

Final Engineer's Report

County Ditch No. 138
Branch B Improvement
25X.138825.000

Renville County, Minnesota
September 2026



**BOLTON
& MENK**

Real People. Real Solutions.

Submitted by:

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Certification

Engineer's Report

For

County Ditch No. 138 Branch B Improvement

In

Renville County, Minnesota

25X.138825.000

September 2026

PROFESSIONAL ENGINEER

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.

Signature: Bill L. Helget

Typed or Printed Name: Bill L. Helget

Date: 9/10/2026

License Number: 42046

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STATE OF MINNESOTA

RENVILLE COUNTY

IN THE MATTER OF THE PETITION FOR IMPROVEMENT OF COUNTY DITCH NO. 138 WITHIN RENVILLE COUNTY:

In January 2026, Renville County, acting as the Drainage Authority for County Ditch No. 138 Branch B in Renville County, in accordance with Minnesota Statute 103E.215, accepted a petition for the Improvement of portions of County Ditch 138. Subsequent to that authorization, field surveys were performed to obtain elevations and establish an alignment for the proposed drain tile improvements, as well as to evaluate the outlet for the system.

On July 7, 2026, the Drainage Authority heard and approved the Preliminary Engineer's Report.

This Final Engineer's Report summarizes the findings of the research, surveys, and analysis for the Improvement and is submitted for consideration by the Drainage Authority.

I. LOCATION AND SCOPE OF THE IMPROVEMENT

County Ditch No. 138 Branch B (CD 138 Br B) lies within and provides drainage to a large watershed in the north-west portion of Renville County. The proposed project location lies within Section 25, 26, 35, and 36 of Ericson Township. The system consists of 18,950' of drainage tile. The outlet for CD 138 Br B is CD 138 Main Open Ditch in section 35 of Ericson Township in Renville County. The project is located about 3.4 miles northwest of Renville, Minnesota. The total estimated watershed for the system based on Lidar contour data, is 533 acres. Exhibit 1 shows the general location of CD 138 Br B and the proposed project.

Field survey information was collected by Bolton & Menk, Inc. in January of 2026. 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 utilizes 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.

II. EXISTING DITCH SYSTEM

Public records regarding CD 138 Br B were reviewed from Renville County. CD 138 was petitioned for establishment on March of 1960. Current benefits for the CD 138 system are \$8,013,576.

III. CONDITION OF THE EXISTING DRAINAGE SYSTEM

The petitioners have requested ditch system improvements because the existing tile infrastructure is in poor condition, exhibits inadequate hydraulic capacity, and is undersized relative to current drainage demands. The portion of the CD 138 Br B system proposed for improvement consists of underground tiles. This Improvement will replace an existing tile system that currently has broken tile, quarter cracks, longitudinal cracks, offset joints, and sags. These broken tiles, cracks, and offset joints have allowed for roots and broken tile pieces to obstruct flow within the system.

Renville County televised a portion of CD 138 Br B and CD 138 Br 6B. Images from the televising report are shown in below.



Image 1: Br Main B 8" half full of mud. Parcel Number 11-00370-00



Image 2: Br Main B 14" filled with sand. Parcel Number 11-00390-00

Table 1 below shows the existing capacity for the CD 138 Br B Tiles proposed to 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 Mannings equation, assuming the original hydraulic efficiency of the system as constructed. 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 the 1/2 of an inch of runoff per day standards that is recommended by Natural Resource Conservation Service (NRCS). The watershed areas have been estimated using DNR Lidar maps.

Table 1: Existing System Capacity						
CD 138 Branch	Location	Total Drainage Area (Acres)	Existing Tile Size (Inches)	Existing Grade (%)	Calculated Capacity (CFS) n=0.013	Calculated Coefficient (In. Per Day)
7-B	EOP to 740' North of 850th Ave	11	5	0.70	0.29	0.63
7-B	740' to 860' North of 850th Ave	22	6	0.20	0.25	0.27
7-B	860' to 1590' North of 850th Ave	49	8	0.10	0.38	0.19
7-B	1590' North of 850th Ave to 6-B	60	9	0.12	0.57	0.23
6-B	EOP to 2560' East of 210th Street	11	5	0.20	0.15	0.33
6-B	2560' East of 210th Street to Br 7-B	18	6	0.20	0.25	0.33
6-B	Br 7-B to Br Main B	98	9	0.28	0.88	0.21
3-B	520' North to 850th Ave	34	7	0.10	0.27	0.19
3-B	850th Ave to Br 4-B	37	8	0.10	0.38	0.25
3-B	Br 4-B to Br Main B	77	9	0.22	0.78	0.24

Table 1: Existing System Capacity						
CD 138 Branch	Location	Total Drainage Area (Acres)	Existing Tile Size (Inches)	Existing Grade (%)	Calculated Capacity (CFS) n=0.013	Calculated Coefficient (In. Per Day)
Main B	3050' to 2270' North of 850th Ave	59	7	0.14	0.32	0.13
Main B	2270' North of 850th Avenue to 6-B	71	8	0.10	0.38	0.13
Main B	6-B to 760' East of 210th Street	200	14	0.10	1.70	0.20
Main B	760' East to 210th Street	297	14	0.10	1.70	0.14
Main B	210th Street to Br 5-B	307	14	0.10	1.70	0.13
Main B	Br 5-B to Br 3-B	321	16	0.10	2.43	0.18
Main B	Br 3-B to Br 2-B	399	18	0.12	3.65	0.22
Main B	Br 2-B to Br 1-B	506	22	0.07	4.76	0.22
Main B	Br 1-B to Open Ditch	533	22	0.07	4.76	0.21

As can be seen from Table 1 above, the system is unable to drain the watershed even if it was in good repair. When compared to the NRCS recommended standard of 1/2" per day, the tile main outlet is only delivering about 42% of the recommended flow, based on the estimated tile size and grade. Portions of the Main tile are only delivering 26% of the recommended flow. Therefore, there is inadequate capacity in the existing drainage system to provide for the efficient production of row crops. The result of this insufficient capacity is extended ponding in the low areas of the watershed and inadequate drainage of the tile lines which drain into the ditch system, thus resulting in crop stress and crop loss. Since there is evidence that the pipe system is in poor repair, allowing sediment to enter joints and partially plug the tile, the system is likely delivering even less flow than has been calculated.

IV. DISCUSSION OF THE IMPROVEMENT

As discussed earlier, the petitioners for the improvement of CD 138 Br B have requested consideration for the construction of an improved tile system to increase the capacity to provide an adequate outlet. The proposed construction would consist of a drain tile reconstruction and improvement. A preliminary survey and the hydrologic and hydraulic analysis of such a drainage system was performed to establish preliminary grades and depths for the tile system. They were also used to determine quantities for construction of such a system, to determine the size of proposed tile lines, and 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 CD 138 Br B 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 – TILE IMPROVEMENT

The proposed drain tile Improvement is shown in Exhibit 1. The type of pipe to be used for construction will be bid with a contractor option as follows:

1. Dual Wall or Triple Wall Polypropylene Drain Tile meeting the requirements of the American Society for Testing Materials F2376. Pipe will be bedded in granular foundation rock.
2. Dual Wall Polyethylene Drain Tile meeting the requirements of the American Society for Testing Materials F 2648. Pipe will be bedded in granular foundation rock as shown on Exhibit 1. Non-perforated pipe will be used in all areas due to the sandy soils (see Exhibit 1). An option would be provided for the contractor to shape the bottom of the trench to conform to the pipe and reduce some of the granular bedding if the pipe manufacturer would warrant the material installation.
3. Reinforced concrete pipe meeting the requirements of MnDOT Specification 2501, with the joints being covered with geotextile fabric or gasketed.

As can be seen in Table 2, the tile capacity for the Improvement System reflects a drainage coefficient of 1/2-inches/day. This is within the recommended drainage capacity from the Natural Resource Conservation Service of 1/2-inches/day.

CD 138 Branch	Location	Total Drainage Area (Acres)	Proposed Tile Size (Inches)	Proposed Grade (%)	Calculated Capacity (CFS) n=0.013	Calculated Coefficient (In. Per Day)
7-B	EOP to 740' North of 850th Ave	11	6	0.65	0.49	1.06
7-B	740' to 860' North of 850th Ave	22	8	0.40	0.83	0.90
7-B	860' to 1590' North of 850th Ave	49	10	0.30	1.30	0.63
7-B	1590' North of 850th Ave to 6-B	60	10	0.30	1.30	0.52
6-B	EOP to 2560' East of 210th Street	11	6	0.50	0.43	0.93
6-B	2560' East of 210th Street to Br 7-B	18	6	0.50	0.43	0.57
6-B	Br 7-B to Br Main B	98	12	0.30	2.12	0.51
3-B	520' North to 850th Ave	34	8	0.40	0.83	0.58
3-B	850th Ave to Br 4-B	37	8	0.40	0.83	0.53
3-B	Br 4-B to Br Main B	77	12	0.25	1.94	0.60
Main B	3050' North of 850th Avenue to 6-B	71	12	0.15	1.50	0.50
Main B	6-B to 760' East of 210th Street	200	18	0.14	4.27	0.51
Main B	760' East of 210 th Street to Br 3-B	321	24	0.10	7.77	0.58
Main B	Br 3-B to Open Ditch	533	30	0.07	11.79	0.53

Also included, as part of the project, there will be provisions to strip and replace the topsoil on the trench area, to provide rip rap as erosion protection at the outlet, and to construct several intakes on the system. It is proposed to use short intake covers for the larger intakes, use wyes at the tile connections, and the outlet pipe is proposed to be angled downstream.

The existing tile that is proposed to be improved will be abandoned and decommissioned at intervals of 200 feet along the tile alignment. Specifically, there will be plugs installed where the proposed alignment crosses the existing tile (due to utility conflicts) and the outlet to the open ditch will be removed.

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 shown on Table 3.

Table 3: Tile Depth		
Tile Branch	Minimum Depth	Maximum Depth
Main	6.1'	14.4'
3-B	8.0'	12.1'
6-B	7.3'	9.9'
7-B	8.5'	11.0'

V. ALTERNATE SOLUTIONS

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 a reduced property value for the wet acres, thus affecting the taxing capacity of the County and State. In addition, the ability of the landowners to receive a reasonable return on their investment is diminished because of this inadequate drainage.

As stated previously, the existing pipe is in poor repair. It is our recommendation, from the observations of the landowners and Renville County staff, that the system is in need of replacement due to the condition of the tile. Mainly that the joints are offset causing additional debris build up, and thereby plugging the tile.

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

B. REPAIR

Separable Maintenance for this project is estimated at \$804,827. A repair would only work as well as was discussed in Section III of this report. Repairing the system to its as constructed system, would not account for changing rainfall patterns or for additional waters being discharged into the system. Current design standards for rural drainage and as recommended by the NRCS are for a drainage coefficient of 1/2 inch/day. From Section III the current tile is approximately 42% efficient with some portions of the main only being 26% efficient for a 1/2 inch/day coefficient. Therefore, we do not recommend going with a repair option, since the repaired system would not meet the NRCS recommended drainage coefficient of a 1/2 inch/day.

C. WASC OB CONSTRUCTION

The WASC OBs included in the Preliminary Engineer's Report have been removed from the scope of the improvement. Water quality and storage features are an important part of the improvement process to help offset larger drain tiles. However, willing landowners are necessary to install any water quality and storage feature. The existing landowners where the WASC OB's were proposed to be constructed have approached the County and stated that they will no longer allow WASC OB's on their property.

D. 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 that is currently accumulating in these areas and drowning out agricultural crops. The proposal would also have added benefits for wildlife and possibly water quality.

Currently wetland locations have not been identified due to the lack of interest within the watershed. For wetlands to be a viable option, finding willing landowners is the most important step in the design process. Without willing landowners' general locations within the watershed can be discussed, but design work and modeling will not be pursued.

To be effective, this alternative would need to restore sufficient acres to wetland use so that the existing ditch system could convey the excess runoff. Utilizing NRCS data, about 38 acre feet of water cannot be discharged from the CD 138 watershed through the existing drainage systems in a 48-hour period for a 5-year rain event. If sufficient wetland acres were available to store this runoff at a maximum depth of 1.5 feet, approximately 25 acres of wetland restoration would be needed to provide sufficient storage capacity for the excess runoff.

To convert the 25 acres to wetlands, at least twice this many acres would need to be acquired. This is due to multiple factors including irregular wetland shapes, marginal damp soils, and squaring off land for modern farming practices. Thus, about 50 acres of land would be needed. This acquisition would likely involve several properties, whose owners would voluntarily need to agree to the reversion. The estimated cost of acquisition plus reconstructing tile lines for wetland conversion would likely be about \$18,000 per acre, resulting in a total cost of about \$900,000, note that this cost only accounts for land acquisition, minor grading work, and seeding. Additional costs would be required for additional depth, repairing the existing tile, and to provide an outlet. Wetland restoration with a Repair to the system is about 2.0 times the estimated cost of the Improvement.

The system does not currently contain locations where water naturally pools to a depth greater than a foot and half. Therefore, if a depth of 4.5 feet were pursued it would cost approximately \$33,000 per acre-foot of construction and acquisition costs. So, if a wetland at a depth of 4.5 feet would be created, 17 acres of property would need to be acquired, and an additional 3 feet of excavation would need to take place over the area. The total cost of this wetland creation route would be \$405,000. The cost of a deeper wetland creation and the cost to Repair the tile system is roughly 1.4 times the estimated cost of the Improvement.

Wetland restoration by itself is not a viable option for providing an improvement to the system. Due to the existing tile being in poor repair the cost to repair should be included when discussing this option in terms of cost.

To be a benefit to the system it is important that the wetlands being created are in the upper part of the watershed and outside of the existing groundwater table. Finding willing landowners to participate in a restoration project and locating sufficient funding would be critical to make this option viable. Copies of this Report will be provided to the SWCD and NRCS so that early coordination can occur for potential funding and technical assistance toward this option.

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 construction which disturbs more than one acre of land, requires that the contractor and owner secure a permit for the work. The permit process will also require erosion control measures to be taken during construction. Typical erosion control measures include placing of riprap and grass stabilization of 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 the contractor can sign the permit application.

A permit from Renville County Highway Department will also be necessary for the crossings of CR 61 (210th Street). This permit will be applied for after the Final Hearing.

B. WETLANDS

National Wetland Inventory (NWI) Maps have been reviewed to locate potential wetlands subject to regulations. No wetlands are shown on the NWI maps near the Improvement alignment. If wetlands are identified 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. We have received two of these forms from landowners and neither identified wetlands within their properties.

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 CD 138 Br B is shown in Exhibit 2 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 beneficial 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 Hawk Creek Middle Minnesota River Watershed Comprehensive Management Plan, have been considered in conjunction with this project. Specific proposals as part of the project to incorporate these measures include:

1. Reduction in annual discharge of 35 acre-feet per year due to improved soil conditions. (Discussed further in Section VII).
2. Groundwater protection through 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.
3. 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.

F. FISH AND WILDLIFE

The 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.

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.

G. 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.

H. ENVIRONMENTAL IMPACT

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

1. Disturbing 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 using 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.

I. LAND USE

The present use of the land in the CD 138 Br B watershed is largely agricultural. It is expected that the land will continue to be used for agricultural purposes in the future.

J. GUIDANCE TO VIEWERS REGARDING IMPROVEMENT BENEFITS

Discussions with landowners in the CD 138 Br B system has provided evidence of the condition of the existing tile systems. Previous repairs on the tile have shown that the existing tile is out of repair. In addition, years of use and settlement of sections of the tile have reduced the hydraulic capacity of the tile. Even if CD 138 Br B 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 CD 138 Br B tiles should be allocated as a Repair cost. The application of this principle 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 \$804,827. 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 CD 138 Br B is into the open ditch of CD 138 in Section 35 of Ericson Township. The Main open ditch of CD 138 then becomes Sacred Heart Creek in Section 2 of Sacred Heart North Township. Then it ultimately flows into the Minnesota River at the border of Renville and Redwood County.

B. ADEQUACY OF THE OUTLET

The adequacy of CD 138 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 portion of CD 138 has been delineated using the US Geological Survey "StreamStats" program and 3-meter Lidar information retrieved from the DNR. The StreamStats program has been used to generate peak flow rates for 2 to 100-year storm events.
2. The proposed and existing conditions were modeled in HydroCAD. It is worth noting that HydroCAD often overestimates the discharge rates compared to other models and calculation methods.
3. Rainfall data was retrieved from NOAA Atlas 14 by using Renville, Minnesota as the data center point.

The change in outlet discharge can be seen in the table below. The modeled outlet for the system is the CD 138 Open Ditch field crossing upstream of 840th Avenue. The reason that the field crossing was chosen was due to a more accurate representation of the change in flows within the open ditch.

Table 4: Change in Outlet Capacity			
Storm Event	Existing Discharge Rate (cfs)	Proposed Discharge Rate (cfs)	Change in Discharge Rate (cfs)
5-year	147	161	+ 14
10-year	186	186	+ 0
25-year	273	264	- 9
50-year	396	355	- 41
100-year	536	510	- 26

Table 4 indicates a slight increase in peak discharge during the 5-year event, no change during the 10-year event, and reduced peak discharges during the 25-year, 50-year, and 100-year events. Table 5 below summarizes the corresponding change in headwater elevation at the field crossing.

Table 5: Change in Headwater Elevation			
Storm Event	Existing Headwater Elevation (ft)	Proposed Headwater Elevation (ft)	Change in Headwater Elevation (ft)
5-year	1050.7	1050.8	+ 0.1
10-year	1051.0	1051.0	+ 0.0
25-year	1051.5	1051.5	+ 0.0
50-year	1052.1	1051.9	- 0.2
100-year	1052.6	1052.5	- 0.1

There is no overtopping requirement at this location due to it being a private crossing. There is a slight decrease in Headwater Elevation for the 50-year and 100-year events. All other events at this location will not change the headwater elevation.

Table 6: Change in Flow Volume			
Storm Event	Existing Flow Volume (af)	Proposed Flow Volume (af)	Change in Flow Volume (af)
5-year	226	210	- 16
10-year	291	273	- 18
25-year	399	378	- 21
50-year	497	474	- 23
100-year	606	582	- 24

The MnDNR has frequently requested flow data during the hearing process. As shown in the table above, the proposed improvement reduces the modeled total runoff volume reaching the ditch. This is only possible due to current conditions of the site not being adequately drained as previously stated in this report. In a well-drained condition, the site gets a reduction of 5 in its Curve Number, reducing the peak discharge of our initial runoff calculations and increasing the time of concentration. The reduction in curve number reflects the decrease of crop stress and an increase in vegetative cover.

From the information calculated above and assuming a 29-inch annual precipitation (Normal Precipitation Annual 1991-2020 – MnDNR) for Renville County the total reduction in annual flow volume can be calculated as 35 acre-feet per year.

A lower curve number reflects improved watershed conditions. Areas that previously experienced prolonged ponding because of poor drainage are expected to have shorter ponding durations, allowing crops to remain healthy. Healthy agricultural crops generate less runoff than bare fields, standing water, or stressed crops because they increase evapotranspiration.

VIII. EFFECT ON DOWNSTREAM WATERS

During the feasibility phase we were requested to complete a more extensive analysis of the CD 138 system. Per this request the next two crossings were analyzed as a part of our HydroCAD model.

Table 7 shows the 840th Avenue crossing information for the change in peak discharge at the culvert. Note that immediately upstream of the 840th Avenue crossing another ditch discharges into the system causing the increase in peak flows when comparing Table 4 and Table 7.

Table 7: Change in Outlet Capacity			
Storm Event	Existing Discharge Rate (cfs)	Proposed Discharge Rate (cfs)	Change in Discharge Rate (cfs)
5-year	309	309	+ 0
10-year	335	335	+ 0
25-year	357	357	+ 0
50-year	485	485	+ 0
100-year	789	789	+ 0

Table 7 shows the Private Driveway crossing immediately downstream of the 840th Avenue crossing. Note that the Private Driveway crossing shown below has a slightly smaller culvert than the crossing immediately upstream. This is what causes the decrease in peak flows when comparing Table 7 and Table 8.

Table 8: Change in Outlet Capacity			
Storm Event	Existing Discharge Rate (cfs)	Proposed Discharge Rate (cfs)	Change in Discharge Rate (cfs)
5-year	252	251	- 1
10-year	313	312	- 1
25-year	352	352	+ 0
50-year	440	440	+ 0
100-year	636	636	+ 0

As can be seen in Table 7 and 8 downstream waters will see no change in flow rate for most events within the open ditch. This is due to large amounts of water draining from elsewhere in the system rather than our proposed project. It is also due to the fact that the open ditch has a near 0% slope within our modeled area, causing very small flow events in the open channel.

With the existing conditions of the open ditch, this area acts as a pond with a metered outlet at the Private Drive Crossing. The change in the discharge rates downstream is close to zero given the hydraulic analyses presented above, CD 138 open ditch has adequate capacity to handle the additional flows, and the hydraulic timing shown does not negatively impact downstream waters. Therefore it is the opinion of your Engineer that the outlet is adequate.

IX. WATER QUALITY

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.

During the feasibility phase the DNR noted in their Natural Resource Assessment that the outlet for this system is approximately 1.5 miles east/southeast of a Drinking Water Protection Area. The area noted is for ground water protection. This improvement will not have a significant impact on the ground water table north of the City of Renville. Our recommendation for drain tile is to not have perforated pipe deeper than 6-feet (measured from top of ground to flow line of pipe).

X. RESPONSE TO ADVISORY LETTER

A. HYDRAULIC IMPACTS AND ADEQUACY OF THE OUTLET

Persistent ponding, as shown in MnTopo 2, in cultivated agricultural land is generally not considered a desirable runoff condition because it increases crop stress, and reduces evapotranspiration compared to healthy vegetated cover. In a bare soil condition water is fully saturating the ground and not allowing for efficient evapotranspiration and creating crop stress. In a fully saturated condition with standing water, the curve number converts to 100. Meaning that for every inch of rainfall an inch of water is discharged from the system.

Our model shows for a 25-year storm event, water will stand in the specified location for 69 hours. This is well beyond our design standard of 48 hours for a 25-year storm event in Renville County. It is also worth noting that substituting that area to a curve number of 100, for a 25-year storm event, results in an increase of 48-acre feet of water discharged.

The hydraulic information requested can be found in sections VII and VIII of this report, and within the Hydrographs attached in Exhibit 8.

B. WETLAND CREATION

Wetland creation done in parts could be effective, but viable grants that allow for grant dollars to be used in improvement projects are not common. Wetland locations have not been identified due to lack of interest by landowners within the watershed. For wetlands to be a viable option, finding willing landowners is the most important step. Without willing landowners, general locations within the watershed can be discussed, but design work and modeling will not be pursued.

C. COMPATIBILITY OF THE PROJECT WITH LOCAL LAND USE PLANS

CD 138 Branch B is a part of the Hawk Creek-Middle Minnesota Comprehensive Watershed Management Plan. Specifically, it is a part of the Sacred Heart Creek Watershed. Sacred Heart Creek was not identified as one of the priority areas and as such does not have measurable goals. Therefore, stabilizing the outlet and reducing the flow volume are compatible with the overall goals of the Comprehensive Watershed Management Plan.

XI. ESTIMATE OF COST

The Improvement cost estimate to construct the proposed Improvement, as described in this report, is shown in Exhibit 2. The total estimated cost for the Improvement is \$904,360. That price includes the cost of administration and engineering fees. Since Separable Benefits are proposed to be applied to this project, we recommend Separable Benefits be allocated at 89% (\$804,827/\$904,360).

Included in the estimate are the approximate 26.43 acres of agricultural land which will be temporarily taken out of production by construction. The individual landowners will be compensated for this loss through the damage process of further ditch proceedings.

XII. RECOMMENDATIONS

The proposed Improvement of County Ditch No. 138 Branch B in Renville County, as described in this report, is feasible, practical and necessary to provide drainage for the cultivation of crops within the watershed area. The existing tile system is in need of an Improvement to provide proper drainage for current agricultural practices. The outlet is adequate in order to convey the discharge.

It is our recommendation to proceed with the Improvement as outlined in this report and that the Final Engineer's Report be approved. If there are adequate funds, we recommend the Drainage Authority order the Improvement.

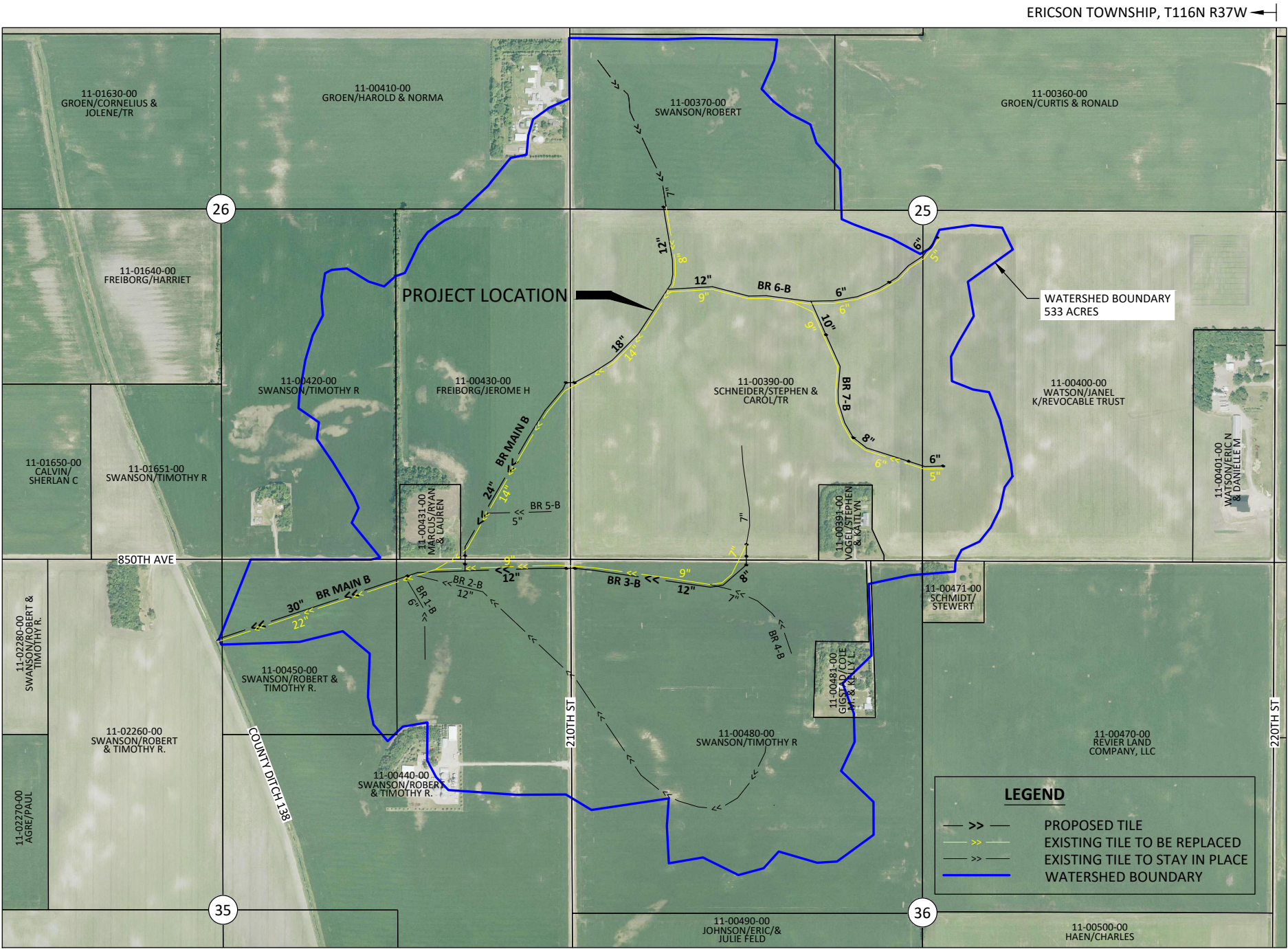
Exhibit 1: Preliminary Plans and Profiles

RENVILLE COUNTY, MINNESOTA

PRELIMINARY PLANS FOR COUNTY DITCH NO. 138 BRANCH B

DRAIN TILE, SURFACE INTAKES, WASCOBS AND EROSION CONTROL

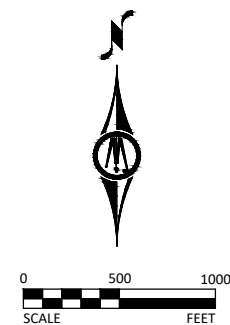
AUGUST, 2026



SHEET NUMBER	SHEET TITLE
GENERAL	
G0.01 - G0.02	TITLE SHEET, LEGEND
CIVIL	
C1.01 - C1.02	TABLES, DETAILS, TYPICAL SECTIONS, PHASING PLAN
C2.01 - C2.04	EROSION CONTROL PLAN, SWPPP
C5.01 - C5.02	DRAIN TILE PLAN & PROFILE - BRANCH B MAIN
C5.03	DRAIN TILE PLAN & PROFILE - BRANCH 3-B
C5.04	DRAIN TILE PLAN & PROFILE - BRANCH 6-B
C5.05	DRAIN TILE PLAN & PROFILE - BRANCH 7-B

THIS PLAN SET CONTAINS 13 SHEETS.

PARTIAL MAP OF
RENVILLE COUNTY, MN



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". THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-22, ENTITLED "STANDARD GUIDELINES FOR INVESTIGATING AND DOCUMENTING EXISTING UTILITIES."

⚡ BM=1069.411 DYSB MNDT ALUMINUM ROD GSID STATION #25831 19.7-FT WEST-SOUTHWEST OF A WITNESS POST.	PROJECT DATUM: RENVILLE CO COORDINATES HORIZONTAL: NAD83 (2011) VERTICAL: NAD88	RECORD DRAWING INFORMATION	
		OBSERVER:	
		CONTRACTOR:	
		DATE:	
RENVILLE COUNTY, MINNESOTA		SHEET G0.01	
COUNTY DITCH NO. 138 BRANCH B IMPROVEMENT			
TITLE SHEET			

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I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY A PROFESSIONAL ENGINEER OR ARCHITECT LICENSED IN THE STATE OF MINNESOTA.
PRELIMINARY NOT FOR CONSTRUCTION
BILL HELGE, P.E.
LIC. NO. 42046 DATE MM/DD/YYYY



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DESIGNED	NO.	ISSUED FOR	DATE
JGB			
DRAWN			
JGB			
CHECKED			
BLH			
CLIENT PROJ. NO.			
25X.138825.000			

EXISTING TOPOGRAPHIC SYMBOLS

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

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		CAST IRON MONUMENT
	CONTROL POINT		STONE MONUMENT
	MONUMENT FOUND		

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
	RECLAIMED WATER

PROPOSED UTILITY LINES

	FORCEMAIN
	SANITARY SEWER
	SANITARY SERVICE
	STORM SEWER
	STORM SEWER DRAIN TILE
	WATERMAIN
	WATER SERVICE
	PIPE CASING
	TRENCHLESS PIPE (PLAN VIEW)
	TRENCHLESS PIPE (PROFILE VIEW)

GRADING INFORMATION

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

HATCH PATTERNS

	BITUMINOUS		GRAVEL
	CONCRETE		

EXISTING PRIVATE UTILITY LINES

NOTE:
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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 38-22, ENTITLED "STANDARD GUIDELINE FOR INVESTIGATING AND DOCUMENTING EXISTING UTILITIES".

	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 UNDERGROUND GAS, QUALITY LEVEL A
UTILITY QUALITY LEVEL (A,B,C,D) DEFINITIONS CAN BE FOUND IN CI/ASCE 38-22.

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.

