

Rimmell Ditch Design/Build Report

Noble County, Indiana

April 2009



Prepared For:

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RIMMELL DITCH DESIGN/BUILD REPORT NOBLE COUNTY, INDIANA

EXECUTIVE SUMMARY

The Skinner Lake Homeowners Association received an Indiana Department of Natural Resources (IDNR) Lake and River Enhancement (LARE) grant to design and build projects identified along Rimmell Ditch in the engineering feasibility study, which was completed in 2007. The goal of the project was to design and implement water quality improvement projects along Rimmell Ditch that would reduce sedimentation and nutrient loading into Skinner Lake. JFNew was contracted to complete projects located on seven of the sites with the County Surveyor completing the work related to projects on an additional 16 sites as in-kind match for the grant.

Due to heavy rains and flooding in spring 2008, an additional erosion area was identified and funding was requested to design and implement a treatment. An agreement was made to modify the original contract by replacing work on two smaller project sites with the implementation of the design/build for the newly identified site. Due to County funding issues and unforeseen projects, an agreement was made to shift from the originally identified in-kind projects to other projects within the Rimmell Ditch drainage area. These projects met the same criteria in reducing sedimentation and nutrient loading and provided water quality benefits to Skinner Lake.

The projects that were completed by JFNew included the installation of two pipe drop structures, three grassed waterways, two grade control structures, 40 feet (12.2 m) of streambank stabilization, a rock-line chute, and culvert erosion stabilization. The Noble County Drainage Board completed the installation of a culvert to replace a deteriorating bridge. They also performed bottom dipping, channel re-alignment, bank re-sloping, bank stabilization, spoils leveling, and seeding on approximately 5,600 feet (1,706 m) of the Rimmell Open/ Melvin System.

ACKNOWLEDGEMENTS

The Indiana Department of Natural Resources Division of Fish and Wildlife Lake and River Enhancement (LARE) Program, the Skinner Lake Homeowners Association, and the Noble County Drainage Board funded this design/build project. JFNew completed designs and obtained permits where necessary, administered sub-contract agreements and provided construction oversight. Ed Sprague of the Skinner Lake Homeowners Association provided initiative and assistance in getting these projects completed. Special thanks are due to Scott Ziegler of the Noble County Surveyor's Office for completing water quality improvement projects as in-kind match; and Kent Tracey with the IDNR LARE program for his assistance in the administration of the projects. Thanks to the Skinner Lake Homeowners Association members for their support and watershed landowners for their assistance. Contributors to this project include Wayne Stanger, Stanger Trees; Colby Stanger, Stanger Excavating; George Hardie, Earthwerks; John Richardson, Mark Pranckus, Christine Dittmar, and Tom Estrem with JFNew.

Cover Photos: Top Left – Site 131 Streambank Stabilization, Top Right – Site 115 Main Grassed Waterway w/Pipe Drop Structure, Lower Left – Rimmell Re-alignment East of 500 E, Lower Right – Pipe Drop Structure at Site 115 During Installation

TABLE OF CONTENTS

	Page
1.0 Statement of Project Purposes.....	1
2.0 General Overall Project Description	1
2.1 Landowner Permission.....	2
2.2 Permit Requirements.....	2
2.3 Contractors.....	2
2.4 Project Timing	2
2.5 Project Accomplishments	3
2.6 Scope Changes.....	4
2.7 Future Project Inspection and Maintenance	5
3.0 Project Specific Design and Construction	5
3.1 Culvert Erosion – Site 21.....	5
3.2 Grade Control Structure – Site 114.....	7
3.3 Pipe Drop Structure/ Grassed Waterways – Site 115	8
3.4 Pipe Drop Structure – Site 115A	15
3.5 Gully Erosion – Site 123.....	16
3.6 Streambank Stabilization/ Grade Control Structure – Site 131.....	17
3.7 Higginbotham Bridge Replacement.....	20
3.8 Rimmell Open/ Melvin System Drainage Project.....	21
4.0 Project Summary.....	24

LIST OF FIGURES

	Page
Figure 1. Approximate project location	1
Figure 2. Location of water quality improvement projects completed by JFNew and Noble County Drainage Board within the Rimmell Ditch watershed	3
Figure 3. Erosion area identified on February 7, 2008.....	4
Figure 4. Culvert erosion area before repair located at Site 21	6
Figure 5. Culvert erosion area after repair located at Site 21	6
Figure 6. Grade control structure installed on November 2, 2008 on Rimmell ditch approximately 350 ft (106.7 m) upstream of C.R. 300 E crossing	7
Figure 7. Projects completed on Higginbotham property including Sites 114, 115 and 115A	8
Figure 8. Severely eroded waterway on Site 115 prior to installation of tile.....	9
Figure 9. Relief well connection to 15-in. tile during installation.....	10
Figure 10. Original pipe drop structure located at Site 115 which was removed	10
Figure 11. New pipe structure located on north side of Rimmell Ditch during installation	11
Figure 12. Grassed waterway and pipe drop structure looking north to RR tracks after installation.....	12
Figure 13. Grassed waterway north of Rimmell Ditch located to the east of the pipe drop structure on the Higginbotham property	13
Figure 14. Grassed waterway south of Rimmell Ditch on Higginbotham property	14
Figure 15. Pipe drop structure installed on south side of Rimmell Ditch at site 115A..	15
Figure 16. Damage to spillway at Site 115A after flooding event in March 2009	16
Figure 17. Corn stubble clogging structure at Site 115A after flooding event	16
Figure 18. Gully erosion Site 123 on south side of Rimmell Ditch before rock chute installation	17
Figure 19. Gully erosion Site 123 on south side of Rimmell Ditch after rock chute installation.....	18
Figure 20. Rimmell Ditch bank caving in downstream of C.R. 500 E.....	18
Figure 21. Rimmell Ditch bank downstream of C.R. 500 E during construction.....	19
Figure 22. Grade control structure downstream of C.R. 500 E after installation	20
Figure 23. Northwest corner of original Higginbotham Bridge showing degraded wing wall and pilings.....	21
Figure 24. New culvert installed by the Noble County Drainage Board at the Higginbotham's residence	22
Figure 25. Example of rock toe installed where old channel adjoined re-aligned channel.....	23
Figure 26. Section of Rimmell Ditch East of C.R. 500 after re-alignment	24
Figure 27. Example of grade control structure installed by Noble County Drainage Board.....	25

LIST OF TABLES

Table 1. Summary of associated project costs 4

LIST OF APPENDICES

Appendix A	Landowner Correspondence
Appendix B	Permits
Appendix C	Scope changes
Appendix D	Typical Design of Rock Chute
Appendix E	Grade Control Structure Design – Site 114
Appendix F	Pipe Drop Structure/Grassed Waterways Design – Site 115
Appendix G	Pipe Drop Structure Design – Site 115A
Appendix H	Streambank Stabilization/Grade Control Design – Site 131
Appendix I	Seed Mixes
Appendix J	Rimmel Open/Melvin System Design

RIMMELL DITCH DESIGN/BUILD REPORT NOBLE COUNTY, INDIANA

1.0 STATEMENT OF PROJECT PURPOSE

The purpose of this project was to reduce sediment and sediment-attached nutrient delivery to Skinner Lake by stabilizing eroded streambanks along Rimmell Ditch and filtering runoff from adjacent agriculture fields.

2.0 GENERAL OVERALL PROJECT DESCRIPTION

The Rimmell Ditch project area is located south and east of Skinner Lake (Figure 1). Rimmell Ditch is the largest inlet to Skinner Lake and its subwatershed drains 7,820 acres (3,165 ha) from its headwaters to its confluence with Skinner Lake. Rimmell Ditch is considered a legal drain and is regulated by the Noble County Drainage Board. The stream generally contains flowing water to a depth of two feet (0.6) and a width of four to six feet (1.2 – 1.8 m). The banks of Rimmell Ditch vary in height from five to fifteen foot (1.5 - 4.6 m), due in part to historic ditch maintenance projects where the removed sediment was placed on the banks adjacent to the ditch. Agriculture is the primary land use in the area surrounding Rimmell Ditch.

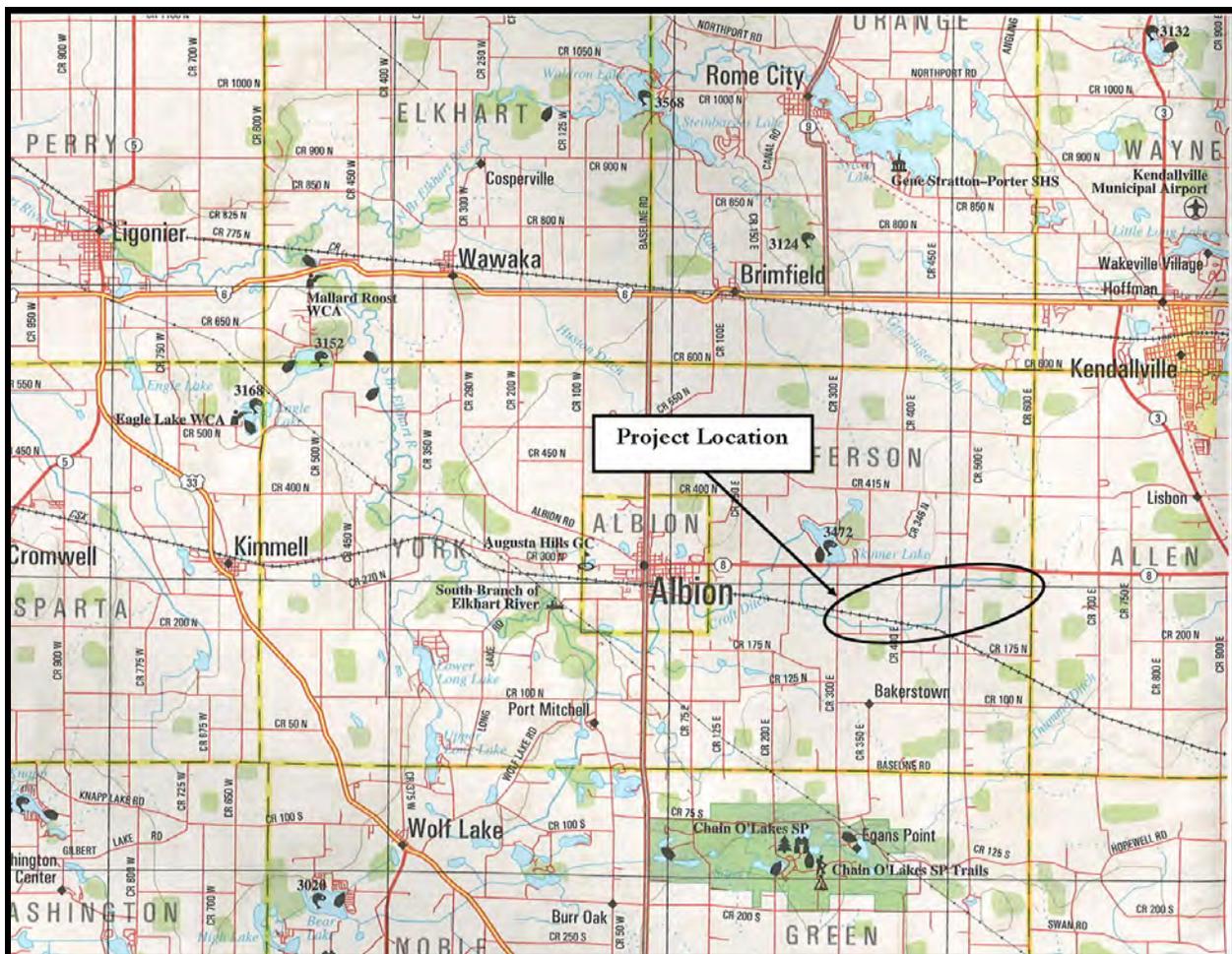


Figure 1. Approximate project location.

2.1 Landowner Permission

A majority of the projects were located within the easement of the Noble County Drainage Board. Written permission was obtained during the engineering feasibility study and verbal permission was granted for the construction phase. Landowner permission was requested and documented for projects that required access through private property (Appendix A).

