80	0.52	$312.00
22-01571-00	SCHMALZ/DALE & CHERYL	NW 1/4, SW 1/4	75+33	75+90	57	80	0.10	$60.00
BR Q4								
22-01571-00	SCHMALZ/DALE & CHERYL	NW 1/4, SE 1/4	260+23	259+83	40	80	0.07	$42.00
	WASCOB	NW 1/4, SE 1/4	N/A	N/A	192	40	0.18	$108.00
	WASCOB	NW 1/4, SE 1/4	N/A	N/A	290	45	0.30	$180.00
22-01580-00	KRUMREY/PATRICK	SW 1/4, NW 1/4	259+17	256+47	270	80	0.50	$300.00
BR Q5								
22-01571-00	SCHMALZ/DALE & CHERYL	NW 1/4, SE 1/4	268+90	268+34	56	80	0.10	$60.00
		NW 1/4, SE 1/4	268+34	259+84	850	35	0.68	$408.00
22-01580-00	KRUMREY/PATRICK	SW 1/4, NW 1/4	265+62	262+44	318	80	0.58	$348.00

Judicial Ditch No. 15 Branch Q Improvement
Renville County, MN
Right-of-way Table
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			Improvement Right-of-Way					Amount/Ac
Parcel No.	Property Owner	Legal Description	Station to Station		Length	Width	Area (Acres)	$600
BR Q6								
22-01601-00	SCHMALZ/LARRY & ROXANNE	SE 1/4, NE 1/4	293+28	292+88	40	80	0.07	$42.00
22-01580-00	KRUMREY/PATRICK	SW 1/4, NW 1/4	292+22	278+35	1387	80	2.55	$1,530.00
		SW 1/4, NE 1/4	278+35	271+40	695	80	1.28	$768.00
BR Q7								
22-01601-00	SCHMALZ/LARRY & ROXANNE	SE 1/4, NE 1/4	323+43	321+42	201	80	0.37	$222.00
22-01580-00	KRUMREY/PATRICK	SW 1/4, NW 1/4	320+76	317+54	322	80	0.59	$354.00
BR Q8								
22-01610-00	SCHMALZ/LARRY & ROXANNE	NE 1/4, SE 1/4	315+57	309+14	643	80	1.18	$708.00
22-01571-00	SCHMALZ/DALE & CHERYL	NW 1/4, SW 1/4	308+45	307+00	145	40	0.13	$78.00
		NW 1/4, SW 1/4	307+00	304+93	207	80	0.38	
22-01580-00	KRUMREY/PATRICK	SW 1/4, NW 1/4	303+36	295+77	759	80	1.39	$834.00
BR Q9								
22-01550-00	SCHMALZ/WAYNE	SE 1/4, SW 1/4	343+68	341+81	187	80	0.34	$204.00
22-01580-00	KRUMREY/PATRICK	SW 1/4, SE 1/4	341+81	337+40	441	80	0.81	$486.00
					0	80	0.00	$0.00
BR Q10								
22-01800-00	WIGGERT/DEAN	NW 1/4, SW 1/4	181+71	181+31	40	80	0.07	$42.00
		NW 1/4, SW 1/4	180+65	170+00	1065	80	1.96	$1,176.00
		NW 1/4, NW 1/4	170+00	163+85	615	80	1.13	$678.00
		NW 1/4, NE 1/4	163+85	148+42	1543	80	2.83	$1,698.00

Judicial Ditch No. 15 Branch Q Improvement
Renville County, MN
Right-of-way Table
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			Improvement Right-of-Way					Amount/Ac
Parcel No.	Property Owner	Legal Description	Station to Station		Length	Width	Area (Acres)	$600
BR Q11								
22-01580-00	KRUMREY/PATRICK	SW 1/4, SW 1/4	249+78	244+67	511	80	0.94	$564.00
		SW 1/4, SE 1/4	244+67	235+22	945	80	1.74	$1,044.00
22-01800-00	WIGGERT/DEAN	NW 1/4, NE 1/4	235+22	231+45	377	80	0.69	$414.00
BR Q12								
22-01601-00	SCHMALZ/LARRY & ROXANNE	SE 1/4, SE 1/4	212+26	211+92	34	80	0.06	$36.00
22-01800-00	WIGGERT/DEAN	NW 1/4, NW 1/4	211+25	195+80	1545	50	1.77	$1,062.00
		NW 1/4, NW 1/4	195+80	184+30	1150	80	2.11	$1,266.00
BR Q13								
22-01730-00	FISCHER/RAY	NE 1/4, NE 1/4	222+80	215+90	690	80	1.27	$762.00
BR Q14								
22-01601-00	SCHMALZ/LARRY & ROXANNE	SE 1/4, SE 1/4	229+03	226+79	224	80	0.41	$246.00
BR Q16								
22-01590-00	SCHMALZ/WAYNE	SE 1/4, NW 1/4	124+73	122+25	248	80	0.46	$276.00
22-01550-00	SCHMALZ/WAYNE	SE 1/4, SW 1/4	122+25	101+40	2085	80	3.83	$2,298.00
BR Q18								
22-01550-00	SCHMALZ/WAYNE	SE 1/4, SE 1/4	99+36	91+43	793	80	1.46	$876.00
22-01773-00	SWANSON/DAWN L.	NE 1/4, NE 1/4	91+43	88+50	293	80	0.54	$324.00
		NE 1/4, NE 1/4	88+50	85+54	296	55	0.37	$222.00
BR Q19								