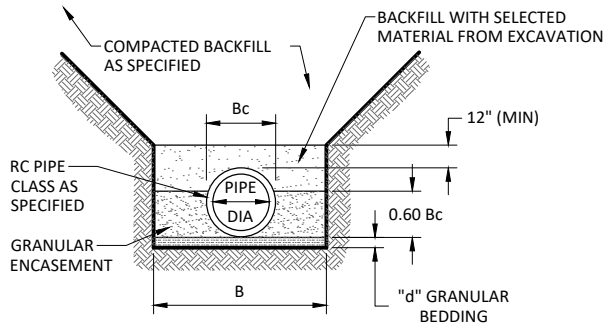
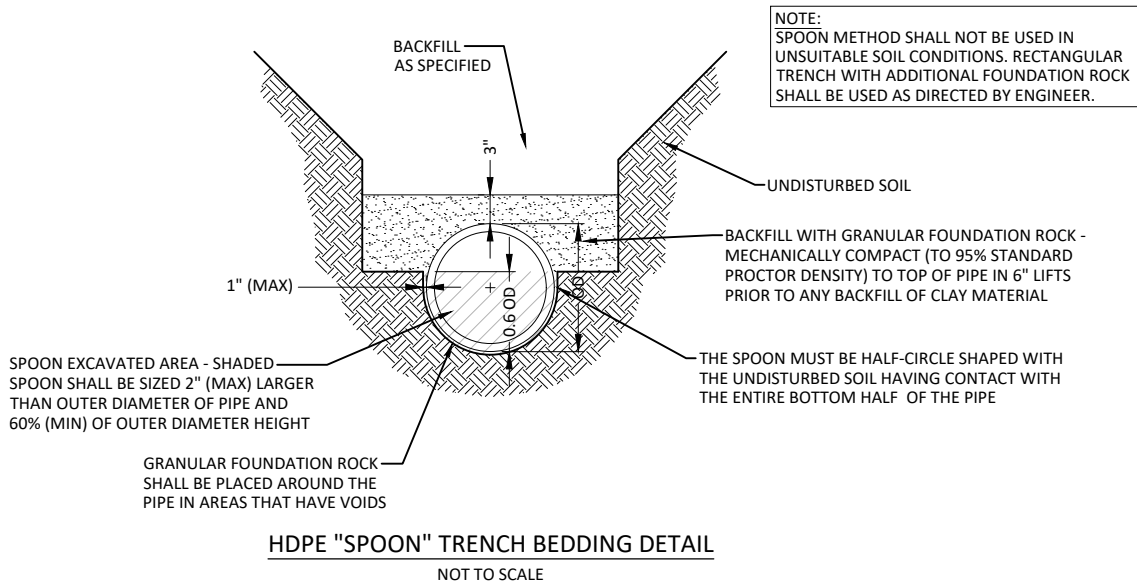
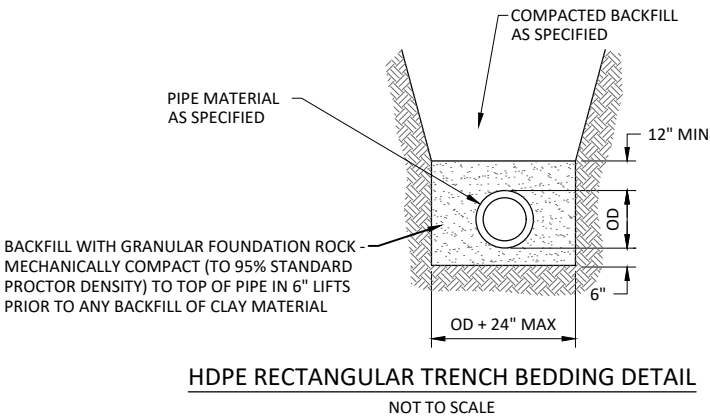
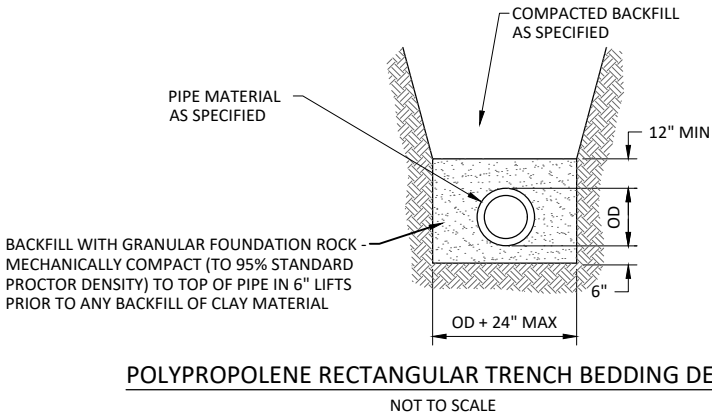
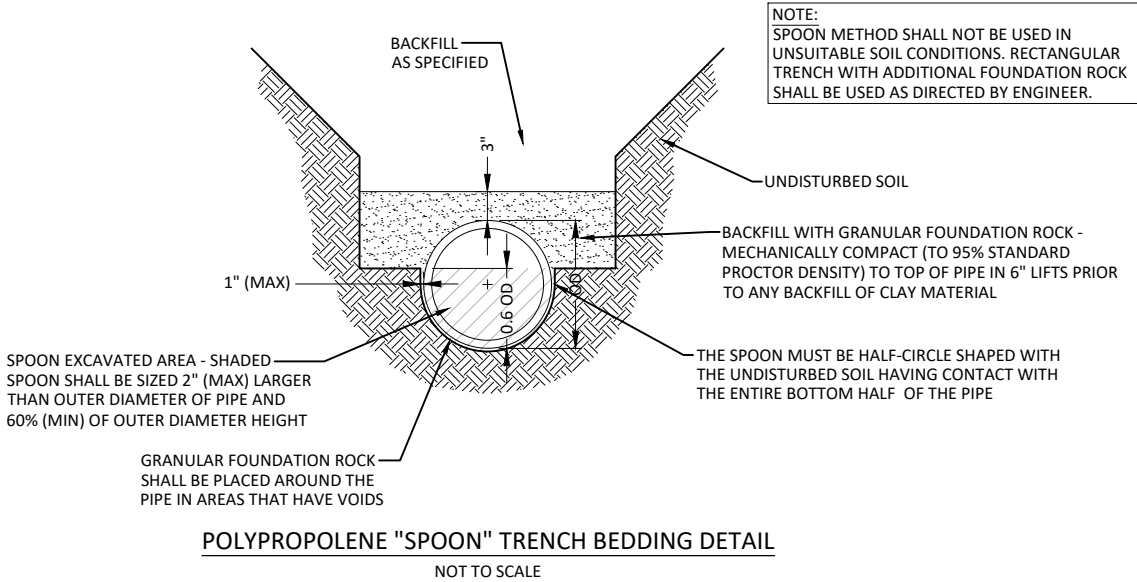
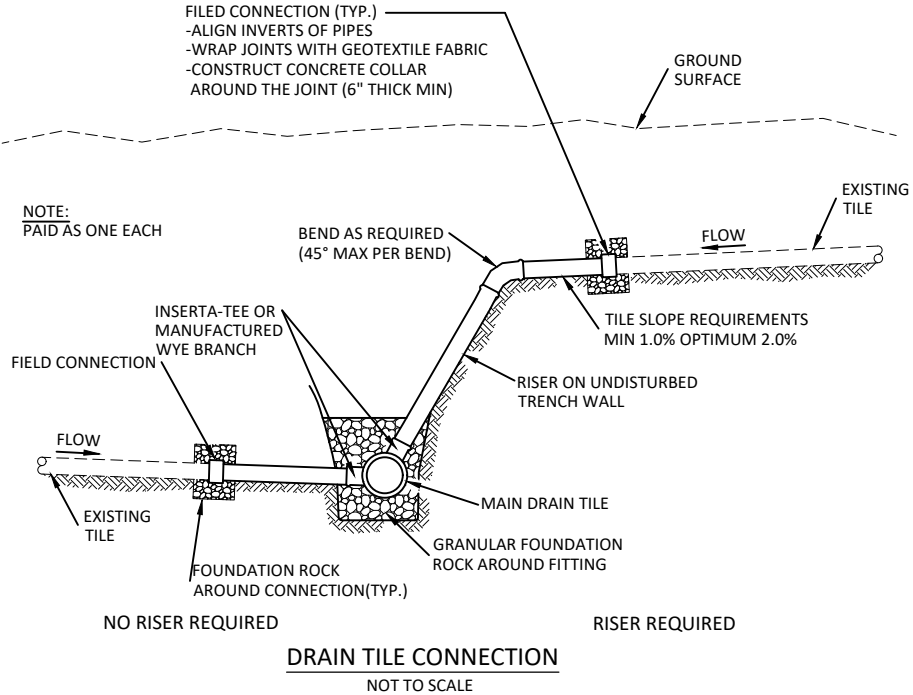
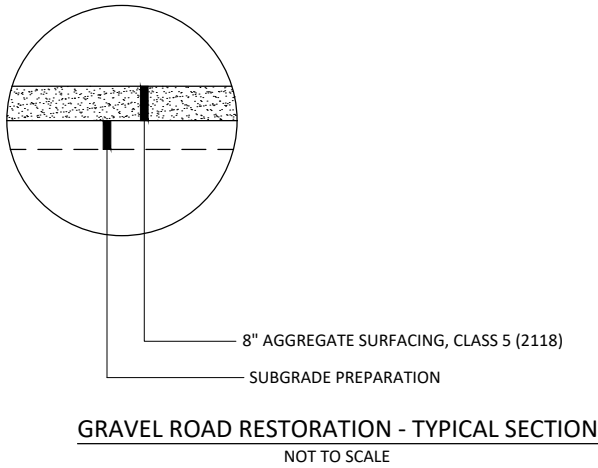
QUALITY LEVEL A: PROVIDES THE HIGHEST LEVEL OF ACCURACY. IT INVOLVES LOCATING OR POTHOLING UTILITIES AS WELL AS ACTIVITIES IN QUALITY LEVELS B, C, AND D. THE LOCATED FACILITY INFORMATION IS SURVEYED AND MAPPED AND THE DATA PROVIDES PRECISE PLAN AND PROFILE INFORMATION.

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	AC	ACRES
DWY	DRIVEWAY	PC	POINT OF CURVE	CF	CUBIC FEET
E	EXTERNAL CURVE DISTANCE	PCC	POINT OF COMPOUND CURVE	CV	COMPACTED VOLUME
ELEC	ELECTRIC	PE	PERMANENT EASEMENT	CY	CUBIC YARD
ELEV	ELEVATION	PED	PEDESTRIAN, PEDESTAL	EA	EACH
EOF	EMERGENCY OVERFLOW	PERF	PERFORATED PIPE	EV	EXCAVATED VOLUME
ER	END RADIUS	PERM	PERMANENT	LB	POUND
ESMT	EASEMENT	PI	POINT OF INTERSECTION	LF	LINEAR FEET
EX	EXISTING	PL	PROPERTY LINE	LS	LUMP SUM
FES	FLARED END SECTION	PRC	POINT OF REVERSE CURVE	LV	LOOSE VOLUME
F-F	FACE TO FACE	PT	POINT OF TANGENT	SF	SQUARE FEET
FF	FINISHED FLOOR	PVC	POLYVINYL CHLORIDE PIPE	SV	STOCKPILE VOLUME
F&I	FURNISH AND INSTALL	PVMT	PAVEMENT	SY	SQUARE YARD
FM	FORCEMAIN	R	RADIUS		
FO	FIBER OPTIC	R/W	RIGHT-OF-WAY		
F.O.	FIELD ORDER	RCP	REINFORCED CONCRETE PIPE		
GRAN	GRANULAR	RET	RETAINING		

GRANULAR MATERIAL DEPTH TO INVERT TABLE (ASTM F2648)	
TILE SIZE (IN)	MAX PIPE DEPTH (FT)
4	21
6	21
8	21
10	21
12	21
15	21
18	21
24	19
30	19
36	18
42	18
48	18
60	17

NOTE: THIS TABLE IS FOR REFERENCE PURPOSES ONLY. ACTUAL MAXIMUM AND MINIMUM DEPTHS SHALL BE DETERMINED IN CONJUNCTION WITH MANUFACTURER AND TESTING AGENCIES.



PIPE DIA	d	B
27" OR LESS	3"	Bc + 24"
30" TO 60"	4"	1.5 x Bc
66" OR OVER	6"	Bc + 36"



**RC PIPE CLASS "B"
BEDDING-SQUARE TRENCH**

NOT TO SCALE

LAST REVISION:
04-2021

PLATE NO.
4-001-1

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY CLOSE PERSONAL SUPERVISION AND THAT I AM A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF MINNESOTA.

PRELIMINARY NOT FOR CONSTRUCTION

BILL HELGREN, P.E.
LIC. NO. 42046 DATE MM/DD/YYYY



1243 CEDAR STREET NE
SLEEPY EYE, MN 56085
Phone: (507) 810-4184
Email: SleepyEye@bolton-menk.com
www.bolton-menk.com

DESIGNED	NO.	ISSUED FOR	DATE
JGB			
DRAWN			
JGB			
CHECKED			
BLH			
CLIENT PROJ. NO.			
25X.138825.000			

RENNVILLE COUNTY, MINNESOTA

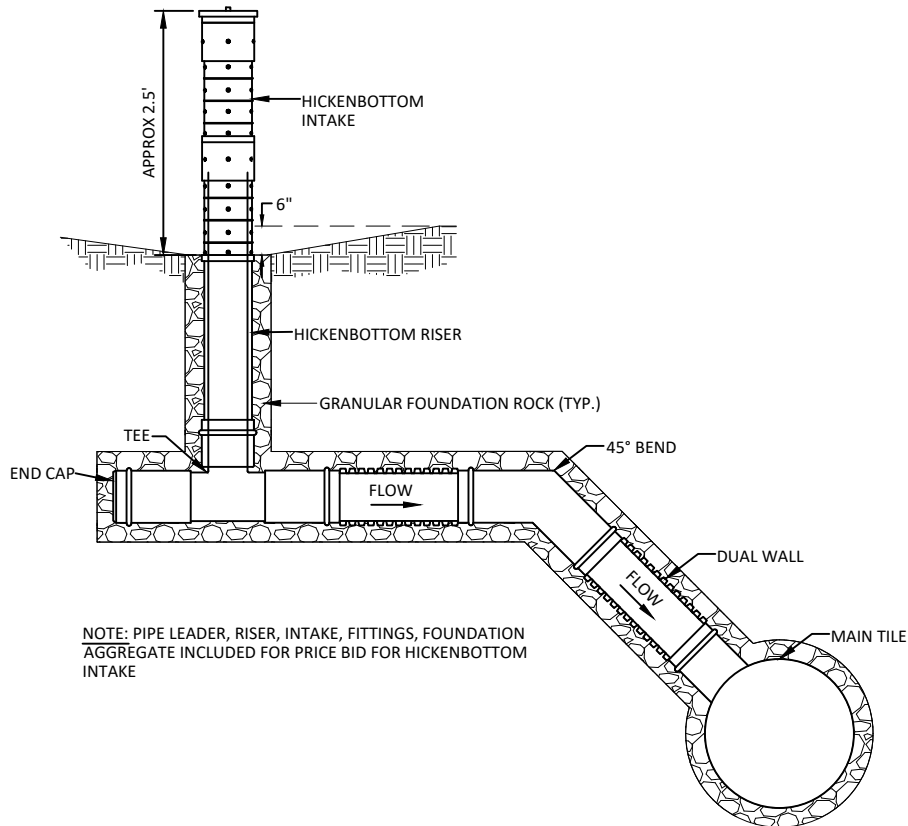
COUNTY DITCH NO. 138 BRANCH B IMPROVEMENT

DETAILS

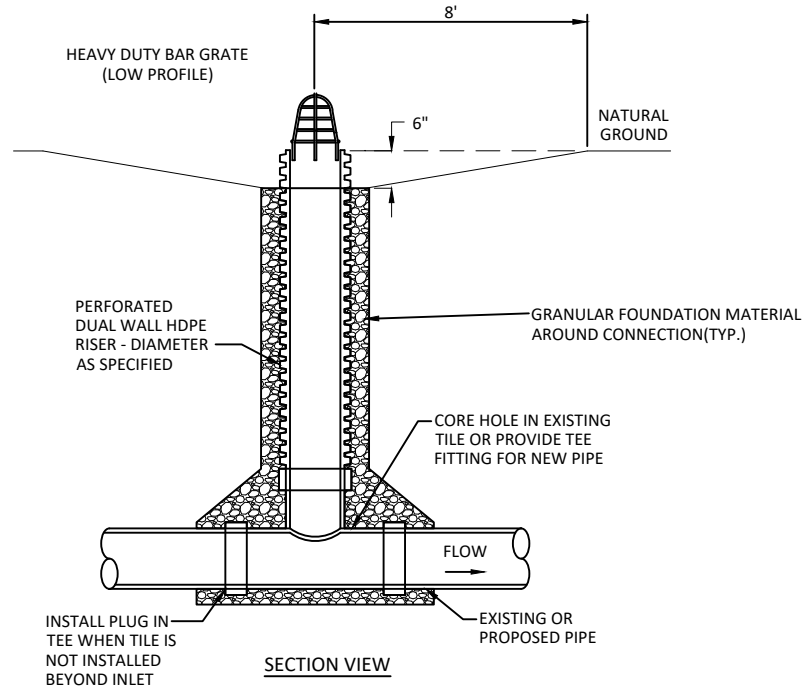
DRAIN TILE DETAILS

SHEET

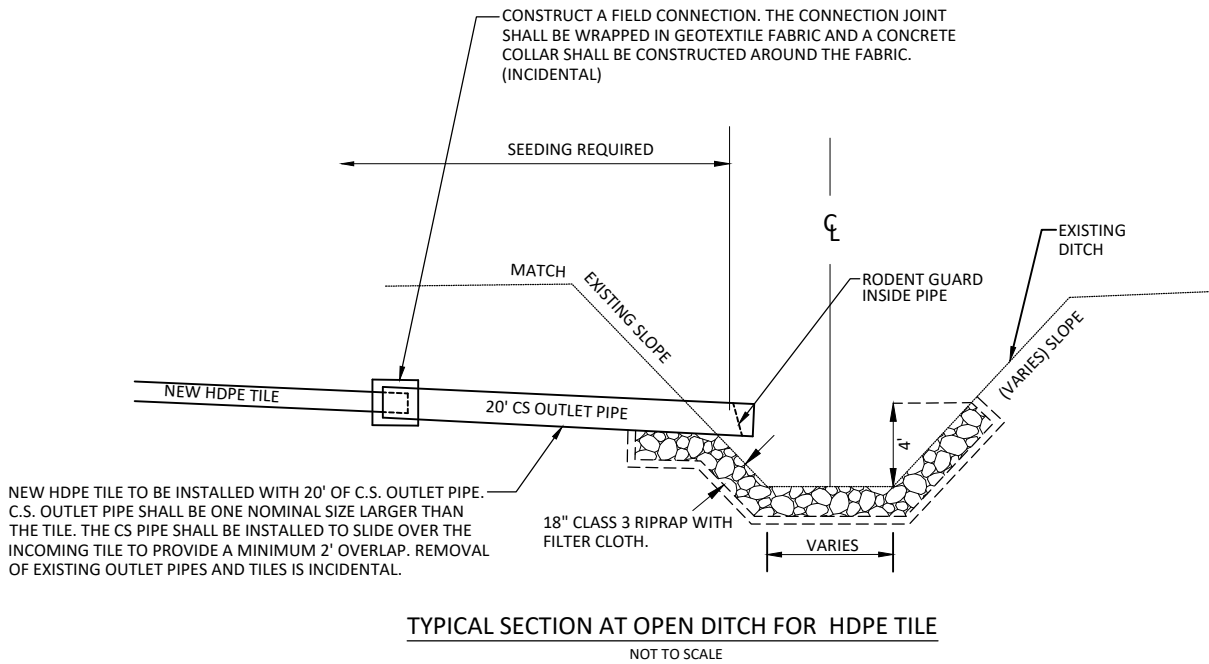
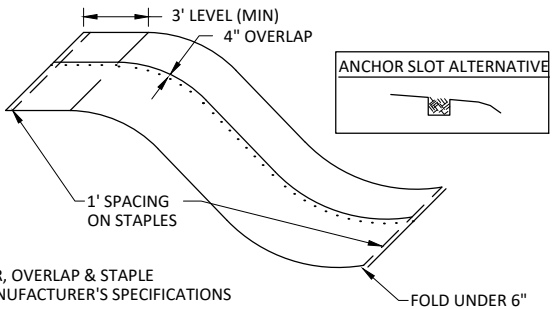
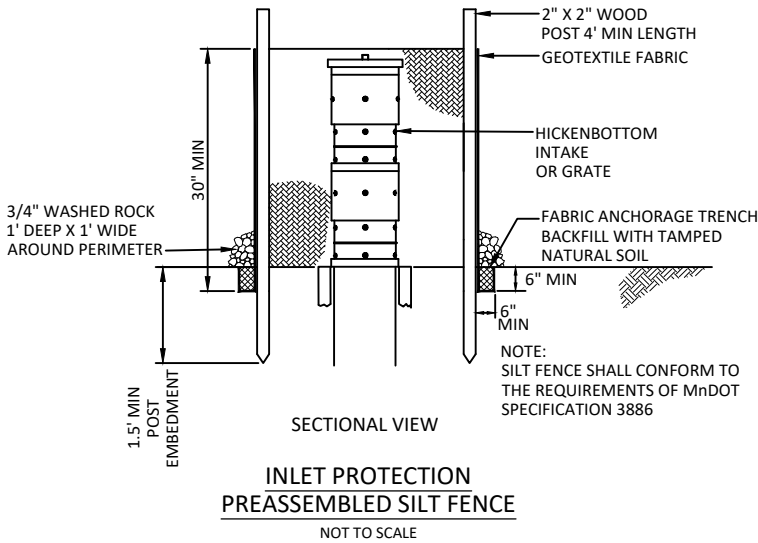
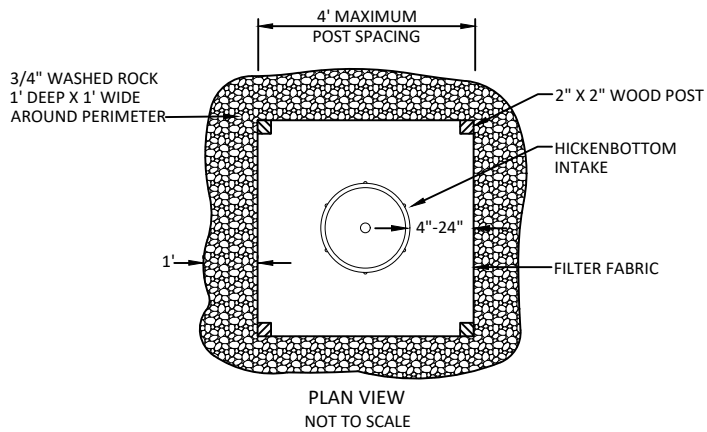
C1.01



HICKENBOTTOM INTAKE - IN ROADSIDE DITCHES
NOT TO SCALE



FIELD INTAKE - IN FIELDS
NOT TO SCALE



EROSION CONTROL
BLANKET INSTALLATION
NOT TO SCALE

LAST REVISION:
04-2021
PLATE NO.
3-200

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BOLTON & MENK, P.C.
LIC. NO. 42046 DATE MM/DD/YYYY



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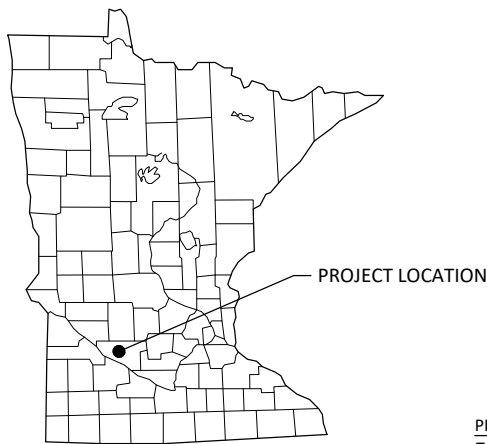
RENNVILLE COUNTY, MINNESOTA
COUNTY DITCH NO. 138 BRANCH B IMPROVEMENT
DETAILS
EROSION CONTROL DETAILS

SHEET

C1.02

CD NO. 138 BRANCH B IMPROVEMENT - 2027

RENNVILLE COUNTY, MINNESOTA



	1-MILE BOUNDARY
	PROJECT BOUNDARY
	RECEIVING WATERS - IMPAIRED, PROTECTED
	NATIONAL WETLANDS INVENTORY

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.	JORDAN BENGTON	507-810-4184
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) =	29.0	ACRES
Existing area of impervious surface =	0.2	ACRES
Post construction area of impervious surface =	0.2	ACRES
Total new impervious surface area created =	0.0	ACRES

Planned Construction Start Date:	<u>XX/XX/XXXX</u>
Estimated Construction Completion Date:	<u>XX/XX/XXXX</u>

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 created

PROJECT LOCATION:

COUNTY	TOWNSHIP	RANGE	SECTION	LATITUDE	LONGITUDE
RENVILLE	T116N	R37W	25, 26, 35, 36	44.8143°	-95.2689°

[illegible]

DESCRIPTION OF CONSTRUCTION ACTIVITIES AND STORMWATER MANAGEMENT:

Construction activities include: Drain tile improvement, temporary erosion and sediment control, and permanent stabilization.

Stormwater currently flows over land through agricultural fields then underground into the drain tile. The drain tile discharges out in County Ditch 138 open ditch.

After construction is complete stormwater will continue to flow as existing conditions, but will flow through an improved drain tile

This project includes the following stormwater management BMPs:

1. Inlet Protection
2. Rapid Stabilization Method 4
3. Mulch Type 1
4. Random Riprap
5. Stabilization Construction Exit



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The map displays a topographic area with contour lines and various features. A red line indicates the project location, and a black line indicates the receiving waters. A 1-mile boundary is shown as a dashed line. The map includes a north arrow and a scale bar (0 to 3000 feet). The project location is labeled 'PROJECT LOCATION' and the receiving waters are labeled 'RECEIVING WATERS'. The 1-mile boundary is labeled '1-MILE BOUNDARY'. The map also shows 'Gravel Pit' locations and 'DITCH' features. The map is divided into sections by a grid of red numbers (1, 2, 3, 4, 19, 23, 24, 25, 26, 27, 30, 31, 34, 35, 36).

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
COUNTY DITCH 138	DITCH	N/A	YES	NONE

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) Construct drain tile improvements.
- 4) Perform backfill, topsoil placement over tile, and shape to match existing conditions
- 5) Install turf establishment
- 6) Add additional temporary BMPs as necessary during construction based on inspection reports.
- 7) Ensure final stabilization measures are complete.
- 8) Provide digital copy of all Field SWPPP Documentation including Inspection Reports and SWPPP Revisions to the Owner.
- 9) 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 LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

**PRELIMINARY NOT
FOR CONSTRUCTION**

BILL L. HELGET, P.E.

LIC. NO. 42046 DATE MM/DD/YYYY

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RENNVILLE COUNTY, MINNESOTA
COUNTY DITCH NO. 138 BRANCH B IMPROVEMENT
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 RI00001 (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.

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:	7 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 discharges to during fish spawning?	NO

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

SWPPP DESIGNER TRAINING DOCUMENTATION:



1243 CEDAR STREET NE
SLEEPY EYE, MN 56085
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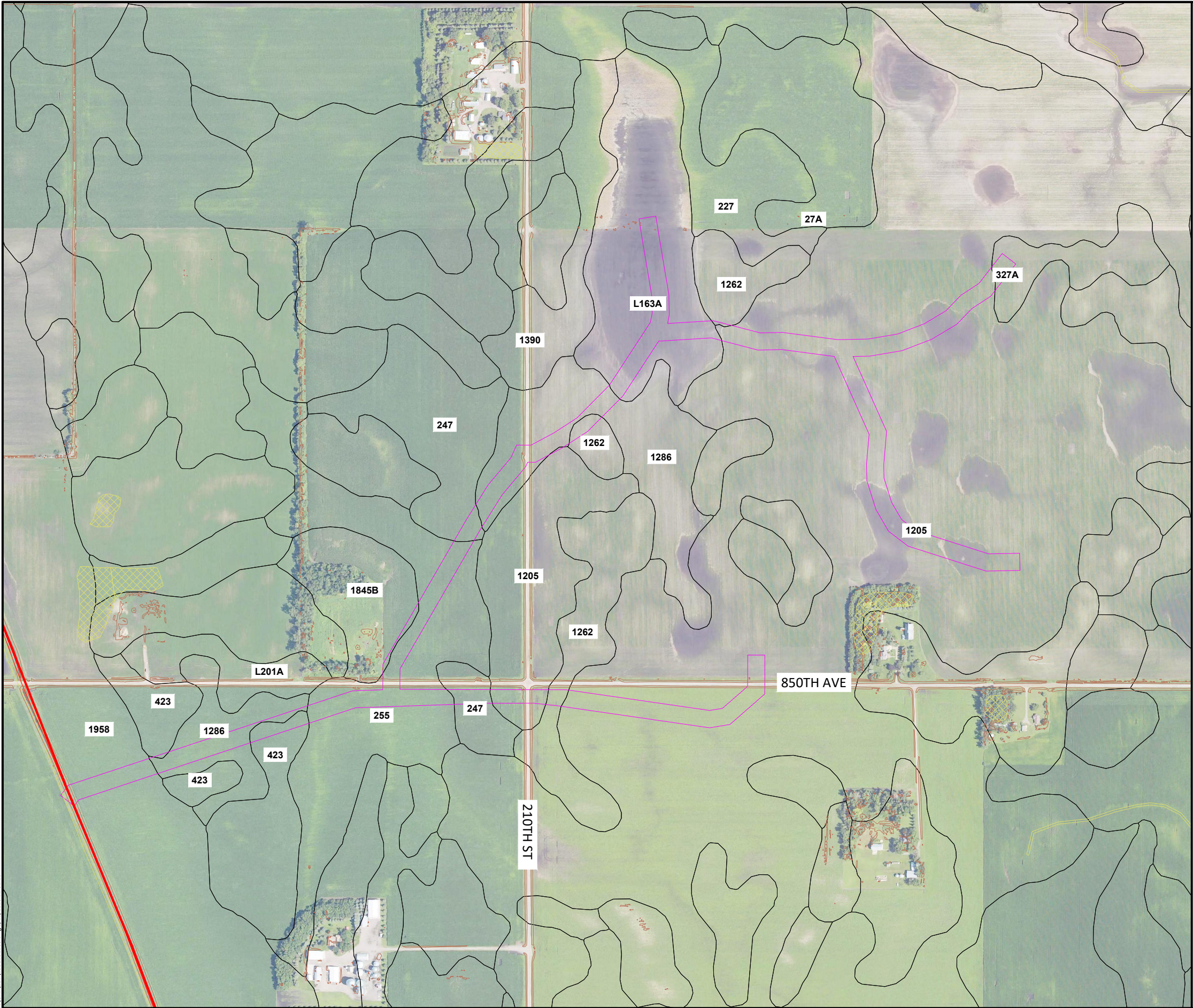
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RENVILLE COUNTY, MINNESOTA
COUNTY DITCH NO. 138 BRANCH B IMPROVEMENT
STORMWATER POLLUTION PREVENTION PLAN
SWPPP NARRATIVE

SHEET

C2.02

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LEGEND

- PROJECT BOUNDARY
- SOIL TYPE
- RECEIVING WATERS: IMPAIRED OR PROTECTED
- NATIONAL WETLANDS INVENTORY
- STEEP SLOPES (>33.3%)



SOIL TYPE SUMMARY

Map Unit Symbol	Soil Name	Hyd. Soil Group	Erodibility
MUSYM	MUNAME	HYDGRP	MUHELCL
1205	LEEN-OKOBOJI, DEPRESSIONAL, COMPLEX. 0 TO 2 PERCENT SLOPES	B/D	NHEL
1262	SEAFORTH SILT LOAM, 1 TO 3 PERCENT SLOPES	C	NHEL
1286	PRINSBURG SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPE	B/D	NEHL
1845B	ESTERVILLE SANDY LOAM, 2 TO 6 PERCENT SLOPES	A	NEHL
1958	DANUBE SILTY CLAY, 0 TO 2 PERCENT SLOPES	C/D	NEHL
247	LINDER LOAM, 0 TO 2 PERCENT SLOPES	B/D	NEHL
255	MAYER LOAM, 0 TO 2 PERCENT SLOPES	B/D	NEHL
327A	DICKMAN SANDY LOAM, 0 TO 2 PERCENT SLOPES	A	NEHL
423	SEAFORTH LOAM, 1 TO 3 PERCENT SLOPES	C	NEHL
L163A	OKOBOJI SILTY CLAY LOAM, 0 TO 1 PERCENT SLOPES	C/D	NEHL

NHEL - Not Highly Erodible Land
PHEL - Potentially Highly Erodible Land
HEL - Highly Erodible Land

LOCATION OF SWPPP REQUIREMENTS IN PROJECT PLAN

DESCRIPTION	SHEET NO.
SITE MAP	C2.01
DIRECTION OF FLOW	C2.04
FINAL STABILIZATION	C2.04
SOILS	C2.03
STORM SEWER PLAN & PROFILE SHEETS	C5.01 - C5.05
EROSION & SEDIMENT CONTROL DETAILS	C1.02
EROSION CONTROL TABULATION	C2.01
TURF ESTABLISHMENT TABULATION	C2.01
NARRATIVE & NOTES	C2.01 - C2.02



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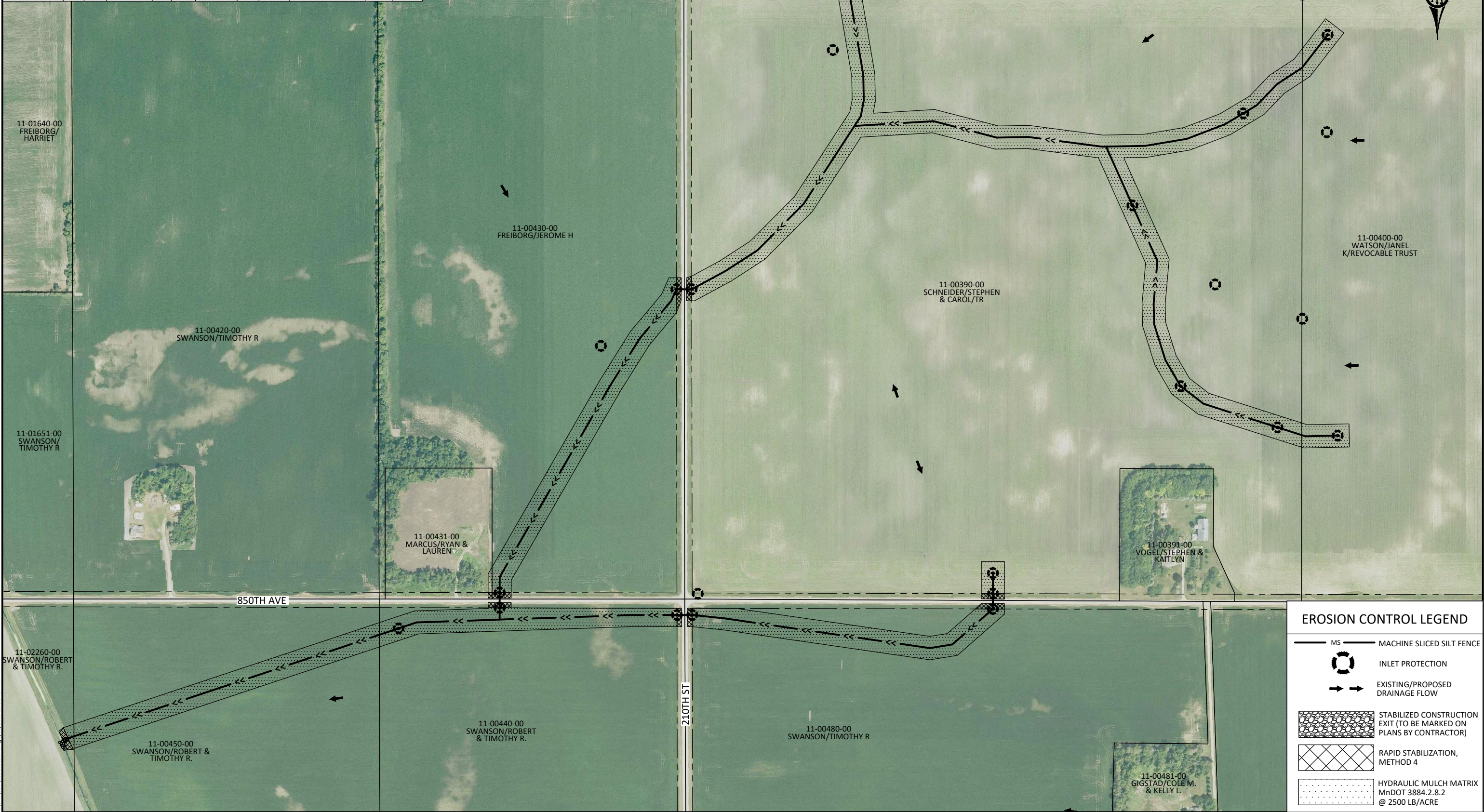
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RENNVILLE COUNTY, MINNESOTA
COUNTY DITCH NO. 138 BRANCH B IMPROVEMENT
STORMWATER POLLUTION PREVENTION PLAN
SWPPP SOILS