2.2 Permit Requirements

Of the projects completed by JFNew, it was determined that only two grade control structures would require permits for construction. Regional General Permit (RGP) notifications were submitted to the U.S. Army Corps of Engineers (Corps) and Indiana Department of Environmental Management (IDEM) for sites 131 and 114 on February 5, 2008 and February 20, 2008, respectively. An electronic permit application was submitted to the Indiana Department of Natural Resources (IDNR) for construction in a floodway on January 25, 2008 and February 14, 2008 for sites 131 and 114, respectively. The Corps verified that the proposed work was authorized under the Regional General Permit (ID # 99-100-003-1) and assigned file number LRE-2008-00456-157 on May 13, 2008. IDEM requested that the two applications be combined and the permit application was re-sent on March 5, 2008 with copies to the Corps. No response was received from IDEM within the 30 working day waiting period, thus allowing the project to proceed under the RGP. Certificates of approval for construction in a floodway (Permits # FW-24682 and FW-24710) were received from the IDNR on April 18, 2008. Permits can be found in Appendix B. All other projects were determined to not need a permit because the work was to take place above the ordinary high water mark, or the project qualified as maintenance and was exempt under the county drainage code, IC 36-9-27.

2.3 Contractors

JFNew was contracted to complete the projects located on Sites 21, 114, 115, 115A, 123, and 131. JFNew sub-contracted portions of the work at sites 114, 115, and 115A to Stanger Excavating from Goshen, Indiana, and work at sites 123 and 131 to Earthwerks, Inc. from Syracuse, Indiana. The Noble County Surveyor contracted Greg Owens of Kendallville, Indiana, for the Rimmell Open/ Melvin System and Gilbert Drainage & Excavation of Ligonier, Indiana, for the Higginbotham Bridge Replacement.

2.4 Project Timing

All necessary permits were obtained by April 2008. Construction of Site 21 was completed on March 26, 2008 and Site 123 was completed on May 30, 2008. Preparations were made to begin construction on Sites 114, 115 and 131 in spring 2008, but excessive rains and crop planting delayed the projects until fall 2008. Projects located at Sites 114, 115, and 115A were completed by November 2, 2008 with projects at Site 131 being completed on November 3, 2008. The Noble County Rimmell Open/ Melvin System project was completed in October 2007 with the Higginbotham Bridge Replacement project being completed in April 2008.

2.5 Project Accomplishments

JFNew completed projects that included the stabilization of 40 feet (12.2 m) of streambank with native seed and a rock toe, installation of two grade control structures, tiling 570 feet (173.7 m) of waterway, installation of three grassed waterways, installation of two pipe drop structures, and installation of two rock chutes. Noble County completed two projects which included replacing a bridge with a culvert and bottom dipping, channel re-alignment, bank re-sloping, bank stabilization, spoils leveling and seeding of approximately 5,600 feet (1,706 m) of the Rimmell Open/ Melvin System between County Roads 500 E and 600 East. The locations of the completed projects are identified in Figure 2. Costs associated with each project are included in Table 1.



Figure 2. Location of water quality improvement projects completed by JFNew and Noble County Drainage Board within the Rimmell Ditch watershed.

Table 1. Summary of associated project costs.

Project Description	Site	Cost
Culvert Erosion	21	\$2,372.00
Grade Control Structure	114	\$4,248.00
Pipe Drop Structure/ Grassed Waterways	115	\$40,190.00
Pipe Drop Structure	115A	\$11,928.00
Gully Erosion	123	\$3,290.00
Streambank Stabilization/ Grade Control Structure	131	\$9,912.00
Higginbotham Bridge Replacement	NA	\$16,038.23
Rimmell Open/ Melvin System Drainage Project	NA	\$82,118.30
Total for all projects		\$170,096.53

2.6 Scope Changes

On February 7, 2008, during a survey of the Higginbotham property at Site 115, Mark Pranckus, JFNew, and Wayne Stanger, Stanger Trees, discovered a large area of soil that had been washed out due to recent heavy rain events (Figure 3). This area was not identified during the initial watershed tour due to lack of active erosion. After discussions with the LARE program representatives and the Skinner Lake Homeowners Association, it was determined that one thousand dollars be re-directed from the original contract to complete a design with cost estimates for a solution to the newly identified washout and was documented with Scope Change No. 1 (Appendix C, pg. C1). The completed design was estimated at \$11,000 to construct. This project was deemed feasible and considered a higher priority than Task 14 identified in the existing contract. An agreement was made to divert monies, previously allocated to Task 14, to cover the cost of construction for this project. This was documented with Scope Change No. 2 (Appendix C, pg. C2).



Figure 3. Erosion area identified on February 7, 2008.

2.7 Future Project Inspection and Maintenance

Maintenance for the projects completed within the Noble County Drainage Board's easement are the responsibility of the County and should be inspected by county personnel or their representative on an annual basis for the next three to five years. At a minimum, the project sites should be inspected in late spring or early summer following a storm flow event. Potential failure of erosion stabilization measures may include portions of the erosion control blankets being torn away from the soil surface, displacement of stone along the toe or grade control structure, or rill erosion under the blanket caused by overland flow. Any issues identified within the easement by local residents or adjacent landowners should be reported to the Noble County Surveyor. Projects outside the easement are the responsibility of the landowner and shall be monitored and maintained by the associated landowner. Minimal maintenance of grassed waterways by the landowner shall include mowing at least once a year in July. Grassed waterways must be periodically mowed to prevent excessive retardation of flow and subsequent ponding of water. Control of vegetation to prevent matted growth will reduce sediment accumulation. Sediment accumulation often results in failure of waterways. This was documented in a summary letter to the landowner once the project was completed (Appendix A).

3.0 PROJECT SPECIFIC DESIGN AND CONSTRUCTION

3.1 Culvert Erosion Control Project – Site 21

The site is located adjacent to C.R. 500 East along the McFarland Branch No. 3 legal drain just south of the driveway access of landowner Tim Addis and north of C.R. 175 E (Figure 2). The purpose of this project was to halt the active erosion that was occurring due to surface runoff entering the ditch along a culvert. When given the option of repairing the area with a bio-engineered solution, the landowner preferred stone for controlling the erosion.

An area of approximately 8 foot (2.4 m) by 20 foot (6.1 m) of eroding soil adjacent to the existing CMP (corrugated metal pipe) was stabilized by re-grading, installing geotextile fabric underlayment and covering with glacial field stone. Once the area was re-graded, a Mirafi 170N non-woven geotextile fabric was keyed into the top of the slope to prevent water undermining the cloth and spanned the length of the gulley into the bottom of the stream. Four to 6 inch (10.16 – 15.24 cm) diameter glacial field stone was placed over the geotextile fabric at a depth of 10 inches (24.5 cm). The construction followed the example of a typical plan for a rock chute which is included in Appendix D. The installation was completed on March 26, 2008. The following figures depict the site before and after installation (Figures 4 & 5).



Figure 4. Culvert erosion area before repair located at Site 21.



Figure 5. Culvert erosion area after repair located at Site 21.

3.2 Grade Control Structure – Site 114

The site is located within Rimmell ditch approximately 350 feet (106.7 m) upstream from the C.R. 300 E crossing (Figure 2 and 7). A grade control structure was installed at this location to stabilize the streambanks. This was done by raising the level of the ditch flowline one foot (0.3 m) so water would back up to the base of an existing grade control structure located approximately 450 feet (137.2 m) further upstream. The grade control structure was constructed using 26 cubic yards (19.87 cubic meters) of 8 to 12-inch (20.32–30.48 cm) diameter limestone rip rap. The stone was keyed into the streambed by excavating a 2 foot (0.6 m) by 2 foot (0.6 m) key trench to prevent undercutting of the structure. The key trench extended 2 feet (0.6 m) into the ditch bank on each side. The upstream side of the structure was graded to a 4:1 slope and the downstream structure was graded to a 15:1 slope. Design details can be found in Appendix E. Figure 6 shows the grade control structure which was completed on November 2, 2008.

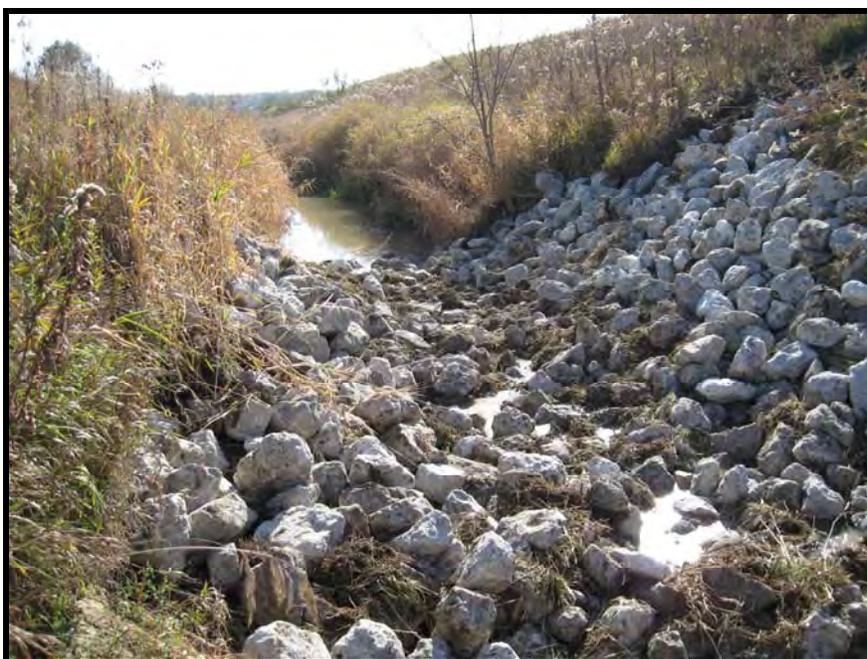


Figure 6. Grade control structure installed on November 2, 2008 on Rimmell ditch approximately 350 feet (106.7 m) upstream of C.R. 300 E crossing.

3.3 Pipe Drop Structure and Grassed Waterways – Site 115

This project consisted of tiling a degraded waterway, replacing a failing pipe drop structure, and creating three grassed waterways; two on the north side and one on the south side of Rimmell Ditch just east of C.R. 300 E (Figure 2 and 7). Designs for the pipe drop structure and grassed waterways were developed using the USDA NRCS Technical Release 55 (TR-55) hydrology modeling method. The details of each practice are described in the following sections of this report (Section 3.3.1, 3.3.2, 3.3.3, 3.3.4).

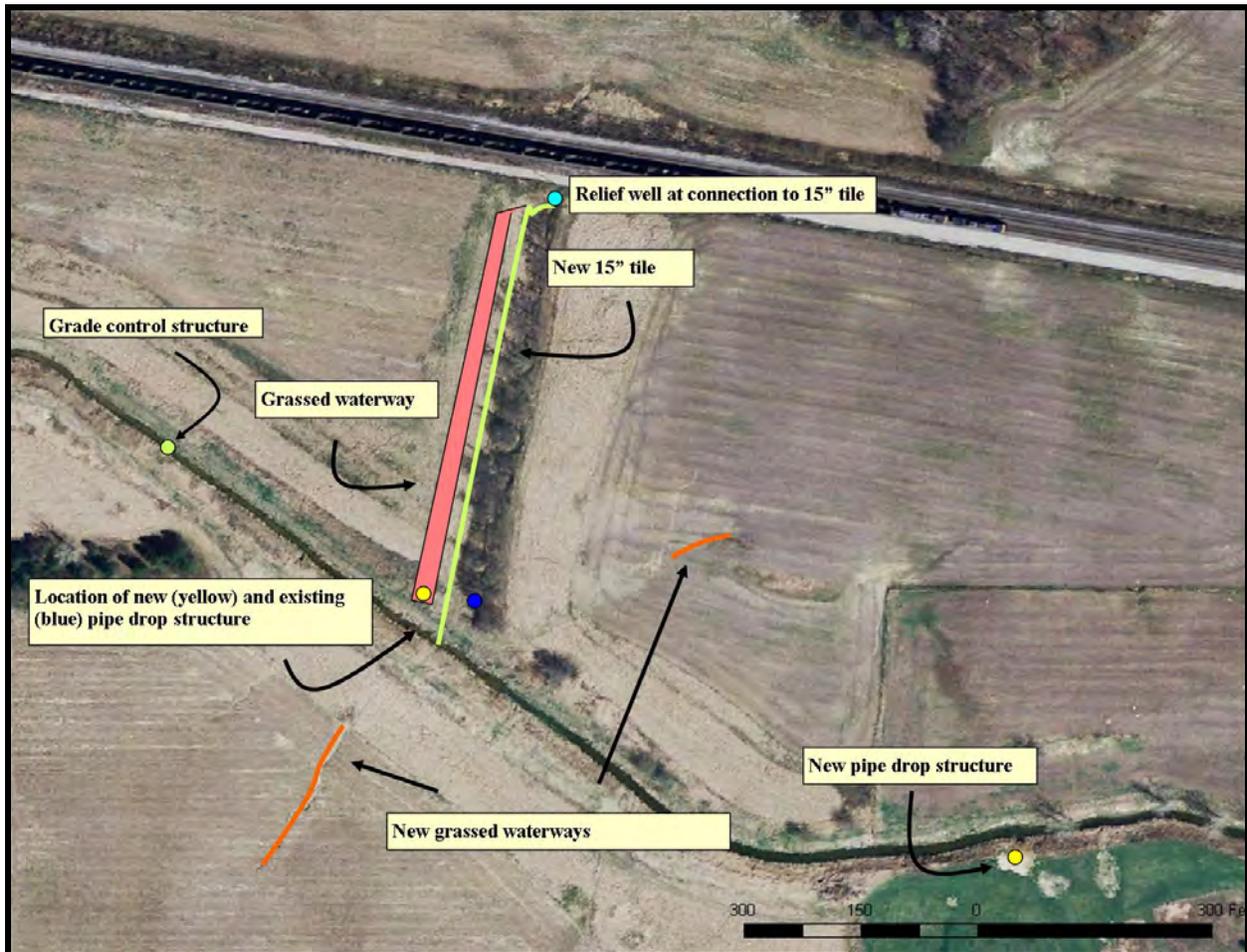


Figure 7. Projects completed on Higginbotham property including Sites 114, 115 and 115A.