Judicial Ditch No. 15 Branch Q Improvement

Renville County, MN

Right-of-way Table

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			Improvement Right-of-Way					Amount/Ac
Parcel No.	Property Owner	Legal Description	Station to Station		Length	Width	Area (Acres)	$600
22-01841-00	SCHMALZ/LARRY & ROXANNE	NW 1/4, NW 1/4	83+12	79+49	363	80	0.67	$402.00
BR Q28								
22-01550-00	SCHMALZ/WAYNE	SE 1/4, SE 1/4	137+36	124+40	1296	80	2.38	$1,428.00
BR Q25								
22-01590-00	SCHMALZ/WAYNE	SE 1/4, NE 1/4	458+72	452+78	594	80	1.09	$654.00
22-01510-00	DETTMAN/KEVIN	SW 1/4, NW 1/4	452+19	440+58	1161	80	2.13	$1,278.00
		SW 1/4, NW 1/4	440+58	430+13	1045	80	1.92	$1,152.00
		SW 1/4, SW 1/4	430+13	422+89	724	80	1.33	$798.00
		SW 1/4, SE 1/4	422+89	411+60	1129	80	2.07	$1,242.00
BR Q26								
22-01502-00	SCHMALZ/MARVIN & ESTHER	NW 1/4, SW 1/4	479+24	478+85	39	80	0.07	$42.00
BR Q27								
22-01560-00	SCHMALZ/WARREN & MABEL	NE 1/4, SE 1/4	476+80	470+50	630	80	1.16	$696.00
		NE 1/4, SE 1/4	470+50	463+15	735	60	1.01	$606.00
22-01502-00	SCHMALZ/MARVIN & ESTHER	NW 1/4, SW 1/4	462+50	462+13	40	50	0.05	$30.00
	Total			**Total Improvement Right-of-Way Damages =**			**61.60**	**$36,732.00**

Exhibit 6: Technical Specifications

TECHNICAL SPECIFICATIONS

IMPROVEMENT OF BRANCH Q OF JUDICIAL DITCH NO. 15

RENVILLE COUNTY, MN

SECTION 02210 - SUBSURFACE INVESTIGATION

PART 1 -- GENERAL

1.1 SUMMARY

A. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to conducting subsurface investigation as shown on the drawings, as specified herein, and/or as specified by the Engineer.

1.2 METHOD OF MEASUREMENT AND PAYMENT

A. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below:

1. No exception to the referenced specification is made.

1.3 SPECIFICATION REFERENCES

A. Mn/DOT Specification Section 2123 shall apply, except as modified herein.

B. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

PART 2 -- PRODUCTS

2.1 MATERIALS

A. No exception to the referenced specification is made.

PART 3 -- EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. The Contractor shall:

1. Perform underground utility exploration as directed by the Engineer which involves excavation to locate pipelines for location and elevation verification.
2. Other work associated with the Project, as directed by the Engineer.
3. Subsurface investigation shall consist of a rubber-tired backhoe, operator and laborer to find the tile.

B. Where exploratory excavation is performed in a location that will not be disturbed later, the backfill shall be placed and compacted to the density specified elsewhere in these Specifications for the type of utility located.

******END OF SECTION******

SECTION 02220 - REMOVING PIPE AND MISCELLANEOUS STRUCTURES

PART 1 -- GENERAL

1.1 SUMMARY

A. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to the removal of pipe and miscellaneous structures as indicated on the drawings or as specified herein.

1.2 METHOD OF MEASUREMENT AND PAYMENT

A. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below:

1. The UNIT PRICE bid for removing miscellaneous structures shall include all costs of labor, materials, equipment and ultimate disposal required to complete the work, as specified.

B. The furnishing and installing of specific items and/or the performance of work under certain circumstances shall not be individually paid. The costs shall be included in the unit price bid for the associated removal and excavation items. Such items of work include but are not limited to:

1. Off-site disposal of debris.
2. Fees and permits for the disposal of materials.
3. Removal and disposal of existing tiles which conflict with the construction
4. Bulkheading the ends of existing pipes designated by the Engineer to be abandoned in place.
5. Salvage and reinstall fence (as needed)
6. Protection from damage of structures or other surface improvements that are not to be removed, and subsequent repair and/or replacement if damaged by Contractor operations.

1.3 SPECIFICATIONS REFERENCES

A. Mn/DOT Specification Section 2104 shall apply to the removal of pipe and miscellaneous structures, except as modified herein.

B. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

1.4 SUBMITTALS

A. No exception to the referenced specification is made.

PART 2 -- PRODUCTS

2.1 NO EXCEPTION TO THE REFERENCED SPECIFICATION IS MADE.

PART 3 -- EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. Salvage existing fences where shown on the plans and/or required for the construction of the project, including posts and hardware. Replace when construction is complete, including new posts and wire if needed.

B. Dispose of all concrete items, rubbish and debris outside of the construction zone. It shall be the Contractor's responsibility to secure all required permits and pay all fees associated with the disposal of the material and to secure the disposal site.

C. The Contractor shall take full responsibility to protect structures or other surface improvements from damage that are not to be removed. If damage to these facilities occurs due to the construction of the project, the Contractor shall replace or repair them.

D. Where existing pipes are to be abandoned in place, the exposed pipe ends shall be bulkheaded shut with a watertight non-shrink concrete grout at a thickness of not less than one pipe diameter.

******END OF SECTION******

SECTION 02240 - DEWATERING

PART 1 -- GENERAL

1.1 SUMMARY

A. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to the dewatering of trenches as necessary to construct the elements shown on the drawings or as specified herein.