SHEET
C2.03

SEEDING QUANTITY TABLE											
ITEM			SEED			FERTILIZER			EROSION CONTROL		
BID ITEM	QTY	UNIT	MIX	QTY	UNIT	TYPE	QTY	UNIT	TYPE	QTY	UNIT
RAPID STABILIZATION METHOD 4	2230	SY	MI	46	LB	10-10-10	161	LB	EROSION CONTROL BLANKET	2230	SY
MULCH TYPE 1	25.7	ACRE	N/A	0	N/A	N/A	0	N/A	MULCH TYPE 1	51	TON



EROSION CONTROL LEGEND

MS

MACHINE SLICED SILT FENCE

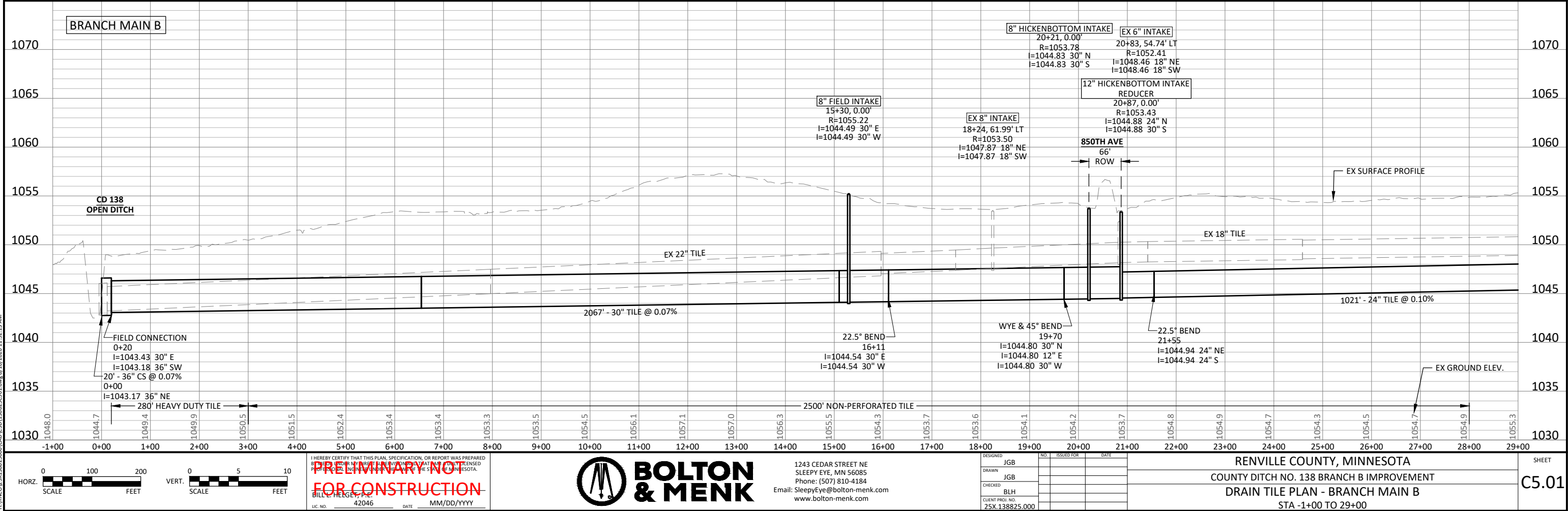
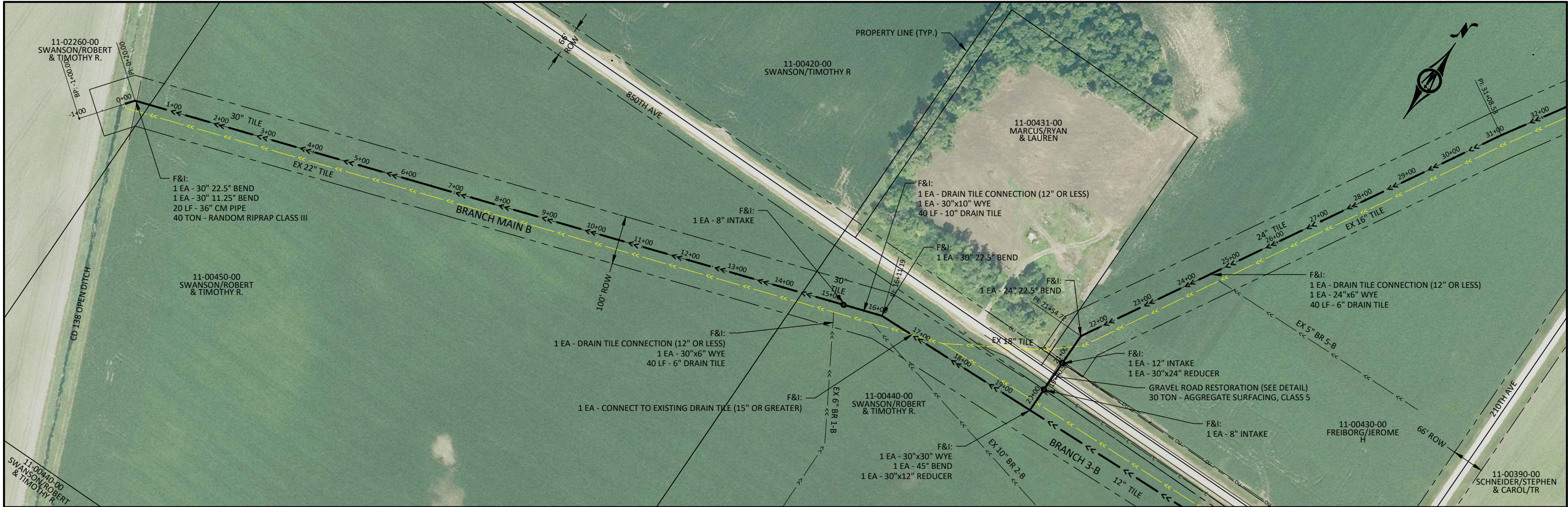
INLET PROTECTION

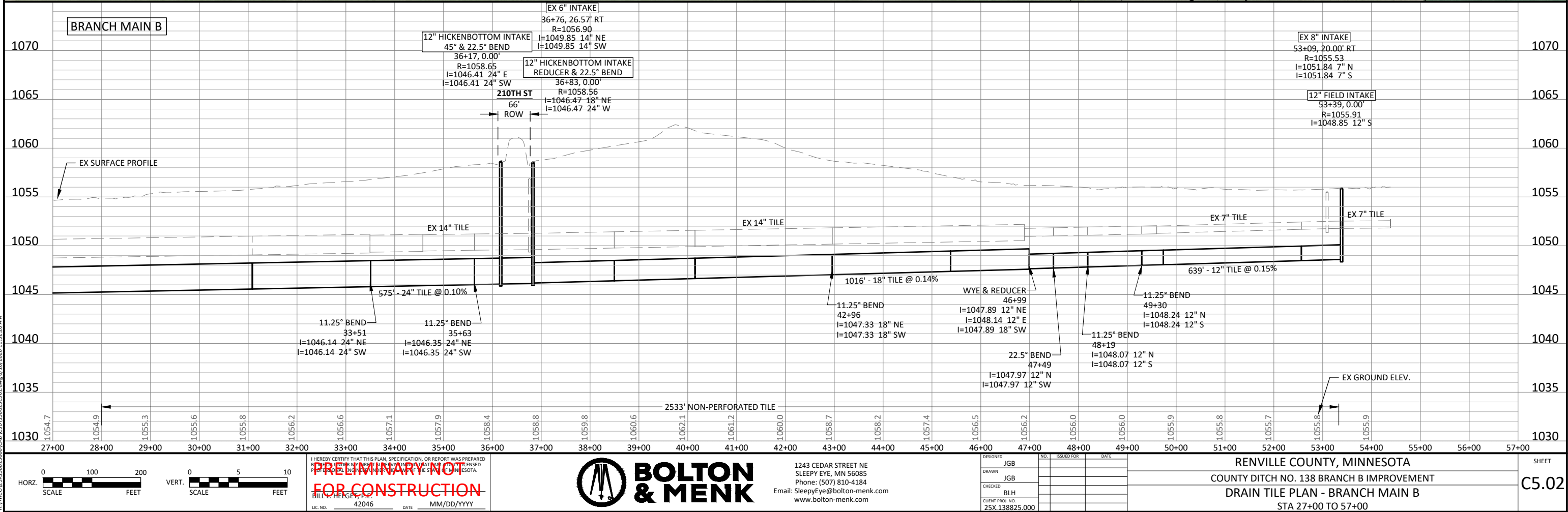
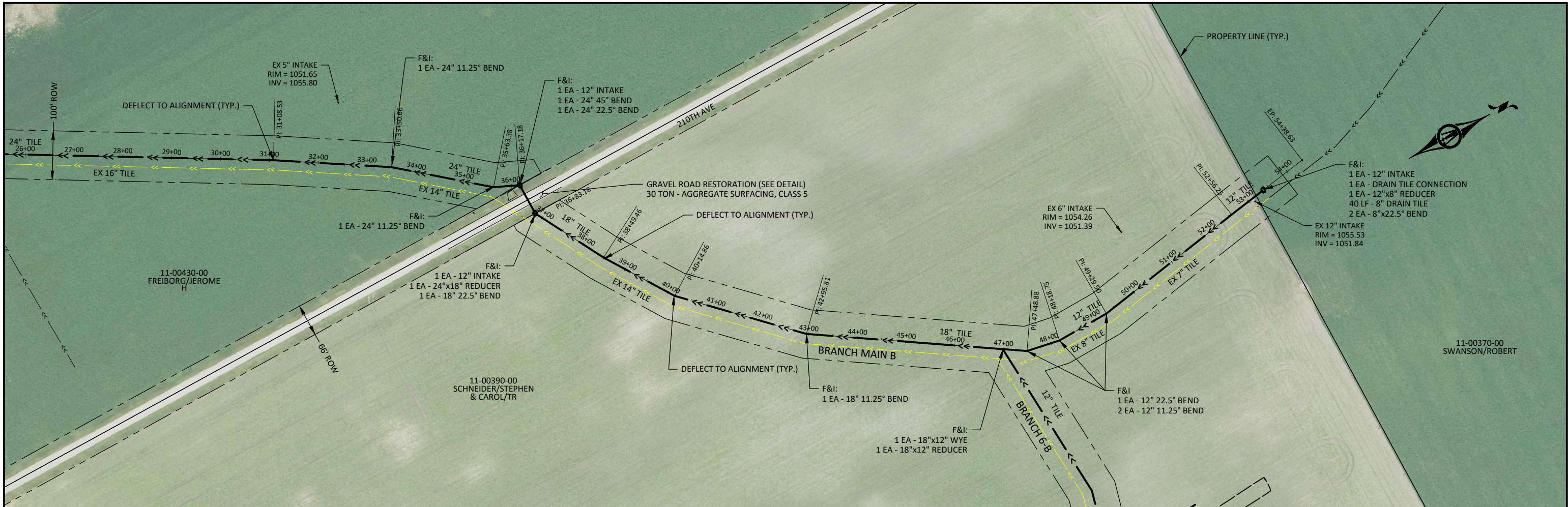
EXISTING/PROPOSED DRAINAGE FLOW

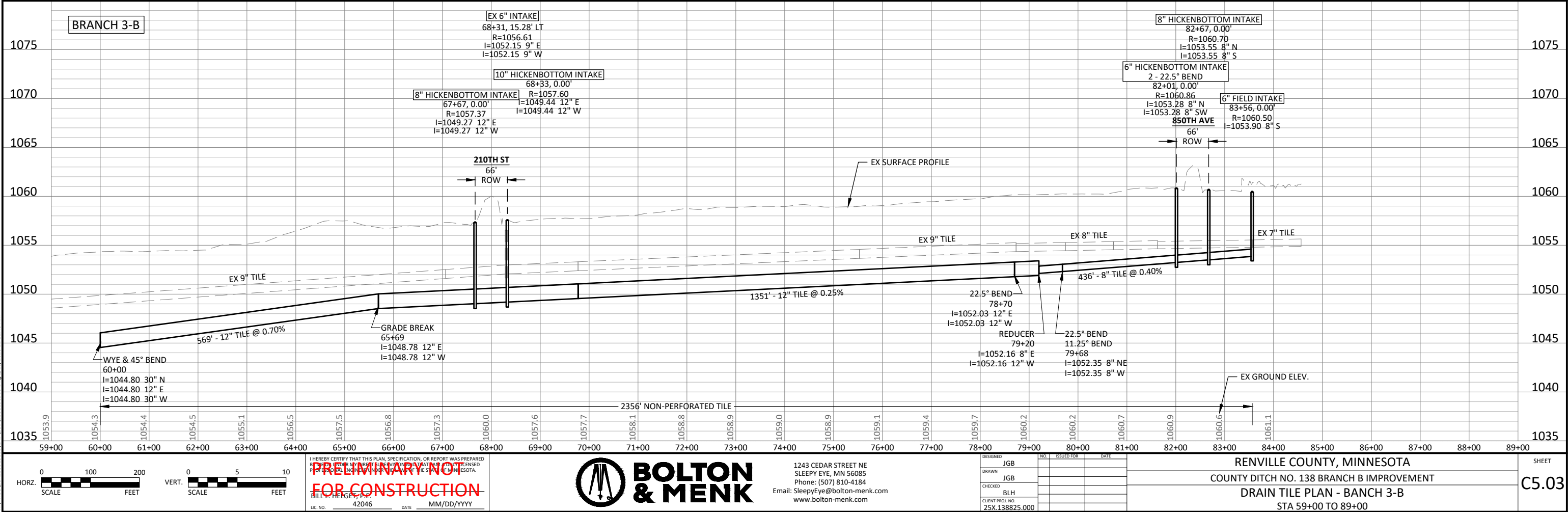
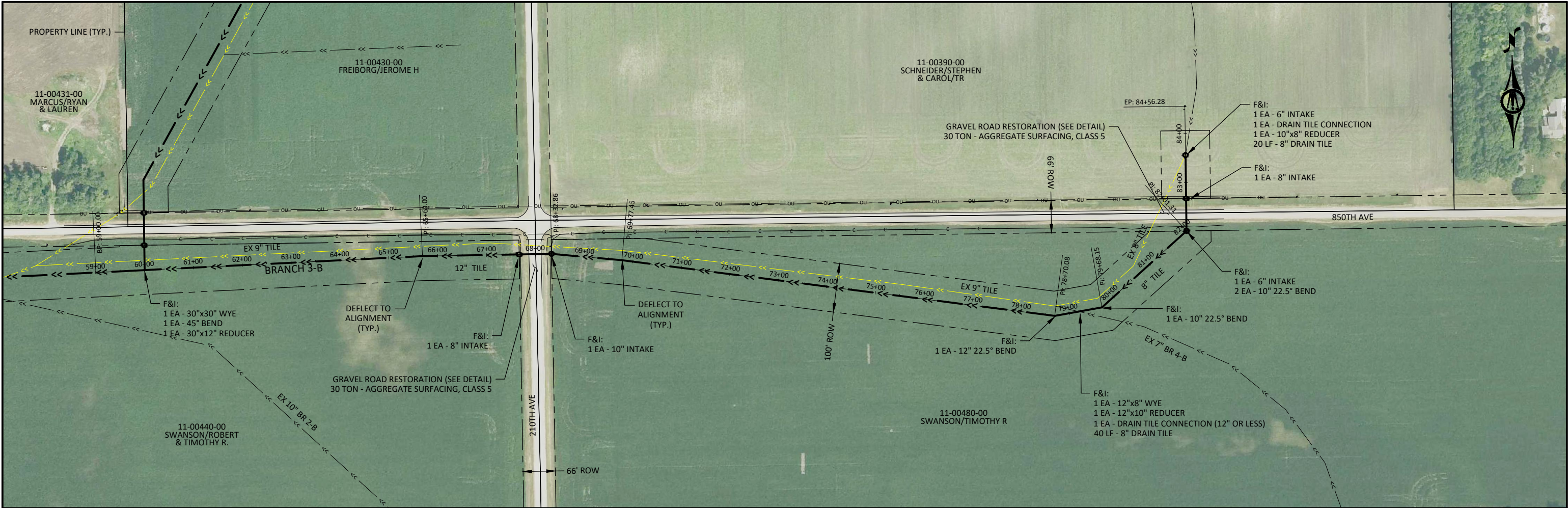
STABILIZED CONSTRUCTION EXIT (TO BE MARKED ON PLANS BY CONTRACTOR)

RAPID STABILIZATION, METHOD 4

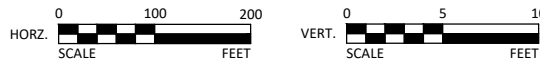
HYDRAULIC MULCH MATRIX
MnDOT 3884.2.8.2
@ 2500 LB/ACRE







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BILL: HELGREN, P.E.
LIC. NO. 42046 DATE MM/DD/YYYY

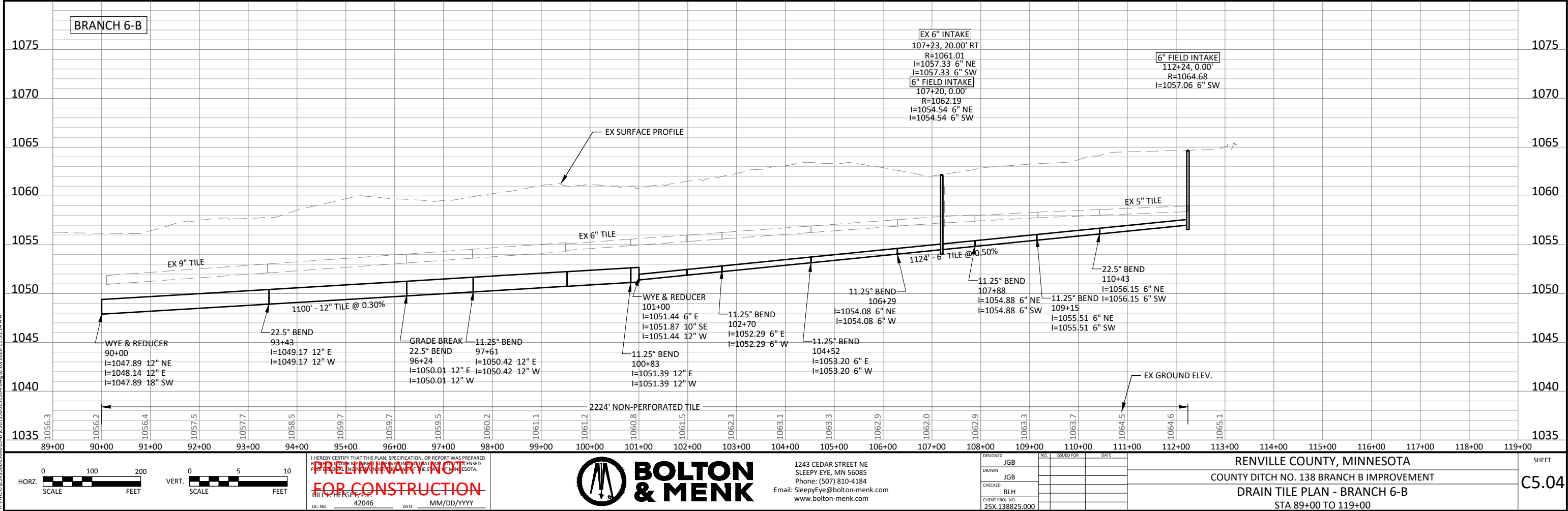
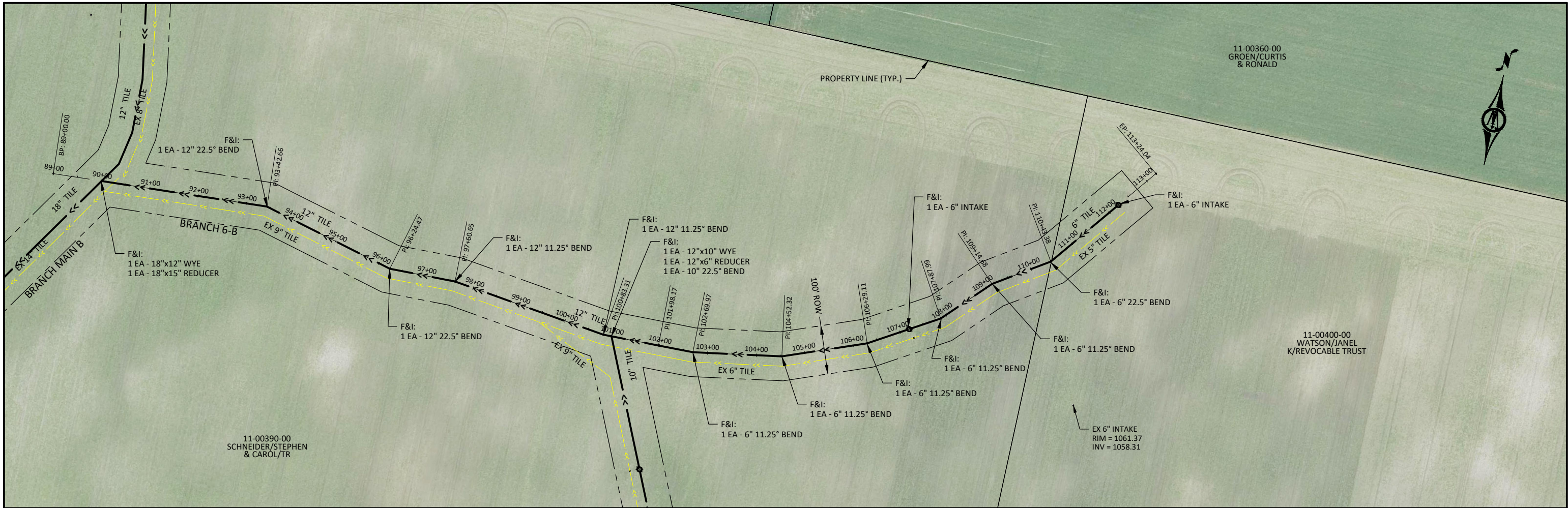


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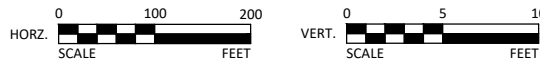
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CLIENT PROJ. NO.	25X.138825.000		

RENNVILLE COUNTY, MINNESOTA
COUNTY DITCH NO. 138 BRANCH B IMPROVEMENT
DRAIN TILE PLAN - BANCH 3-B
STA 59+00 TO 89+00

SHEET
C5.03



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CHECKED			
BLH			
CLIENT PROJ. NO.			
25X138825.000			

RENNVILLE COUNTY, MINNESOTA
COUNTY DITCH NO. 138 BRANCH B IMPROVEMENT
DRAIN TILE PLAN - BRANCH 6-B
STA 89+00 TO 119+00

SHEET
C5.04

Exhibit 2: Preliminary Cost Estimate

ENGINEER'S ESTIMATE

County Ditch No. 138 Branch B
Renville County, MN
25X.138825.000



Real People. Real Solutions.

Date: 9/10/2026

Item No.	Item	Estimated Quantity	Unit	Unit Price	Total Amount
BASE BID					
1	MOBILIZATION	1	LUMP SUM	\$40,000.00	\$40,000.00
2	AGGREGATE SURFACING CLASS 5	120	TON	\$35.00	\$4,200.00
3	EXPLORATORY EXCAVATION	70	HOURL	\$300.00	\$21,000.00
4	CONNECT TO EXISTING DRAIN TILE (12" OR LESS)	60	EACH	\$600.00	\$36,000.00
5	CONNECT TO EXISTING DRAIN TILE (15" OR GREATER)	1	EACH	\$1,000.00	\$1,000.00
6	GRANULAR FOUNDATION ROCK	11960	LIN FT	\$5.00	\$59,800.00
7	TRENCH FOUNDATION ROCK	990	TON	\$40.00	\$39,600.00
8	6" FIELD INTAKE	6	EACH	\$500.00	\$3,000.00
9	6" HICKENBOTTOM INTAKE	1	EACH	\$650.00	\$650.00
10	8" FIELD INTAKE	2	EACH	\$650.00	\$1,300.00
11	8" HICKENBOTTOM INTAKE	3	EACH	\$800.00	\$2,400.00
12	10" HICKENBOTTOM INTAKE	1	EACH	\$1,000.00	\$1,000.00
13	12" FIELD INTAKE	1	EACH	\$1,000.00	\$1,000.00
14	12" HICKENBOTTOM INTAKE	3	EACH	\$1,200.00	\$3,600.00
15	6" NON-PERFORATED TILE	1840	LIN FT	\$16.00	\$29,440.00
16	8" NON-PERFORATED TILE	680	LIN FT	\$20.00	\$13,600.00
17	10" NON-PERFORATED TILE	1160	LIN FT	\$22.00	\$25,520.00
18	12" NON-PERFORATED TILE	3660	LIN FT	\$24.00	\$87,840.00
19	18" NON-PERFORATED TILE	1020	LIN FT	\$31.00	\$31,620.00
20	24" NON-PERFORATED TILE	1600	LIN FT	\$42.00	\$67,200.00
21	30" NON-PERFORATED TILE	1800	LIN FT	\$52.00	\$93,600.00
22	30" HEAVY DUTY TILE	280	LIN FT	\$80.00	\$22,400.00
23	36" CM TILE	20	LIN FT	\$150.00	\$3,000.00
24	RANDOM RIPRAP, CLASS 3	40	TON	\$110.00	\$4,400.00
25	INLET PROTECTION	23	EACH	\$100.00	\$2,300.00
26	MULCH TYPE 1	52	TON	\$175.00	\$9,100.00
27	RAPID STABILIZATION METHOD 4	2240	SQ YD	\$2.50	\$5,600.00
28	STABILIZED CONSTRUCTION EXIT	1.00	LUMP SUM	\$2,000.00	\$2,000.00

ESTIMATED BASE BID TOTAL: \$612,170.00

TEMPORARY ROW DAMAGES 26.43 ACRES \$600.00 \$15,858.00

SUBTOTAL: \$628,028.00

20% CONTINGENCY: \$125,605.00

TOTAL ESTIMATED CONSTRUCTION COST: \$753,633.00

DESIGN, ADMINISTRATION AND CONSTRUCTION ENGINEERING: \$150,727.00

TOTAL ESTIMATED PROJECT COST: \$904,360.00

ENGINEER'S ESTIMATE

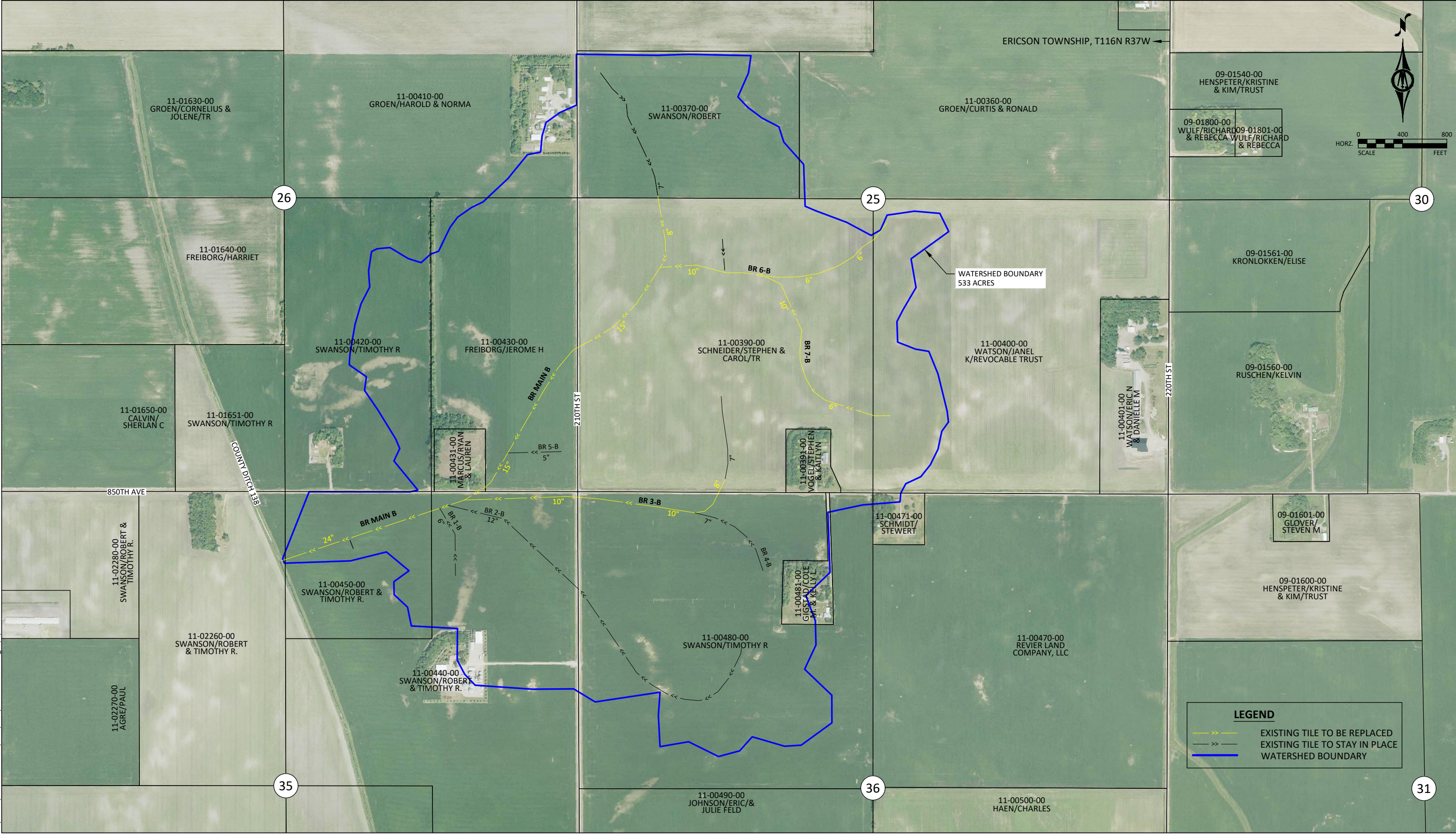
County Ditch No. 138 Branch B
Renville County, MN
25X.138825.000



Date: 9/10/2026

Item No.	Item	Estimated Quantity	Unit	Unit Price	Total Amount	BRANCH MAIN B		BRANCH 3-B		BRANCH 6-B		BRANCH MAIN 7-B	
						Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost
BASE BID													
1	MOBILIZATION	1.00	LUMP SUM	\$40,000.00	\$40,000.00	0.57	\$22,800.00	0.17	\$6,800.00	0.14	\$5,600.00	0.12	\$4,800.00
2	AGGREGATE SURFACING CLASS 5	120	TON	\$35.00	\$4,200.00	60	\$2,100.00	60	\$2,100.00				
3	EXPLORATORY EXCAVATION	70	HOUR	\$300.00	\$21,000.00	32	\$9,600.00	14	\$4,200.00	12	\$3,600.00	12	\$3,600.00
4	CONNECT TO EXISTING DRAIN TILE (12" OR LESS)	60	EACH	\$600.00	\$36,000.00	25	\$15,000.00	12	\$7,200.00	11	\$6,600.00	12	\$7,200.00
5	CONNECT TO EXISTING DRAIN TILE (15" OR GREATER)	1	EACH	\$1,000.00	\$1,000.00	1	\$1,000.00						
6	GRANULAR FOUNDATION ROCK	11960	LIN FT	\$5.00	\$59,800.00	5,480	\$27,400.00	2,360	\$11,800.00	2,240	\$11,200.00	1,880	\$9,400.00
7	TRENCH FOUNDATION ROCK	990	TON	\$40.00	\$39,600.00	450	\$18,000.00	210	\$8,400.00	180	\$7,200.00	150	\$6,000.00
8	6" FIELD INTAKE	6	EACH	\$500.00	\$3,000.00								
9	6" HICKENBOTTOM INTAKE	1	EACH	\$650.00	\$650.00								
10	8" FIELD INTAKE	2	EACH	\$650.00	\$1,300.00	1	\$650.00						
11	8" HICKENBOTTOM INTAKE	3	EACH	\$800.00	\$2,400.00	1	\$800.00	2	\$1,600.00				
12	10" HICKENBOTTOM INTAKE	1	EACH	\$1,000.00	\$1,000.00	1	\$1,000.00	1	\$1,000.00				
13	12" FIELD INTAKE	1	EACH	\$1,000.00	\$1,000.00								
14	12" HICKENBOTTOM INTAKE	3	EACH	\$1,200.00	\$3,600.00	3	\$3,600.00						
15	6" NON-PERFORATED TILE	1840	LIN FT	\$16.00	\$29,440.00	80	\$1,280.00			1,140	\$18,240.00	620	\$9,920.00
16	8" NON-PERFORATED TILE	680	LIN FT	\$20.00	\$13,600.00	40	\$800.00	500	\$10,000.00			140	\$2,800.00
17	10" NON-PERFORATED TILE	1160	LIN FT	\$22.00	\$25,520.00	40	\$880.00					1,120	\$24,640.00
18	12" NON-PERFORATED TILE	3660	LIN FT	\$24.00	\$87,840.00	640	\$15,360.00	1,920	\$46,080.00	1,100	\$26,400.00		
19	18" NON-PERFORATED TILE	1020	LIN FT	\$31.00	\$31,620.00	1,020	\$31,620.00						
20	24" NON-PERFORATED TILE	1600	LIN FT	\$42.00	\$67,200.00	1,600	\$67,200.00						
21	30" NON-PERFORATED TILE	1800	LIN FT	\$52.00	\$93,600.00	1,800	\$93,600.00						
22	30" HEAVY DUTY TILE	280	LIN FT	\$80.00	\$22,400.00	280	\$22,400.00						
23	36" CM TILE	20	LIN FT	\$150.00	\$3,000.00	20	\$3,000.00						
24	RANDOM RIPRAP, CLASS 3	40	TON	\$110.00	\$4,400.00	40	\$4,400.00						
25	INLET PROTECTION	23	EACH	\$100.00	\$2,300.00	8	\$800.00	6	\$600.00	3	\$300.00	6	\$600.00
26	MULCH TYPE 1	52	TON	\$175.00	\$9,100.00	24	\$4,200.00	10	\$1,750.00	10	\$1,750.00	8	\$1,400.00
27	RAPID STABILIZATION METHOD 4	2240	SQ YD	\$2.50	\$5,600.00	1,320	\$3,300.00	920	\$2,300.00				
28	STABILIZED CONSTRUCTION EXIT	1.00	LUMP SUM	\$2,000.00	\$2,000.00	0.57	\$1,140.00	0.17	\$340.00	0.14	\$280.00	0.12	\$240.00
ESTIMATED BASE BID TOTAL:					\$612,170.00		\$351,930.00		\$105,320.00		\$82,170.00		\$72,750.00
TEMPORARY ROW DAMAGES						26.43	ACRES	\$600.00	\$15,858.00		\$3,066.00	5.10	\$2,526.00
SUBTOTAL:					\$628,028.00		\$359,136.00		\$108,386.00		\$85,230.00		\$75,276.00
20% CONTINGENCY:					\$125,605.00		\$71,827.00		\$21,677.00		\$17,046.00		\$15,055.00
TOTAL ESTIMATED CONSTRUCTION COST:					\$753,633.00		\$430,963.00		\$130,063.00		\$102,276.00		\$90,331.00
DESIGN, ADMINISTRATION AND CONSTRUCTION ENGINEERING:					\$150,727.00		\$86,193.00		\$26,013.00		\$20,455.00		\$18,066.00
TOTAL ESTIMATED PROJECT COST:					\$904,360.00		\$517,156.00		\$156,076.00		\$122,731.00		\$108,397.00

Exhibit 3: Separable Maintenance



**BOLTON
& MENK**

Real People. Real Solutions.