3.3.1 Waterway Tiling

The project is located on the Higginbotham property between the railroad tracks and Rimmell Ditch (Figure 7). The rail road bed acts as a berm which collects runoff from the watershed to the north. This water is passed under the rail road through a 15-inch (38.1 cm) clay tile which outlets into the existing waterway. The waterway was severely eroded, which was contributing to sediment transport and nutrient delivery into Rimmell Ditch (Figure 8). Four tenths of an acre (0.2 ha) of trees were removed along the waterway. The logs were stockpiled at the landowners request for use as firewood and the stumps and tops were burned and then buried. Five hundred seventy feet (173.7 m) of 15-inch (38.1 cm) diameter dual wall plastic tile was installed sub-surface and back-filled within the existing waterway. The tile was connected to a 36-inch (91.4 cm) diameter relief well at the north end of the property and outlet into Rimmell Ditch (Figure 9 and Appendix F, pg. F15). The outlet consisted of a 15-foot (4.6 m) section of schedule 35 PVC pipe, with animal guard, attached to the dual wall plastic tile (Appendix F, pg. F8). The purpose of the tile was to transport water from the north side of the railroad tracks into Rimmell Ditch.



Figure 8. Severely eroded waterway on Site 115 prior to installation of tile.



Figure 9. Relief well connection to 15-inch tile during installation.

3.3.2 Pipe Drop Structure

The original pipe drop structure was failing due to corrosion of the structure over the years. For a specific location of this structure refer to Figure 7. This structure (Figure 10) was removed and replaced with a structure consisting of a 30-inch (76.2 cm) diameter CMP riser and a 24-inch (61 cm) diameter CMP outlet pipe (Figure 11 and Appendix F, pg. F17). The structure was sized based on a drainage area of 9 acres (3.6 ha) with a 25-yr/24-hr storm event of 4.4 inch (11.2 cm) and a four percent watershed slope (Appendix F, pg. F5).



Figure 10. Original pipe drop structure located at Site 115 which was removed.

The structure was anchored using a 4.5-foot (1.4 m) by 4.5-foot (1.4 m) concrete pad with a depth of one foot (0.3 m). A 4-foot (1.2 m) anti-vortex corrugated metal baffle was bolted to the top of the structure and a 4-foot (1.2 m) by 4-foot (1.2 m) galvanized metal anti-seep collar was installed at the joint of the outlet pipes (Appendix F, pg. F16).



Figure 11. New pipe structure located on north side of Rimmell Ditch during installation.

An earthen berm was constructed with a 15 foot (4.6 m) top width and a slope of 4:1 on the north side and a slope of 1.5:1 on the south side to capture and direct water into the structure (Appendix F, pg. F16). Limestone rip rap with a D50 = 9 inches (22.9 cm) was placed around the inlet and outlet of the structure to prevent scour.

3.3.3 Restoration of Original Grassed Waterway

After the trees were removed and tile installation was completed (Section 3.3.1), a 530-foot (161.5 m) grassed waterway was constructed within the footprint of the original grassed waterway and was designed to transport surface water to the pipe drop structure described in section 3.3.2. The waterway was designed based on a 10-yr/24-hr rainfall event of 3.9 inches (9.9 cm) and a drainage area of 3.8 acres (1.5 ha) (Appendix F, pg. F5). The waterway was constructed as a trapezoidal cross section with the bottom and each side measuring 8 feet (2.4 m) for a total structure width of 24 feet (7.3 m) (Figure 12). The waterway was then seeded with Kentucky 31 Fescue at a rate of 35 lbs/acre (39.6 kg/ha) and covered with NAG SC150BN (North American Green Straw Coconut Biodegradable Netting) erosion control blankets.



Figure 12. Grassed waterway and pipe drop structure looking north to RR tracks after installation.

3.3.4 New Grassed Waterways

Two additional grassed waterways were installed to stabilize soil that was eroding within the agriculture fields adjacent to the grassed waterway described in section 3.3.3 (Figure 7). The purpose of these additional waterways was to transport surface water from the field to the buffer areas along Rimmell Ditch. Both waterways were constructed with a trapezoidal cross section and designed based on size of the drainage areas and percent slope using the Natural Resources Conservation Service (NRCS) Alternative Waterway Design Method (Appendix F, pg. F18 and F22). The waterway to the north of Rimmell Ditch measured 24 feet (7.3 m) wide by 120 feet (36.6 m) long and was based on a drainage area of three acres (1.2 ha) with an average slope of seven percent (Figure 13). The waterway to the south of Rimmell Ditch measured 24 feet (7.3 m) by 350 feet (106.7 m) long and was based on a drainage area of 5 acres (2.0 ha) with an average slope of three percent (Figure 14).



Figure 13. Grassed waterway north of Rimmell Ditch located to the east of the pipe drop structure on the Higginbotham property.



Figure 14. Grassed waterway south of Rimmell Ditch on Higginbotham property.

3.4 Pipe Drop Structure – Site 115A

On February 7, 2008, during a survey of the Higginbotham property, a large area of slumping soil was identified on the south side of Rimmell Ditch upstream of Site 115. A change was made to the existing contract to design and construct a pipe drop structure as a solution to stabilize the streambank (See section 2.7). For specific location refer to Figure 7. Recent heavy rains and tile damage were the initial cause of the erosion. The identified area accounted for a large drainage area of 518 acres (209.6 ha). The runoff from this drainage area is restricted by a 24-inch (61.0 cm) CMP road culvert at C.R. 175 N, thus causing the road to overtop at least once a year. The design for the pipe drop structure was developed using the USDA NRCS Technical Release 55 (TR-55) hydrology modeling method. The design consisted of a 42-inch (106.7 cm) CMP riser and a 30-inch (76.2 cm) diameter CMP outlet (Figure 15). The structure was sized based on a drainage area of 518 acres (209.6 ha) with a 10-yr/24-hr storm event of 3.9 inches (9.9 cm) and a 1.2 percent slope (Appendix G, pg. G1). The existing 21-inch (53.3 cm) flared inlet structure located along Rimmell ditch was utilized as part of the capacity during the design. The structure was anchored using a 5.5 foot (1.7 m) by 5.5 foot (1.7 m) concrete pad with a depth of one foot (0.3 m). A 5 foot (1.2 m) anti-vortex corrugated metal baffle was bolted to the top of the structure and two 5 foot (1.5 m) by 5 foot (1.5 m) galvanized metal anti-seep collars were installed at the joints of the outlet pipes. An earthen berm was constructed with a 15 foot (4.6 m) top width and a slope of 2:1 on the north side and a slope of 4:1 on the south side to capture and direct water into the structure (Appendix G, pg. G8). Limestone rip rap with a D50 = 9 inches (22.9 cm) was placed around the inlet and outlet of the structure to prevent scour. Due to the location and concerns of the landowner, 0.375-inch (0.9 cm) diameter reinforcing rods were placed in an 8 inch (20.3 cm) grid pattern to prevent anyone from falling into the structure.



Figure 15. Pipe drop structure installed on south side of Rimmell Ditch at Site 115A.

On March 12th, 2009, JFNew was notified that a large gulley had formed in the emergency spillway of the south pipe drop structure. A heavy rain event exceeding the 100-yr/ 24-hr storm event on March 10th and 11th caused local flooding which overtopped the structure's spillway. After a site investigation from JFNew and a LARE representative, the gulley formation was determined to be caused by the untimely flooding event in combination with other physical factors not related to the design. Recent earthwork, immature vegetation on the spillway, and corn stubble transported from the field to the south of CR 175 N were contributing factors to the spillway failure. At the time of this report, JFNew is working with the LARE program to repair the spillway.



Figure 16. Damage to spillway at Site 115A after flooding event in March 2009.



Figure 17. Corn stubble clogging structure at Site 115A after flooding event.

3.5 Gulley Erosion – Site 123

Site 123 is located adjacent to the south side of Rimmell Ditch near the boundary of the Barry Metzger property and the Craig Bender property (Figure 2). The purpose of this project was to halt the active erosion that was occurring due to surface runoff entering the ditch at this location. A typical rock chute design was utilized to address the eroding gulley (Appendix D). A rock-lined chute approximately 25 feet (7.6 m) long by 10 feet wide (3.0 m) was installed at this location. The installation included re-grading the eroded area, installing Mirafi 170 N non-woven geotextile filter fabric, and placing D50 = 8 inches (20.3 cm) limestone rip rap over the area to a depth of 1.5 feet (0.5 m). The installation was completed on May 30, 2008, and the following figures depict the site before and after installation.



Figure 18. Gulley erosion Site 123 on south side of Rimmell Ditch before rock chute installation.



Figure 19. Gully erosion Site 123 on south side of Rimmell Ditch after rock chute installation.

3.6 Streambank Stabilization/ Grade Control Structure – Site 131

Project site 131 is located on Rimmell Ditch, 650 feet downstream of CR 500 E (Figure 2). Rimmell Ditch is generally flowing west but makes a 90 degree turn to the south just upstream from this project and then another 90 degree turn back west again at this identified project location. At this second turn, the outside bend (south side) of Rimmell Ditch was approximately three feet higher than the ditch bottom and was being undermined by the stream, resulting in erosion into the agricultural field (Figure 18).



Figure 20. Rimmell Ditch bank caving in downstream of C.R. 500 E.

Forty feet of the south embankment was reconstructed with a bank-full bench to reduce the velocity and shear stress of high flows on the outside bend (Appendix H, pg. H5). The 3 foot wide, 2 foot tall bank full bench was constructed with a rock toe (limestone riprap; D-50 = 8 inch, 12 inch minimum thickness) to prevent erosion of the bench (Figure 19 and Appendix H, pg. H7). Non-woven geotextile fabric (Mirafi 170 N) was placed underneath the rock to prevent soil loss behind the rocks. The remaining stream bank and the top of the bank-full bench was seeded with native seed mix specifically designed for slope stabilization (Appendix I, pg. I1) and then covered with an erosion control blanket (North American Green-SC150 BN).



Figure 21. Rimmell Ditch bank downstream of C.R. 500 E during construction.

To stabilize the banks upstream, a grade control structure was installed within Rimmell ditch approximately 50 feet (15.2 m) upstream from the bank stabilization project (Appendix H, pg. H5). The grade control structure raised the level of the ditch bottom one foot (0.3 meters) and flattened the stream up to the next bend. The grade control structure was constructed using 15 cubic yards (11.5 cubic meters) of 8 inch (20.32 cm) to 12 inch (30.48 cm) diameter limestone rip rap. The stone was keyed into the streambed by excavating a 2 foot (0.6 m) by 2 foot (0.6 m) key trench to prevent undercutting of the structure. The key trench extended 2 foot (0.6 m) into the ditch bank on each side. The upstream side of the structure was graded to a 4:1 slope and the downstream structure was graded to a 15:1 slope. Areas disturbed by the equipment were seeded with native grass seed mix (Appendix I, pg. I1) and covered with NAG SC150BN erosion blanket. Design details can be found in Appendix H, pg. H6. Figure 20 shows the grade control structure which was completed on November 3, 2008.



Figure 22. Grade control structure downstream of C.R. 500 E after installation.

3.7 Higginbotham Bridge Replacement

Vehicle access to the Higginbotham residence is limited to one driveway which crosses Rimmell Ditch. A concrete and wooden bridge structure, which has been in place for more than forty years, provides access to the home site. Check dams which were removed in the early 1970's lowered the ditch level and exposed more of the wing walls and footings to the erosive forces of the ditch. Since this time, the bridge had deteriorated to the point where it was becoming unsafe and erosion was occurring around the footings of the bridge (Figure 21). The Noble County Drainage Board removed the original bridge and replaced it with a 40 foot (12.2 m), 142 inch (360.7 cm) by 91 inch (231.1 cm), 10 gauge CMP culvert (Figure 22). Forty Eight tons (43.5 metric tons) of limestone rip rap and 96 tons (87.1 metric tons) of No. 53 limestone gravel was used to back-fill the structure and stabilize the toe.