B. This item shall be considered exempt from the requirements of Supplementary Condition 11.03.

1.2 METHOD OF MEASUREMENT AND PAYMENT

A. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below:

1. No dewatering payment will be made for dewatering for the construction.

B. The furnishing and installing of specific items and/or the performance of work under certain circumstances shall not be individually paid. The costs shall be included in the unit price bid for other associated improvements, as indicated. Such items of work include but are not limited to:

1. The costs of furnishing discharge pumps, rock, piping including bends, and adapters, include in the price bid for tile construction.
2. Protecting existing improvements from damage, include in the price bid for tile construction.
3. Digging a portion of the ditch, allowing it to dewater, and returning later to finish the installation, include in the price bid for tile construction.

1.3 SPECIFICATION REFERENCES

A. Mn/DOT Specification Section 2451.3C shall apply to the dewatering of trenches, except as modified herein.

B. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

PART 2 -- PRODUCTS

2.1 MATERIALS

A. None

PART 3 -- EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. The Contractor shall furnish and install all necessary discharge piping and obtain all permits, easements, rights-of-way, etc. to convey and discharge the water at a sufficient distance from the project area to eliminate recharge of the ground water a the project site.

B. Water from dewatering operations shall not be discharged where it will pond or cause damage to cropland or personal property due to the presence of standing or flowing water.

C. Water shall be discharged into temporary sedimentary basins prior to ultimate discharge into natural streams or waterways.

******END OF SECTION******

SECTION 02320 - TRENCH EXCAVATION, BEDDING AND BACKFILL

PART 1 -- GENERAL

1.1 SUMMARY

A. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to maintenance of utility service, trench excavation, bedding and backfill necessary for the construction of underground utilities and structures, as indicated on the drawings or as specified herein.

1.2 DEFINITIONS

A. Excess Material - Material that is not needed to complete the earthwork balance.

B. Suitable Material - Sand, silty sand or low plasticity clay soils with no organic content. The Engineer shall make the final determination as to what material will be considered suitable.

C. Unsuitable Material - Soil with organic content including topsoil, swamp deposits, peat, muck, or other material deemed by the Engineer to be unsuitable for fill or embankment construction.

1.3 METHOD OF MEASUREMENT AND PAYMENT

A. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below:

1. Rock Excavation

   (a) No extra payment will be made for rock excavation.

2. Items specifically identified in the *Schedule of Unit Prices* will be compensated in accordance with the description of measurement and payment contained in the section applicable to the individual item. Otherwise, no direct compensation shall be granted for compliance with the provisions contained herein.

B. The furnishing and installing of specific items and/or the performance of work under certain circumstances shall not be individually paid. The costs shall be included in the unit price bid for the individual pipeline items associated with the stated specific item or work effort. Such items of work include but are not limited to:

1. Interference with other above and underground structures and utilities.

   (a) The removal and restoration, or protection of existing structures and utilities that are shown on the plans and for which there is no bid item for removing and restoring, or working around the utility.

2. Any dewatering necessary for construction.

3. Foundation materials placed in addition to or in lieu of performing necessary dewatering.

4. Bulkheading of existing pipes to be abandoned in place.

5. Granular foundation, granular bedding and granular encasement materials.

6. Granular foundation materials used in lieu of bedding materials in the specified bedding zone, where specified.

7. Granular foundation materials used in unstable trench conditions.

8. The removal and disposal of native materials that are unsuitable for bedding and/or backfill.

9. Providing and maintaining flow through the existing tiles.
10. The removal of excess materials above the original topography resulting from the additional volume created from pipe and pipe bedding.
11. Delays due to other utility conflicts that result during the course of construction.
12. Protecting existing improvements and previously accepted elements of this construction from damage.
13. Protecting the inverts of other utility pipes from the accumulation of debris and soil, the removal of blockages that threaten to damage property, and/or the cleaning of both the newly constructed lines and the existing lines of all debris and soil that accumulated during the construction.
14. Providing temporary bypass pumping / control of storm water flows around the construction zone, include in the price bid for the associated items being installed.
15. The use of special construction techniques such as trench boxes, sheeting, shoring, etc., include in the price bid for the associated items being installed.
16. Shaping and grading of the construction zone so that surface drainage is restored following the construction.

1.4 SPECIFICATION REFERENCES

A. Reference CEAM Specification No. 2600 shall apply to excavating, installing bedding, and backfilling all trench excavation construction necessary for the completion of work, except as modified herein.

1. All references to Mn/DOT specifications shall mean the specific edition, including Supplemental Specifications and Technical Memoranda as identified in Section 01420 of these Specifications.
2. CEAM Specification 2600.3.A1 Maintenance of Traffic is hereby deleted, See Section 01555 of these Specifications.
3. CEAM Specification 2600.3.A2 Establishing Line and Grade is modified by Section 01720 of these Specifications.
4. CEAM Specification 2600.3.A3 Protection of Surface Structures:
   (a) The last sentence in the third paragraph is deleted.
5. CEAM Specification 2600.3.A5 Removal of Surface Improvements - All rubble and debris to be disposed of off-site, shall be disposed of at a location secured by the Contractor and in a manner in compliance with applicable Local, State and Federal regulations.
6. CEAM Specification 2600.3.B3 Excavation Limits and Requirements - OSHA limitations shall also apply to the top of trench width determination. The seven day written notice is waived if changing soil conditions and OSHA compliance apply.
7. CEAM 2600.3.F1 Turf Restoration is hereby deleted, See Section 02920 of these Specifications.
8. CEAM 2600.4 Method of Measurement Paragraphs B and C are hereby deleted. See applicable sections of these Specifications.

B. Reference Mn/DOT Specification No. 2451 shall apply to granular materials for foundation, bedding and encasement of utility line construction, except as modified herein.

C. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

1.5 SUBMITTALS

A. No exception to the referenced specification is made.

PART 2 -- PRODUCTS

2.1 GRANULAR MATERIALS

A. Granular Bedding and Granular Encasement - Granular bedding and granular encasement materials used in the pipe zone in dry conditions shall conform to CEAM specifications, with the gradation limits modified as shown below.

Granular Bedding and Granular Encasement	
Sieve Size	**Percent Passing**
1½"	100
# 4	35 - 85
# 10	20 - 70
# 40	5 - 35
# 200	0 - 15

B. Granular Foundation - Granular foundation material shall be rock material, with the gradation limits as modified as shown below. This material shall be used in lieu of standard granular bedding and granular encasement materials where added pipe support is needed due to poor or wet subgrade soil conditions. This rock material shall also be used along with the required trench dewatering to provide for a stable pipe foundation.

Granular Foundation	
Sieve Size	**Percent Passing**
2"	100
1½"	95 - 100
¾	20 - 40
# 4	0 - 5

PART 3 -- EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

3.2 EXCAVATION AND PREPARATION OF TRENCH

A. Interference and Protection of Underground Structures

1. If an existing utility is shown on the plans and there is no bid item for removing and restoring, or working around the utility, the Contractor shall be required to remove and restore, or protect the utility.
2. The inverts of existing tiles, culverts, drains, etc. shall be protected during construction. The Contractor is responsible to inspect and clean, if necessary, all lines which have become compromised by the construction operations.

B. Excavation Limits and Requirements

1. The trench for all flexible pipe shall be undercut six-inches below the pipe barrel to permit the installation of granular bedding or foundation material.
2. The Contractor shall be responsible for any damage to adjacent structures or buildings caused by the dewatering operations
3. Use of granular foundation material in lieu of performing dewatering is permitted.

C. Preparation and Maintenance of Foundation

1. Flexible Pipe Materials

(a) In ordinary trench conditions, the pipe shall be bedded in compacted granular bedding which extends from 6" below the bottom of the pipe to the spring line of the pipe. The Contractor shall bed and encase the pipe in bedding and encasement material, as shown on the plan details. The bedding and encasement shall be compacted to 95% Standard Proctor Density, or as recommended by the pipe manufacturer, whichever is denser.

(b) Where the trench foundation has been found to be unstable and/or not suitable for pipe support, the trench shall be undercut until acceptable conditions are found. The Contractor shall furnish and install compacted granular foundation material from the bottom of the excavation to the bottom of the pipe. Bedding material shall then be placed to the spring line of the pipe.

3.3 INSTALLATION OF PIPE AND FITTINGS

A. The Contractor shall keep accurate records as to the location of the tile connections, utility crossings, etc. either constructed or encountered during the construction Measurements to lines shall be taken from the two nearest permanent structures (i.e., roads, intakes, etc). Final payment for the project will not be made until the information is in the possession of the Owner.

B. When connection to an existing tile is required, the Contractor shall expose and verify the elevation of the existing tile prior to laying any pipe toward, or away from, the connection point. If the elevation of the existing tile does not match the elevation shown on the plans, the Contractor shall notify the Engineer, at which time the Engineer may adjust the proposed grades.

C. Connection and Assembly of Joints

1. For dual wall polyethylene pipe, a soil-tight joint is required.

D. Bulkheading Open Pipe Ends

1. The Contractor shall furnish, install and maintain a temporary, water-tight plug adequately blocked in place to prevent flooding of the existing downstream tile system. The plug shall be placed at the beginning of the project or at the end of each working day at the end of the day's operation.
2. When flows are diverted from an existing tile to be abandoned in place, the Contractor shall construct a water-tight plug on the open end of the abandoned pipe.
3. Permanent watertight plugs shall be constructed with concrete grout with a thickness of not less than 1 pipe diameter.

3.4 BACKFILLING OPERATIONS

A. Backfill material around all utilities shall be compacted with hand machines. The maximum lift thickness shall be 6-inches.

B. Flexible Pipe Materials

1. Granular bedding and granular encasement material shall be furnished, placed and compacted to bed and encase the pipe to an elevation 12 inches above the pipe the full width of the trench. The

contractor shall bed and encase the pipe in granular bedding and granular encasement material to 95% Standard Proctor Density or as recommended by the pipe manufacturer, whichever is denser. Select native material shall be used above the bedding and encasement material (12-inches above the pipe) up to the bottom of the subgrade excavation zone.

C. Trench backfill for road crossing shall be compacted in accordance with the Quality Compaction Method. In agricultural fields, no compaction is required on the trench above the bedding and encasement zone.

3.5 SOURCE QUALITY CONTROL

A. The Contractor shall arrange for having the following testing performed:

1. One (1) gradation test per each 500 tons or 275 cubic yards (CV) of granular materials.

******END OF SECTION*****

SECTION 02370 -EROSION & SEDIMENT CONTROL

PART 1 -- GENERAL

1.1 SUMMARY

A. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to storm water management as indicated on the plans or as specified herein or as directed by the Engineer.

B. The Contractor and Owner shall identify a person knowledgeable and experienced in the application of erosion and sediment control BMP's who will oversee the implementation of the SWPPP.