Date: 9/10/2026

Item No.	Item	Estimated Quantity	Unit	Unit Price	Total Amount	BRANCH MAIN B		BRANCH 3-B		BRANCH 6-B		BRANCH MAIN 7-B	
						Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost
BASE BID													
1	MOBILIZATION	1.00	LUMP SUM	\$40,000.00	\$40,000.00	0.58	\$23,200.00	0.15	\$6,000.00	0.17	\$6,800.00	0.10	\$4,000.00
2	AGGREGATE SURFACING CLASS 5	120	TON	\$35.00	\$4,200.00	60	\$2,100.00	60	\$2,100.00				
3	EXPLORATORY EXCAVATION	70	HOUR	\$300.00	\$21,000.00	32	\$9,600.00	14	\$4,200.00	12	\$3,600.00	12	\$3,600.00
4	CONNECT TO EXISTING DRAIN TILE (12" OR LESS)	60	EACH	\$600.00	\$36,000.00	25	\$15,000.00	12	\$7,200.00	11	\$6,600.00	12	\$7,200.00
5	CONNECT TO EXISTING DRAIN TILE (15" OR GREATER)	1	EACH	\$1,000.00	\$1,000.00	1	\$1,000.00						
6	GRANULAR FOUNDATION ROCK	11960	LIN FT	\$5.00	\$59,800.00	5,480	\$27,400.00	2,360	\$11,800.00	2,240	\$11,200.00	1,880	\$9,400.00
7	TRENCH FOUNDATION ROCK	990	TON	\$40.00	\$39,600.00	450	\$18,000.00	210	\$8,400.00	180	\$7,200.00	150	\$6,000.00
8	6" INTAKE	13	EACH	\$500.00	\$6,500.00	4	\$2,000.00	4	\$2,000.00	2	\$1,000.00	3	\$1,500.00
9	8" INTAKE	3	EACH	\$650.00	\$1,950.00	2	\$1,300.00					1	\$650.00
10	6" HDPE TILE	1980	LIN FT	\$16.00	\$31,680.00	80	\$1,280.00			1280	\$20,480.00	620	\$9,920.00
11	8" HDPE TILE	2160	LIN FT	\$20.00	\$43,200.00	640	\$12,800.00					1040	\$20,800.00
12	10" HDPE TILE	3100	LIN FT	\$22.00	\$68,200.00	40	\$880.00	1880	\$41,360.00	960	\$21,120.00	220	\$4,840.00
13	15" HDPE TILE	1360	LIN FT	\$26.00	\$35,360.00	1360	\$35,360.00						
14	18" HDPE TILE	1760	LIN FT	\$31.00	\$54,560.00	1760	\$54,560.00						
15	24" HDPE TILE	1300	LIN FT	\$42.00	\$54,600.00	1300	\$54,600.00						
16	24" HEAVY DUTY TILE	280	LIN FT	\$70.00	\$19,600.00	280	\$19,600.00						
17	30" CW TILE	20	LIN FT	\$125.00	\$2,500.00	20	\$2,500.00						
18	RANDOM RIPRAP, CLASS 3	40	TON	\$110.00	\$4,400.00	40	\$4,400.00						
19	INLET PROTECTION	22	EACH	\$100.00	\$2,200.00	8	\$800.00	5	\$500.00	3	\$300.00	6	\$600.00
20	MULCH TYPE 1	52	TON	\$175.00	\$9,100.00	24	\$4,200.00	10	\$1,750.00	10	\$1,750.00	8	\$1,400.00
21	RAPID STABILIZATION METHOD 4	2240	SQ YD	\$2.50	\$5,600.00	1320	\$3,300.00	920	\$2,300.00				
22	STABILIZED CONSTRUCTION EXIT	1.00	LUMP SUM	\$2,000.00	\$2,000.00	0.58	\$1,160.00	0.15	\$300.00	0.17	\$340.00	0.10	\$200.00
ESTIMATED BASE BID TOTAL:					\$543,050.00		\$295,040.00		\$97,510.00		\$80,390.00		\$70,110.00
TEMPORARY ROW DAMAGES						26.43	ACRES	\$600.00	\$15,858.00		\$3,060.00	5.10	\$2,526.00
SUBTOTAL:					\$558,908.00		\$302,246.00		\$100,576.00		\$83,450.00		\$72,636.00
20% CONTINGENCY:					\$111,781.00		\$60,449.00		\$20,115.00		\$16,690.00		\$14,527.00
TOTAL ESTIMATED CONSTRUCTION COST:					\$670,689.00		\$362,695.00		\$120,691.00		\$100,140.00		\$87,163.00
DESIGN, ADMINISTRATION AND CONSTRUCTION ENGINEERING:					\$134,138.00		\$72,539.00		\$24,138.00		\$20,028.00		\$17,433.00
TOTAL ESTIMATED PROJECT COST:					\$804,827.00		\$435,234.00		\$144,825.00		\$120,168.00		\$104,596.00

Exhibit 4: Right-of-Way Table

County Ditch No. 138 Branch B Improvement

Renville County, MN

Right-of-way Table

25X.138825.000



Real People. Real Solutions.

Date: 8/10/2026

Parcel No.	Property Owner	Legal Description	Repair Right-of-Way					Temporary
			Station to Station	Length	Width	Area (Acres)	\$600	
Branch Main B								
11-02260-00	SWANSON/ROBERT & TIMOTH R.	NE 1/4, NE 1/4	0+23	0+51	28	100	0.06	\$36.00
11-00450-00	SWANSON/ROBERT & TIMOTH R.	NW 1/4, NE 1/4	0+51	14+42	1391	100	3.19	\$1,914.00
11-00440-00	SWANSON/ROBERT & TIMOTH R.	NE 1/4, NE 1/4	14+42	20+21	579	100	1.33	\$798.00
11-00430-00	FREIBORG/JEROME H	SE 1/4, SE 1/4	20+87	36+17	1530	100	3.51	\$2,106.00
11-00390-00	SCHNEIDER/STEPHEN & CAROL/TR	NW 1/4, SW 1/4	36+83	53+20	1637	100	3.76	\$2,256.00
11-00370-00	SWANSON/ROBERT	SW 1/4, NW 1/4	53+20	53+89	69	100	0.16	\$96.00
Branch 3-B								
11-00440-00	SWANSON/ROBERT & TIMOTH R.	NE 1/4, NE 1/4	60+50	67+67	717	100	1.65	\$990.00
11-00480-00	SWANSON/ROBERT & TIMOTH R.	NW 1/4, NW 1/4	68+33	82+01	1368	100	3.14	\$1,884.00
11-00390-00	SCHNEIDER/STEPHEN & CAROL/TR	SW 1/4, SW 1/4	82+67	84+06	139	100	0.32	\$192.00
Branch 6-B								
11-00390-00	SCHNEIDER/STEPHEN & CAROL/TR	NW 1/4, SW 1/4	90+40	96+24	584	100	1.34	\$804.00
		NE 1/4, SW 1/4	96+24	110+46	1422	100	3.26	\$1,956.00
11-00400-00	WATSON/JANEL K/REVOCABLE TRUST	NW 1/4, SE 1/4	110+46	112+64	218	100	0.50	\$300.00
Branch 7-B								
11-00390-00	SCHNEIDER/STEPHEN & CAROL/TR	NE 1/4, SW 1/4	120+50	127+30	680	100	1.56	\$936.00
		SE 1/4, SW 1/4	127+30	136+79	949	100	2.18	\$1,308.00
11-00400-00	WATSON/JANEL K/REVOCABLE TRUST	SW 1/4, SE 1/4	136+79	138+85	206	100	0.47	\$282.00
TOTAL			Total Branch B Improvement Right-of-Way Damages = \$15,858.00					
H:\R\NCO\25X138825000\3_Design\A_Calculations\[138825_ROW.xlsx]Sheet1								

H:\RNC0\25X138825000\3_Design\A_Calculations\[138825_ROW.xlsx]Sheet1

Exhibit 5: Televising Images



Drainage Department

Shane Bruns - Drainage Technician
Renville County Government Services Center
105 South 5th Street • Suite 319 • Olivia, MN 56277
Office: 320-523-3712 • Cell: 320-522-4774
Email: shane.bruns@renvillecountymn.gov
www.renvillecountymn.gov

Tile Conditions

- CD 138 Br – 6B was televised and revealed offset joints in several sections of the main (see picture below)
- CD 138 Br – Main B was found to be out of repair in spots
 - In Parcel Number 11-00450-00 & 11-00440-00 the tile line has been repaired in multiple locations
 - Sand was found in the tile in multiple locations in these same parcels
 - In Parcel Number 11-00430-00 the tile line has settled in spots throughout the parcel causing sags in the tile up to 7 inches
 - In Parcel Number 11-00390-00 the tile line was repaired in multiple locations as well as taking on dirt close to where Br – 6B outlets in to Br – Main B

Br – Main B 8” half full of mud

Parcel Number 11-00370-00



Br – 6B 9”

Parcel Number 11-00390-00



Br – Main B 14” filled with sand

Parcel Number 11-00390-00



Exhibit 6: Petition for Improvement

**PETITION FOR IMPROVEMENT OF DRAINAGE SYSTEM
FOR RENVILLE COUNTY DITCH NO. 138**

TO: RENVILLE COUNTY BOARD OF COMMISSIONERS AS THE DRAINAGE
AUTHORITY FOR RENVILLE COUNTY DITCH NO. 138

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 and designated as County Ditch No. 138 ("CD 138") located in Ericson Township, Renville County, Minnesota.

3. Need for Improvement.

The existing drainage system has insufficient capacity or needs enlarging or extending to furnish sufficient capacity or a better outlet. The proposed improvements are necessary because the existing drainage system does not have sufficient capacity to adequately drain agricultural land for modern farming practices. 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 and enlarging Branch B of CD 138, together with lateral branches Branch 3B, 6B, and 7B.

Branch B would be improved from its outlet into the open ditch portion of CD 138 in the NE $\frac{1}{4}$ of the NW $\frac{1}{4}$ Section 35 of Ericson Township and continue along its length to the southern boundary of the SW $\frac{1}{4}$ of the NW $\frac{1}{4}$ Section 25.

Branch 3B would be improved from its outlet into Branch B in the NE $\frac{1}{4}$ of the NE $\frac{1}{4}$ Section 35 and continue along its length to the southern boundary of the SW $\frac{1}{4}$ Section 25.

Branch 6B would be improved from its outlet into Branch B in the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ Section 25 and continue along its length to its terminus in the NW $\frac{1}{4}$ of the SE $\frac{1}{4}$ Section 25.

Branch 7B would be improved from its outlet into Branch 6B in the NE ¼ of the SW ¼ Section 25 and continue along its length to its terminus in the SW ¼ of the SE ¼ Section 25.

The portions of the drainage system subject to this petition consist of buried tile. Branches B, 3B, 6B, and 7B would be enlarged and capacity increased where necessary to meet the NRCS recommended standard ½ inch per day drainage coefficient. The location of the proposed improvements, subject to any alterations deemed prudent or necessary by the project engineer, are depicted on the map attached hereto as **Exhibit A** and is located in Ericson Township in Renville County.

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	Robert Swanson and Timothy R. Swanson, Trustees of Family Share Trust	84709 210 th St Renville, MN 56284	11-02260-00	NE ¼ NW ¼	35	116N	37W	Renville
2	Robert Swanson and Timothy R. Swanson, Trustees of Family Share Trust	84709 210 th St Renville, MN 56284	11-00450-00	NW ¼ NE ¼	35	116N	37W	Renville
3	Robert Swanson and Timothy R. Swanson, Trustees of Family Share Trust	84709 210 th St Renville, MN 56284	11-00440-00	NE ¼ NE ¼	35	116N	37W	Renville
4	Timothy R. Swanson	84709 210 th St Renville, MN 56284	11-00480-00	NW ¼ NW ¼	36	116N	37W	Renville
5	Jerome H. Freiborg	PO Box 327 Renville, MN 56284	11-00430-00	SE ¼ SE ¼	26	116N	37W	Renville
6	Stephen L. & Carol J. Schneider Living Trust (c/o Hertz Farm Management)	151 St. Andrews Court #1310 Mankato, MN 56001	11-00390-00	SW ¼ SW ¼	25	116N	37W	Renville
7	Stephen L. & Carol J. Schneider Living Trust (c/o Hertz Farm Management)	151 St. Andrews Court #1310 Mankato, MN 56001	11-00390-00	SE ¼ SW ¼	25	116N	37W	Renville
8	Stephen L. & Carol J. Schneider Living Trust (c/o Hertz Farm Management)	151 St. Andrews Court #1310 Mankato, MN 56001	11-00390-00	NW ¼ SW ¼	25	116N	37W	Renville

	Owner	Address	PID	Description	Sec	Twp	Rge	County
9	Stephen L. & Carol J. Schneider Living Trust (c/o Hertz Farm Management)	151 St. Andrews Court #1310 Mankato, MN 56001	11-00390-00	NE ¼ SW ¼	25	116N	37W	Renville
10	Janel K. Watson Revocable Trust & Curtis J. Watson Revocable Trust	306 Cedar Ave Prinsburg, MN 56281	11-00400-00	NW ¼ SE ¼	25	116N	37W	Renville
11	Janel K. Watson Revocable Trust & Curtis J. Watson Revocable Trust	306 Cedar Ave Prinsburg, MN 56281	11-00400-00	SW ¼ SE ¼	25	116N	37W	Renville
12	Robert Swanson	PO Box 653 Renville, MN 56284	11-00370-00	SW ¼ NW ¼	25	116N	37W	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.

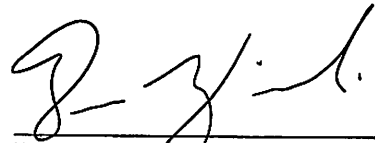
7. Cost Bond.

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 purposed improvement, including allowing the engineer to analyze other potential routes for the proposed improvement and whether separable maintenance may be employed. Petitioners request Bill L. Helget, P.E., Bolton & Menk, be appointed as project engineer.

Dated: December 10, 2025.



Dean M. Zimmerli #0396791
dzimmerli@gislason.com
GISLASON & HUNTER LLP
Attorney 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]

SIGNATURE PAGES FOR
PETITION FOR IMPROVEMENT OF DRAINAGE SYSTEM
FOR RENVILLE COUNTY DITCH NO. 138

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

Janel K. Watson as Janel Watson Revocable Trust
& Curtis J. Watson Revocable Trust,

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: Janel K. Watson Revocable Trust & Curtis J. Watson Revocable Trust)
☐ Other (explanation: J. Watson Revocable Trust)

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.

<u>Tract Description</u>	<u>Section</u>	<u>Township</u>	<u>Range</u>	<u>County</u>
<u>11-00400-00</u>	<u>25</u>	<u>116N</u>	<u>37W</u>	<u>Renville</u>
<u>11-00400-00</u>	<u>25</u>	<u>116N</u>	<u>37W</u>	<u>Renville</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Dated: 10-23-25

Janel K. Watson for Janel K. Watson
(signature) Revocable Trust & Curtis
J. Watson Revocable Trust

Dated: 10-23-25

Janel K. Watson for Janel K. Watson
(signature) Revocable Trust & Curtis J. Watson
Revocable Trust

Dated: _____

(signature)

SIGNATURE PAGES FOR
PETITION FOR IMPROVEMENT OF DRAINAGE SYSTEM
FOR RENVILLE COUNTY DITCH NO. 138

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

Stephen L. Schneider, as Trustee of the Stephen L. & Carol J. Schneider Living Trust

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: Stephen L. & Carol J. Schneider Living 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.

<u>Tract Description</u>	<u>Section</u>	<u>Township</u>	<u>Range</u>	<u>County</u>
<u>SW 1/4</u>	<u>25</u>	<u>116N</u>	<u>37W</u>	<u>Renville</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Dated: _____

Stephen L. Schneider
Stephen L. Schneider 04/17/2025 12:54:41 MDT
(signature)

Dated: _____

(signature)

Dated: _____

(signature)

EXHIBIT A

County Ditch 138 Branch B
Renville County

Proposed Conditions
May 2025

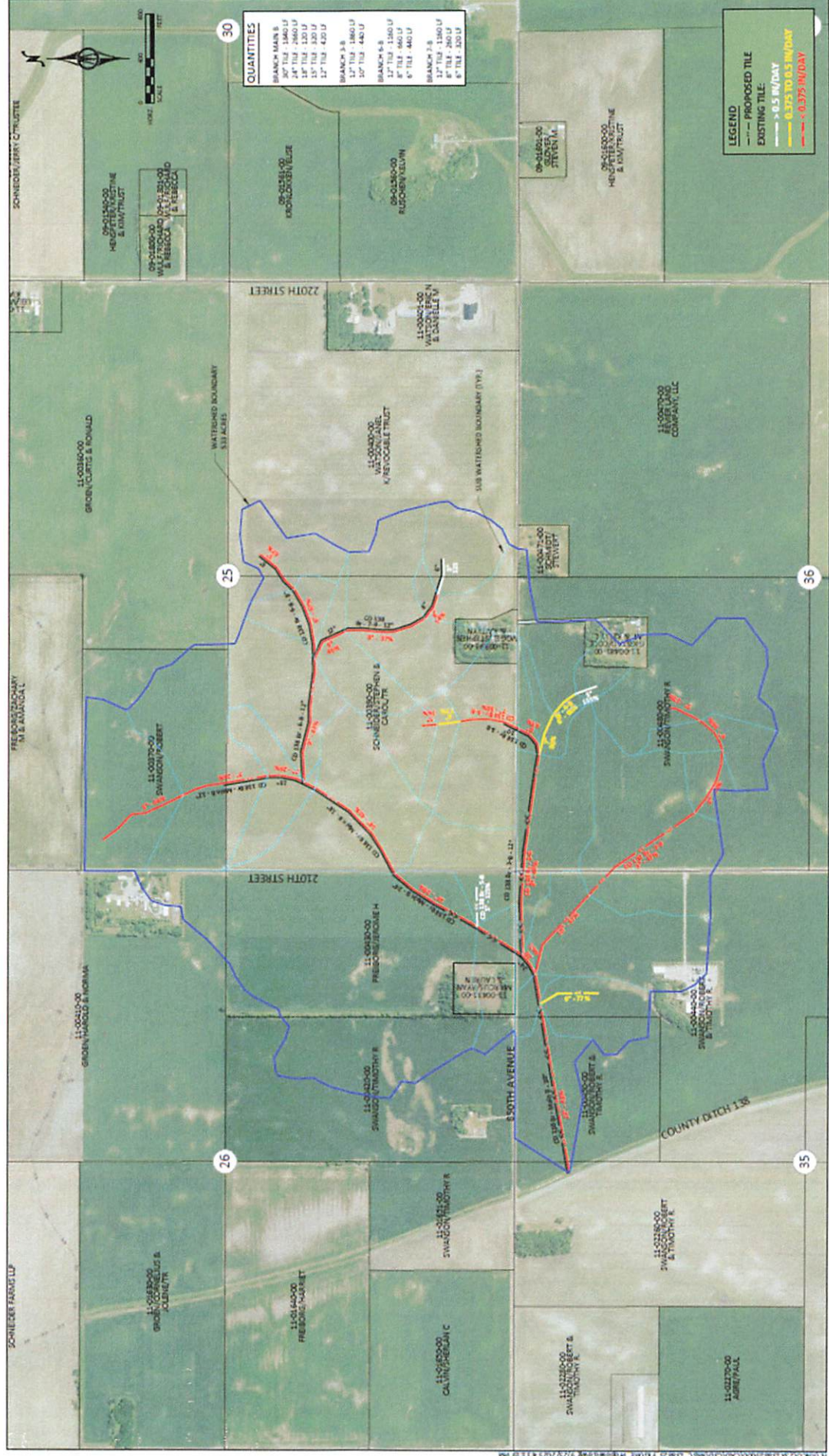


Exhibit 7: Tile Type Map

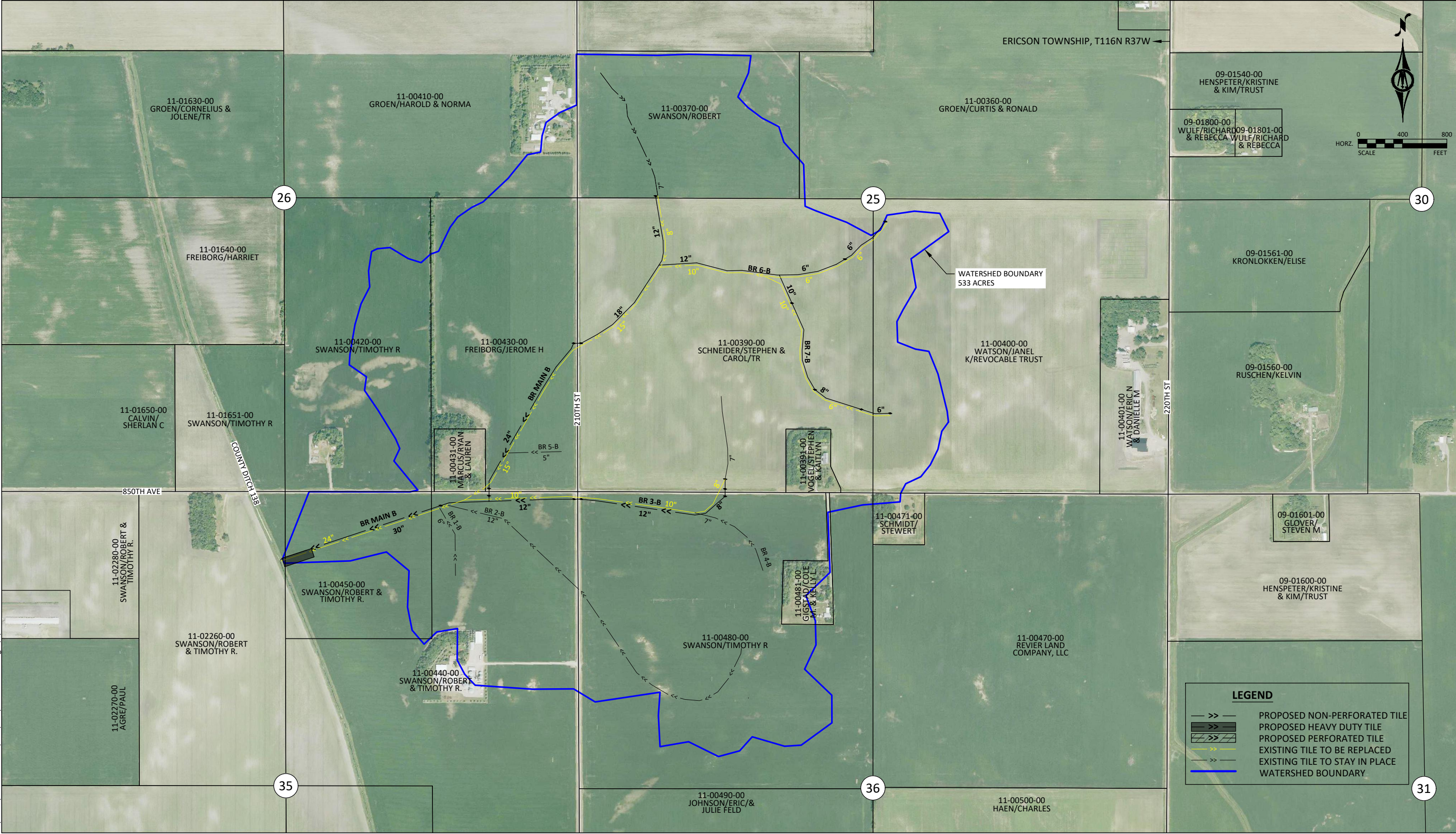


Exhibit 8: Hydrographs

138825_Existing

MSE 24-hr 3 5-year Rainfall=3.28"

Prepared by Bolton & Menk, Inc

Printed 9/1/2026

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Page 1

Summary for Pond 26P: (new Pond)

Inflow Area = 1,516.523 ac, 0.00% Impervious, Inflow Depth = 1.79" for 5-year event
 Inflow = 169.23 cfs @ 12.65 hrs, Volume= 226.410 af
 Outflow = 146.60 cfs @ 23.35 hrs, Volume= 226.410 af, Atten= 13%, Lag= 641.9 min
 Primary = 146.60 cfs @ 23.35 hrs, Volume= 226.410 af
 Routed to Reach 37R : Downstream of Outlet

Routing by Stor-Ind method, Time Span= 5.00-240.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,050.73' @ 23.35 hrs Surf.Area= 23.475 ac Storage= 27.818 af

Plug-Flow detention time= 131.6 min calculated for 226.410 af (100% of inflow)
 Center-of-Mass det. time= 131.6 min (1,736.6 - 1,605.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,041.50'	641.573 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,041.50	0.010	0.000	0.000
1,044.50	0.500	0.765	0.765
1,049.00	1.030	3.443	4.208
1,050.00	16.700	8.865	13.073
1,060.00	109.000	628.500	641.573

Device	Routing	Invert	Outlet Devices
#1	Primary	1,041.38'	Channel/Reach using Reach 37R: Downstream of Outlet
#2	Device 1	1,041.49'	48.0" Round 48" Rcp L= 43.0' Ke= 0.500 Inlet / Outlet Invert= 1,041.49' / 1,041.34' S= 0.0035 ' /' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#3	Device 1	1,047.80'	Overtopping, C= 3.27 Offset (feet) 0.00 326.00 735.00 1,006.90 1,225.00 1,469.50 1,796.10 1,905.00 2,013.80 2,313.00 2,422.00 2,531.00 2,694.00 Elev. (feet) 1,060.00 1,053.00 1,050.85 1,050.60 1,047.80 1,051.10 1,051.54 1,053.30 1,050.90 1,055.90 1,054.90 1,055.50 1,060.00

Primary OutFlow Max=146.51 cfs @ 23.35 hrs HW=1,050.73' (Free Discharge)

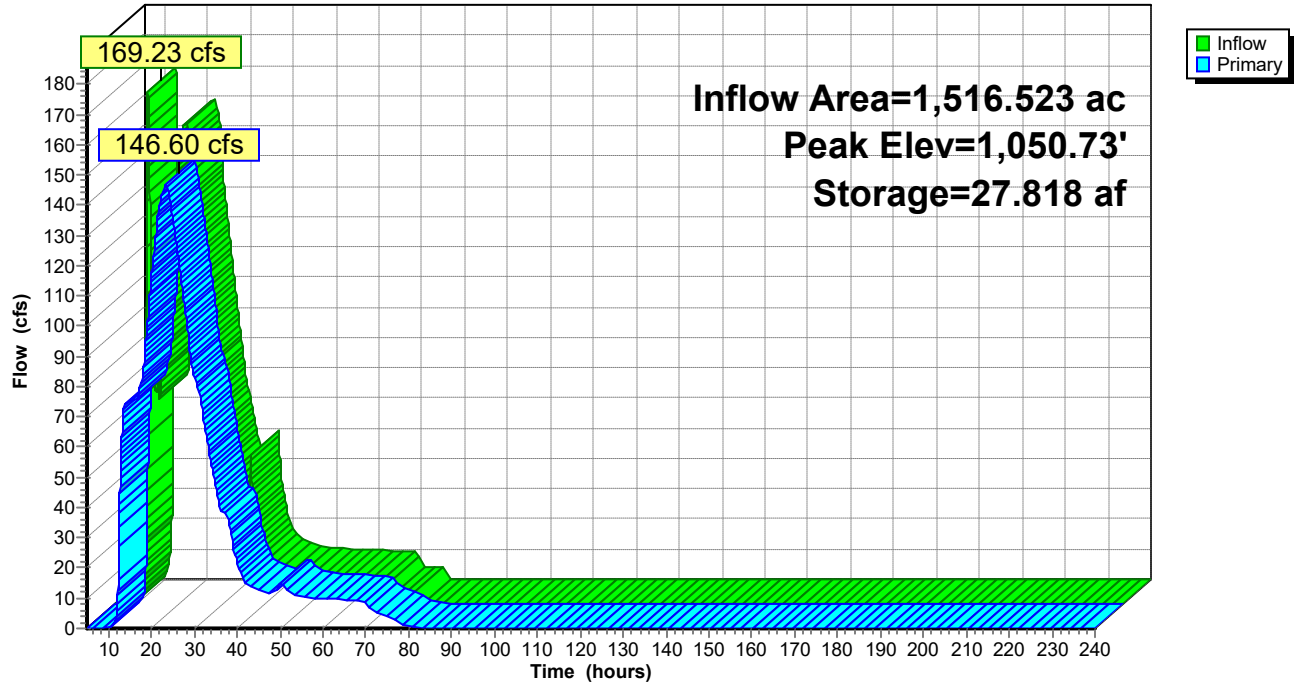
1=Channel/Reach (Channel Controls 146.51 cfs @ 0.09 fps)

2=48" Rcp (Passes < 162.85 cfs potential flow)

3=Overtopping (Passes < 2,940.05 cfs potential flow)

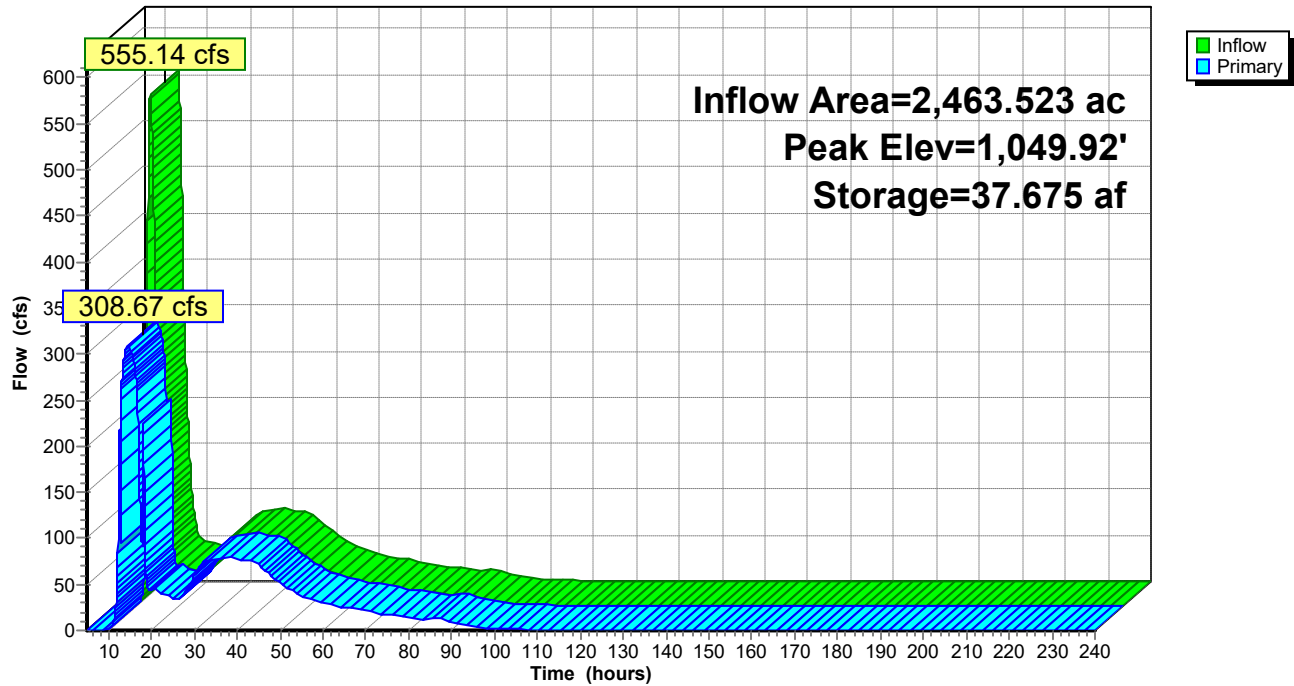
Pond 26P: (new Pond)