Figure 23. Northwest corner of original Higginbotham Bridge showing degraded wing wall and pilings.



Figure 24. New culvert installed by the Noble County Drainage Board at the Higginbotham's residence.

3.8 Rimmell Open/ Melvin System Drainage Project

To improve drainage and reduce erosion, the Noble County Drainage Board completed a project which included bottom dipping, bank re-sloping, spoils leveling, channel re-alignment, bank stabilization, seeding and installation of four grade control structures on approximately 5,600 feet (1706.9 m) of the Rimmell Open/ Melvin System between C.R. 500 E and C.R. 600 E (Figure 2). Design details can be found in Appendix J.

3.8.1 Bottom Dipping

An average of 12 inches (30.5 cm) of sediment was mechanically removed throughout the project reach. An average bottom width of between four feet (1.2 m) and six feet (1.8 m) was maintained throughout the project reach.

3.8.2 Bank Re-Sloping

Both sides of Rimmell Ditch banks were re-sloped for a length of 5,300 feet (1615.4 m). The existing banks were generally at a 1:1 slope or steeper and were re-sloped to a 1:2 slope or less. An average of one cubic yard (0.76 cubic meters) was removed for each foot (0.3 m) of bank. A rock toe was installed along the areas that immediately adjoin the old channel where the channel was re-aligned. The rock was 2 foot (0.6 m) high by 4 foot (1.2 m) wide at the base with 1:1 side slopes. Fill, which included tree stumps and compacted soil, was placed behind the rock toe.



Figure 25. Example of rock toe installed where old channel adjoined re-aligned channel.

3.8.3 Spoils Leveling

Spoils from the bank re-sloping and bottom dipping were placed at least 10 feet (3.0 m) from the top of the bank to avoid re-entering the channel. The spoils were placed so that the landowner could continue to farm or mow the area. Both the new spoils and those from previous jobs were leveled to a depth of no more than 1 foot (0.3 m) above the adjacent grade.

3.8.4 Channel Re-alignment

Approximately 300 feet (91.4 m) of the channel was re-aligned and small meanderings removed. Stable banks were not disturbed unless it was within the area specified to be re-sloped.



Figure 26. Section of Rimmell Ditch East of C.R. 500 after re-alignment.

3.8.5 Bank Stabilization

Portions of the banks within the project area were identified as being unstable. These areas typically met one or more of the following criteria: a slope that was steeper than 1:1, were part of a bank slide or contained no vegetation. These areas were stabilized by placing 18 inch (45.7 cm) of rip rap over a geotextile fabric within the area that was unstable.

3.8.6 Seeding

Approximately 10 acres (4.0 ha) of Rimmell Ditch banks were hydro-seeded using the Noble County ditch bank seed mix (Appendix I, pg. I2) and was applied at a rate of 30 lb/acre (33.9 kg/ha) with a 12-12-12 fertilizer at a rate of 100 lb/acre (113 kg/ha). This included areas that were disturbed by the re-sloping or bottom dipping process. The spoils were not seeded until they were dried and leveled. Areas in which row crops were grown were not seeded.

3.8.7 Grade Control Structures

Four grade control structures were installed within the project site to reduce the gradient of the ditch and prevent head cuts. The grade control structures were installed by excavating a key trench and installing standard limestone rip rap (Figure 25). The height of each structure varied according to the topography within a maximum of two feet (0.6 m).



Figure 27. Example of grade control structure installed by Noble County Drainage Board.

4.0 PROJECT SUMMARY

Increased water velocity and peak flows resulting from anthropogenic impacts within the Rimmell Ditch watershed caused moderate to severe streambank erosion within the project sites. The purpose of this project was to reduce erosion along Rimmell Ditch and delivery of eroded materials from the project sites to Skinner Lake. This was accomplished by stabilizing eroded streambanks along Rimmell Ditch and filtering runoff from adjacent agriculture fields. Construction was completed by November 2008. Monitoring of the project site is recommended for the next three to five years.

APPENDIX A

LANDOWNER CORRESPONDENCE

RIMMEL DITCH DESIGN/BUILD REPORT
NOBLE COUNTY, INDIANA



708 Roosevelt Rd
Walkerton, Indiana 46574
Phone: 574-586-3400 ext. 338
Fax: 574-586-3446

Mark Pranckus

Aquatic Biologist

mpranckus@jfnew.com
Mobile: 574-229-8723

Corporate Office:

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Ann Arbor, Michigan

Grand Haven, Michigan

Cincinnati, Ohio

Madison, Wisconsin

Native Plant Nursery:
Walkerton, Indiana

www.jfnew.com

November 28, 2007

Tom and Billie Higginbotham
3369 E. 200 N.
Albion, IN 46701

RE: Skinner Lake Feasibility Study – Construction Phase

Dear Tom and Billie:

Earlier this summer, the Skinner Lake Homeowner's Association received a grant from the Indiana Department of Natural Resources Lake and River Enhancement Program to construct projects identified in the feasibility study. As you remember, the projects on your property were replacing the pipe-drop structure, installing a grassed waterway, and addressing the erosion areas adjacent to Rimmel Ditch. The Association and JFNew would like to move forward with the projects. To do that we would like to re-confirm your interest in completing the projects, provide you with a proposed schedule of activities, and allow you to provide feedback or comments about the design and schedule. JFNew will again be working with Wayne Stanger to complete the final designs.

Here is our preliminary schedule:

- December 2007 – Receive confirmation from you on your interest in participating in the project
- January 2008 – Survey and design pipe-drop structure, grassed waterway and erosion solutions
- February 2008 – Provide you with information about the design for review and seek final approval.
- February – March 2008 – Construct projects

As you can see, the work will occur over a short period of time in the early part of 2008 because we want to complete the work prior to the beginning of your farming activities.

Thank you again for your participation with this project. I will be following up with you by mid-December to discuss the project, but if you have any questions before then, please feel free to contact me at (574) 586-3400 or at the address listed to the left. Questions about the Skinner Lake Homeowner's Association and their work to improve the water quality of Skinner Lake can be directed to Ed Sprague, head of the water quality committee (260-636-7336.)

Thank you,

Mark Pranckus

Cc. JFNew file 05-10-69.01
Ed Sprague, SLHOA

March 5, 2008

Tom and Billie Higginbotham
3369 E. 200 N.
Albion, IN 46701



RE: Pipe Drop Structure Replacement and Waterways Installation

Dear Tom and Billie:

708 Roosevelt Road
Walkerton, IN 46574
Phone: 574-586-3400
Fax: 574-586-3446

Mark Prancus
Ecological Resource Specialist
mprancus@jfnew.com
574-229-8723 (mobile)

The Skinner Lake Homeowner's Association (SLHOA) and JFNew have completed the design work to replace the failing pipe drop structure and install three waterways on your property. Project descriptions are detailed below for your review. If the design and proposed construction schedule is acceptable to you, please sign the bottom of the letter and return it in the stamped envelope. Your signature will indicate your approval for the project to proceed through construction.

Subproject 1 - Replace failing pipe drop structure, install a grassed waterway and new tile line.

The tree line will be cleared and the existing open ditch will be filled and graded to match the surrounding elevation. Trees removed from the tree line will be placed in a designated area adjacent to the tree line for your use as firewood. Woody debris and brush will be cleared and burned adjacent to the tree line. JFNew will install a new tile line from the existing 15-inch tile outlet at the north end of the tree line to Rimmell Ditch. The tile line will be located approximately 10 feet to the west of the tree line (See enclosed map). A waterway 30 feet wide by approximately 1 foot deep will be installed approximately 25 feet to the west of the tree line. The existing pipe drop structure will be removed and disposed of by JFNew or their subcontractor. A new pipe drop structure will be installed approximately 25 feet to the west of the existing structure.

Subproject 2 - Install two grassed waterways in eroding areas of the adjacent farm fields

Two grassed waterways will be installed at locations designated on the enclosed map. The waterways will be constructed to be approximately 24 feet wide and 0.8 feet deep. The waterway on the south side of Rimmell Ditch will be 250 feet long. The waterway on the north side of Rimmell Ditch will be 120 feet long. The waterways will be seeded and blanketed with erosion control material.

General construction conditions and schedule

1. No work will occur without 48 hours notice to you by JFNew or their designated representatives.
2. Work on the waterways for Subproject 2 is scheduled to be completed by April 15, 2008. If work cannot be completed by April 15th, work will be postponed until after crop harvest.
3. Work to clear the tree line, install the tile, install the waterway, and

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Madison, Wisconsin

Monee, Illinois

Grand Haven, Michigan

Cincinnati, Ohio

Native Plant Nursery:
Walkerton, Indiana

replace the existing pipe drop structure at Subproject 1 will occur anytime after April 1, 2008. Access to the project area will be through the gravel access road to the north of the project site. No equipment will be driven through planted or prepared agricultural fields without written permission from you.

4. A pit will be dug to improve the burning of brush. At the end of the project, the pit will be graded to match the existing topography and seeded.
5. Any areas disturbed during construction will be seeded in an attempt to return the area to the pre-disturbance state.
6. Prior to construction, JFNew will meet with you to stake out the centerline of the waterway for Subproject 1, mark the trees to be stockpiled for firewood, and designate an area for stockpiling logs.
7. The stockpiled trees will be the responsibility of the landowner.
8. The landowner will not be responsible for any cost of the design or construction. JFNew will provide suggested maintenance for the installed features.

Please sign below and return in the stamped envelope. Enclosed is a copy for your records. If you have any questions before signing, please contact Wayne Stanger (574-536-9879) or me. We will be happy to answer any questions you may have about the project. Questions about the Skinner Lake Homeowner's Association and their work to improve the water quality of Skinner Lake can be directed to Ed Sprague, head of the water quality committee (260-636-7336.)

Thank you,



Mark Prancus

I agree with the proposed design and the construction conditions as it has been explained to me by the Skinner Lake Homeowner's Association (SLHOA) and/or their representative, JFNew, and by the documentation they have provided. I grant access to the site for construction of the projects and for the projects to be constructed.

Tom Higginbotham

Billie Higginbotham

3/08/08

Date



708 Roosevelt Road
Walkerton, Indiana 46574
Phone: 574-586-3400 ext. 305
Fax: 574-586-3446

Tyson Edwards
Project Manager
tedwards@jfnew.com

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Madison, Wisconsin

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March 11, 2008

John Bauman
3388 E 600 N
Kendallville, IN 46755

RE: Streambank Stabilization and Grade Control Installation

Dear Mr. Bauman:

The Skinner Lake Homeowner's Association (SLHOA) and JFNew have completed the design work to stabilize the streambank and install a rock grade control structure within Rimmell Ditch adjacent to your property. A project description is detailed below for your review. If the design and proposed construction schedule is acceptable to you, please sign the bottom of the letter and return it in the stamped envelope. JFNew is requesting your permission to access the project site off 500E along the edge of your field. Your signature will indicate your approval for the project to proceed through construction.

Streambank stabilization and rock grade control installation.

Approximately 40 feet of eroded streambank will be stabilized using native seed and erosion control blanket with a rip rap toe to protect the bank from further erosion. The streambank stabilization will occur on the outside of the second bend downstream of 500E. Approximately 50 feet upstream, a rock grade control structure will be placed within the stream to reduce erosion and prevent sediment from entering Skinner Lake.

General construction conditions and schedule

1. No work will occur without 48 hours notice to you by JFNew or their designated representatives.
2. Work on the streambank stabilization is scheduled to be completed by April 15th, 2008. If work cannot be completed by April 15th, work will be postponed until after crop harvest.
3. Access to the project site will be from 500E along your property boundary adjacent to Rimmell Ditch.
4. Access and construction will only occur when soil conditions are dry as to prevent rutting with equipment.
5. Any areas disturbed during construction will be seeded in an attempt to return the area to the pre-disturbance state.
6. The landowner will not be responsible for any cost of the design or construction.

Please sign below and return in the stamped envelope. Enclosed is a copy for your records. If you have any questions before signing, please contact me at 574 586-3400. Questions about the Skinner Lake Homeowner's Association and their work to improve the water quality of Skinner Lake can be directed to Ed Sprague, head of the water quality committee (260-636-7336.)