C. Minnesota Pollution Control Agency (MPCA) - General Storm Water Permit for Construction Activity (MN R100001)

1. The **Owner** has developed a **Storm Water Pollution Prevention Plan (SWPPP)** in accordance with Part III (Storm Water Discharge Design Requirements) of the National Pollutant Discharge Elimination System (NPDES)/State Disposal System Permit that is included in the Appendix or in the drawings.
2. As a condition of the Award, the Contractor shall assume the role of "**Operator**" under the NPDES Permit by applying and paying for the permit within 7 days of acknowledging the *Notice of Award*. Late submittals will not be rejected; however, the MPCA reserves the right to take enforcement for any unpermitted discharges or permit noncompliance for the new registered party that has assumed control of the site.
3. For **storm water** discharges from construction activities where the **Owner** or **Operator (Contractor)** changes, the new **Owner** or **Operator** can implement the original **SWPPP** created for the project or develop and implement their own **SWPPP**.
4. **Permittee(s)** shall ensure either directly or through coordination with other **Permittee(s)** that their **SWPPP** meets all terms and conditions of this permit and that their activities do not render ineffective another party's **erosion prevention** and **sediment control Best Management Practices (BMP's)**."
5. The Contractor shall maintain copies of the SWPPP on the project site at all times and comply with all provisions contained therein.
6. Process Summary:
   (a) Owner issues *Notice of Award* to Contractor
   (b) Contractor acknowledges the *Notice of Award*
   (c) Within 7 days of acknowledgement, the Contractor applies and pays for the ***MPCA Permit Application*** to the MPCA to accept the responsibilities of the "Operator" on the NPDES Permit. Copies of the application shall be sent to the Owner and the Engineer.
   (d) The Contractor may then review the SWPPP and propose changes or a new SWPPP to the Engineer for review and comment; and the Owner for approval.
      (1) During the review and modification period, all work performed on the project shall be in compliance with the original SWPPP, including having copies available on the project site.
      (2) Once a SWPPP is modified / amended, the Contractor shall distribute new copies to the Owner, the Engineer, the on-site project supervisor and the construction observer.

1.2 METHOD OF MEASUREMENT AND PAYMENT

A. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below:

1. Erosion and Sediment Control

(a) Payment for "Inlet Protection" shall be at the contract price per EACH for furnishing, installing, maintaining, and removing the materials as detailed in the plans. Eighty percent (80%) of payment shall be made upon installation. The remaining 20% shall be made upon complete removal of the control measure, removal of any accumulated sediment and surface restoration.

B. The furnishing and installing specific items and/or the performance of work under certain circumstances shall not be individually paid. The costs shall be included in the unit price bid for the associated erosion control and excavation items. Such items of work include but are not limited to:

1. Complying with the Minnesota Pollution Control Agency (MPCA) - General Storm Water Permit for Construction Activity (MN R100001) – Reference Storm Water Pollution Prevention Plan (SWPPP) included in the Appendix.
2. Maintaining clean exit areas or roads from the site.
3. Clean adjacent roads of excess soil.
4. Cleaning drain tiles and culverts that have been partially or completely obstructed by sediment that originated from the site.
5. Geotextile fabric for rock installation.
6. Emergency erosion control mobilization.

1.3 SPECIFICATION REFERENCES

A. Mn/DOT Specification Section 2573 shall apply to temporary erosion control.

B. Mn/DOT Specification Section1717.2 shall apply to erosion control.

C. Section 02930 of these specifications shall apply to Rapid Stabilization, if applicable.

D. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

PART 2 -- PRODUCTS

2.1 EROSION CONTROL

A. Seeding shall be performed as outlined in Section 02920.

PART 3 -- EXECUTION

3.1 GENERAL

A. Construction and/or installation of all erosion & sediment control devices shall be completed prior to any soil disturbing activities. The rock check dam shall be installed prior to starting any excavation work.

B. Prior to construction, the Owner, Engineer and Contractor shall observe the existing open ditch and discharge area and shall document the existing conditions. Upon completion of turf establishment, the open ditch and discharge area shall be observed and all increased sediment deposits shall be removed and disposed of by the Contractor. All increases in sediment deposits shall be considered to have originated from the project site.

C. Exit areas or roads shall be kept clean of excess soil by routine blading.

D. The Contractor shall salvage, transport and place cohesive materials excavated from the work for use in constructing berms for temporary sediment traps.

3.2 CONSTRUCTION REQUIREMENTS

A. A goal of the project during construction is to get the cleanest water possible into the drainage system and protect critical and unique areas. Every effort shall be required by the Contractor to achieve these goals.

B. The Contractor shall limit the area of disturbance and shall finish shaping and restoring an area before progressing into new areas. **Less than one half mile of tile shall be under construction and not fully graded and leveled at any one time.**

C. The Contractor shall control drainage and erosion on the project including: haul roads, temporary construction, waste disposal sites, plant and storage locations. The contractor shall clean up the area, shape the area to allow storm runoff with a minimum of erosion and/or siltation, replace topsoil, and establish vegetative cover to the satisfaction of the Engineer on areas where the potential for pollution has been increased due to the Contractor's operations.

D. If Contractor fails to install and/or perform the appropriate erosion and sediment control practices, as determined by the Engineer, the Engineer may issue a written order to the Contractor. The Contractor shall respond within 24 hours with sufficient personnel, equipment and/or materials and conduct the **required work or be subject to a $ 500 per calendar day deduction for non-completion.**

E. When the Engineer determines that the erosion and/or sediment control practices installed by the Contractor have failed, the Contractor shall correct the cause and alleviate all sediment deposition, to the fullest extent possible. If the corrective action is not taken in a timely manner, the Engineer may issue a written order to the Contractor. The Contractor shall respond within 24 hours with sufficient personnel, equipment and/or materials and conduct the **required work or be subject to a $ 500 per calendar day deduction for non-completion.**

F. The Contractor shall remove all deltas and sediment deposited in drainage ways or tiles and re-stabilize the areas where sediment removal results in exposed soil. The removal and stabilization shall take place within 7 calendar days of discovery.