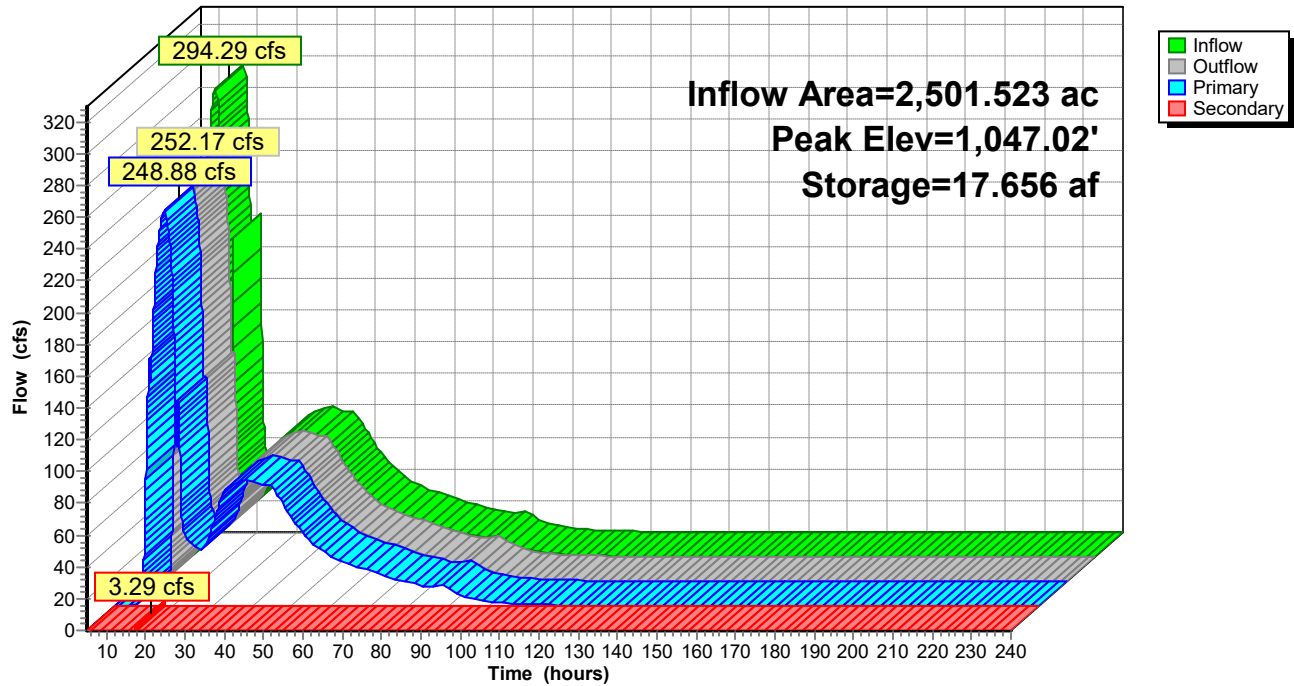
Hydrograph



Pond 29P: (new Pond)

Hydrograph



Pond 32P: (new Pond)**Hydrograph**

138825_Existing

MSE 24-hr 3 10-year Rainfall=3.87"

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Summary for Pond 26P: (new Pond)

Inflow Area = 1,516.523 ac, 0.00% Impervious, Inflow Depth = 2.30" for 10-year event
 Inflow = 212.44 cfs @ 12.64 hrs, Volume= 291.014 af
 Outflow = 185.66 cfs @ 23.39 hrs, Volume= 291.014 af, Atten= 13%, Lag= 644.9 min
 Primary = 185.66 cfs @ 23.39 hrs, Volume= 291.014 af
 Routed to Reach 37R : Downstream of Outlet

Routing by Stor-Ind method, Time Span= 5.00-240.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,051.01' @ 23.39 hrs Surf.Area= 25.981 ac Storage= 34.530 af

Plug-Flow detention time= 133.7 min calculated for 290.952 af (100% of inflow)
 Center-of-Mass det. time= 133.7 min (1,703.4 - 1,569.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,041.50'	641.573 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,041.50	0.010	0.000	0.000
1,044.50	0.500	0.765	0.765
1,049.00	1.030	3.443	4.208
1,050.00	16.700	8.865	13.073
1,060.00	109.000	628.500	641.573

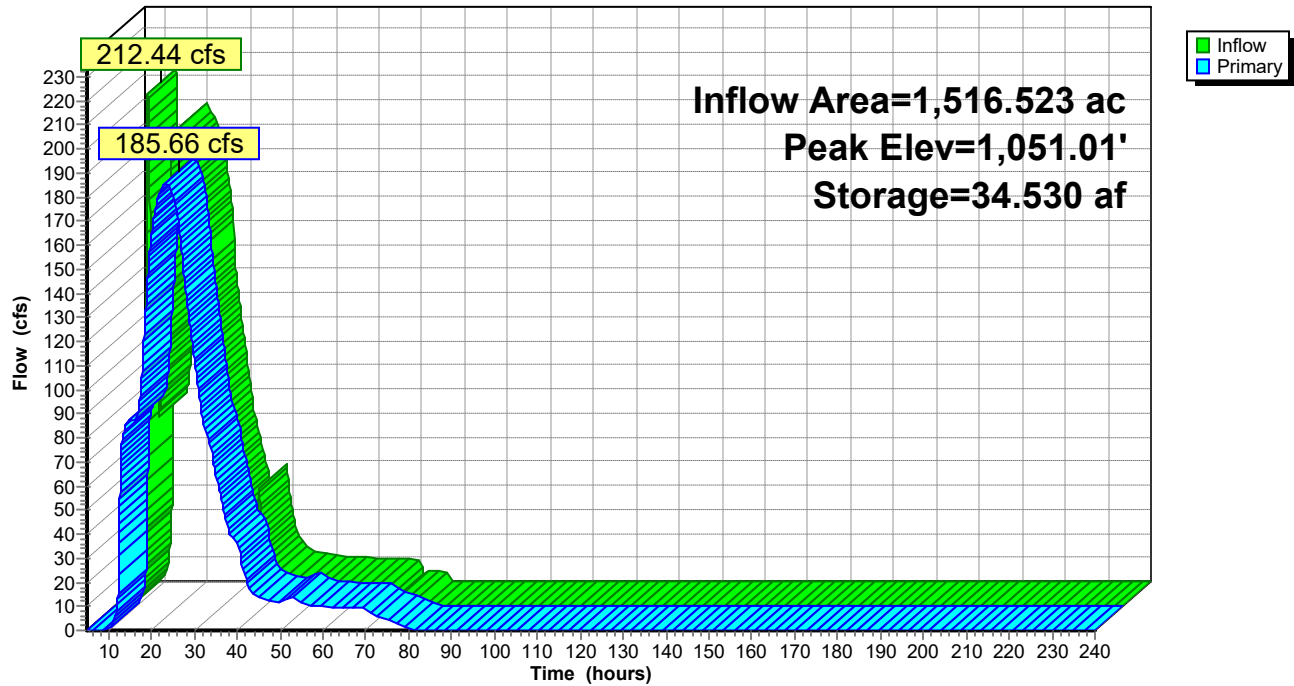
Device	Routing	Invert	Outlet Devices
#1	Primary	1,041.38'	Channel/Reach using Reach 37R: Downstream of Outlet
#2	Device 1	1,041.49'	48.0" Round 48" Rcp L= 43.0' Ke= 0.500 Inlet / Outlet Invert= 1,041.49' / 1,041.34' S= 0.0035 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#3	Device 1	1,047.80'	Overtopping, C= 3.27 Offset (feet) 0.00 326.00 735.00 1,006.90 1,225.00 1,469.50 1,796.10 1,905.00 2,013.80 2,313.00 2,422.00 2,531.00 2,694.00 Elev. (feet) 1,060.00 1,053.00 1,050.85 1,050.60 1,047.80 1,051.10 1,051.54 1,053.30 1,050.90 1,055.90 1,054.90 1,055.50 1,060.00

Primary OutFlow Max=185.37 cfs @ 23.39 hrs HW=1,051.01' (Free Discharge)

1=Channel/Reach (Channel Controls 185.37 cfs @ 0.10 fps)

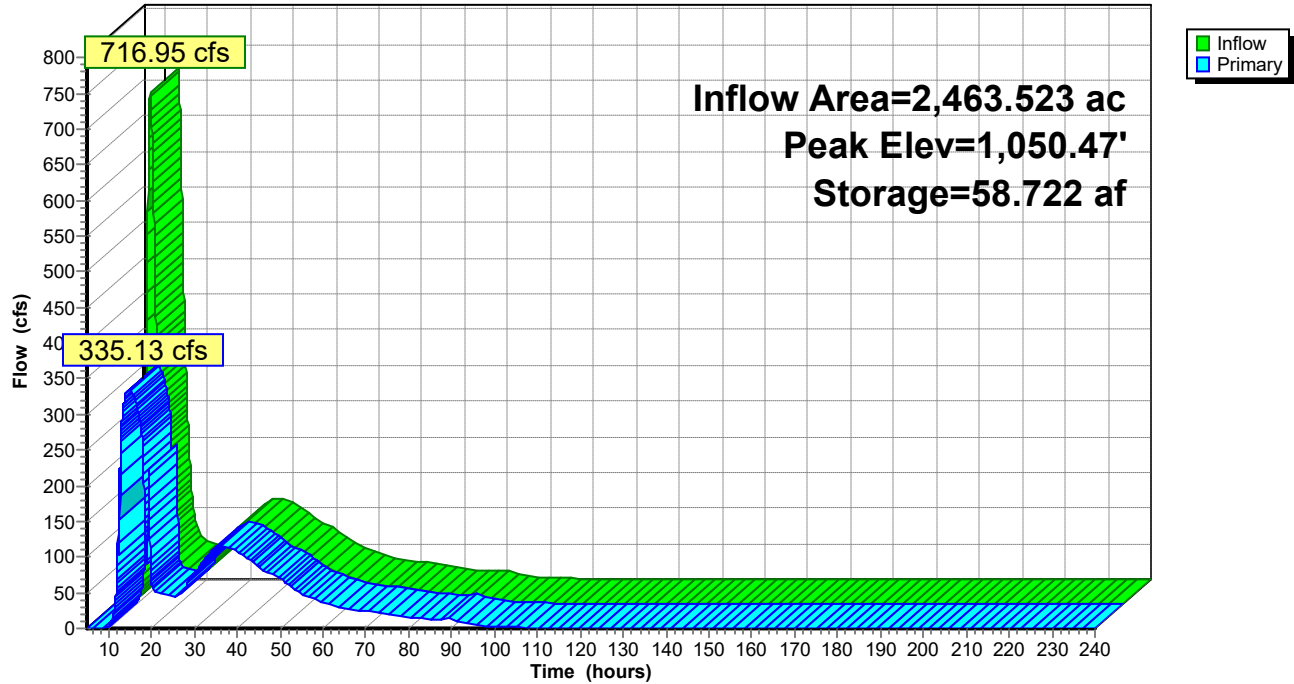
2=48" Rcp (Passes < 165.88 cfs potential flow)

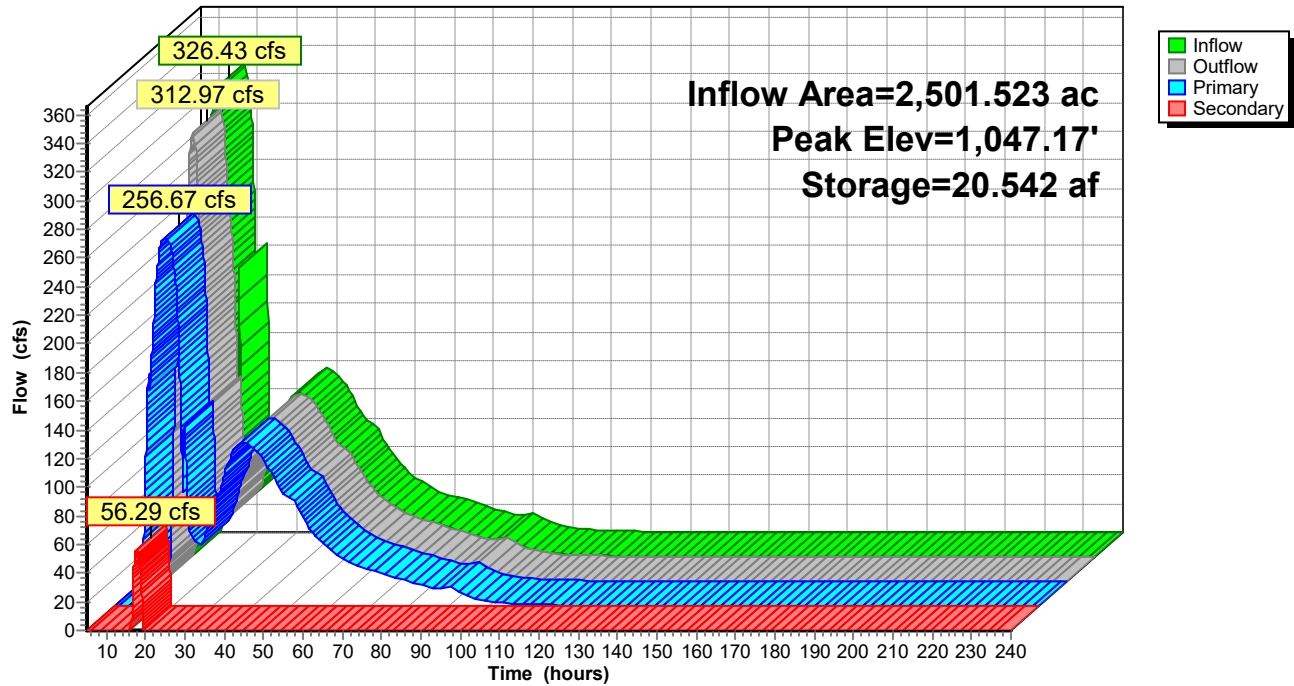
3=Overtopping (Passes < 3,784.77 cfs potential flow)

Pond 26P: (new Pond)**Hydrograph**

Pond 29P: (new Pond)

Hydrograph



Pond 32P: (new Pond)**Hydrograph**

138825_Existing

MSE 24-hr 3 25-year Rainfall=4.82"

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Summary for Pond 26P: (new Pond)

Inflow Area = 1,516.523 ac, 0.00% Impervious, Inflow Depth = 3.16" for 25-year event
 Inflow = 316.68 cfs @ 18.10 hrs, Volume= 398.938 af
 Outflow = 273.11 cfs @ 20.34 hrs, Volume= 398.938 af, Atten= 14%, Lag= 134.2 min
 Primary = 273.11 cfs @ 20.34 hrs, Volume= 398.938 af
 Routed to Reach 37R : Downstream of Outlet

Routing by Stor-Ind method, Time Span= 5.00-240.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,051.52' @ 20.34 hrs Surf.Area= 30.695 ac Storage= 49.004 af

Plug-Flow detention time= 132.2 min calculated for 398.853 af (100% of inflow)
 Center-of-Mass det. time= 132.2 min (1,631.3 - 1,499.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,041.50'	641.573 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,041.50	0.010	0.000	0.000
1,044.50	0.500	0.765	0.765
1,049.00	1.030	3.443	4.208
1,050.00	16.700	8.865	13.073
1,060.00	109.000	628.500	641.573

Device	Routing	Invert	Outlet Devices
#1	Primary	1,041.38'	Channel/Reach using Reach 37R: Downstream of Outlet
#2	Device 1	1,041.49'	48.0" Round 48" Rcp L= 43.0' Ke= 0.500 Inlet / Outlet Invert= 1,041.49' / 1,041.34' S= 0.0035 ' /' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#3	Device 1	1,047.80'	Overtopping, C= 3.27 Offset (feet) 0.00 326.00 735.00 1,006.90 1,225.00 1,469.50 1,796.10 1,905.00 2,013.80 2,313.00 2,422.00 2,531.00 2,694.00 Elev. (feet) 1,060.00 1,053.00 1,050.85 1,050.60 1,047.80 1,051.10 1,051.54 1,053.30 1,050.90 1,055.90 1,054.90 1,055.50 1,060.00

Primary OutFlow Max=272.95 cfs @ 20.34 hrs HW=1,051.52' (Free Discharge)

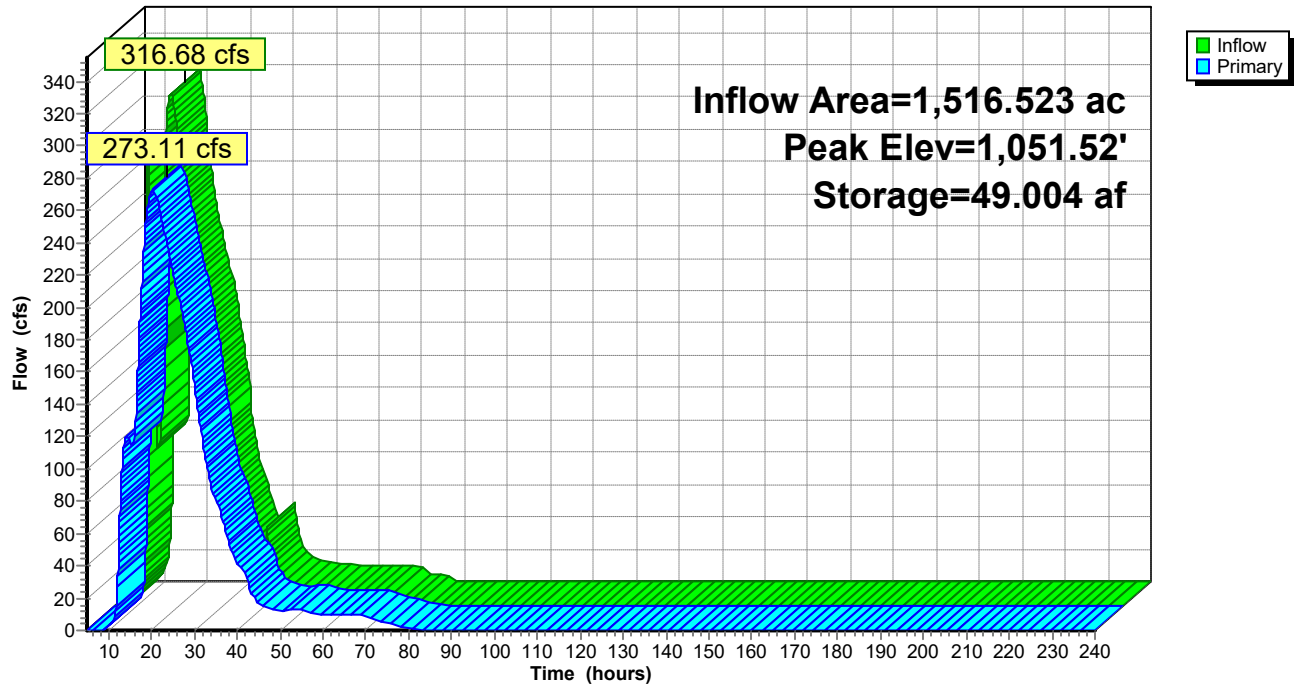
1=Channel/Reach (Channel Controls 272.95 cfs @ 0.11 fps)

2=48" Rcp (Passes < 171.42 cfs potential flow)

3=Overtopping (Passes < 6,067.31 cfs potential flow)

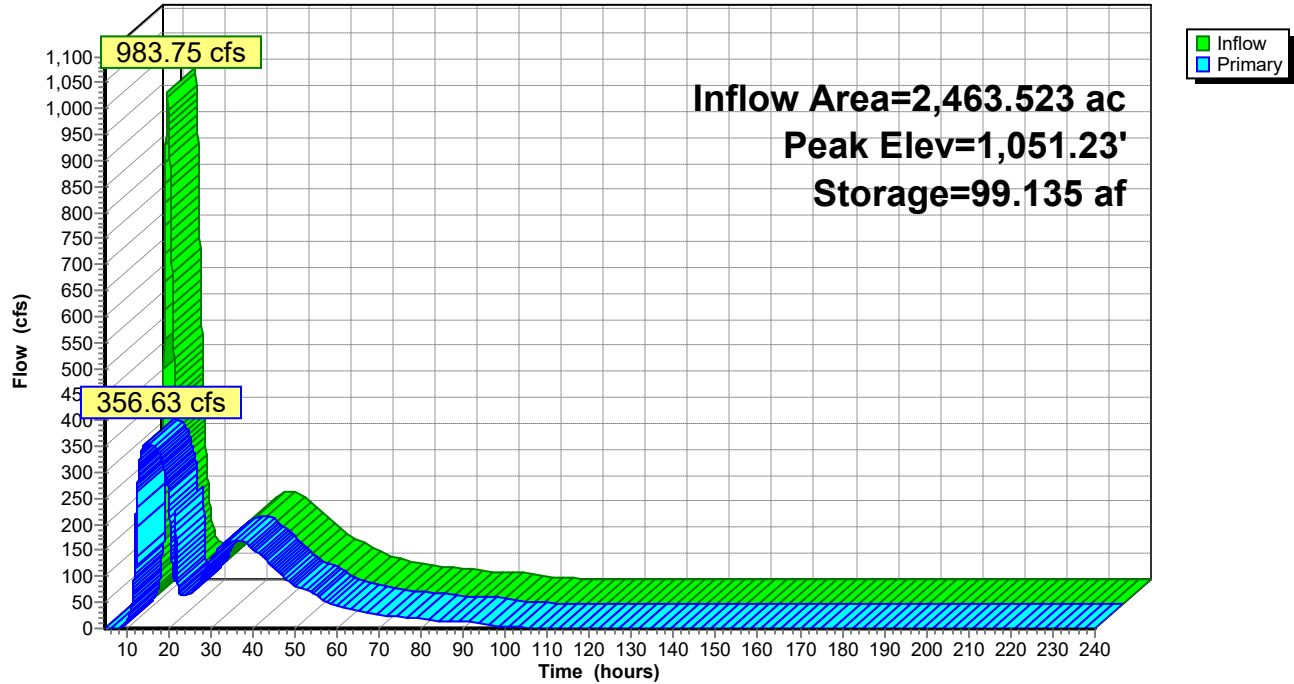
Pond 26P: (new Pond)

Hydrograph



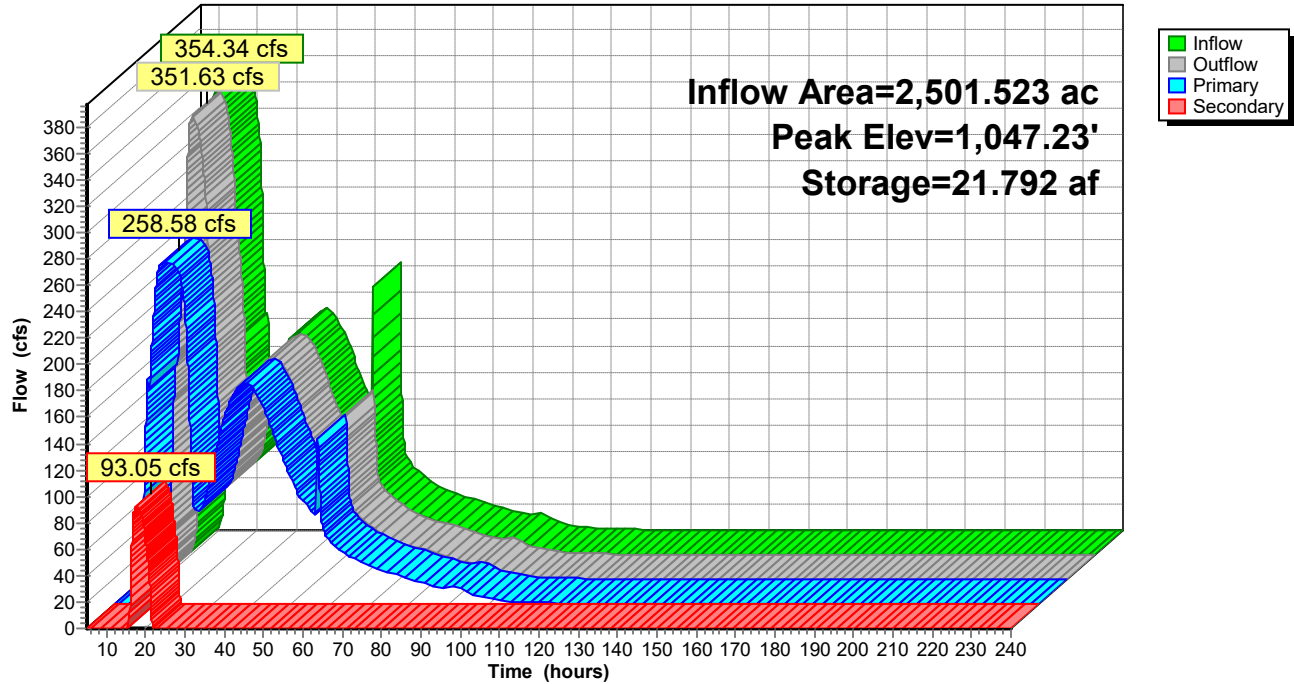
Pond 29P: (new Pond)

Hydrograph



Pond 32P: (new Pond)

Hydrograph



138825_Existing

MSE 24-hr 3 50-year Rainfall=5.66"

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Summary for Pond 26P: (new Pond)

Inflow Area = 1,516.523 ac, 0.00% Impervious, Inflow Depth = 3.93" for 50-year event
 Inflow = 466.03 cfs @ 17.71 hrs, Volume= 497.043 af
 Outflow = 396.17 cfs @ 19.45 hrs, Volume= 497.043 af, Atten= 15%, Lag= 104.4 min
 Primary = 396.17 cfs @ 19.45 hrs, Volume= 497.043 af
 Routed to Reach 37R : Downstream of Outlet

Routing by Stor-Ind method, Time Span= 5.00-240.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,052.08' @ 19.45 hrs Surf.Area= 35.931 ac Storage= 67.901 af

Plug-Flow detention time= 129.8 min calculated for 496.937 af (100% of inflow)
 Center-of-Mass det. time= 129.8 min (1,566.7 - 1,436.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,041.50'	641.573 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,041.50	0.010	0.000	0.000
1,044.50	0.500	0.765	0.765
1,049.00	1.030	3.443	4.208
1,050.00	16.700	8.865	13.073
1,060.00	109.000	628.500	641.573

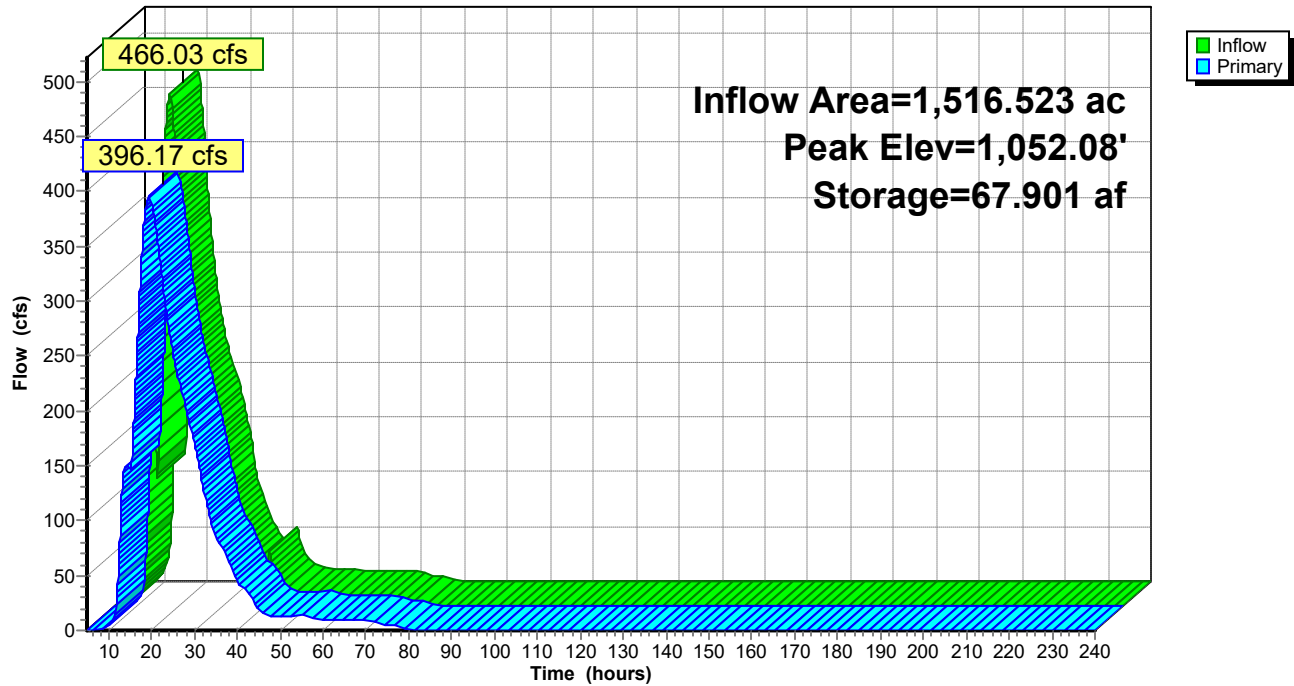
Device	Routing	Invert	Outlet Devices
#1	Primary	1,041.38'	Channel/Reach using Reach 37R: Downstream of Outlet
#2	Device 1	1,041.49'	48.0" Round 48" Rcp L= 43.0' Ke= 0.500 Inlet / Outlet Invert= 1,041.49' / 1,041.34' S= 0.0035 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#3	Device 1	1,047.80'	Overtopping, C= 3.27 Offset (feet) 0.00 326.00 735.00 1,006.90 1,225.00 1,469.50 1,796.10 1,905.00 2,013.80 2,313.00 2,422.00 2,531.00 2,694.00 Elev. (feet) 1,060.00 1,053.00 1,050.85 1,050.60 1,047.80 1,051.10 1,051.54 1,053.30 1,050.90 1,055.90 1,054.90 1,055.50 1,060.00

Primary OutFlow Max=395.94 cfs @ 19.45 hrs HW=1,052.08' (Free Discharge)

1=Channel/Reach (Channel Controls 395.94 cfs @ 0.12 fps)

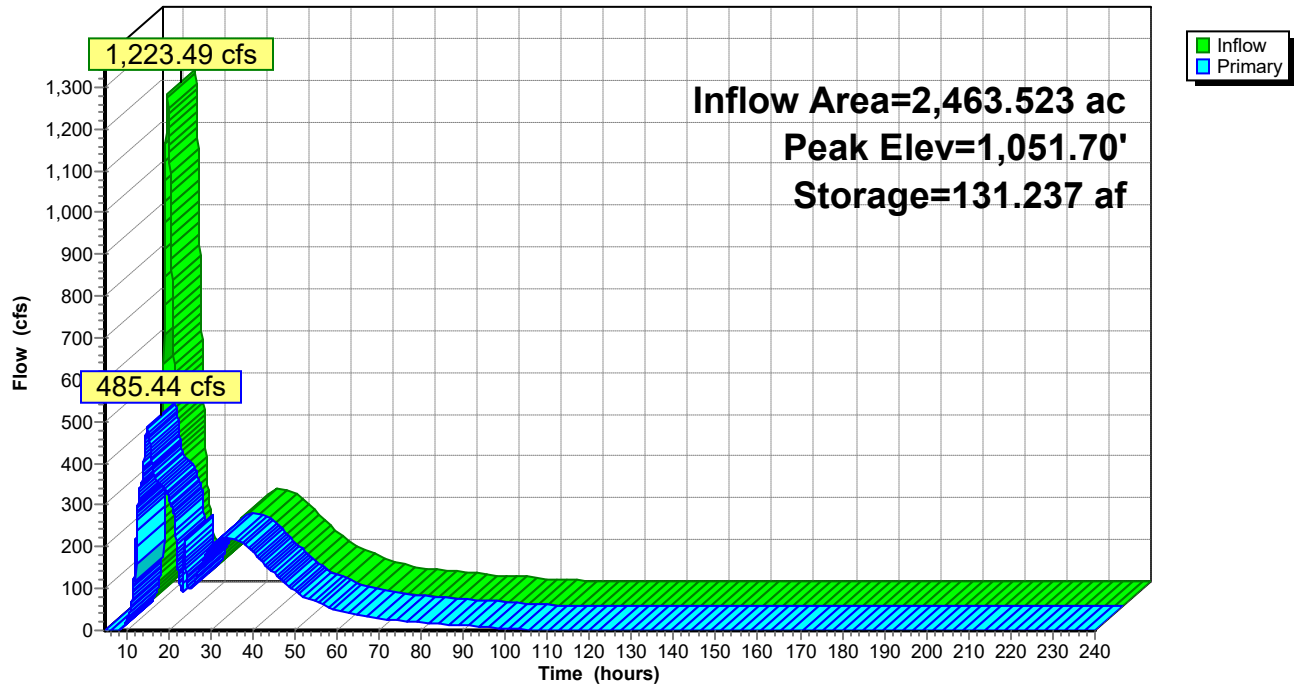
2=48" Rcp (Passes < 177.37 cfs potential flow)

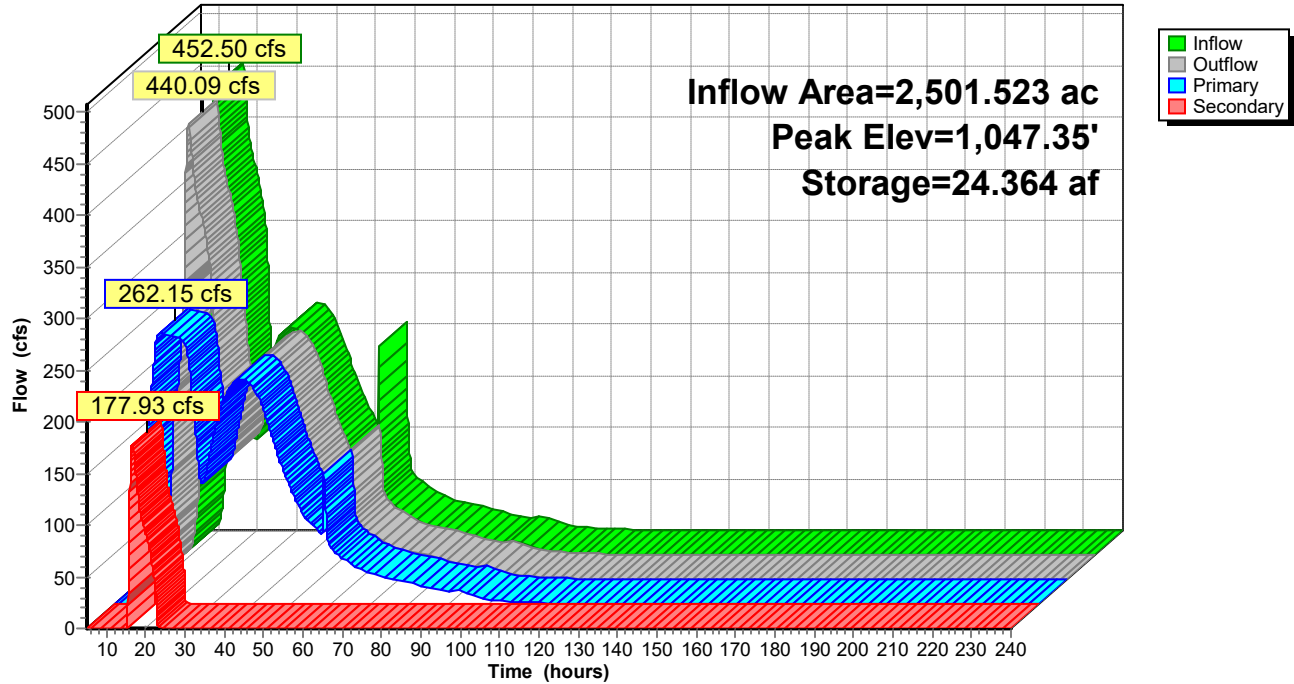
3=Overtopping (Passes < 9,960.14 cfs potential flow)