Thank you,

Tyson Edwards

I agree with the proposed design and the construction conditions as it has been explained to me by the Skinner Lake Homeowner's Association (SLHOA) and/or their representative, JFNew, and by the documentation they have provided. I grant access to the site for construction of the projects and for the projects to be constructed.

(Signature)

John Bauman

(Printed Name)

3-26-08

Date



708 Roosevelt Road
Walkerton, Indiana 46574
Phone: 574-586-3400 ext. 305
Fax: 574-586-3446

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March 11, 2008

Barry Metzger
3717 E 200 N
Albion, IN 46701

RE: Rock Chute Installation

Dear Mr. Metzger:

Thank you for meeting with me on February 25th to discuss the upcoming projects along Rimmell Ditch and access points on your property. The Skinner Lake Homeowner's Association (SLHOA) and JFNew have completed the design work to install a rock chute on your property within the easement of Rimmell Ditch. A project description is detailed below for your review. If the design and proposed construction schedule is acceptable to you, please sign the bottom of the letter and return it in the stamped envelope. Your signature will indicate your approval for the project to proceed through construction.

Rock chute installation on east property boundary on south side of Rimmell Ditch.

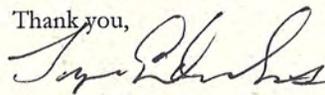
The erosion gully will be re-graded, lined with a filter fabric and covered with 6" to 8" rip rap. The final structure will measure approximately 25' long by 10' wide by 1.5' deep. The goal of this project is to reduce erosion and prevent sediment from entering Rimmell Ditch.

General construction conditions and schedule

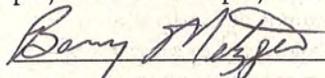
1. No work will occur without 48 hours notice to you by JFNew or their designated representatives.
2. Work on the rock chute is scheduled to be completed by June 30, 2008.
3. Access to the project site will be from one of the two points identified in February: one was from the southwestern corner of your property along the edge of the field and the other option was through the driveway to the back of the field.
4. Access and construction will only occur when soil conditions are dry as to prevent rutting with equipment.
5. The removal of trees will be kept to a minimum at the point of entry and any large fallen trees in the path will be moved to the edge of the field for your use as firewood.
6. Any areas disturbed during construction will be seeded in an attempt to return the area to the pre-disturbance state.
7. The landowner will not be responsible for any cost of the design or construction.

Please sign below and return in the stamped envelope. Enclosed is a copy for your records. If you have any questions before signing, please contact me at 574-586-3400. Questions about the Skinner Lake Homeowner's Association and their work to improve the water quality of Skinner Lake can be directed to Ed Sprague, head of the water quality committee (260-636-7336.)

Thank you,


Tyson Edwards

I agree with the proposed design and the construction conditions as it has been explained to me by the Skinner Lake Homeowner's Association (SLHOA) and/or their representative, JFNew, and by the documentation they have provided. I grant access to the site for construction of the projects and for the projects to be constructed.

 (Signature)

BARRY METZGER (Printed Name)

3-20-08
Date



708 Roosevelt Road
Walkerton, Indiana 46574
Phone: 574-586-3400 ext. 305
Fax: 574-586-3446

Tyson Edwards
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Madison, Wisconsin

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March 11, 2008

Michael Klopfenstein
2750 N 500 E
Kendallville, IN 46755

RE: Streambank Stabilization and Grade Control Installation

Dear Mr. Klopfenstein:

The Skinner Lake Homeowner's Association (SLHOA) and JFNew have completed the design work to stabilize the streambank and install a rock grade control structure within Rimmell Ditch adjacent to your property. A project description is detailed below for your review. If the design and proposed construction schedule is acceptable to you, please sign the bottom of the letter and return it in the stamped envelope. JFNew is requesting your permission to access the project site off 500E along the edge of your field. Your signature will indicate your approval for the project to proceed through construction.

Streambank stabilization and rock grade control installation.

Approximately 40 feet of eroded streambank will be stabilized using native seed and erosion control blanket with a rip rap toe to protect the bank from further erosion. The streambank stabilization will occur on the outside of the second bend downstream of 500E. Approximately 50 feet upstream, a rock grade control structure will be placed within the stream to reduce erosion and prevent sediment from entering Skinner Lake.

General construction conditions and schedule

1. No work will occur without 48 hours notice to you by JFNew or their designated representatives.
2. Work on the streambank stabilization is scheduled to be completed by April 15th, 2008. If work cannot be completed by April 15th, work will be postponed until after crop harvest.
3. Access to the project site will be from 500E along your property boundary adjacent to William Wink's property boundary.
4. Access and construction will only occur when soil conditions are dry as to prevent rutting with equipment.
5. Any areas disturbed during construction will be seeded in an attempt to return the area to the pre-disturbance state.
6. The landowner will not be responsible for any cost of the design or construction.

Please sign below and return in the stamped envelope. Enclosed is a copy for your records. If you have any questions before signing, please contact me at 574-586-3400. Questions about the Skinner Lake Homeowner's Association and their work to improve the water quality of Skinner Lake can be directed to Ed Sprague, head of the water quality committee (260-636-7336.)

Thank you,

Tyson Edwards

I agree with the proposed design and the construction conditions as it has been explained to me by the Skinner Lake Homeowner's Association (SLHOA) and/or their representative, JFNew, and by the documentation they have provided. I grant access to the site for construction of the projects and for the projects to be constructed.

(Signature)

Michael Klopfenstein (Printed Name)

3/23/08
Date



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Phone: 574-586-3400 ext. 325
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June 25, 2008

Craig Bender
3823 E 200 N
Albion, IN 46701

Re: Skinner Lake Water Quality Improvement Project

Dear Mr. Bender:

JFNew is working with the Skinner Lake Homeowners' association to implement several projects throughout the watershed to reduce sediment and nutrient input to Skinner Lake. Funding has been allocated to the Skinner Lake Homeowners' Association through the Indiana DNR Lakes and River Enhancement program. In 2007 JFNew completed a feasibility study in which we identified several projects that are targeted at improving water quality. One potential project was identified on your property along the stretch of Rimmell Ditch that bisects the cattle pasture.

Last November you spoke with Mark Prancus, a JFNew employee, regarding the potential project along this stretch of Rimmell Ditch. Since that time, and numerous heavy rain events, JFNew has identified other problem areas along Rimmell Ditch that have taken priority. We are currently researching our options and the reallocation of funding to address the most pertinent issues. JFNew and the Skinner Lake Homeowners' are definitely still interested in working with you on a project that will improve the water quality within the section of Rimmell Ditch on your property. Once the research and design for the other projects is complete, we will have a better handle on what funding will be available for projects located on your property.

Thank you for your continued patience in this matter and JFNew will contact you in the future to discuss your interest in pursuing a project on your property. If you have any questions, please feel free to call my office at 574-586-3400.

Sincerely,

Tyson Edwards
Ecological Resource Specialist

A7

JFNew File #051069.01



708 Roosevelt Road
Walkerton, Indiana 46574
Phone: 574-586-3400 ext. 325
Fax: 574-586-3446

Tyson Edwards
Ecological Resource Specialist
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January 19, 2009

Tom and Billie Higginbotham
3369 E. 200 N.
Albion, IN 46701

RE: Pipe Drop Structure Replacement and Waterways Installation

Dear Tom and Billie:

As you are aware, the Skinner Lake Homeowner's Association (SLHOA) and JFNew have completed the installation of the two pipe drop structures and three grassed waterways. Minimal maintenance of these structures will be required to maximize the benefits of these water quality improvement projects. Below is a list of recommended maintenance practices that will extend the life of the structures while optimizing their efficiency to reduce sediment and nutrient transport from the surrounding watershed:

- 1.) Mow all grassed waterways at least annually, preferably in July, to reduce sediment accumulation within the waterway.
- 2.) Inspect and remove debris, if necessary, from the south pipe drop structure after every major storm event or at least annually.
- 3.) Inspect all projects on an annual basis and after each storm event and note any problems

During the inspections, if any problems or erosion areas are identified, please contact JFNew or the Noble County Surveyors Office. Depending on the situation, you will be directed to which course of action is needed at that time.

Thank you for working with JFNew and the Skinner Lake Homeowner's Association to implement the water quality improvement projects on your land. If you have any questions regarding this project or the maintenance of the installed structures, please contact me or Mark Prankus at 574-586-3400. Mark will contact you this Spring to schedule the tree planting that was agreed upon during the project.

Thank you,

Tyson Edwards

APPENDIX B

PERMITS

RIMMEL DITCH DESIGN/BUILD REPORT NOBLE COUNTY, INDIANA



IN REPLY REFER TO

DEPARTMENT OF THE ARMY

DETROIT DISTRICT, CORPS OF ENGINEERS

BOX 1027

DETROIT, MICHIGAN 48231-1027

May 13, 2008

Engineering & Technical Services
Regulatory Office
File Number: LRE-2008-00456-157

Ed Sprague
Skinner Lake Homeowners Association
2916 East Skinner Lake Road
Albion, IN 46701-9797

Dear Mr. Sprague:

Please refer to your application dated March 3, 2008 for a Department of the Army permit to discharge fill for streambank protection in Rimmell Ditch at two locations in the ditch upstream of CR 300 near Albion, Noble County, Indiana.

Under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act, Louisville and Detroit Districts reissued Regional Permit 99-100-003-1 on December 15, 2004 for certain activities having minimal impact in Indiana. We have verified that your proposed work shown on the enclosed plans and described below is authorized under the Regional Permit. You may proceed with the work subject to the enclosed general conditions, and any noted special conditions and Indiana Department of Environmental Management (IDEM) Section 401 Water Quality Certification.

The project appears to meet the terms for IDEM's blanket 401 Certification. You are required to submit the enclosed notification form to IDEM at the address indicated. If you have questions concerning 401 Certification and its conditions, contact IDEM at 317-233-8488. The following work is authorized under Section 404.

Site 1 Rimmell Ditch- Discharge 15 cubic yards of riprap in a 21 foot long by 13 foot wide by 1.5 foot deep area for a grade control structure.

Site 2 Rimmell Ditch- Discharge 15 cubic yards of riprap in a 21 foot long by 13 foot wide by 1.5 foot deep area for a grade control structure. Discharge 3 cubic yards of riprap in a 40 foot long by 1 foot wide by 2 foot deep area along the bank of the tributary for bank stabilization.

Special Conditions:

1. All fill shall consist of clean, inert materials from an upland source.

2. Upon completion of construction, the permittee shall restore any vegetation disturbed or destroyed during project implementation.
3. After completion of construction, all disturbed areas shall be permanently stabilized by seeding with native plants and mulching and/or by the planting of trees and shrubs native to the area.

Any construction activity other than that shown on the plans may not qualify for the Regional Permit. If you plan changes or additional activities from those depicted on the plans, please submit them to this office for review prior to construction.

Upon completion of the work authorized by this RGP, the enclosed Completion Report form must be completed and returned to this office. This verification is valid until December 15, 2009, or 1 year from the date of this letter, whichever occurs later, unless the regional permit is modified, suspended or revoked.

If you have questions, please contact me of this office at the above address or telephone (313) 226-3396. Please refer to File Number: LRE-2008-00456-157.

Sincerely,

ORIGINAL SIGNED BY

James D. Luke
Project Manager
Permit Evaluation Branch A

Enclosures

Copies Furnished

IDEM, Office of Water, w/encl.
IDNR, Division of Water, w/encl.
South Bend Field Office, w/encl.
JFNew (Edwards), w/encl. ✓

GENERAL CONDITIONS:

1. **Minimization/Avoidance:** Discharges of dredged or fill material into waters of the United States must be minimized or avoided to the maximum extent practicable at the project site (i.e. on-site). In determining the minimal impact threshold, the Districts will consider the direct and secondary impacts of the fill or work and any mitigation measures. A wetland delineation report is also required.

2. **Mitigation:** The permittee shall provide a mitigation/monitoring plan for any activity where the adverse impact on special aquatic sites exceeds 0.10 acre (4,356 sq. ft.) or is determined to be more than minimal impact. The permittee shall also provide a mitigation/monitoring plan for any channelization, encapsulation, or relocation of greater than 300 linear feet of intermittent or perennial stream. All mitigation plans should include a minimum 50-foot wide buffer between the edge of the project site and the waters and/or wetlands to be affected unless a lesser distance has been specifically approved under the RGP. If mitigation is required, the permittee shall develop the mitigation site concurrently with site construction.

3. **Soil Erosion and Sedimentation Controls:** The permittee shall install sedimentation and soil erosion control measures prior to any construction activity, and maintain them in effective operating condition during construction. This shall include the installation of straw bale barriers, silt fencing and/or other approved methods to control sedimentation and erosion. The permittee shall immediately stabilize areas disturbed by any construction activity, including channel banks, and revegetated with a combination of grasses, legumes and shrubs compatible to the affected area.