G. Where applicable, the Contractor will be required to co-sign for a "General Storm Water Permit" for construction activity with the Minnesota Pollution Control Agency (MPCA). The application form and information is included an appendix of these specifications. The Owner will initiate the Permit process and pay the required "Application Fee." The Contractor will be required to comply with all of the terms and conditions of the Permit that also includes performing the required inspections of the erosion control devices and maintaining an Inspector's Log for the MPCA Storm Water Permit. A copy of the proposed log form is available from the Engineer.

H. Energy dissipation or other outlet treatment must be installed within 24 hours of connection to surface water.

3.3 EROSION CONTROL

A. Unless precluded by snow cover, all exposed soil areas, including topsoil stockpiles, shall have temporary erosion control or permanent cover for the exposed soil areas within 14 days where the area has not been, or will not be, worked by the Contractor.

NOTE THAT THIS REQUIREMENT WILL RESULT IN MULTIPLE MOBILIZATIONS IN ORDER TO PROVIDE THE REQUIRED STABILIZATION.

3.4 SEDIMENT CONTROL

A. The Contractor shall install Sediment Control Devices where control is required and/or where directed by the Engineer. The control measures as shown on the plans shall be considered the minimum requirements with additional measures required dependent on construction sequencing and scheduling.

B. Inlet Protection shall be used around inlets and/or other surface water accesses to any existing or proposed storm water conveyance system.

C. The Contractor shall take all steps necessary to prevent excess soil erosion of the project. Temporary erosion control devices shall be constructed, maintained and left in place to such time as permanent erosion control measures are in place or instructed to remove them by the Engineer.

D. The Contractor shall construct temporary sediment traps with granular outlets within the disturbed area and shall stockpile a sufficient quantity of suitable fill material to regrade sedimentation ponds and temporary ditches to match the subgrade elevation.

3.5 INSPECTION AND MAINTENANCE:

A. The Contractor shall routinely inspect the construction site once every seven (7) days during active construction and within 24 hours of a rainfall event greater than 0.5 inches in a 24 hour period.

B. All inspections performed during construction must be recorded and records retained with the SWPP in accordance with the Storm Water Permit.

C. Silt fence, erosion control, and other BMP's must be replaced, repaired, or supplemented when they reach 50% design load.

3.6 FINAL STABILIZATION:

A. The Contractor shall ensure final stabilization of the site. The Contractor shall submit a Notice Of Termination within 30 days after final stabilization is complete or control has been passed to another owner.

B. The Contractor shall remove all temporary erosion control measures and BMP's as part of the final site stabilization.

C. The storm water permit further defines final stabilization and its requirements.

******END OF SECTION******

SECTION 02625 – AGRICULTURAL DRAIN TILE

PART 1 -- GENERAL

1.1 SUMMARY

A. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to drain tile construction as indicated on the drawings or as specified herein.

1.2 METHOD OF MEASUREMENT AND PAYMENT

A. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below:

1. Drain Tile Pipe

(a) Measurement of main line drain tile pipe shall be along the centerline of the pipe. Payment shall be at the unit price bid for the specified size, type and class of pipe, regardless of depth.

2. Tile Connections

(a) Measurement for the connection of existing lateral drain tile to the new main line tile where necessary, shall be per each connection and paid for at the unit price bid.

B. The furnishing and installing of specific items and/or the performance of work under certain circumstances shall not be individually paid. The costs shall be included in the unit price bid for the drain tile items, as indicated. Such items of work include but are not limited to:

1. Excavating, salvaging, stockpiling and replacing the full depth of existing topsoil over the trench in agricultural and turf areas, include in the price bid for drain tile.
2. Providing, installing and compacting granular bedding and encasement material for the polyethylene tile construction.
3. Providing and installing granular foundation materials if unsuitable soils are encountered, include in the price bid for drain tile.
4. Furnishing and placing geotextile fabric at open pipe joints, include in the price bid for drain tile.
5. Furnishing and installing necessary bends, fittings, wyes, tees and adaptors on the drain tile line, include in the unit price bid for the drain tile.
6. Providing an inventory of additional pipe, bends, fittings, wyes, tees and adaptors of various sizes at the project site to accommodate changes which occur during construction and ordering additional materials as needed to complete the work, include in the price bid for drain tile.
7. Marking the location of existing tiles with lathe so that the Engineer can record the location on the plan, include in the price bid for lateral tile connection.
8. Connection of existing lateral drain tiles to the new main tile, including tees, wyes, bends and fittings, include in the price bid for lateral tile connection.
9. Performing the required 12 inch deep tillage of all disturbed areas, include in the price bid for drain tile.
10. Trench excavation, backfill and compaction, include in the price bid for drain tile.
11. Bulkheading of existing pipes to be abandoned in place, include in the price bid for drain tile.

12. Maintenance of an appropriate drain tile outlet during construction, include in the price bid for drain tile.

13. Dewatering or trench pumping necessary for drain tile construction, include in the price bid for drain tile.

14. Removing and replacing fences as necessary to construct the improvements, include in the price bid for drain tile.

15. Removing and disposing of miscellaneous trees and brush necessary to construct the improvements, include in the price bid for drain tile.

16. Delays due to other utility conflicts, which result during the course of construction, include in the price bid for drain tile.

17. Protecting existing improvements from damage, include in the price bid for drain tile.

18. Protecting the inverts of other pipes from the accumulation of debris and soil, the removal of blockages which threaten to damage property, and/or the clearing of both the newly constructed lines and the existing lines of all debris and soil which accumulated during construction, include in the unit price bid for drain tile.