Pond 26P: (new Pond)**Hydrograph**

Pond 29P: (new Pond)

Hydrograph



Pond 32P: (new Pond)**Hydrograph**

138825_Existing

MSE 24-hr 3 100-year Rainfall=6.58"

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Summary for Pond 26P: (new Pond)

Inflow Area = 1,516.523 ac, 0.00% Impervious, Inflow Depth = 4.80" for 100-year event
 Inflow = 605.03 cfs @ 17.85 hrs, Volume= 606.407 af
 Outflow = 536.20 cfs @ 19.22 hrs, Volume= 606.407 af, Atten= 11%, Lag= 81.8 min
 Primary = 536.20 cfs @ 19.22 hrs, Volume= 606.407 af
 Routed to Reach 37R : Downstream of Outlet

Routing by Stor-Ind method, Time Span= 5.00-240.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,052.58' @ 19.22 hrs Surf.Area= 40.492 ac Storage= 86.785 af

Plug-Flow detention time= 126.5 min calculated for 606.278 af (100% of inflow)
 Center-of-Mass det. time= 126.5 min (1,514.1 - 1,387.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,041.50'	641.573 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,041.50	0.010	0.000	0.000
1,044.50	0.500	0.765	0.765
1,049.00	1.030	3.443	4.208
1,050.00	16.700	8.865	13.073
1,060.00	109.000	628.500	641.573

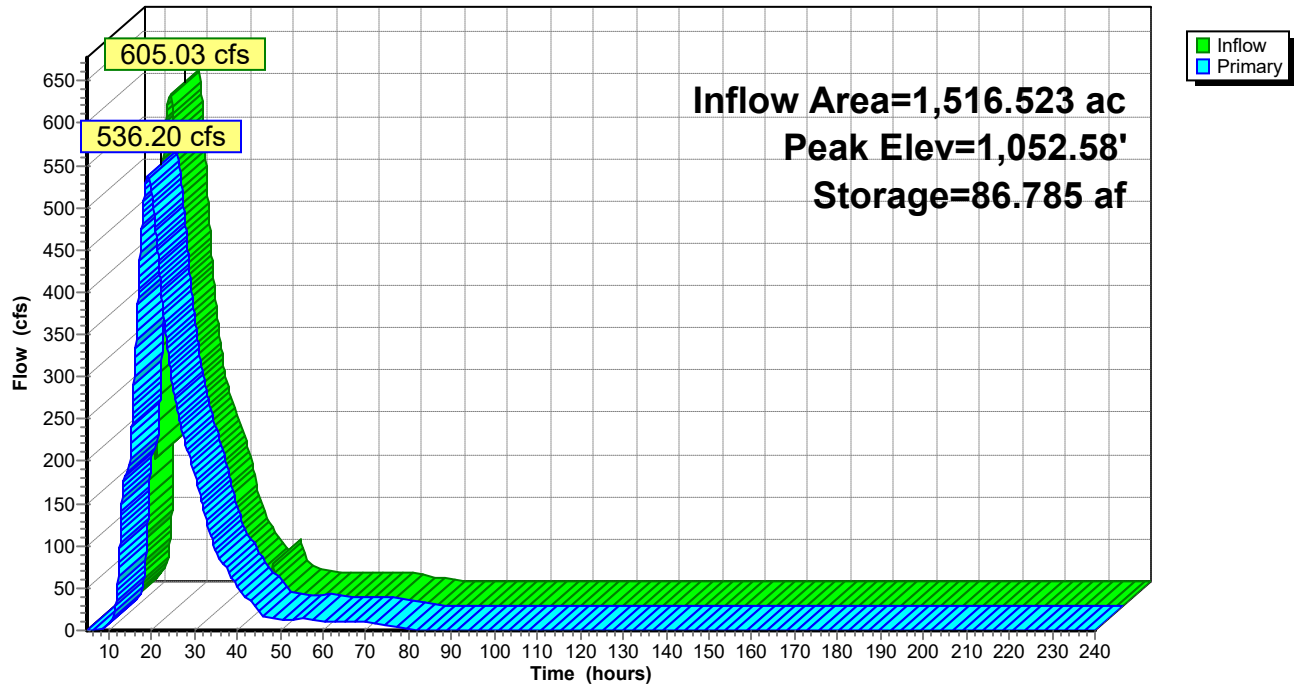
Device	Routing	Invert	Outlet Devices
#1	Primary	1,041.38'	Channel/Reach using Reach 37R: Downstream of Outlet
#2	Device 1	1,041.49'	48.0" Round 48" Rcp L= 43.0' Ke= 0.500 Inlet / Outlet Invert= 1,041.49' / 1,041.34' S= 0.0035 ' / Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#3	Device 1	1,047.80'	Overtopping, C= 3.27 Offset (feet) 0.00 326.00 735.00 1,006.90 1,225.00 1,469.50 1,796.10 1,905.00 2,013.80 2,313.00 2,422.00 2,531.00 2,694.00 Elev. (feet) 1,060.00 1,053.00 1,050.85 1,050.60 1,047.80 1,051.10 1,051.54 1,053.30 1,050.90 1,055.90 1,054.90 1,055.50 1,060.00

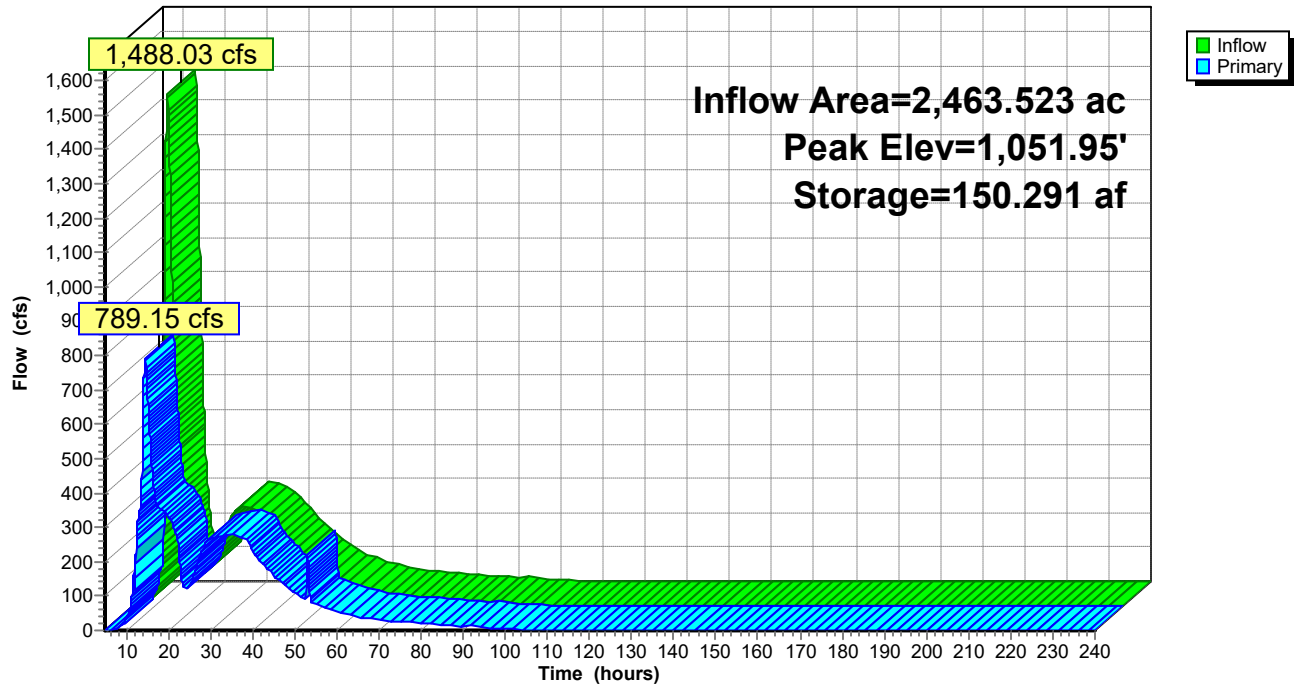
Primary OutFlow Max=536.04 cfs @ 19.22 hrs HW=1,052.58' (Free Discharge)

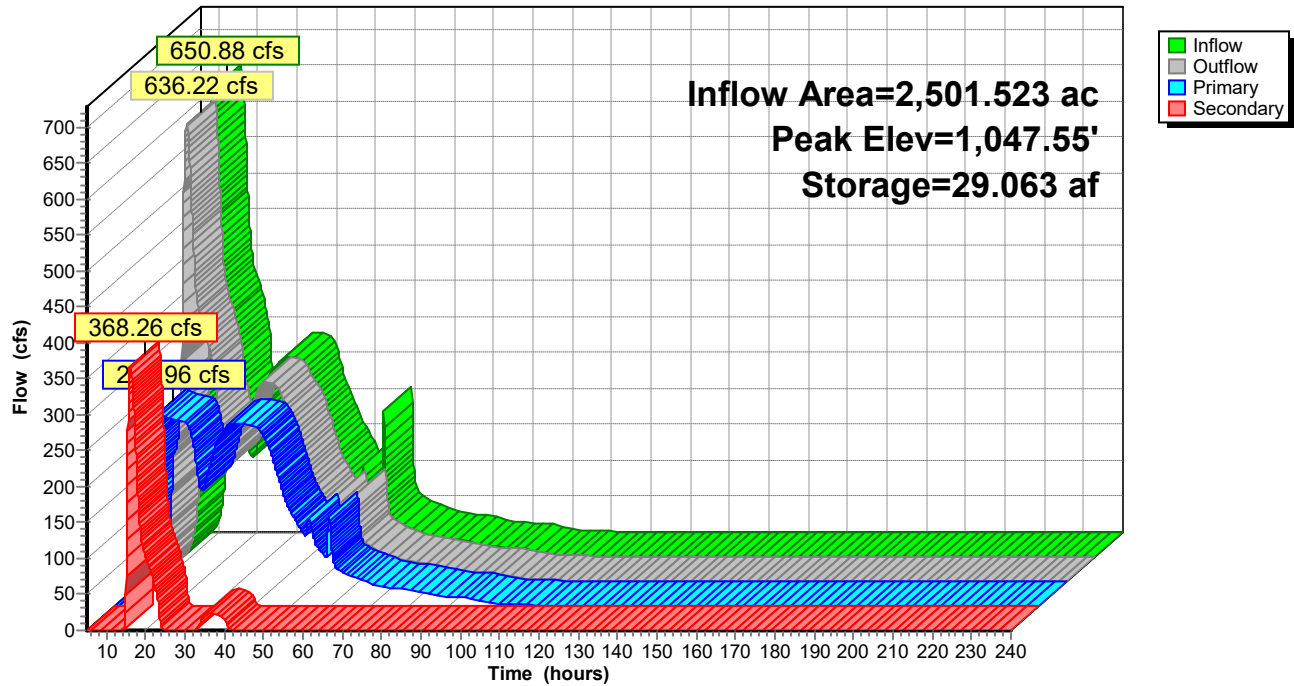
1=Channel/Reach (Channel Controls 536.04 cfs @ 0.13 fps)

2=48" Rcp (Passes < 182.40 cfs potential flow)

3=Overtopping (Passes < 14,422.80 cfs potential flow)

Pond 26P: (new Pond)**Hydrograph**

Pond 29P: (new Pond)**Hydrograph**

Pond 32P: (new Pond)**Hydrograph**

138825_Proposed

MSE 24-hr 3 5-year Rainfall=3.28"

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Page 1

Summary for Pond 26P: (new Pond)

Inflow Area = 1,516.523 ac, 0.00% Impervious, Inflow Depth = 1.67" for 5-year event
 Inflow = 176.25 cfs @ 12.75 hrs, Volume= 210.422 af
 Outflow = 160.84 cfs @ 22.63 hrs, Volume= 210.422 af, Atten= 9%, Lag= 592.6 min
 Primary = 160.84 cfs @ 22.63 hrs, Volume= 210.422 af
 Routed to Reach 37R : Downstream of Outlet

Routing by Stor-Ind method, Time Span= 5.00-360.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,050.84' @ 22.63 hrs Surf.Area= 24.419 ac Storage= 30.266 af

Plug-Flow detention time= 134.0 min calculated for 210.392 af (100% of inflow)
 Center-of-Mass det. time= 134.0 min (1,458.0 - 1,324.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,041.50'	641.573 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,041.50	0.010	0.000	0.000
1,044.50	0.500	0.765	0.765
1,049.00	1.030	3.443	4.208
1,050.00	16.700	8.865	13.073
1,060.00	109.000	628.500	641.573

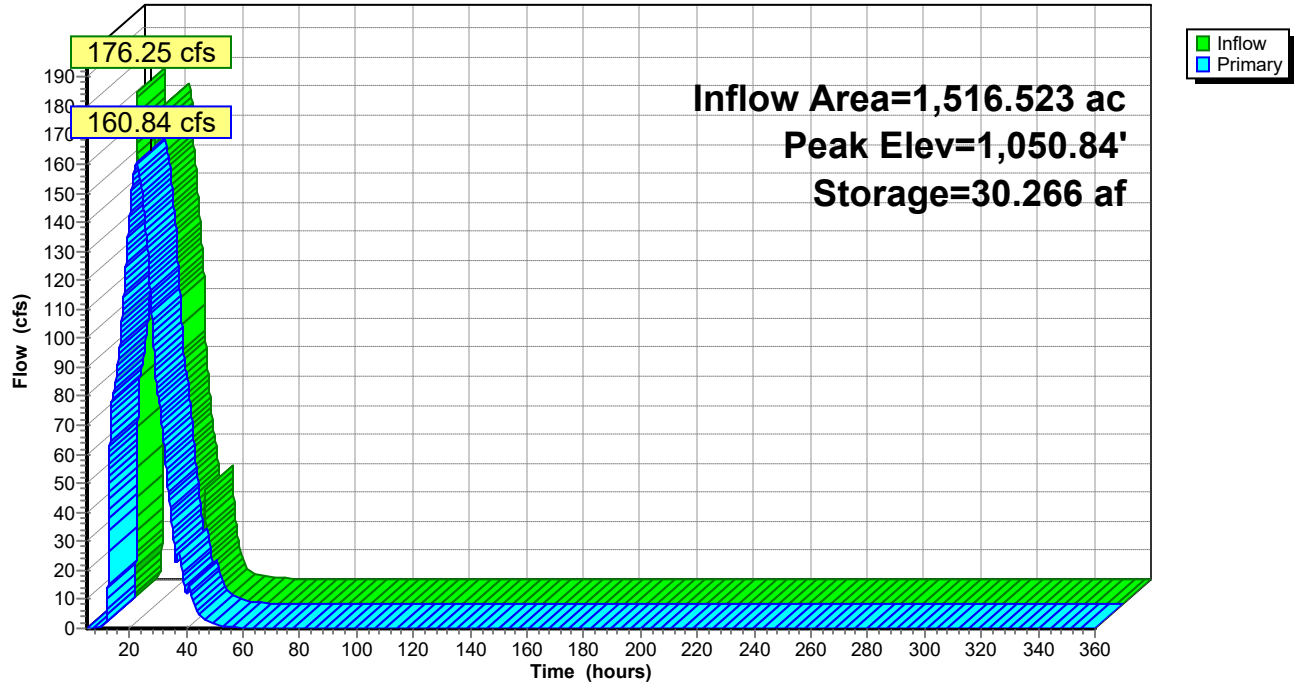
Device	Routing	Invert	Outlet Devices
#1	Primary	1,041.38'	Channel/Reach using Reach 37R: Downstream of Outlet
#2	Device 1	1,041.49'	48.0" Round 48" Rcp L= 43.0' Ke= 0.500 Inlet / Outlet Invert= 1,041.49' / 1,041.34' S= 0.0035 ' /' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#3	Device 1	1,047.80'	Overtopping, C= 3.27 Offset (feet) 0.00 326.00 735.00 1,006.90 1,225.00 1,469.50 1,796.10 1,905.00 2,013.80 2,313.00 2,422.00 2,531.00 2,694.00 Elev. (feet) 1,060.00 1,053.00 1,050.85 1,050.60 1,047.80 1,051.10 1,051.54 1,053.30 1,050.90 1,055.90 1,054.90 1,055.50 1,060.00

Primary OutFlow Max=160.53 cfs @ 22.63 hrs HW=1,050.84' (Free Discharge)

1=Channel/Reach (Channel Controls 160.53 cfs @ 0.09 fps)

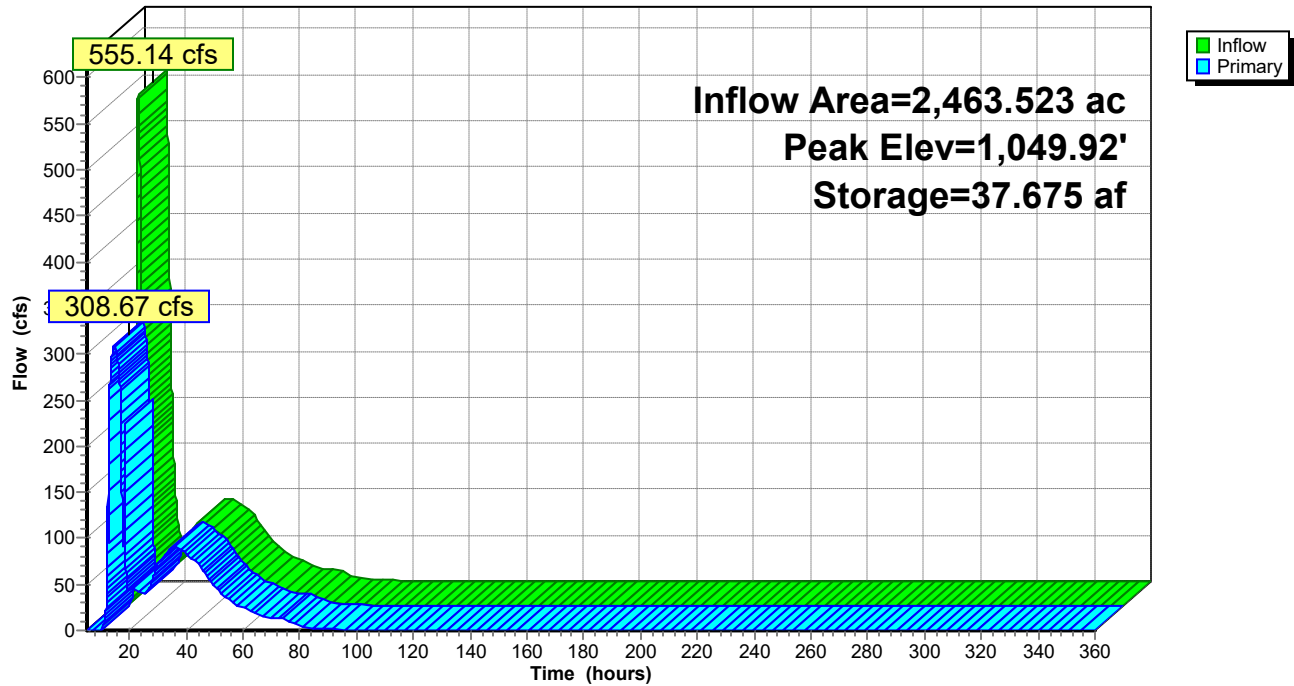
2=48" Rcp (Passes < 164.00 cfs potential flow)

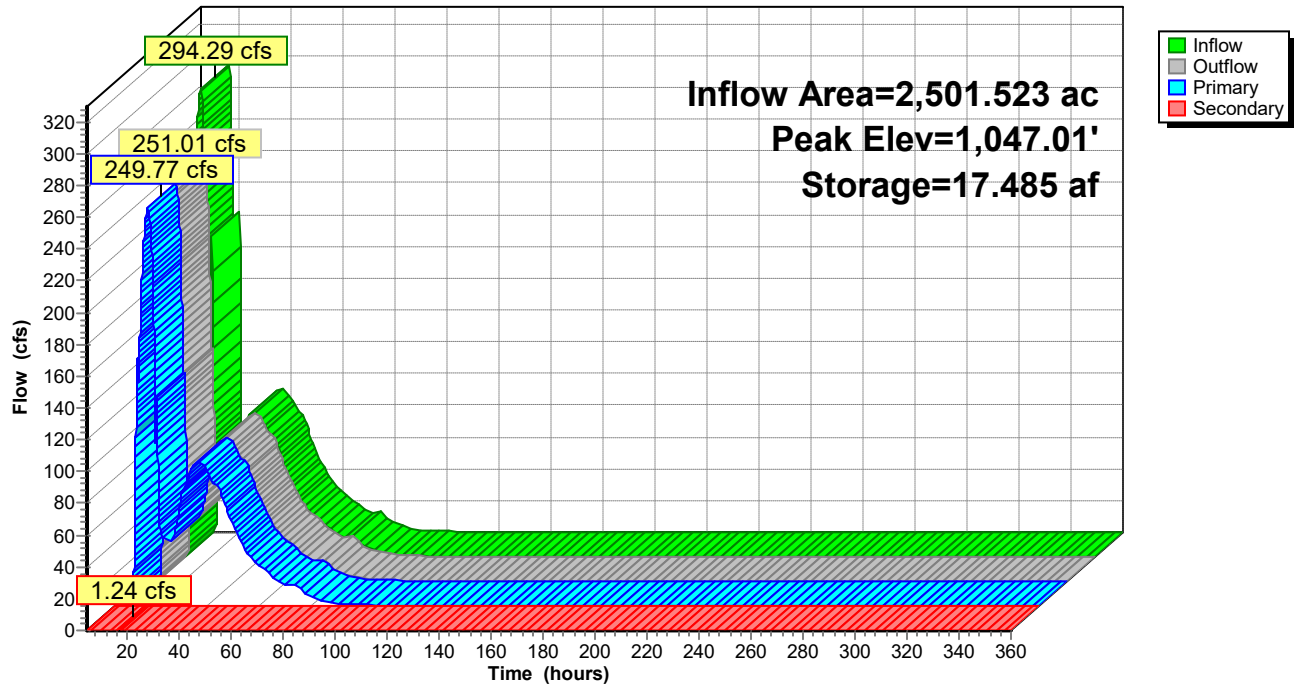
3=Overtopping (Passes < 3,229.07 cfs potential flow)

Pond 26P: (new Pond)**Hydrograph**

Pond 29P: (new Pond)

Hydrograph



Pond 32P: (new Pond)**Hydrograph**

138825_Proposed

MSE 24-hr 3 10-year Rainfall=3.87"

Prepared by Bolton & Menk, Inc

Printed 9/1/2026

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Summary for Pond 26P: (new Pond)

Inflow Area = 1,516.523 ac, 0.00% Impervious, Inflow Depth = 2.16" for 10-year event
 Inflow = 222.79 cfs @ 12.66 hrs, Volume= 273.005 af
 Outflow = 185.62 cfs @ 24.05 hrs, Volume= 273.005 af, Atten= 17%, Lag= 683.5 min
 Primary = 185.62 cfs @ 24.05 hrs, Volume= 273.005 af
 Routed to Reach 37R : Downstream of Outlet

Routing by Stor-Ind method, Time Span= 5.00-360.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,051.01' @ 24.05 hrs Surf.Area= 25.979 ac Storage= 34.524 af

Plug-Flow detention time= 134.6 min calculated for 272.966 af (100% of inflow)
 Center-of-Mass det. time= 134.6 min (1,496.3 - 1,361.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,041.50'	641.573 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,041.50	0.010	0.000	0.000
1,044.50	0.500	0.765	0.765
1,049.00	1.030	3.443	4.208
1,050.00	16.700	8.865	13.073
1,060.00	109.000	628.500	641.573

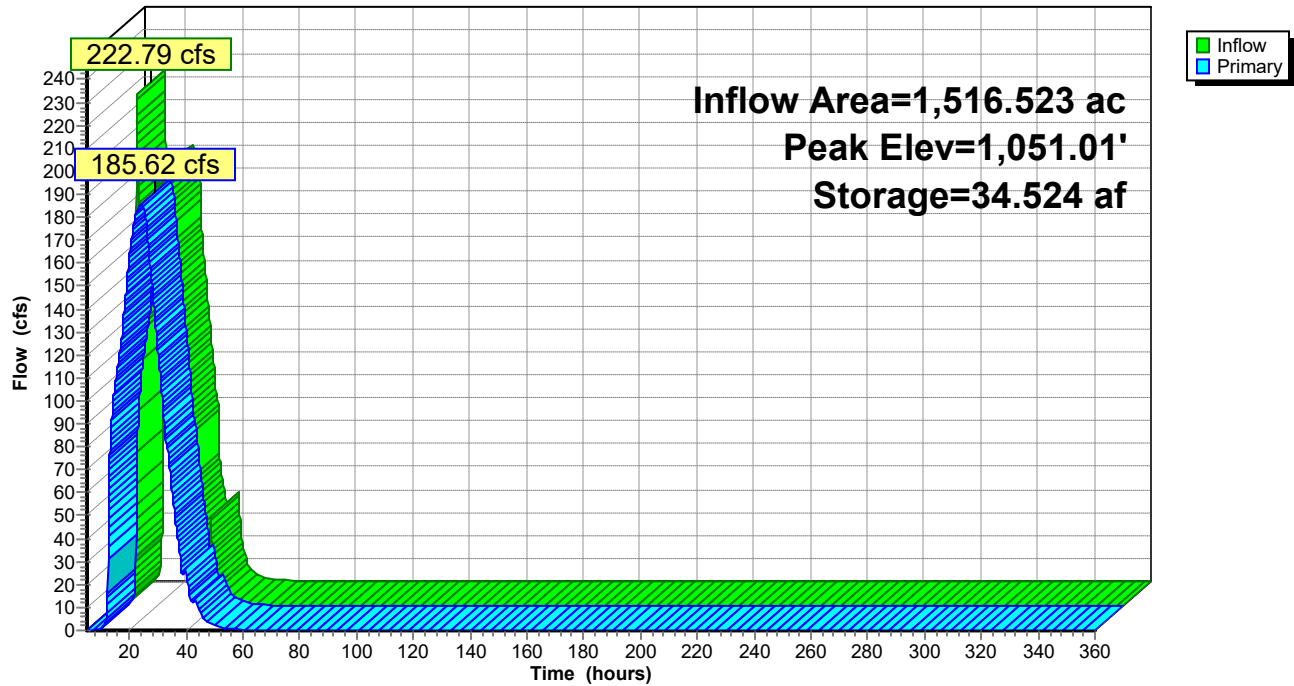
Device	Routing	Invert	Outlet Devices
#1	Primary	1,041.38'	Channel/Reach using Reach 37R: Downstream of Outlet
#2	Device 1	1,041.49'	48.0" Round 48" Rcp L= 43.0' Ke= 0.500 Inlet / Outlet Invert= 1,041.49' / 1,041.34' S= 0.0035 ' /' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#3	Device 1	1,047.80'	Overtopping, C= 3.27 Offset (feet) 0.00 326.00 735.00 1,006.90 1,225.00 1,469.50 1,796.10 1,905.00 2,013.80 2,313.00 2,422.00 2,531.00 2,694.00 Elev. (feet) 1,060.00 1,053.00 1,050.85 1,050.60 1,047.80 1,051.10 1,051.54 1,053.30 1,050.90 1,055.90 1,054.90 1,055.50 1,060.00

Primary OutFlow Max=185.33 cfs @ 24.05 hrs HW=1,051.01' (Free Discharge)

1=Channel/Reach (Channel Controls 185.33 cfs @ 0.10 fps)

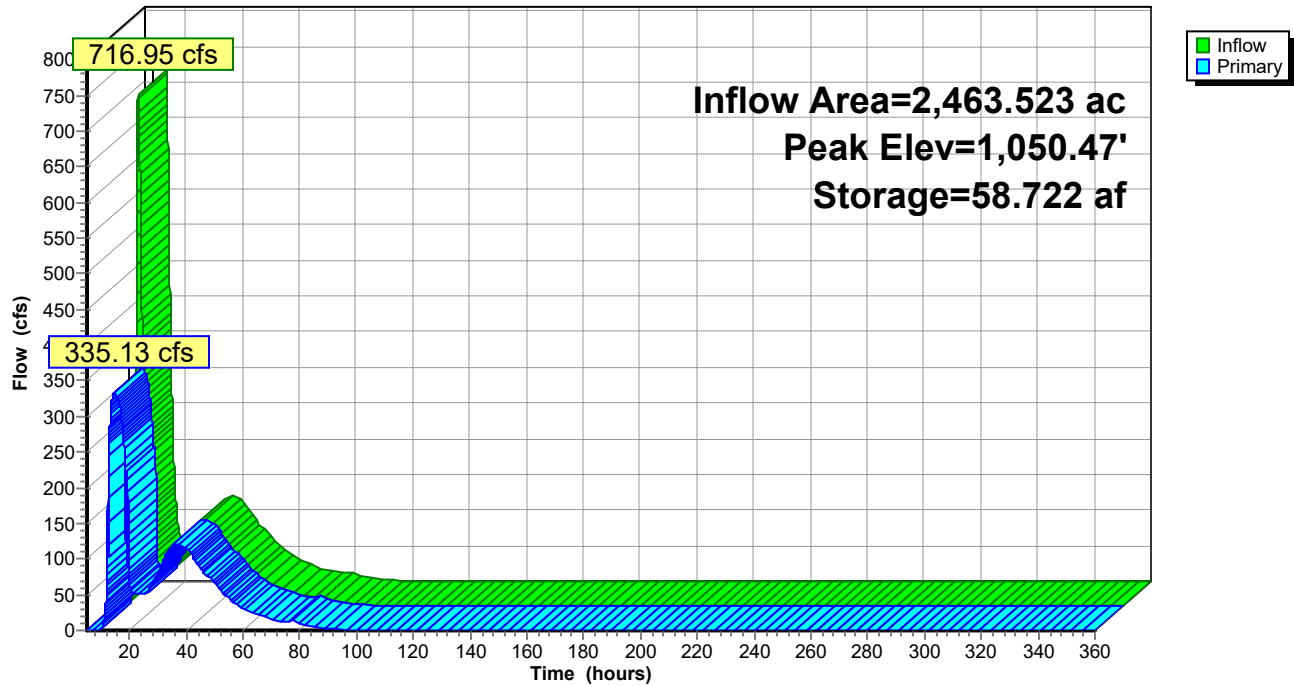
2=48" Rcp (Passes < 165.87 cfs potential flow)

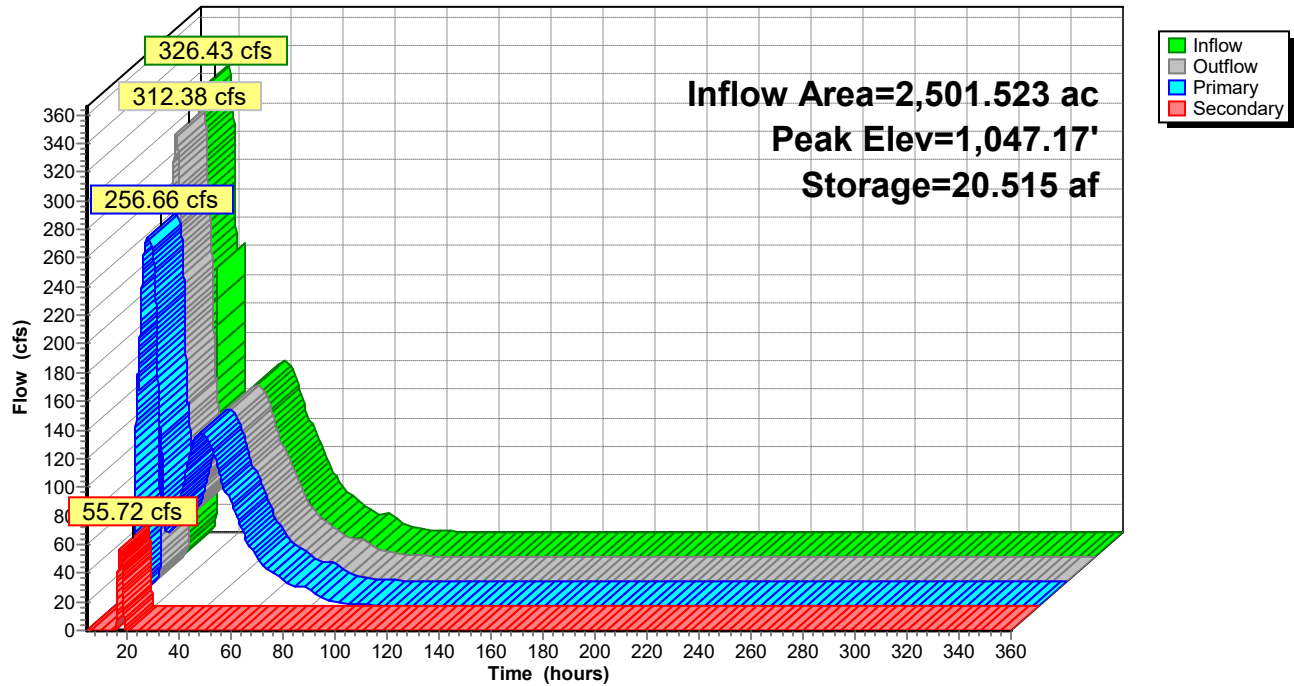
3=Overtopping (Passes < 3,783.93 cfs potential flow)