4. **Management of Water Flows:** In-stream work during periods of high flows should be avoided. The activity must be designed to maintain preconstruction flow conditions to the maximum extent practicable. The activity must not permanently restrict or impede the passage of high flows (unless the primary purpose of the fill is to impound waters). The activity must, to the maximum extent practicable, reduce adverse effects such as flooding or erosion downstream and upstream of the project site.

5. **Waterfowl Breeding Areas:** The discharge of dredged and/or fill material in known waterfowl breeding areas must be avoided to the maximum extent practicable.

6. **Aquatic Life:** The permittee shall not perform in-stream construction activity during the fish-spawning season between April 1 through June 30 without prior approval from the Districts. The Districts will coordinate with the Indiana Department of Natural Resources for their expertise on impacts to the fishery resource. The permittee will ensure that the activity authorized will not disrupt movement of those aquatic species indigenous to the waterbody, including those species which normally migrate through the area unless the activity's specific purpose is to impound water.

7. **Equipment:** All construction equipment shall be refueled and maintained on an upland site away from

existing streams, drainageways and wetland areas. Heavy equipment working in wetlands must be placed on mats, or other measures taken to minimize soil disturbance.

8. **Water Quality:** The permittee must provide a copy of the site specific State Section 401 WQC before the Corps will authorize a project under the RGP.

9. **Case-by-case conditions:** The permittee must comply with any case specific special conditions added by the Corps or by the State Section 401 WQC. The conditions imposed in the State Section 401 WQC are also conditions of this RGP.

10. **Navigation:** The permittee shall assure that no activity authorized by the RGP may cause more than a minimal adverse effect on navigation.

11. **Maintenance:** Any structure or fill authorized by this RGP shall be properly maintained, including maintenance to ensure public safety.

12. **Wild and Scenic Rivers:** The permittee shall not perform any work within any Wild and Scenic Rivers or in any river officially designated as a "study river" for possible inclusion in the system, unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity authorized by the RGP will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal Land Management agency in the area (e.g. U.S. Forest Service, Bureau of Land Management or the U.S. Fish and Wildlife Service).

13. **Endangered Species:** The permittee shall not perform any work under the RGP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which is likely to destroy or adversely modify the critical habitat of such species. The permittee shall notify the District Engineer if any listed species or critical habitat might be affected or is in the vicinity of the project, and shall not begin work under the RGP until notified by the District Engineer that the requirements of the Endangered Species Act have been satisfied and that the activity is authorized. Authorization of an activity under the RGP does not authorize the "take" of a threatened or endangered species as defined under the Federal Endangered Species Act. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, both lethal and non-lethal "takes" of protected species are in violation of the Endangered Species Act.

14. **Historic Properties:** The permittee shall not perform any activity under the RGP which may affect historic properties listed, or eligible for listing, in the National Register of Historic Places until the District Engineer has complied with the provisions of 33 CFR Part 325, Appendix C. The permittee must notify the District Engineer if the activity authorized by the RGP may

affect any historic properties listed, determined to be eligible or which the permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not begin construction until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology.

the RGP authorization including compliance with all general and special conditions and completion of mitigation work.

If the permittee discovers any previously unknown historic or archaeological remains while accomplishing the activity authorized by the RGP, work must be immediately stopped and this office immediately notified of what you have found. The District will initiate the Federal, tribal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

15. Water Supply Intakes: The permittee shall not perform any work under the RGP where the discharge of dredged and/or fill material would occur in the proximity of a public water supply intake except where the activity is for the repair of the public water supply structure or adjacent bank stabilization.

16. Suitable Materials: No activity, including structures and work in waters of the United States or discharges of dredged or fill material may consist of unsuitable materials (e.g. trash, debris, car bodies, asphalt, etc.) and that materials used for construction or discharge must be free from toxic pollutants in toxic amounts.

17. Impoundments: The permittee shall ensure that if the activity approved by the RGP includes impoundment of water, measures will be taken to minimize adverse effects on the aquatic ecosystem caused by the accelerated passage of water and/or the restriction of flow.

18. Removal of Temporary Fills: The permittee shall ensure that all temporary fills, authorized under the RGP, be removed in their entirety and the affected areas returned to pre-construction elevation.

19. Access: Representatives from the Corps of Engineers and/or IDEM may inspect any authorized activity or mitigation site at any time deemed necessary to ensure compliance with the terms and conditions of the RGP, Section 401 WQC, and applicable laws.²⁰
Construction Period: All work authorized by this RGP must be completed by the expiration date of this RGP or 1 year after the date of the Corps authorization letter, whichever occurs later. If you find you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least 3 months before the expiration date.

21. Reporting: The permittee after completion of work under the RGP shall submit a signed certification letter regarding the completed work and required mitigation, if applicable. The certification letter will include a statement that the work was done in accordance with

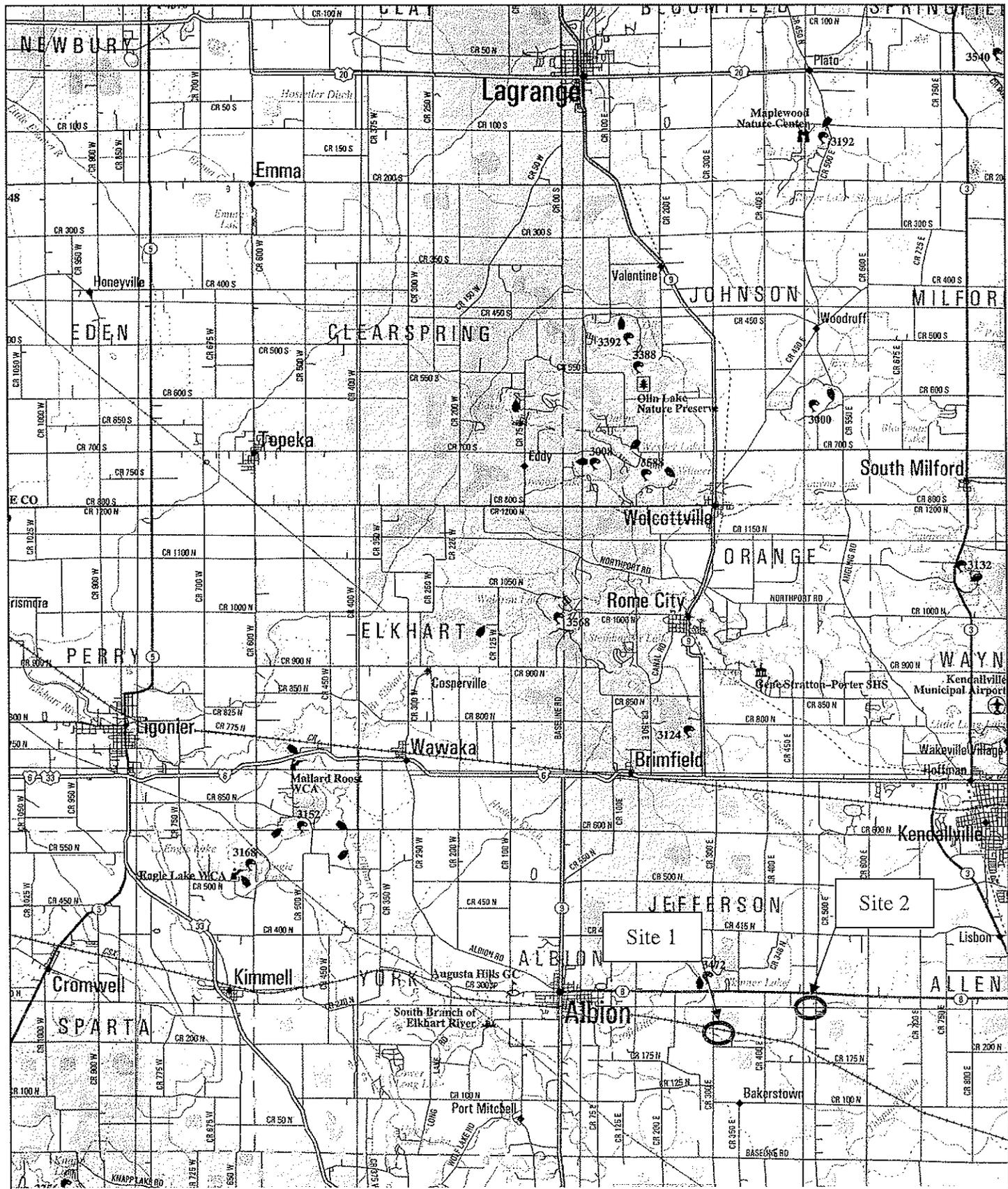


Figure 1: Location Map
 Rimmell Ditch—Skinner Lake
 Homeowners Association
 Noble County, Indiana



Scale: 1" = 2.5 mi.

JFNew #
 051069.01



708 Roosevelt Road, Walkerton, IN 46574
 Phone 574-586-3400 / Fax 574-586-3446
 www.jfnew.com

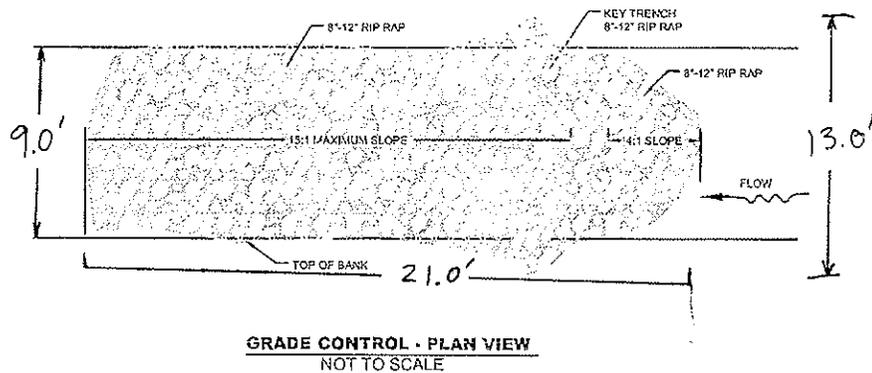
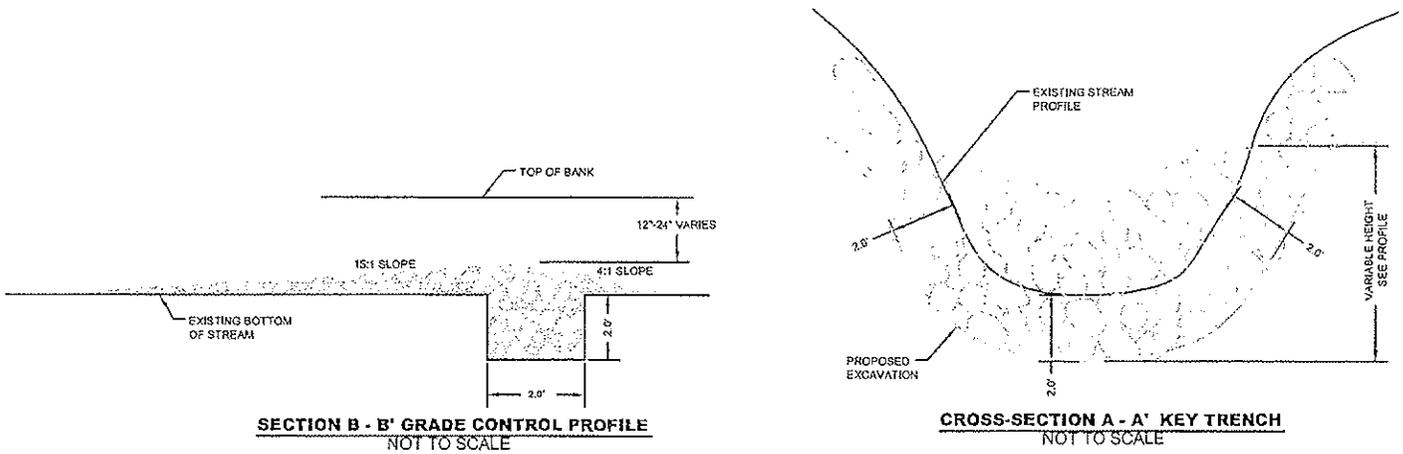
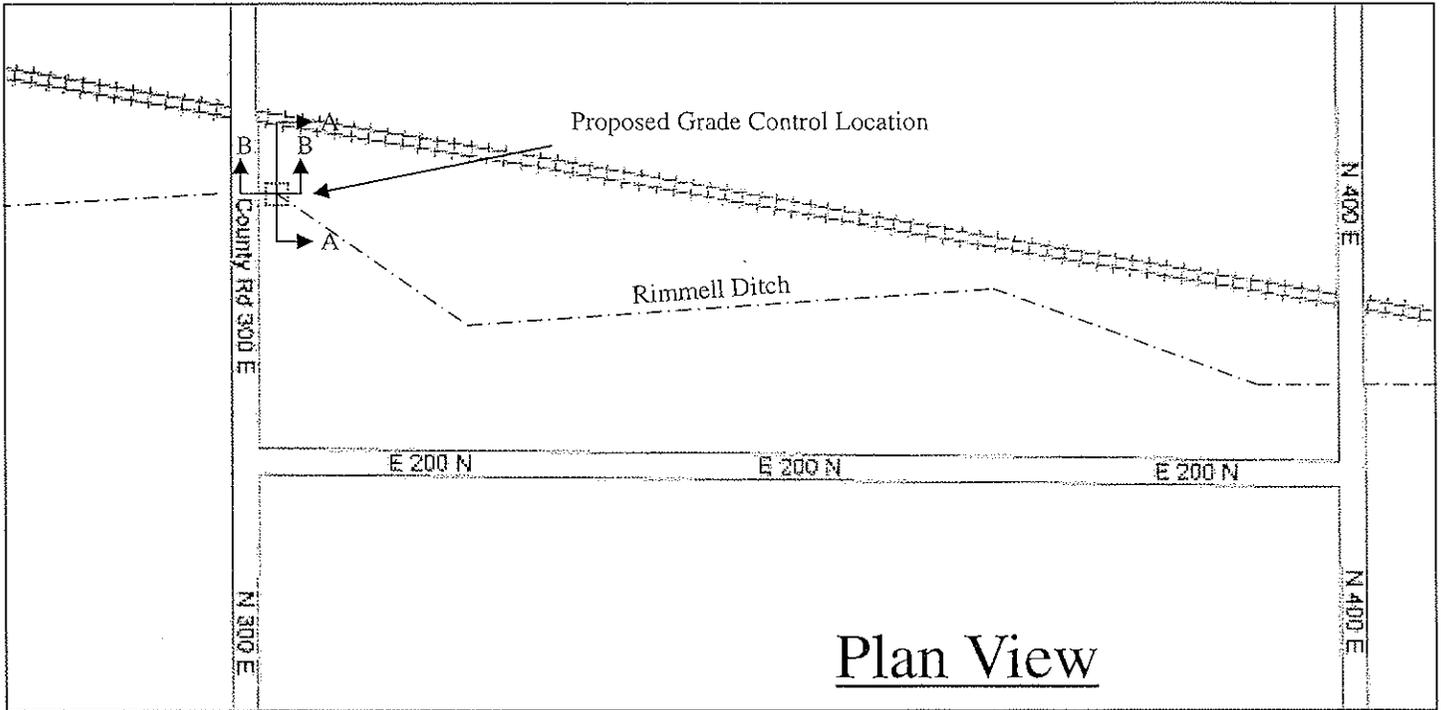