19. Interference and protection of underground structures and utilities, include in the price bid for drain tile.

(a) The removal and restoration, or protection of existing utilities for which there is no bid item for removing and restoring, or working around the utility.

(b) The utility information included on the Plan may not be complete and is furnished from information supplied by various utility companies as an indication of the presence of utility lines in the vicinity of construction. The Contractor shall contact the utility companies to determine the extent and exact location of their facilities. In the event of accidental damage to any such facility, the Contractor shall immediately notify the utility company and cooperate fully in whatever is necessary to repair such facility or restore service.

1.3 SPECIFICATION REFERENCES

A. Reference Section 02320 of these Specifications for trench excavation, bedding and backfill, except as modified herein.

B. CEAM Specification No. 2621 shall apply to construction of pipe sewers/drain tile, except as modified herein.

C. MnDOT Specification No. 2503 shall apply to measurement and payment of pipe sewers/drain tile, except as modified herein.

D. MnDOT Standard Plates Manual with latest revisions.

E. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

PART 2 -- PRODUCTS

2.1 DRAIN TILE PIPE

A. Perforated Dual Wall Polyethylene Pipe

1. Dual wall perforated and non-perforated corrugated polyethylene pipe shall conform to the requirement of the American Society for Testing Materials F2648 and shall be perforated or non-perforated as shown on the plans. Perforated pipe shall be installed with woven geotechnical sock. Joints shall be water tight gasketed joints.

B. Reinforced concrete pipe

1. All reinforced concrete pipe shall meet MnDOT Standard Plate 3000 or 3006.
2. Reinforced concrete pipe shall conform to MnDOT 3236 with tongue and groove joints, Class 3 minimum except as shown otherwise on the plans. Provide geotextile wrap of all joints.
3. Pipe ties shall be required for all joints.
4. Fittings for bends and lateral tile connections shall be precast.
5. Connections of private tile shall be made by sawing a hole in the pipe and making a field connection using inserta-tee fittings or equivalent connections.

2.2 GEOTEXTILE FABRIC

A. Mn/DOT 3733, Type I, knit sock.

PART 3 -- EXECUTION

3.1 INSTALLATION OF PIPE AND FITTINGS

A. Drain Tile

1. All piping shall be installed in accordance with the details in the Plans. Granular bedding and encasement materials shall be installed and compacted as noted.

B. Equipment

1. The use of rubber tired earth moving equipment shall not be permitted on the agricultural fields. Backfill and leveling shall be accomplished with dozers.

C. Bulkheading Open Pipe Ends

1. When flows are diverted from an existing drain tile to be abandoned in place, the Contractor shall construct a water-tight plug on the open ends of the abandoned tile. The plugs shall be constructed with concrete grout and with a thickness of not less than 1 pipe diameter.

D. Backfilling

1. The initial lift of native backfill material, from the top of the granular material to 2' higher, shall be gently placed with a backhoe to avoid placing rocks on the pipe and to avoid impacting the pipe.

3.2 DRAIN TILE CONNECTIONS

A. Connect to Main Tile

1. When connection to an existing tile or concrete main is made, the Contractor shall expose and verify the elevation of the existing tile prior to laying any tile to, or from, the connection point. If the elevation of the existing tile does not match the elevation shown on the plans, the Contractor shall notify the Engineer, at which time the Engineer may adjust the proposed grades.
2. When connecting to a plastic main, appropriate fittings shall be furnished and installed for the connection so that the main tile does not need to be cut for the connection.
3. If there is a vertical elevation difference of more than 2 feet between the existing tile and the new tile connection, the existing tile shall be reconstructed upstream to a point where the tile can be laid at a 45 degree slope to the connection. The tile shall rest on undisturbed soil or soil which has been compacted to a density of the adjacent soil.

******END OF SECTION******

SECTION 02630 – SURFACE WATER INTAKES

PART 1 -- GENERAL

1.1 SUMMARY

A. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to intake construction as indicated on the drawings or as specified herein.

1.2 METHOD OF MEASUREMENT AND PAYMENT

A. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below:

1. Surface Water Intakes

(a) Surface water intakes shall be measured by the individual unit based on the inside diameter of the riser.

B. The furnishing and installing of specific items and/or the performance of work under certain circumstances shall not be individually paid. The costs shall be included in the unit price bid for the intake items, as indicated. Such items of work include but are not limited to:

1. Locating and connecting to drain tile, include in the price bid for Surface Water Intakes.
2. The costs of furnishing bends and adapters, include in the price bid for Surface Water Intakes.
3. Trench excavation, backfill and compaction, include in the price bid for Surface Water Intakes.
4. Furnishing and installing a Hickenbottom riser, or approved equal, on the intake.
5. Furnishing and installing a field marker at each intake.

1.3 SPECIFICATION REFERENCES

A. Reference Section 02320 of these Specifications for trench excavation, bedding and backfill, except as modified herein.

B. CEAM Specification No. 2621 shall apply to construction of pipe, except as modified herein.

C. Mn/DOT Standard Plates Manual with latest revisions.

D. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

PART 2 -- PRODUCTS

2.1 PIPE AND FITTINGS

1. Dual Wall polyethylene pipe as specified in Section 02625.
2. Hickenbottom tee and riser sections, or approved equal.

2.2 GEOTEXTILE FABRIC

A. Mn/DOT 3733, Type II, non-woven for use in wrapping joints in pipe.

PART 3 -- EXECUTION

A. Surface water intake locations and sizes will be staked by the Engineer as the project progresses. Surface water intakes shall be constructed within two days following the tile construction.

B. The Contractor shall assure that surface water has an outlet at all times into either the existing tile system, or once it is constructed, the new tile. If the Contractor fails to provide such an outlet, any claims for crop damages will be deducted from payments to the Contractor.