Pond 26P: (new Pond)**Hydrograph**

Pond 29P: (new Pond)

Hydrograph



Pond 32P: (new Pond)**Hydrograph**

Summary for Pond 26P: (new Pond)

Inflow Area = 1,516.523 ac, 0.00% Impervious, Inflow Depth = 2.99" for 25-year event
 Inflow = 295.77 cfs @ 12.65 hrs, Volume= 378.253 af
 Outflow = 263.67 cfs @ 21.60 hrs, Volume= 378.253 af, Atten= 11%, Lag= 536.8 min
 Primary = 263.67 cfs @ 21.60 hrs, Volume= 378.253 af
 Routed to Reach 37R : Downstream of Outlet

Routing by Stor-Ind method, Time Span= 5.00-360.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,051.47' @ 21.60 hrs Surf.Area= 30.235 ac Storage= 47.484 af

Plug-Flow detention time= 132.8 min calculated for 378.200 af (100% of inflow)
 Center-of-Mass det. time= 132.7 min (1,495.4 - 1,362.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,041.50'	641.573 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,041.50	0.010	0.000	0.000
1,044.50	0.500	0.765	0.765
1,049.00	1.030	3.443	4.208
1,050.00	16.700	8.865	13.073
1,060.00	109.000	628.500	641.573

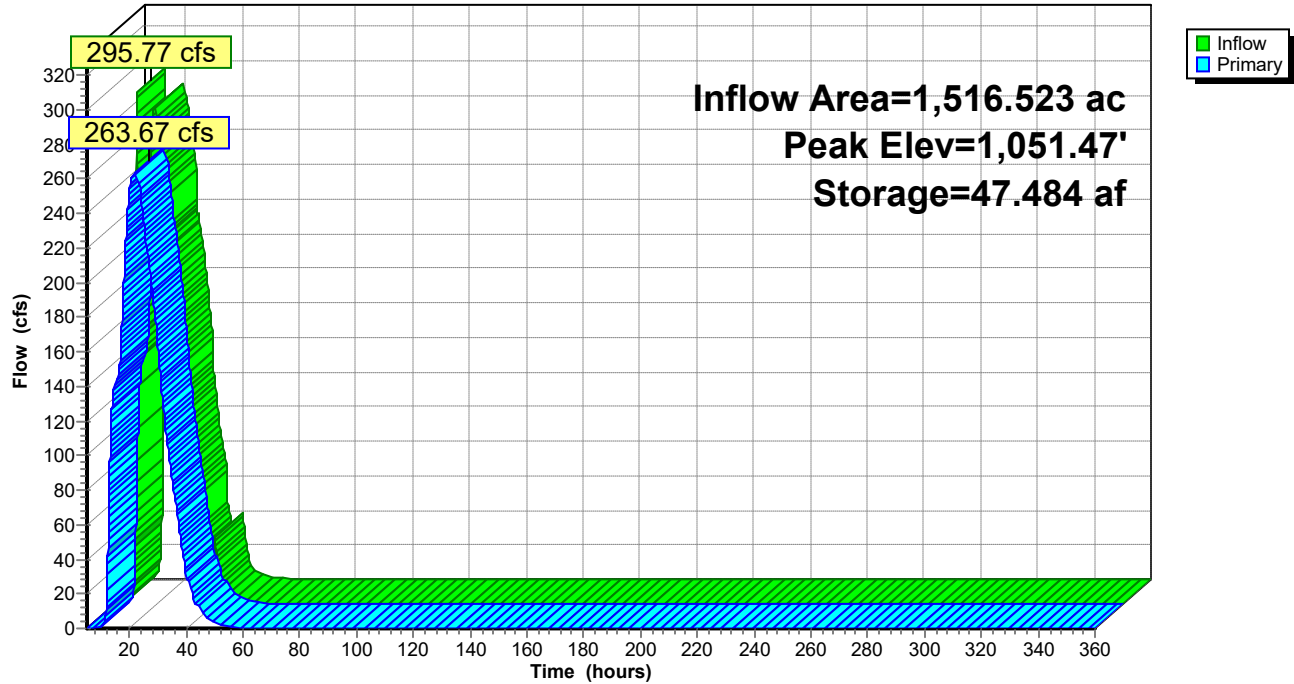
Device	Routing	Invert	Outlet Devices
#1	Primary	1,041.38'	Channel/Reach using Reach 37R: Downstream of Outlet
#2	Device 1	1,041.49'	48.0" Round 48" Rcp L= 43.0' Ke= 0.500 Inlet / Outlet Invert= 1,041.49' / 1,041.34' S= 0.0035 ' /' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#3	Device 1	1,047.80'	Overtopping, C= 3.27 Offset (feet) 0.00 326.00 735.00 1,006.90 1,225.00 1,469.50 1,796.10 1,905.00 2,013.80 2,313.00 2,422.00 2,531.00 2,694.00 Elev. (feet) 1,060.00 1,053.00 1,050.85 1,050.60 1,047.80 1,051.10 1,051.54 1,053.30 1,050.90 1,055.90 1,054.90 1,055.50 1,060.00

Primary OutFlow Max=263.53 cfs @ 21.60 hrs HW=1,051.47' (Free Discharge)

1=Channel/Reach (Channel Controls 263.53 cfs @ 0.11 fps)

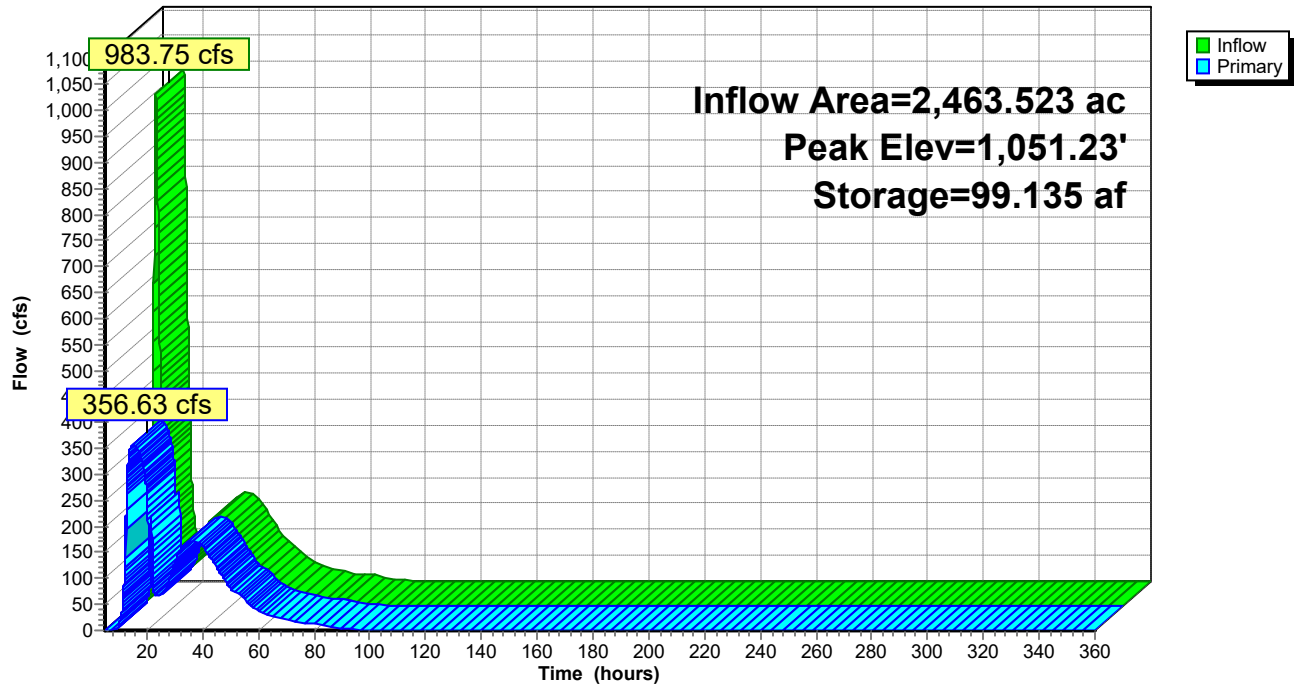
2=48" Rcp (Passes < 170.89 cfs potential flow)

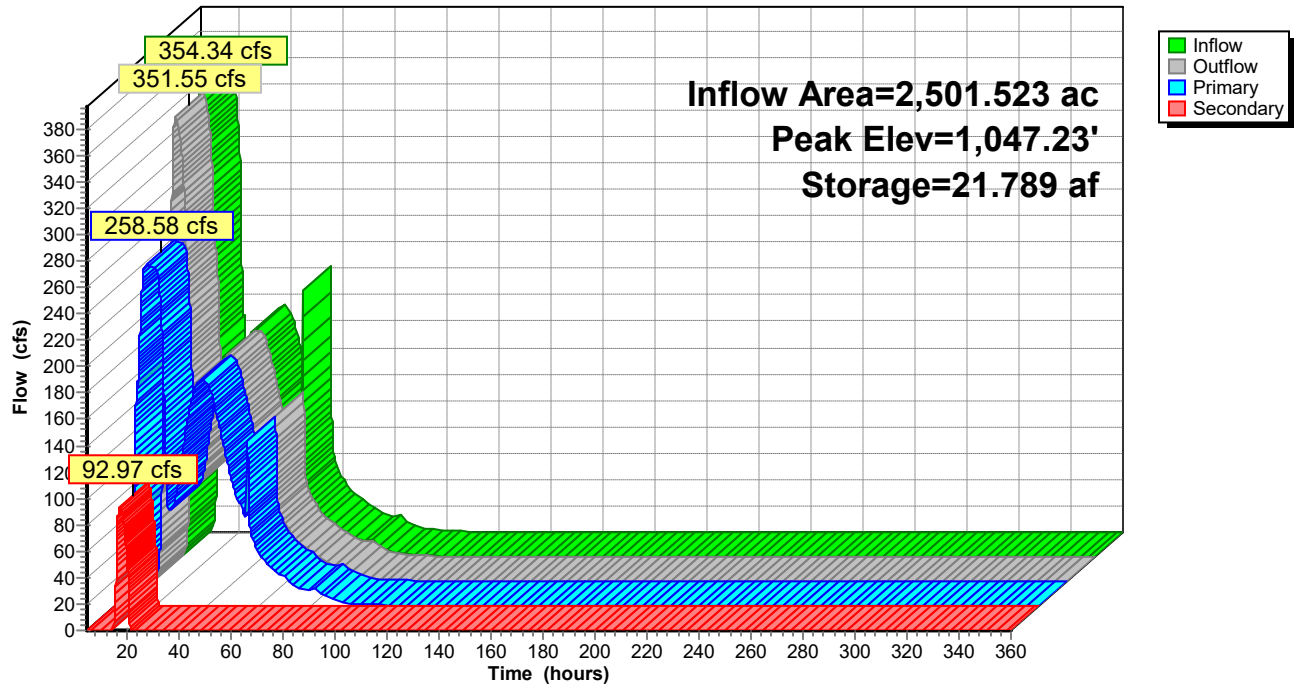
3=Overtopping (Passes < 5,793.55 cfs potential flow)

Pond 26P: (new Pond)**Hydrograph**

Pond 29P: (new Pond)

Hydrograph



Pond 32P: (new Pond)**Hydrograph**

Summary for Pond 26P: (new Pond)

Inflow Area = 1,516.523 ac, 0.00% Impervious, Inflow Depth = 3.75" for 50-year event
 Inflow = 407.56 cfs @ 18.29 hrs, Volume= 474.472 af
 Outflow = 354.60 cfs @ 20.30 hrs, Volume= 474.472 af, Atten= 13%, Lag= 120.6 min
 Primary = 354.60 cfs @ 20.30 hrs, Volume= 474.472 af
 Routed to Reach 37R : Downstream of Outlet

Routing by Stor-Ind method, Time Span= 5.00-360.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,051.91' @ 20.30 hrs Surf.Area= 34.326 ac Storage= 61.793 af

Plug-Flow detention time= 130.5 min calculated for 474.405 af (100% of inflow)
 Center-of-Mass det. time= 130.5 min (1,477.6 - 1,347.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,041.50'	641.573 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,041.50	0.010	0.000	0.000
1,044.50	0.500	0.765	0.765
1,049.00	1.030	3.443	4.208
1,050.00	16.700	8.865	13.073
1,060.00	109.000	628.500	641.573

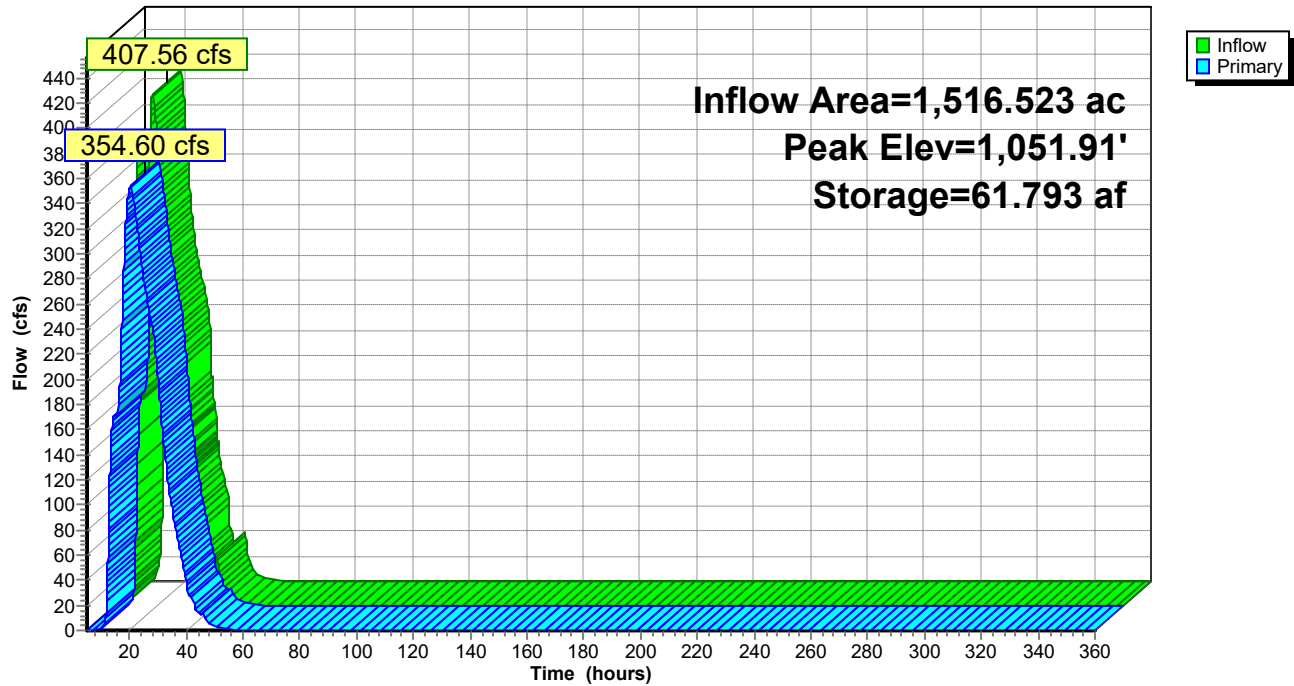
Device	Routing	Invert	Outlet Devices
#1	Primary	1,041.38'	Channel/Reach using Reach 37R: Downstream of Outlet
#2	Device 1	1,041.49'	48.0" Round 48" Rcp L= 43.0' Ke= 0.500 Inlet / Outlet Invert= 1,041.49' / 1,041.34' S= 0.0035 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#3	Device 1	1,047.80'	Overtopping, C= 3.27 Offset (feet) 0.00 326.00 735.00 1,006.90 1,225.00 1,469.50 1,796.10 1,905.00 2,013.80 2,313.00 2,422.00 2,531.00 2,694.00 Elev. (feet) 1,060.00 1,053.00 1,050.85 1,050.60 1,047.80 1,051.10 1,051.54 1,053.30 1,050.90 1,055.90 1,054.90 1,055.50 1,060.00

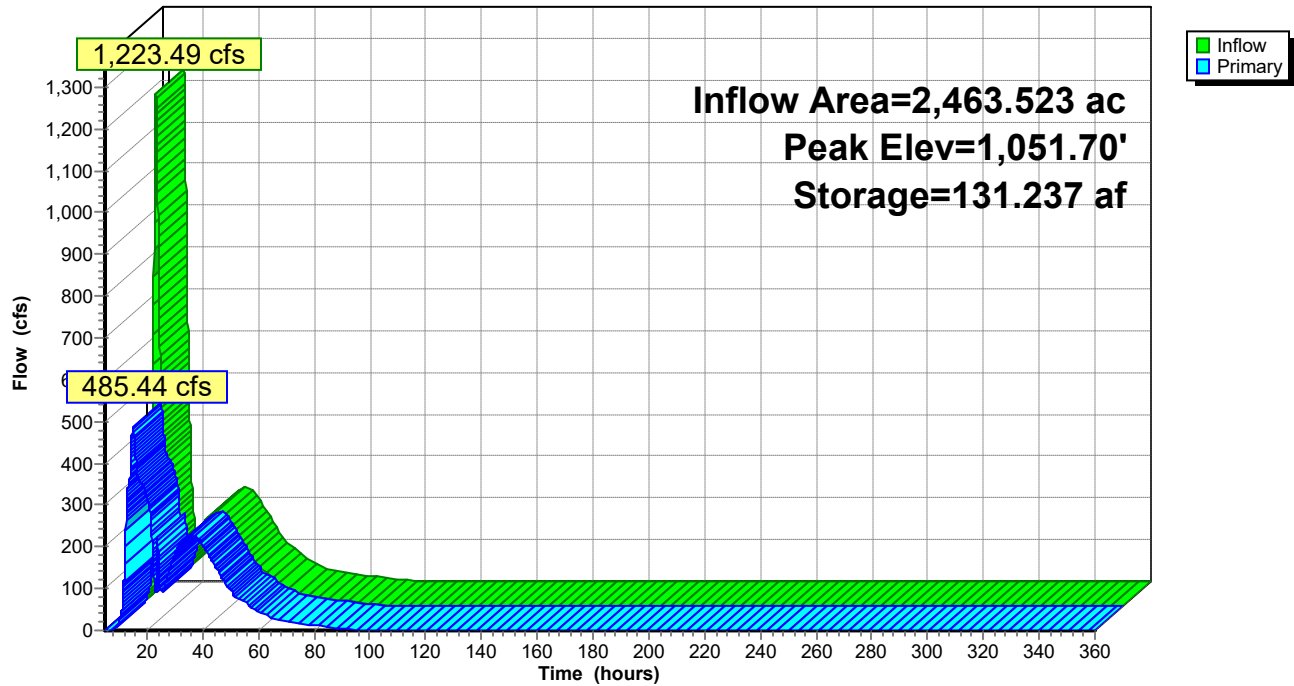
Primary OutFlow Max=354.06 cfs @ 20.30 hrs HW=1,051.91' (Free Discharge)

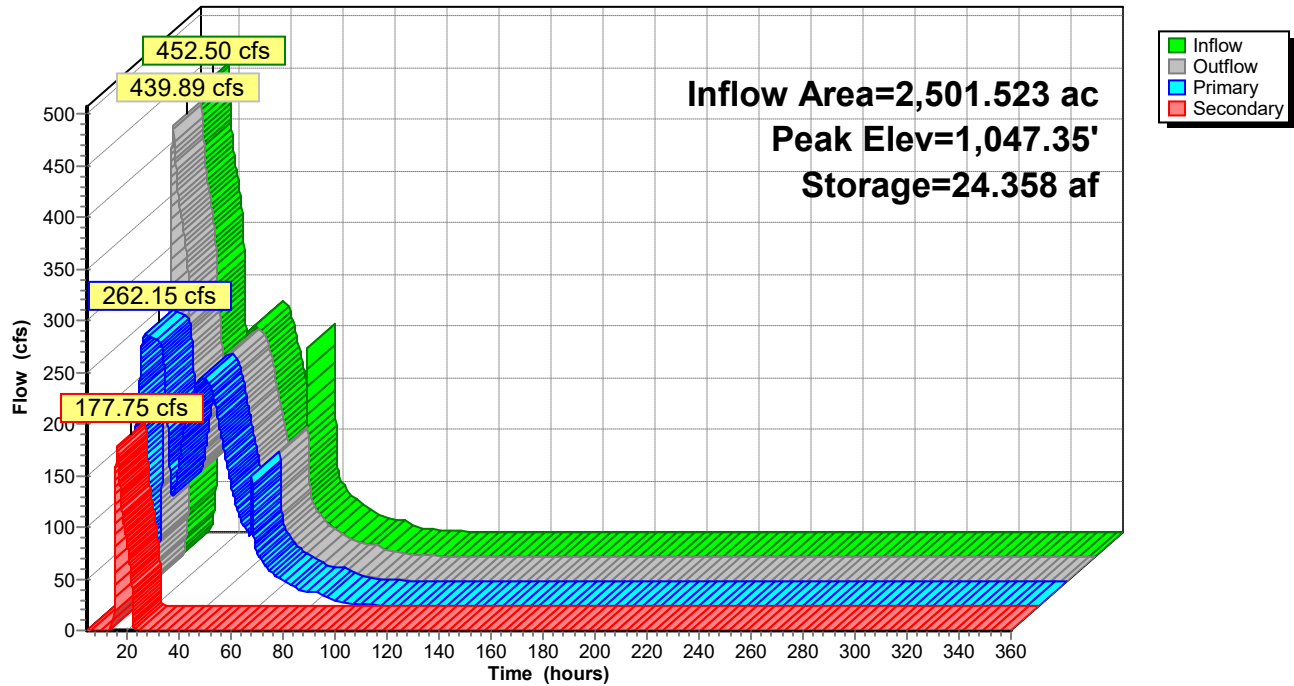
1=Channel/Reach (Channel Controls 354.06 cfs @ 0.12 fps)

2=48" Rcp (Passes < 175.57 cfs potential flow)

3=Overtopping (Passes < 8,624.41 cfs potential flow)

Pond 26P: (new Pond)**Hydrograph**

Pond 29P: (new Pond)**Hydrograph**

Pond 32P: (new Pond)**Hydrograph**

Summary for Pond 26P: (new Pond)

Inflow Area = 1,516.523 ac, 0.00% Impervious, Inflow Depth = 4.61" for 100-year event
 Inflow = 603.41 cfs @ 18.10 hrs, Volume= 582.135 af
 Outflow = 510.43 cfs @ 19.67 hrs, Volume= 582.135 af, Atten= 15%, Lag= 93.9 min
 Primary = 510.43 cfs @ 19.67 hrs, Volume= 582.135 af
 Routed to Reach 37R : Downstream of Outlet

Routing by Stor-Ind method, Time Span= 5.00-360.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,052.49' @ 19.67 hrs Surf.Area= 39.692 ac Storage= 83.311 af

Plug-Flow detention time= 127.2 min calculated for 582.135 af (100% of inflow)
 Center-of-Mass det. time= 127.2 min (1,447.5 - 1,320.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,041.50'	641.573 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,041.50	0.010	0.000	0.000
1,044.50	0.500	0.765	0.765
1,049.00	1.030	3.443	4.208
1,050.00	16.700	8.865	13.073
1,060.00	109.000	628.500	641.573

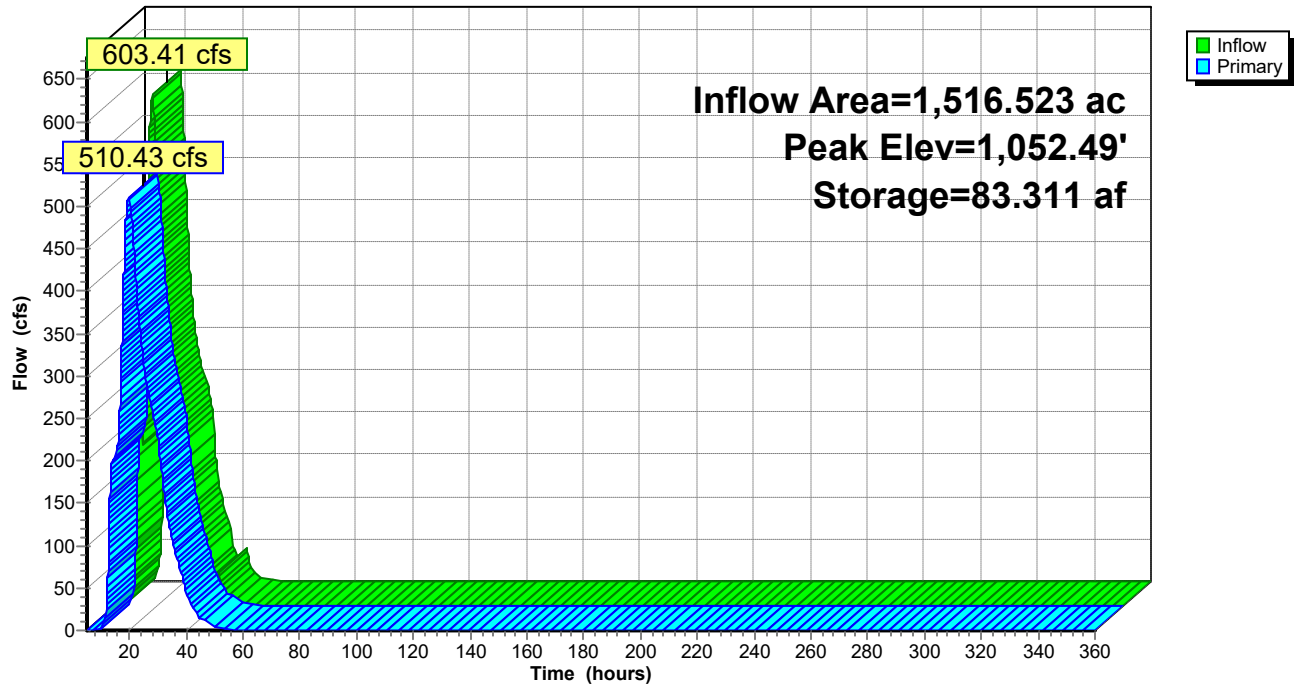
Device	Routing	Invert	Outlet Devices
#1	Primary	1,041.38'	Channel/Reach using Reach 37R: Downstream of Outlet
#2	Device 1	1,041.49'	48.0" Round 48" Rcp L= 43.0' Ke= 0.500 Inlet / Outlet Invert= 1,041.49' / 1,041.34' S= 0.0035 ' /' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#3	Device 1	1,047.80'	Overtopping, C= 3.27 Offset (feet) 0.00 326.00 735.00 1,006.90 1,225.00 1,469.50 1,796.10 1,905.00 2,013.80 2,313.00 2,422.00 2,531.00 2,694.00 Elev. (feet) 1,060.00 1,053.00 1,050.85 1,050.60 1,047.80 1,051.10 1,051.54 1,053.30 1,050.90 1,055.90 1,054.90 1,055.50 1,060.00

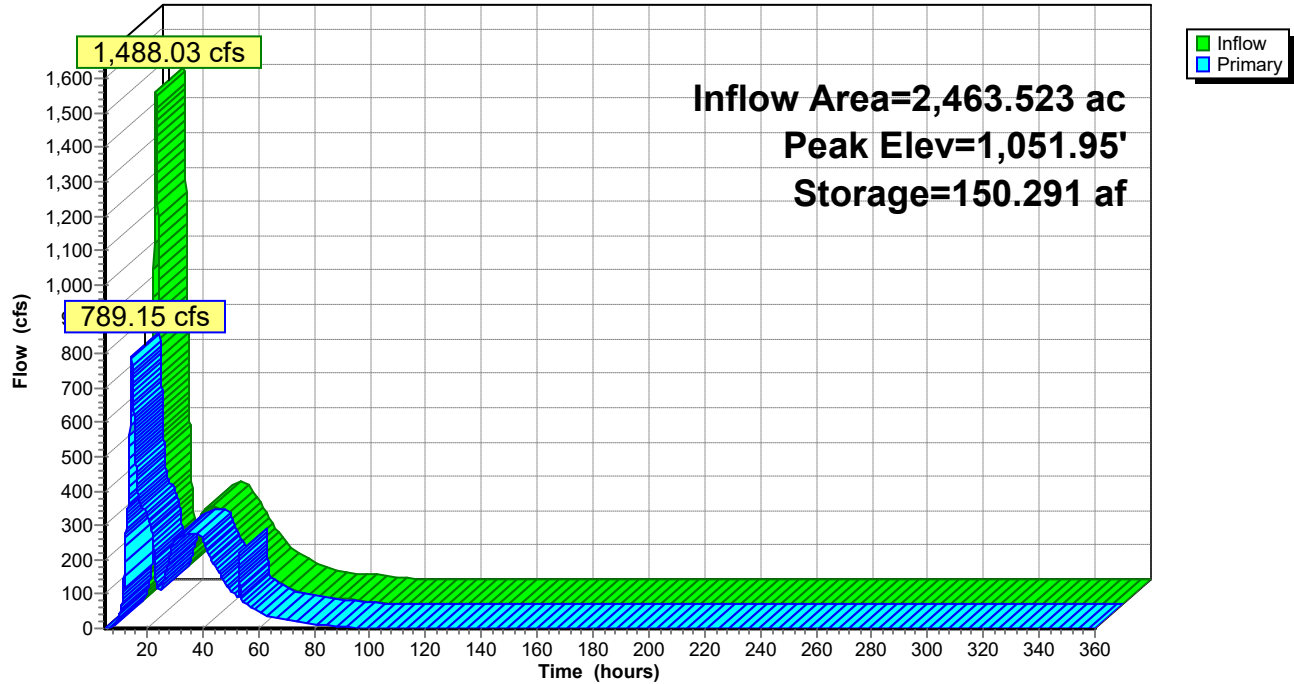
Primary OutFlow Max=510.09 cfs @ 19.67 hrs HW=1,052.49' (Free Discharge)

1=Channel/Reach (Channel Controls 510.09 cfs @ 0.13 fps)

2=48" Rcp (Passes < 181.53 cfs potential flow)

3=Overtopping (Passes < 13,568.85 cfs potential flow)

Pond 26P: (new Pond)**Hydrograph**

Pond 29P: (new Pond)**Hydrograph**

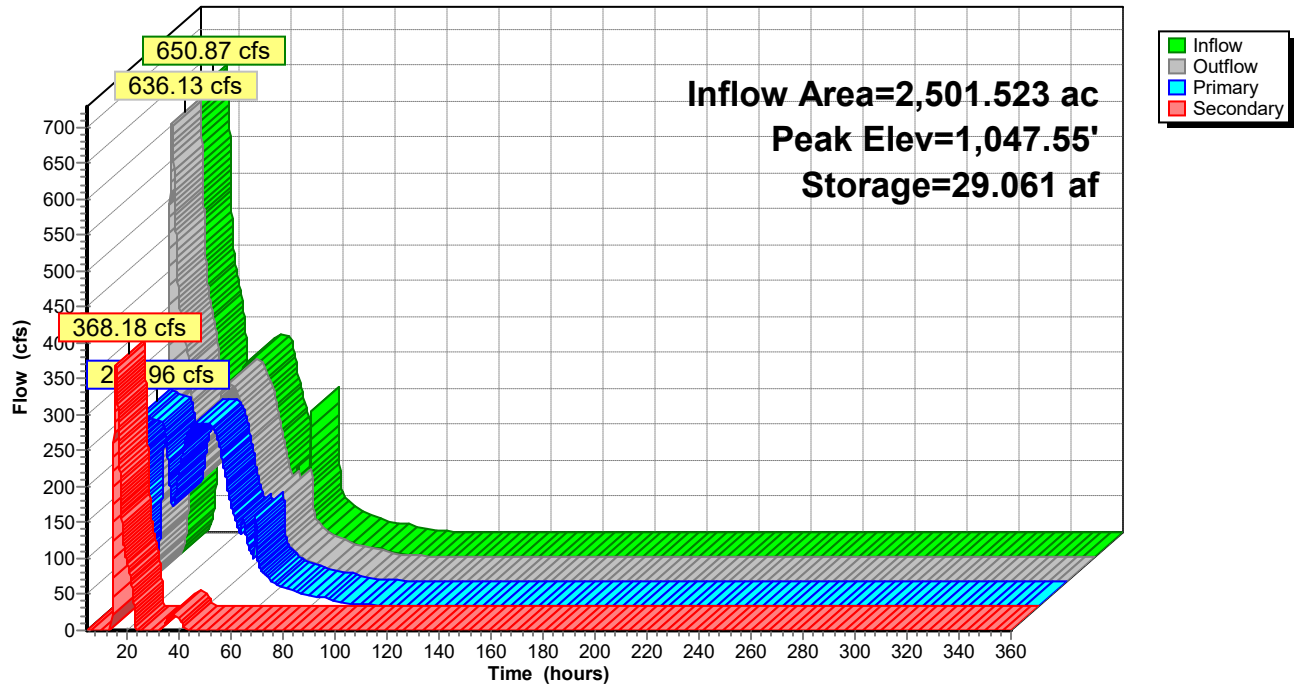
Pond 32P: (new Pond)**Hydrograph**

Exhibit 9: Technical Specifications

TECHNICAL SPECIFICATIONS

for

County Ditch No. 138
Branch B Improvement

Renville County, MN

SECTION 02 32 19 - EXPLORATORY EXCAVATION

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 a 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 will be paid according to the referenced specification or as modified below:
 - 1. The unit price bid for exploratory excavation will include all costs of labor, 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 will not be individually paid in the absence of a specific bid item for the work. The costs will 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. Exploratory excavation without prior authorization and approval by the Engineer.
 - 2. Exploratory excavation to locate and connect to existing pipes unless the Engineer agrees that excavation beyond what could be considered reasonable is required.
 - 3. Materials for re-grouting of inverts.
- B. All costs of off-site disposal of excess excavated material and debris including but not limited to hauling, fees, and permits for such disposal.