Figure 5: Grade Control Detail—Site 1
Rimmell Ditch Grade Control
Skinner Lake Homeowners Association
Noble County, Indiana

JFNew #
051069.01



708 Roosevelt Road, Walkerton, IN 46574
 Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

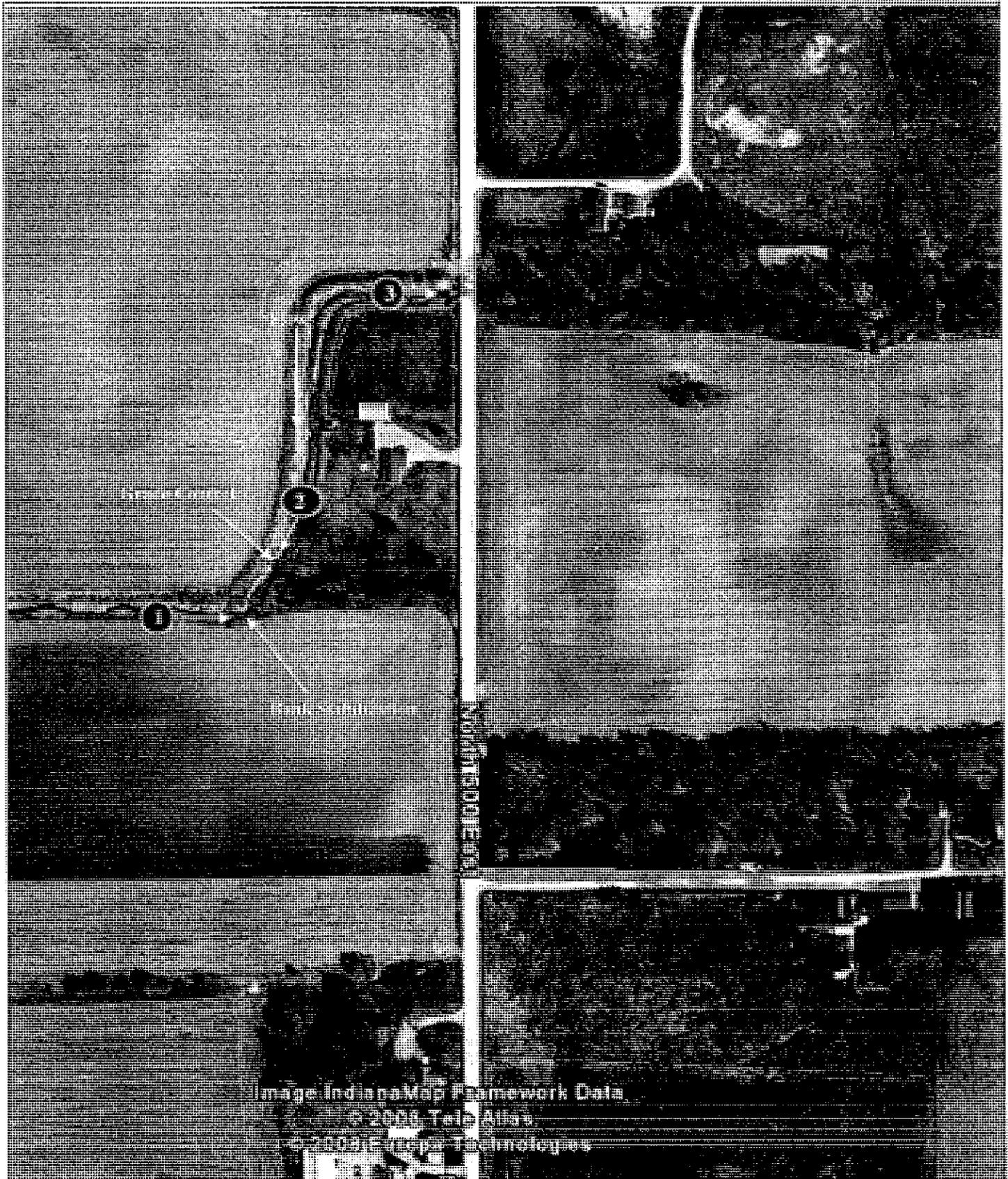


Figure 6: Location of Photos—Site 2
 Rimmell Ditch—Skinner Lake
 Homeowners Association
 Noble County, Indiana

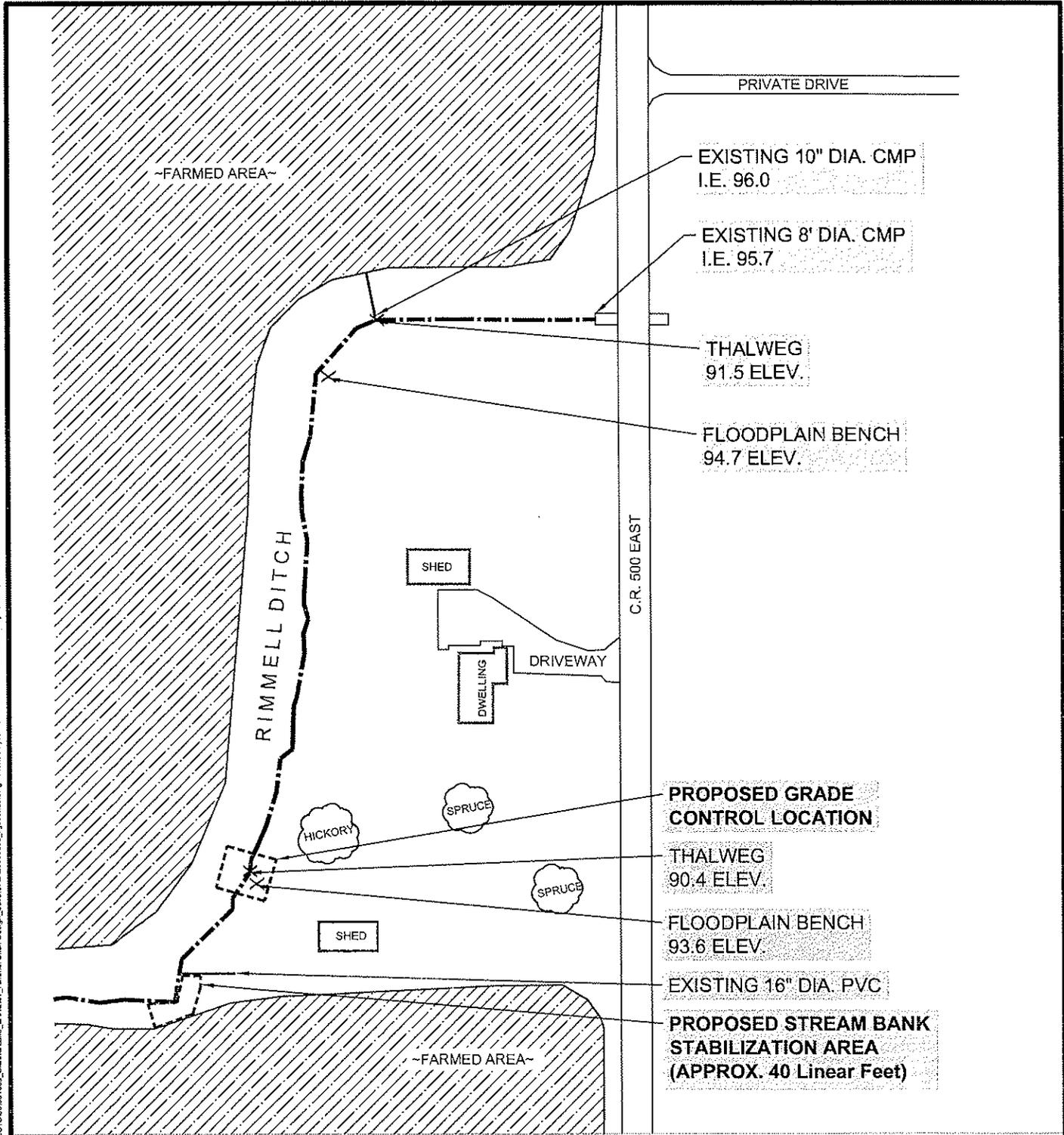


JFNew #
 051099L01



708 Rossmore Road, Webster, IN 46784
 Phone 874-886-2400 / Fax 874-886-2448
www.jfnew.com

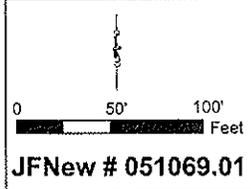
Location: S:\Water\PROJ\CTS\051069_SkinnersLake_LARE21_RimmellDitch_Develop_Buils\CAD\0002025_Ky52nd98.dwg Plotted By: Chelsea Dumas Plotted February 5, 2008 4:39:46 PM



NOTES:

- 1.) Elevational data collected by JFNew on January 24, 2008.
- 2.) Elevations are relative.