C. Additional grading shall be performed around the intakes to permit farming operations around the intakes.

******END OF SECTION******

SECTION 02920 - TURF RESTORATION

PART 1 -- GENERAL

1.1 SUMMARY

A. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to turf restoration as indicated on the drawings or as specified herein.

B. A goal of the project during construction is to get the cleanest water possible into the protected drainage systems as quickly as possible and protect critical and unique areas. Every effort shall be required by the Contractor to achieve these goals.

C. Temporary seeding may be necessary during construction in erosion sensitive areas. The Contractor shall do temporary seeding work as specified herein, as required to comply with the MPCA permit or as directed by the Engineer at no additional expense.

1.2 METHOD OF MEASUREMENT AND PAYMENT

A. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below:

1. Payment for seeding shall include the costs for furnishing and placing the designated seed mixture, fertilizer and mulch at the rate specified and shall be measured by the ACRE.

B. The furnishing and installing specific items and/or the performance of work under certain circumstances shall not be individually paid. The costs shall be included in the unit price bid for the associated seeding and sodding items. Such items of work include but are not limited to:

1. Complying with the Minnesota Pollution Control Agency (MPCA) - General Storm Water Permit for Construction Activity (MN R100001) – Reference Section 02370 – Storm Water Pollution Prevention Plan (SWPPP).
2. Subgrade preparation and topsoil placement as required on all areas shown on the plans.
3. Maintenance of newly seeded areas, as specified, include in the unit price for the associated items.
4. All re-work necessary to repair areas that do not grow, include in the unit price for the associated items.

1.3 SPECIFICATION REFERENCES

A. Mn/DOT Specification Sections 2575, 3876, and 3878, Controlling Erosion, Establishing Vegetation and Seed shall apply to the establishment of grass and sod as shown on the plans.

B. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

PART 2 -- PRODUCTS

2.1 MATERIALS

A. Seeding Items

1. The seed mixtures to be used are shown below. In general, all application rates for mixes, except oats, are 150% the rate in Mn/DOT Table.
2. Seeding with the various seed mixture designations shall utilize the following combinations of seed, fertilizer and mulch:

(a) Type 1 mulch shall consist of clean straw with no pasture hay.

(b) Temporary seeding, if required, shall use Seed Mixture – 110B Oats.

(c) Fertilizer shall be 22-5-10. (Phosphorous use in fertilizer for first establishment and the first year is allowed unless limited or prohibited by local ordinances.)

APPLICATION RATES						
		FERTILIZER		MULCH		
Seed Mix	Rate	Type	Rate	Type	Rate	Typical Use
	lb/AC		lb/AC		ton/AC	
25-141 (Mesic General Roadside)	105	22-5-10	200	1	2	All.
21-111 (Oats)	100	22-5-10	200	1	2	All, temporary seeding
Temporary Stabilization- Ag Areas				1	2	Pipe Trench Areas

B. Seed Mixtures:

1. The application rates for Mn/DOT seed mixes shall be at 1.5 times that specified in the referenced specification.

PART 3 -- EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. GENERAL

1. Prior to construction, the Owner, Engineer and Contractor shall observe the existing storm water outfall system and discharge area and shall document the existing conditions. Upon completion of surface restoration (i.e., paving and turf establishment), the storm water outfall system and discharge area shall be observed and all increased sediment deposits shall be removed and disposed of by the Contractor. All increases in sediment deposits shall be considered to have originated from the project site.
2. Prior to construction, the Owner, Engineer and Contractor shall review the project to identify critical areas that could require rapid stabilization during the construction process, and develop a plan to either mitigate disturbance to those areas or identify the methods of rapid stabilization most appropriate.
3. If Contractor fails to install and/or perform the appropriate rapid stabilization practices and immediate ditch seeding within 7 days following final slope shaping, the Contractor will **be subject to a $ 500 per calendar day deduction for non-completion.**
4. The subgrade shall be shaped to approximate contour of the finished surface. All construction debris shall be removed from the area prior to the placement of the topsoil.
5. The topsoil shall be shaped to the approximate the contour of the finished surface, with a minimum depth of 12-inches.. All construction debris shall be removed from the area prior to seeding. The topsoil shall be loosened with a disc or harrow to its full depth prior to seeding.
6. The Contractor shall be responsible for providing water and maintenance until final acceptance by the Engineer or Owner, to firmly establish the seed. The term maintenance shall include mowing, weed control and watering, as necessary.
7. The Contractor shall remove all rocks and debris from the surface prior to seeding and mulching.

B. SEEDING REQUIREMENTS

1. Turf establishment by seeding shall be done utilizing the various combinations of seed mixtures, fertilizing and mulching as described.
2. Areas prepared for seeding shall be free of rocks, debris and clumps of soil. The areas shall be graded uniformly dragged until free of chunks exceeding 1 inches diameter.

3. Seed shall be applied with a drill seeder, unless otherwise approved in writing by the Engineer.
4. The Contractor shall furnish weight tickets documenting pounds of fertilizer placed and pounds of seed placed. The seed tickets shall show individual plant species along with the percent purity and percent germination. The fertilizer tickets shall show mix proportions. The Contractor shall also furnish its QA/QC data to the Engineer.
5. Dormant seeding and snow seeding may be utilized in accordance with the referenced specification and technical memorandum, provided the final acceptance standards are met.
6. Final acceptance of seeding shall be based on an established growth of 6-inches with a uniform density to cover 70% of the designated area, free of weeds and bare spots. Any re-seeding necessary shall be performed at the Contractor's expense.

******END OF SECTION******