1.3 SPECIFICATION REFERENCES

- A. The following referenced Specifications will apply to this Section:
 - 1. MnDOT 2123.
- B. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

1.4 SUBMITTALS

- A. No submittals for this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. No exception to this 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. Failure to perform exploratory excavation as directed by the Engineer shall be a reason to withhold payment. Alternatively, the Engineer may elect to have all costs (material, labor, equipment, ect.) to connect existing tiles to the Main Tile Line be

incidental to the proposed tile where exploratory excavation was not completed as directed by the Engineer.

2. Clean debris and gravel which is present before the Project, out of existing manholes and catch basins along the Project and to regrout the inverts, as directed by the Engineer.
3. Other work associated with the Project, as directed by the Engineer.
4. Exploratory excavation shall consist of, at a minimum, a rubber-tired backhoe, operator, and laborer to find the tile. And additional equipment and personnel that the contractor chooses to use as a part of exploratory excavation shall be incidental. Any time and equipment necessary to backfill the excavation shall be incidental.
5. Where exploratory excavation is performed in a location that will not be disturbed later, the backfill will be placed and compacted to the density specified elsewhere in these Specifications for the type of utility located.

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

SECTION 31 20 00 - EARTH MOVING

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 excavation and embankment of the site improvements as indicated on the drawings or as specified herein.

1.2 DEFINITIONS

- A. Compacted Volume (CV) – The volume of material placed as determined by computing the difference between original and final cross-sections by the average end area method.
- B. Excavated Volume (EV) – The volume of material excavated as determined by computing the difference between original and final cross-sections by the average end area method.
- C. Excess Material - Material that is not needed to complete the earthwork balance.
- D. Subcut - Excavation performed below the proposed subgrade elevation shown on the plans to remove unsuitable material.
- E. Subgrade - The top surface of a roadbed upon which the pavement structure (including aggregate base and/or granular subbase) is to be constructed. This is also a general term denoting the soil foundation upon which a proposed improvement is to be placed.
- F. 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.
- G. Topsoil - Any soil, generally black, containing organic material.
- H. 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 will be paid according to the referenced specification or as modified below:
 - 1. Common Excavation:
 - (a) Measurement and payment for Common Excavation will be based upon the cubic yard (P).
 - 2. Common Embankment:
 - (a) Measurement and payment for Common Embankment will be based upon the cubic yard (P).
 - 3. Granular Foundation Rock
 - (a) Measurement and payment for Granular Foundation Rock will be based upon the linear foot (LF).
 - 4. Rock Excavation
 - (a) No extra payment will be made for rock excavation.
 - 5. 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 will 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 will not be individually paid in the absence of a specific bid item for the work. The costs will be included in the unit price bid for the associated excavation items. Such items of work include but are not limited to:
 - 1. Separating, salvaging, stockpiling, and spreading of topsoil will be included in the price bid for common excavation and common embankment.
 - 2. Subcutting the existing topsoil before placing embankment in all areas with proposed impoundments will be included in the price bid for common excavation and common embankment.
 - 3. Salvaging and separately stockpiling suitable aggregate base material.
 - 4. Separating, salvaging, stockpiling, and placing suitable material for use in embankment areas.

1.4 SPECIFICATION REFERENCES

- A. The following referenced Specifications will apply to this Section:
 - 1. MnDOT 2106.
 - 2. MnDOT 2574.
- B. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

1.5 SUBMITTALS

- A. No submittals for this section.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All suitable excess excavated material will remain the property of the Owner and will be loaded, hauled, placed as directed (i.e. leveling), and compacted at a site chosen by the Owner within the project site. If the Owner requires the suitable excess material to be stockpiled, the Contractor shall load, haul, and shape the material to produce uniform stockpile(s).

PART 3 - EXECUTION

3.1 GENERAL

- A. Excavated topsoil and suitable material for reuse in the project will be segregated and stockpiled at a site selected by the Contractor.
- B. Frozen material will not be allowed for roadway or building pad construction. The Engineer shall approve locations for placement of frozen material.
- C. All excavations will be kept free of water during the placement of fill.
- D. The Contractor shall utilize methods and equipment for excavating that will minimize the disturbance to the subgrade. The use of backhoes rather than scrapers or front-end loaders may be required to minimize repeated passes of equipment over wet subgrade soils.
- E. Sufficient common excavation will be utilized by the Contractor to replace the soil shrinkage from excavation which occurs through the course of construction handling and compaction. The Contractor shall make their estimate of the amount of shrinkage that will occur.
- F. Topsoil
 - 1. Once the salvaged topsoil is stockpiled, the Contractor shall estimate any potential shortage or surplus of topsoil possible in meeting the other provision of this Contract and notify the Engineer of the estimate.

2. The priority in re-distributing the topsoil on site will be to meet the minimum depths required over the entire project area.
- G. In areas where filling above the existing grade is necessary to establish the final designed elevation, the Contractor shall fully remove the topsoil and organic material to the level of stable underlying sand or clay before backfilling with suitable embankment material.
- H. The Contractor shall make their determination as to whether the proposed grading has been completed according to the plans. When the Contractor determines that the grading has been completed, he will notify the Engineer. Neither the Owner nor the Engineer will provide any intermediate acceptance of the grading improvements until all of the gradings have been completed and all topsoil has been spread.

3.2 COMPACTION

- A. All embankment grading will be compacted using the Quality Compaction Method.

3.3 FIELD QUALITY CONTROL

- A. Samples for testing shall be taken from material at locations approved by the Engineer. All sampling methods shall be approved by the Engineer.
- B. The Contractor shall coordinate the site grading and inform the Engineer when the roadway subgrade is ready for test rolling, before installing any aggregate base. The Engineer may order some subgrade correction before allowing the installation of the aggregate base.
- C. Should any of the specified tests or inspections fail, the Contractor may arrange and pay for additional tests or inspections as may be necessary to satisfy the Engineer that the specified requirements have been met.

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

SECTION 31 23 13 - SUBGRADE PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This section covers the furnishing of all labor, materials, tools, equipment, and performance of all work and services necessary or incidental to the subgrade preparation as indicated on the drawings or as specified herein.

1.2 METHOD OF MEASUREMENT AND PAYMENT

- A. Measurement and compensation for the following items will be paid according to the referenced specification or as modified below:
 - 1. No direct payment will be made for subgrade preparation. Costs will be included in the unit prices bid for the various excavation items.
- B. The furnishing and installing of specific items and/or the performance of work under certain circumstances will not be individually paid in the absence of a specific bid item for the work. The costs will be included in the unit price bid for the various excavation items. Such items of work include but are not limited to:
 - 1. Drying and adding water to the subgrade.
 - 2. Subgrade excavation, furnishing stabilizing aggregate, geotextile fabric installation, compaction, regrading, and/or other efforts necessary to repair the subgrade after satisfying the rolling test and failing to protect the integrity of the subgrade.
 - 3. Test rolling the compacted subgrade.

1.3 SPECIFICATION REFERENCES

- A. MnDOT 2112 will apply to this Section.
- B. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

1.4 SUBMITTALS

- A. No submittals for this section.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. No exception to the referenced specification is made.

PART 3 - EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

- A. At the end of each day, and before the placement of aggregate base, the Contractor shall eliminate surface indentations, including those caused by sheeps foot rollers and tractor cleats, and roll the surface with a steel wheel or rubber-tired roller.
- B. The Contractor shall disc, scarify, shape and compact the street subgrade or existing base, adding water or drying as may be necessary to give uniform and desired density.
- C. If the subgrade is unstable and the instability is due to excessive moisture, the subgrade will be scarified and dried over a reasonable period. When the material has reached acceptable moisture limits, the material will be returned to the roadbed and compacted into place to the proper elevation. The roadbed will once again be test rolled. If the material continues to be unstable, the Engineer may authorize the removal of the undesirable material as subgrade excavation.

- D. Once the subgrade has been test rolled and accepted by the Engineer, no traffic or construction equipment will be permitted to operate directly on the subgrade without the prior approval of the Engineer. All equipment will be restricted to operating only in areas where the aggregate base has been installed to its full design depth. If inclement weather occurs after a test roll, and before placement of the aggregate base or first course of bituminous, the test roll will be voided and a new test roll will be performed.
- E. The subgrade will be compacted in accordance with the Quality Compaction Method.

3.2

FIELD QUALITY CONTROL

- A. "Blue Top" stakes will be provided by the Contractor at 50 foot intervals to confirm that the subgrade is constructed to the required grades and elevations. Methods other than "Blue Top" staking may be allowed if approved by the Engineer.
- B. The compacted subgrade will be test rolled using a fully loaded aggregate truck (tandem) in a pattern approved by the Engineer. The subgrade stability will be considered adequate when the surface shows less than 1.0 inch of yielding or rutting after one pass, or as otherwise approved by the Engineer.

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

SECTION 31 23 19 - 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 will be considered exempt from the requirements of Supplementary Condition 13.03.

1.2 METHOD OF MEASUREMENT AND PAYMENT

- A. Measurement and compensation for the following items will be paid according to the referenced specification or as modified below:
 - 1. No 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 will not be individually paid in the absence of a specific bid item for the work. The costs will be included in the unit price bid for the dewatering items, as indicated. Such items of work include but are not limited to:
 - 1. The cost of furnishing discharge pumps, rock, piping including bends, and adapters, include in the price bid for tile construction.
 - 2. Interference of other underground structures and utilities.
 - 3. Protection of existing improvements from damage, include in the price bid for tile construction.
 - 4. Installing a portion of the tile, allowing the area to dewater, and returning later to finish the installation, shall be included in the price bid for tile construction.

1.3 SPECIFICATION REFERENCES

- A. MnDOT 2451 will apply to this Section.
- B. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

1.4 SUBMITTALS

- A. No submittals for this section.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. No exception to this section is made.

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 groundwater at the project site.
- B. Water from dewatering operations will 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. The Contractor shall be responsible for obtaining all necessary permits required for dewatering prior to the beginning of dewatering. The Contractor shall provide a plan for the discharge showing the discharge

location, energy dissipation, and water quality treatment. The discharge rate, location, and water quality will meet all local, State, and Federal requirements.

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

SECTION 31 37 00 - RIPRAP

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 construct the riprap and geotextile fabric as indicated on the drawings or as specified herein.

1.2 METHODS OF MEASUREMENT AND PAYMENT

- A. Measurement and compensation for the following items will be paid according to the referenced specification or as modified below:
 - 1. Payment for riprap will be by the Ton based on actual weigh tickets. The amount bid will be compensation in full for all costs of excavating, removing, and disposing of, if necessary, all materials encountered in the course of riprap placement.
- B. The furnishing and installing of specific items and/or the performance of work under certain circumstances will not be individually paid in the absence of a specific bid item for the work. The costs will be included in the unit price bid for the associated rip-rap items. Such items of work include but are not limited to:
 - 1. Geotextile fabric filter.
 - 2. Excavation is required to place rip-rap.

1.3 SPECIFICATION REFERENCES

- A. The following referenced Specifications will apply to this Section:
 - 1. MnDOT 2511.
 - 2. MnDOT 3601.
 - 3. MnDOT 3733.
- B. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

1.4 SUBMITTALS

- A. No submittals for this section.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. The material to be used will be the class riprap and fine filter aggregate shown on the plans as specified in MnDOT 3601.
- B. The geotextile fabric shall meet the requirements of MnDOT 3733, Type 4, unless otherwise shown on the plans.

PART 3 - EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

- A. No exception to the referenced specification is made.

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

SECTION 32 15 00 - AGGREGATE SURFACING

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 construct the aggregate surfacing / shouldering as indicated on the drawings or as specified herein.

1.2 METHODS 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.
- B. The furnishing and installing of specific items and/or the performance of work under certain circumstances shall not be individually paid in the absence of a specific bid item for the work. The costs shall be included in the unit price bid for the associated aggregate surfacing items. Such items of work include but are not limited to:
 - 1. Protecting existing improvements and previously accepted in-process improvements from damage.
 - 2. Subgrade excavation, furnishing stabilizing aggregate, geotextile fabric installation, compaction, regrading and/or other efforts necessary to repair the subgrade after satisfying the rolling test and failing to protect the integrity of the subgrade.
 - 3. The cost of all labor, equipment and materials necessary for meeting the testing requirements of field quality control, if required.
 - 4. Furnishing and installing blue tops for aggregate surfacing.
 - 5. Test rolling of the compacted aggregate surface using a fully loaded tandem axle truck.

1.3 SPECIFICATION REFERENCES

- A. MnDOT 2118 shall apply to the construction of aggregate surfacing, except as modified herein.
- B. MnDOT 2221 shall apply to the construction of aggregate shouldering, except as modified herein.
- C. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

1.4 SUBMITTALS

- A. Provide the following test results for each source of aggregate:
 - 1. Two gradation tests One percent crushing test (only if requested by Engineer).
 - 2. One aggregate quality test (only if requested by Engineer).

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials included here consist of new aggregate surfacing, Class 5. If additional rock is used to provide a coarser Class 5 gradation, the added materials must pass the Los Angeles Rattler (L.A.R.) test.

PART 3 - EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

- A. At the end of each day the Contractor shall eliminate surface indentations, including those caused by sheeps foot rollers, tractor tires and tracked equipment, and roll the surface with a steel wheel or rubber tired roller.
- B. The depth and class of aggregate surfacing to be constructed shall be as shown on the plans. Aggregate surfacing construction shall take place only after the subgrade or aggregate base condition and grade has been examined by the Engineer.
- C. Existing aggregate surfacing shall be salvaged prior to commencing trenching activities and shall be restored after underground construction is completed.
- D. Compaction of the aggregate surfacing courses shall be by the Quality Compaction Method.
- E. The compacted aggregate surface shall be test rolled using a fully loaded tandem axel truck in a pattern approved by the Engineer. The stability of the compacted aggregate shall be considered adequate when the surface shows less than one 3/4-inch of yielding or rutting after one pass, or as otherwise approved by the Engineer. Test rolling shall be incidental.

3.2 SOURCE QUALITY CONTROL

- A. The Owner may arrange for and pay all costs associated with having the following testing performed:
 - 1. One gradation test for each 500 tons or 275 cubic yards (CV) of each class of aggregate.
 - 2. One percent crushing test (if required by the Engineer).
 - 3. One aggregate quality test (if required by the Engineer).
- B. Samples for testing shall be taken from material in stock at locations approved by the Engineer. All sampling methods shall be approved by the Engineer.
- C. The Contractor shall cooperate fully with the individuals performing the tests.

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

SECTION 32 92 00 – TURF AND GRASSES

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 variety of different seeding mixtures may be utilized on this project. The Contractor shall refer to the plan for the locations of the different turf establishment areas.
- 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.

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. All measurements for payments for turf establishment items shall be based on the Unit Price bid per item.
- B. The furnishing and installing specific items and/or the performance of work under certain circumstances shall not be individually paid in the absence of a specific bid item for the work. 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.
 - 2. Application of starter fertilizer on all areas to be seeded shall be included in the price bid for seeding.
 - 3. Subgrade preparation and topsoil placement as required on all areas shown on the plans.
 - 4. Maintenance of newly seeded areas, as specified, include in the unit price for the associated items.
 - 5. All re-work necessary to repair areas that do not grow.

1.3 SPECIFICATION REFERENCES

- A. The following referenced Specifications will apply to this Section:
 - 1. MnDOT 2574.
 - 2. MnDOT 2575.
 - 3. MnDOT 3876.
 - 4. MnDOT 3877.
 - 5. MnDOT 3878.
 - 6. MnDOT 3881.
 - 7. MnDOT 3882.
 - 8. MnDOT 3884.
 - 9. MnDOT 3885.
- B. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

1.4 SUBMITTALS

- A. Seeding - Certificates of Compliance for seed mixture.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Seeding

1. The seed mixtures to be used shall be: 25-141 (Mesic General Roadside), unless otherwise specified on the plans or within the specifications.
2. All application rates for MnDOT mixes, except temporary seed, are 150 percent the specified rate.
3. Type 1 mulch shall consist of clean straw with no pasture hay at a rate of 2 tons/Ac.
4. Temporary seeding, if required shall use Seed Mixture – 110B Oats.
5. Temporary Stabilization in Ag. Areas over the pipe trench areas shall be completed by furnishing and installing type 1 mulch at a rate of 2 tons/AC.
6. Seed must be obtained from as close to the project site as reasonably possible with an emphasis on obtaining seed from the local ecotype region.
7. Source identified (Yellow tag) seed through the Minnesota Crop Improvement Association (MCIA) unless otherwise approved by the Engineer.
8. All seed shall be supplied as pure-live seed (PLS).
9. All seed and seed mixes shall conform to State seed requirements for noxious weed content.
10. All seed and seed mixes shall conform to State labeling requirements. For all species in the mix, the label and or invoice shall include the county of origin, and if from Canada, the province.

B. Imported Topsoil

1. Unless otherwise indicated on the plans, imported topsoil borrow for general use as a turf growing medium shall comply with MnDOT 3877.2.A.
2. Unless otherwise indicated on the plans, imported topsoil borrow for use as a plant growing medium in designated areas such as landscape beds shall meet the requirements of MnDOT 3877.2.B.

C. Fertilizer

1. Fertilizer shall be 10-10-10, type 3 (slow release).
2. Fertilizer shall be applied at a rate of 350 lbs/acre.

D. Rapid Stabilization

1. Rapid Stabilization, Method 4, shall be performed at the outlet and at other locations designated by the Engineer. The work shall include seeding and fertilizing at the rates above and covering the seeded area with Category 3 erosion control blanket.

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 and discharge area and shall document the existing conditions. Upon completion of surface restoration (i.e., turf establishment), the storm water outfall 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-compliance.**
4. The subgrade shall be shaped to the approximate contour of the finished surface. All construction debris shall be removed from the area prior to the placement of the topsoil. The subgrade shall be loosened with a disc or harrow to a depth of 6.0-inches prior to application of the topsoil.
5. The topsoil shall be shaped to the approximate contour of the finished surface, with a minimum depth of 12.0-inches. All construction debris, rocks and trash 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 for a period of 30 calendar days, or until final acceptance by the Owner, to firmly establish the seed. The term maintenance includes mowing, weed control and watering, as necessary. Failure to perform this work within 24-hours of notification of non-compliance may result in the Owner or Engineer arranging for completion of the work by others. A contract deduction will be made equal to the total of all costs to perform such work so arranged, including but not limited to, labor, materials, equipment and administrative costs.
7. Where dormant seeding is authorized, the maintenance period will be extended to include the first 30 calendar days after the beginning of the growing season. The beginning of growing season will be defined as bud burst.

B. SEEDING REQUIREMENTS

1. Turf establishment by seeding shall be done utilizing the various combinations of seed mixtures, fertilizing and mulching.
2. Areas prepared for seeding shall be free of rocks, debris and clumps of soil. The areas shall be graded uniformly, and vegetated areas shall be raked free of chunks exceeding 1-inch diameter.
3. Seed shall be applied with a drill seeder, unless otherwise approved by the Owner.
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. Use of seed mix carriers: In some cases, it can be beneficial to add seed mix carriers to mixes such as cracked corn, vermiculite or sand, the choice often depends on the type of seeder used. Manufacturers of seeding equipment should be consulting about carrier recommendations. The material used and rate applied must be approved by the Engineer prior to use. The cost of seed mix carriers will be incidental to the unit price bid for the seed.
7. Final acceptance of seeding will be based on an established growth of 6.0-inches with a uniform density to cover 70 percent 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****

SECTION 33 05 06 - TRENCHING AND BACKFILLING

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 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.
- D. Flexible Pipe Materials – For this specification section, flexible pipe materials will include the following:
 - 1. Polyvinyl chloride (PVC) pipe – solid wall and profile wall pipe.
 - 2. Polypropylene profile wall pipe.
 - 3. High-density polyethylene pipe – solid wall and profile wall pipe.
 - 4. Corrugated steel or aluminum pipe.
- E. Rigid Pipe Materials – For this specification section, rigid pipe materials will include the following:
 - 1. Reinforced concrete pipe.

1.3 METHOD OF MEASUREMENT AND PAYMENT

- A. Measurement and compensation for the following items will 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 following the description of measurement and payment contained in the section applicable to the individual item. No direct compensation will 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 will not be individually paid in the absence of a specific bid item for the work. The costs will 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.
 - 2. 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.
 - 3. Any dewatering is necessary for construction.
 - 4. Foundation materials placed instead of performing necessary dewatering.
 - 5. Bulkheading of existing pipes to be abandoned in place.

6. Granular foundation, granular bedding, and granular encasement materials.
7. Granular foundation materials used as bedding materials in the specified bedding zone.
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 replacement of all material displaced due to shrinkage or loss during the excavation and backfilling operations.
11. The removal of excess materials above the original topography resulting from the additional volume created from pipe bedding, utility pipe, and/or underground structures.
12. Delays due to other utility conflicts that result during construction.
13. Protecting existing improvements and previously accepted elements of this construction from damage.
14. 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.
15. Providing temporary bypass pumping/control of stormwater flows around the construction zone.
16. The use of special construction techniques such as trench boxes, sheeting, shoring, etc., will be included in the price bid for the associated items being installed.
17. Compaction testing and compaction, if required, will be included in the price bid for the associated items being installed.
18. Shaping and grading of the construction zone so that farming operations can be easily accomplished, and surface drainage is restored following construction.
19. Off-site disposal of debris and any fees and permits for the disposal of those materials.

1.4 SPECIFICATION REFERENCES

- A. CEAM 2600 will apply, except as modified herein.
- B. MnDOT 2451 will apply, except as modified herein.
- C. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

1.5 SUBMITTALS

- A. Gradation Test Results for any granular borrow materials.
- B. Two separate tests, as required in Source Quality Control provisions of individual sections contained herein, from material stockpiles of aggregates to be used on this project. These tests may be run by the Contractor or its supplier during aggregate production.

PART 2 - PRODUCTS

2.1 GRANULAR MATERIALS

- A. Granular Foundation - Granular foundation (Rock) material will be rock material, with the gradation limits meeting MnDOT Course Filter Aggregate, 3149. This material shall be used for the granular bedding and granular encasement materials for the tile construction:

Granular Foundation	
Sieve Size	Percent Passing
2-inch	100
1½-inch	95 - 100
¾-inch	20 - 60
# 4	1 - 10

PART 3 - EXECUTION

3.1 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. will 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 will be undercut 6.0-inches below the pipe barrel to permit the installation of granular bedding or foundation material.
2. The trench for all rigid pipe will be undercut 3.0-inches below the pipe barrel, or as shown in the bedding detail, to permit the installation of granular bedding or foundation material.
3. The Contractor shall install and operate a dewatering system to maintain all trenches free of water wherever necessary. The Contractor shall make their subsurface investigations and determine what dewatering methods to utilize to prevent such damage.
4. The Contractor shall be responsible for any damage to adjacent structures or buildings caused by the dewatering operations.
5. Use of granular foundation material in place of performing dewatering is permitted.
6. All excess excavated material will remain the property of the Owner and will be loaded, hauled, placed, and compacted at a site chosen by the Owner within 5 miles of the site. All unsuitable excess excavated material, except for topsoil will become the property of the Contractor and will be removed from the site and disposed of at a site secured by the Contractor.

3.2 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 before 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.

2. If a reinforced concrete pipe is used, the Contractor may at its discretion choose to wrap each joint with a geotextile filter fabric, as specified, rather than place mastic in the joint.
- 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 will be placed at the beginning of the project or 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 will construct a water-tight plug on the open end of the abandoned pipe.
 3. Permanent watertight plugs will be constructed with concrete grout with a thickness of not less than 1 pipe diameter.

3.3 BEDDING AND BACKFILLING OPERATIONS

- A. Backfill material around all utilities will be compacted with hand machines. The maximum lift thickness will be 6.0-inches.
- B. Flexible Pipe Materials
1. The pipe will be bedded and backfilled with granular foundation material compacted to 95 percent Standard Proctor Density or as recommended by the pipe manufacturer, whichever is denser, from 6.0-inches below the bottom of the pipe to 12.0-inches above the top of the pipe the full width of the trench. The Contractor shall bed and backfill the pipe as shown on the plan details.
 2. Where the trench foundation is unstable and not suitable for bedding, the trench will be undercut until acceptable conditions are found. The Contractor shall then install compacted foundation material to meet the line and grade specified on the plan.
 3. Select native material will be used as a trench backfill above the granular bedding up to the bottom of the subgrade except in those conditions where the top of the pipe is less than 12.0-inches from the bottom of the subgrade in which case granular material compacted to 100 percent Standard Proctor Density will be used as trench backfill the full width of the trench to the bottom of the subgrade excavation zone.
- C. Rigid Pipe Materials
1. In ordinary or stable trench conditions, the bottom of the trench will be first excavated to a depth of approximately 15 percent of the outside pipe diameter below the established grade for the bottom of the pipe. Then the bottom of the trench will be further excavated to allow for the placement of 6.0-inches of granular bedding for a width of at least 60 percent of the outside diameter of the pipe. A pipe will be placed on the bottom of the pre-shaped excavated trench. The bottom of the excavated trench will be shaped to fit the circumference of the pipe up to 0.15 of the outside diameter of the pipe. The Contractor shall encase the pipe from the 0.15 outside diameter to the 0.60 diameter height of the pipe with granular material compacted to 95 percent Standard Proctor Density or as recommended by the pipe manufacturer, whichever is denser.
 2. Where the trench foundation is unstable and not suitable for bedding, the trench will be undercut until acceptable conditions are found. The Contractor shall then install compacted foundation material to meet the line and grade specified on the plan.
 3. Select native material may be used as trench backfill above the granular bedding up to the bottom of the subgrade except in those conditions where the top of the pipe is less than 12.0-inches from the bottom of the subgrade in which case granular material compacted to 100 percent Standard proctor Density will be used as trench backfill the full width of the trench to the bottom of the subgrade excavation zone.
- D. Tile Intakes

1. All tile intakes, and miscellaneous structures will be backfilled with granular foundation rock and will be compacted with a hand-operated motorized compactor.

E. All trench backfill will be compacted in accordance with the Quality Compaction Method.

3.4 SOURCE QUALITY CONTROL

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

1. One gradation test per every 500 tons or 275 cu yd (CV) of granular materials.

3.5 FIELD QUALITY CONTROL

A. No exception to the referenced Specification is made.

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

SECTION 33 41 16.11 - 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
 - (a) Measurement of main line drain tile 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) Since the number of necessary connections is unknown, the Owner reserves the right to increase or decrease the quantity by any amount with no adjustment in unit price.
- B. The furnishing and installing of specific items and/or the performance of work under certain circumstances shall not be individually paid in the absence of a specific bid item for the work. 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 topsoil over the trench in agricultural and turf areas, include in the price bid for drain tile or drain tile repair.
 - 2. Furnishing, installing and compacting granular foundation bedding and encasement material for the tile construction.
 - 3. Furnishing and placing pipe joint sealer and geotextile fabric at pipe joints, include in the price bid for drain tile.
 - 4. Furnishing and installing necessary bends, adapters and couplers, and the cutting and removing and/or realigning of the existing lateral tile encountered during main line construction, include in the price bid per LINEAR FOOT for drain tile.
 - 5. Decommissioning the existing tile.
 - 6. Marking the location of existing tiles with lathe so that the engineer can record the location on the plan.
 - 7. Connection of existing lateral drain tiles to the new main tile, including the lateral tile, inserta tee, tees, wyes, bends and fittings, include in the price bid for lateral tile connection.
 - 8. Performing the required deep tillage of all disturbed areas, include in the price bid for drain tile.
 - 9. Salvaging, stockpiling and reuse of existing aggregate surfacing material at driveway and roadway crossings 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.
20. Providing temporary bypass pumping / control of storm water flows around the service line if needed.

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. Reference Section 33 05 06 "Trenching and Backfilling" of this Project Manual, except as modified herein.
- D. MnDOT 2501 shall apply to the construction of pipe culvert, outlet pipe and appurtenance items, except as modified herein.
- E. MnDOT Specification No. 2503 shall apply to measurement and payment of pipe sewers/drain tile, except as modified herein.
- F. MnDOT Standard Plates Manual with latest revisions.
- G. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

PART 2 - PRODUCTS

2.1 DRAIN TILE

- A. Polyethylene Pipe

1. Dual wall perforated and non-perforated corrugated polyethylene pipe shall conform to the requirements of ASTM F2648 with smooth interior and annular exterior corrugations. Joints shall be bell and spigot meeting ASTM F2648 and shall be soil tight. The gasket shall meet the requirements of ASTM F477. Pipe shall be perforated or non-perforated as indicated on the plans. Perforated pipe shall include micro perforations/slots to avoid granular infiltration into the pipe.
2. Single wall corrugated polyethylene pipe shall conform to the requirements of ASTM D3350.
3. Fittings for lateral tiles and intakes shall conform to ASTM 2306. Joints shall be bell and spigot soil tight.
4. Connections of private tiles and unknown laterals up to 18-inches in diameter shall use inserta-tee connectors or approved equal.
5. Connections of known laterals as shown on the plans, and private tiles and unknown laterals greater than 18-inches in diameter shall use fabricated wye fittings.
6. No internal push in fittings will be allowed.

2.2 CS TILE

A. Corrugated Steel Pipe

1. No exception to the referenced specification is made.

2.3 HEAVY DUTY DRAIN TILE

A. Polypropylene Pipe

1. Polypropylene Pipe shall conform to the requirement of ASTM F2736 and ASASHTO M330. Joints shall be bell and spigot meeting ASTM F2881 and shall be silt tight. The gasket shall meet the requirements of ASTM F477. Pipe shall be non-perforated.
2. Fittings for bends and known lateral tile connections shall be bell and spigot meeting ASTM F2764. Fittings shall be bedded and encased with foundation aggregate.
3. Connections of private tile lines and unknown laterals shall use inserta-tee connectors or approved equals and shall be bedded and encased with foundation aggregate.

2.4 RC TILE

A. Reinforced Concrete Pipe (MnDOT 3236)

1. No exception to the referenced specification is made.

2.5 RC APRON

1. No exception to the referenced specification is made.

2.6 GEOTEXTILE FABRIC

- A. MnDOT 3733, Type I, non-woven for use in wrapping joints in drain tile joints (minimum 24-inch width).
- B. MnDOT 3711, Type I knit sock for use as a sock on the perforated polyethylene drain tile. Overlap joints by 12 inches.

2.7 GRANULAR MATERIAL

- A. No exception to the referenced specification is made.

PART 3 - EXECUTION

3.1 INSTALLATION OF PIPE AND FITTINGS

A. Polyethylene Drain Tile

1. All piping shall be installed in accordance with the details in the Plans. Foundation aggregate (Rock) shall be installed around the pipe as noted. All fittings shall be encased in Granular Foundation rock.
 2. Dual Wall Polyethylene Drain Tile may be installed by the "spoon method," where the soil is shaped to fit the outside diameter of the pipe provided the following conditions are met:
 - (a) The soil conditions are adequate to provide support and will stand without sloughing.
 - (b) The pipe manufacturer or supplier shall provide evidence that the pipe can be satisfactorily installed by this method, with a recommendation on the maximum depth at which this installation is permissible.
 - (c) Specific installation procedures are provided, specifying the maximum diameter of the shaped trench and the height to which the shaping needs to extend, foundation aggregate material shall be furnished and installed around and to the top of the pipe as shown on the details.
 - (d) The pipe manufacturer provides a letter or other document which verifies that the standard warranty for the pipe will be valid under this installation method.
 - (e) All voids around the outside of the pipe shall be filled with foundation aggregate material.
 - (f) The spoon shall extend above the mid-point of the pipe by approximately 3 inches.
 3. The Contractor shall install an intake and tile markers on both sides of the road at each road crossing at the right-of-way.
- B. Equipment
1. The use of rubber-tired earth moving equipment shall not be permitted on the agricultural fields until after the topsoil has been stripped except for exploratory excavations. Topsoil striping shall be performed with an excavator. 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 backfill, from the top of the pipe to 2' higher, shall be gently placed with a backhoe to avoid placing rocks on the pipe and to avoid impacting the pipe.
- E. Utility Crossings
1. The Utility companies shall be notified prior to constructing a tile across their utility line. The Contractor shall follow any special requirements when working around the utility line.
- F. Salvage and Reinstall Fence
1. 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 completed, including new posts and wire if needed.
- G. Decommissioning Existing Tile
1. All existing laterals and private tile that are connected to the existing tile shall be reconnected to the new tile. Where the new tile alignment is substantially in the same location as the existing tile, the existing tile shall be removed from service by breaking the pipe at a minimum of 200-foot intervals. Where the new tile alignment deviates from the existing tile, the existing tile shall be connected to the new tile on the downstream end and plugged at the upstream end when the new alignment and existing alignment once again converge.

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.

3.3 ROADWAY AND DRIVEWAY CROSSINGS

- A. Where the proposed tile crosses an aggregate surfaced roadway or driveway, the crossing shall be accomplished by open cutting of the surface.
- B. Prior to crossing of the roadway or driveway, all existing aggregate surfacing material over the full width of the trench shall be salvaged and stockpiled.
- C. The salvaged aggregate material shall be utilized in the upper portions of the trench backfill in the roadway areas or for temporary surfacing as directed by the Engineer.
- D. Signage and maintenance of traffic shall be as specified elsewhere herein.

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

SECTION 33 42 00.01 – 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 Intake
 - (a) Measurement for Surface Water Intake shall be by the EACH. The amount bid shall be compensation in full for all costs of furnishing and installing the intake, for each designated size, the pipe to connect the intake to the main, insert-a-tee and any fitting, as shown on the detail in the plan set.
 - (b) The surface water intakes at roadway right of ways shall have a Hickenbottom risers.
 - (c) The surface water intakes in the fields shall be low profile intakes as shown on the plans.
- 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 an Agri-Drain beehive inlet grate or approved equal.
 - 6. Furnishing and installing clean foundation aggregate for the blind/rock intakes and a cap on top of the riser pipe.
 - 7. Furnishing and installing a tile and 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. MnDOT Standard Plates Manual with latest revisions.
- C. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

- A. Dual Wall polyethylene pipe as specified in Section 33 41 16.11 "Agricultural Drain Tile" of this Project Manual.
- B. Hickenbottom tee and riser sections or approved equal.
- C. Agri-Drain beehive inlet grate or approved equal.

- D. Geotextile Fabric for surface water intakes shall be 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 always has an outlet 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******