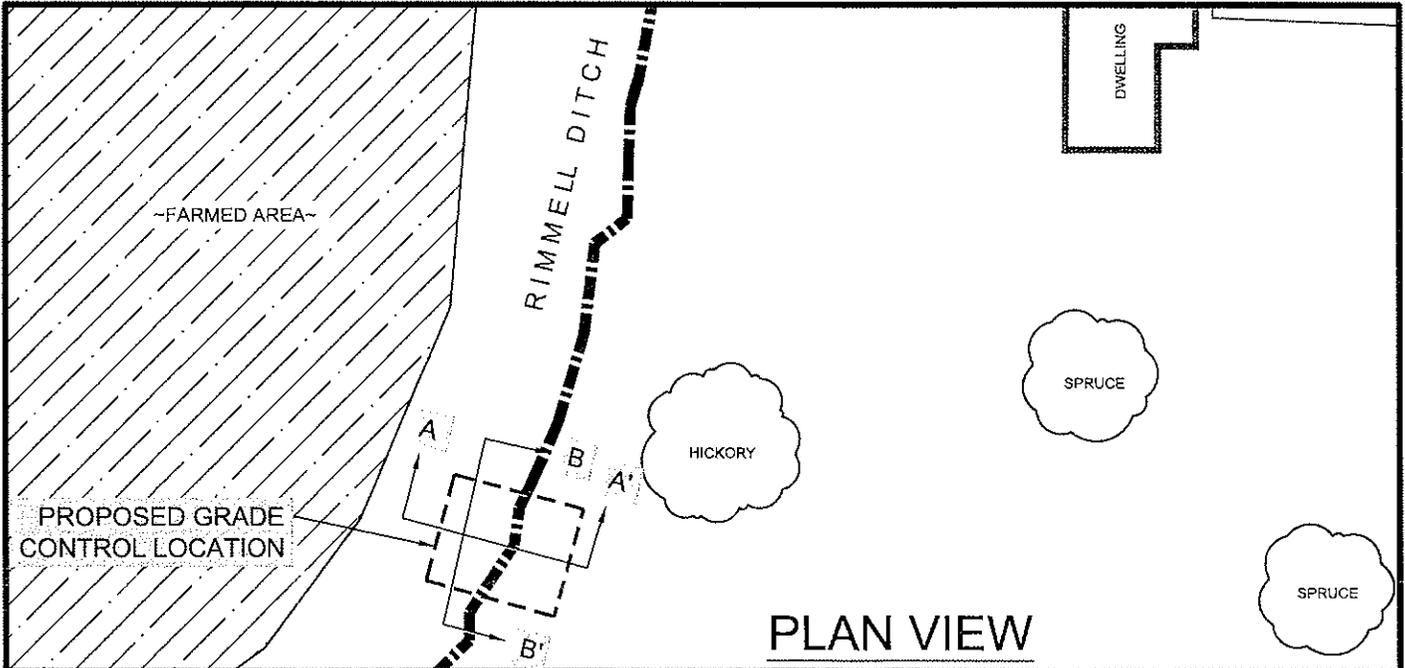
Figure 9: Site Plan - Site 2
Rimmell Ditch
Skinner Lake Homeowners Association
Noble County, Indiana



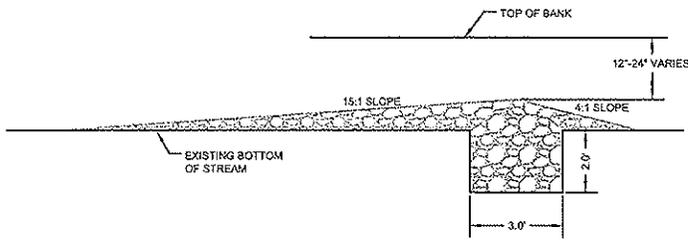
JFNew
 708 Roosevelt Road, Walkerton, IN 46574
 Phone 574-586-3400 / Fax 574-586-3446
 www.jfnew.com

COD

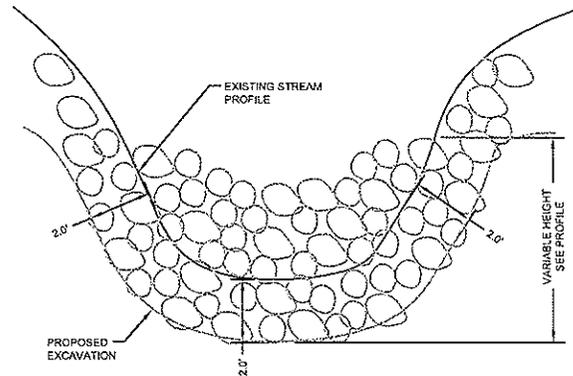
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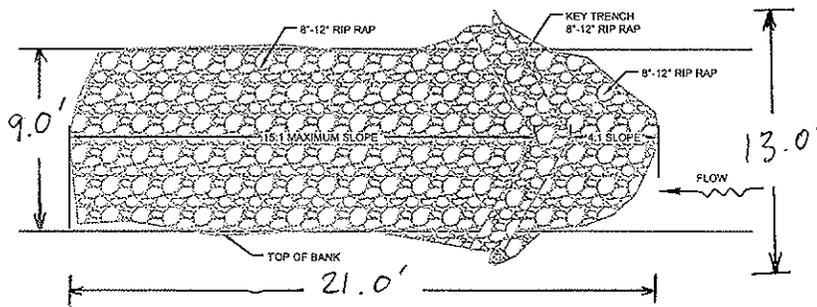
PLAN VIEW



SECTION B - B' GRADE CONTROL PROFILE
NOT TO SCALE

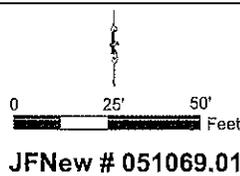


CROSS-SECTION A - A' KEY TRENCH
NOT TO SCALE



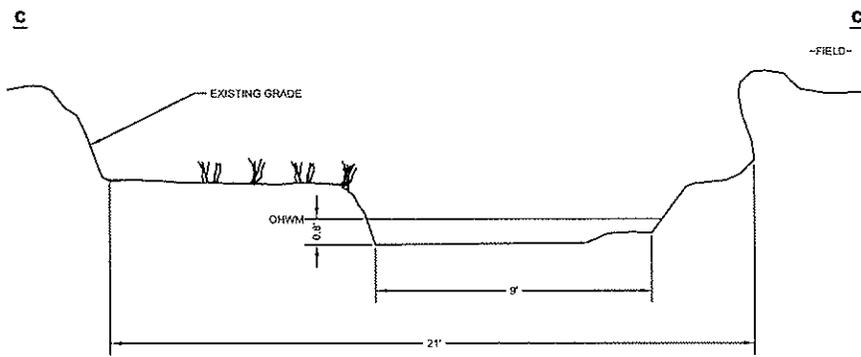
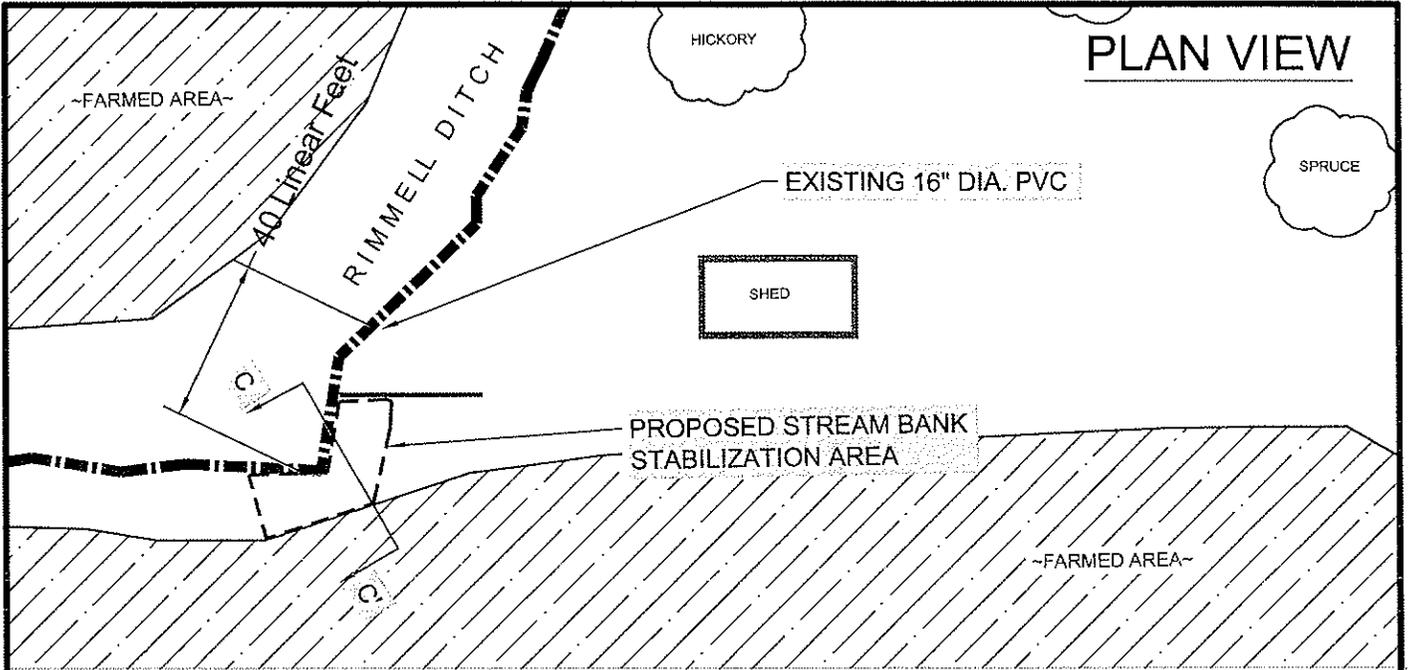
GRADE CONTROL - PLAN VIEW
NOT TO SCALE

Figure 10: Grade Control Detail - Site 2
Rimmell Ditch
Skinner Lake Homeowners Association
Noble County, Indiana

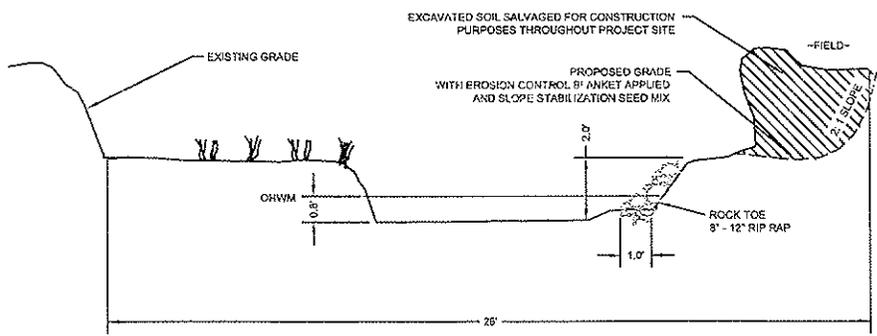


JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

C.O.D.



SECTION C - C' EXISTING CONDITIONS
NOT TO SCALE



SECTION C - C' PROPOSED GRADE / STABILIZATION
NOT TO SCALE

Figure 11: Slope Stabilization - Site 2
Rimmell Ditch
Skinner Lake Homeowners Association
Noble County, Indiana

0 25' 50'
Feet

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Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

Location: S:\SWSection\PROJECTS\051069_Skinner_Lake_LAR\01_Rimmell_Ditch_04.dwg, Build: CAD\2008\2005_ggs\stn08.dwg, Plotted By: Christine D'Amico, Plotted: February 5, 2008, 4:38:50 PM

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STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

**CERTIFICATE OF APPROVAL
CONSTRUCTION IN A FLOODWAY**

MAILED APR 18 2008

APPLICATION # : FW-24710

STREAM : Rimmell Branch

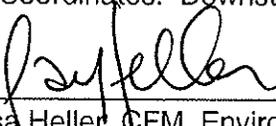
APPLICANT : Skinner Lake Homeowners Association
Ed Sprague
2916 East Skinner Lake Drive
Albion, IN 46701-9797

AGENT : JFNew
Tyson B Edwards
708 Roosevelt Road
Walkerton, IN 46574-1220

AUTHORITY : IC 14-28-1 with 312 IAC 10

DESCRIPTION : A 21' long by 9' wide riprap grade control structure will be placed across Rimmell Branch. The maximum height of the structure will not exceed 1' above the existing stream bottom. The structure will be keyed into the bed with a 2' by 2' trench. Details of the project are contained in information received electronically at the Division of Water on February 15, 2008 and in plans and information received at the Division of Water on March 25, 2008 and March 27, 2008.

LOCATION : Approximately 25' upstream of the County Road 300 East stream crossing near Albion, Jefferson Township, Noble County
NW¼, SW¼, SW¼, Section 22, T 34N, R 10E, Kendallville Quadrangle
UTM Coordinates: Downstream 4582740 North, 636571 East

APPROVED BY : 
Larissa Heller, CFM, Environmental Scientist
Division of Water

APPROVED ON : April 17, 2008

Attachments: Notice Of Right To Administrative Review
General Conditions
Special Conditions
Service List

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

NOTICE OF RIGHT TO ADMINISTRATIVE REVIEW

APPLICATION #: FW- 24710

This signed document constitutes the issuance of a permit by the Department of Natural Resources, subject to the conditions and limitations stated on the pages entitled "General Conditions" and "Special Conditions".

The permit or any of the conditions or limitations which it contains may be appealed by applying for administrative review. Such review is governed by the Administrative Orders and Procedures Act, IC 4-21.5, and the Department's rules pertaining to adjudicative proceedings, 312 IAC 3-1.

In order to obtain a review, a written petition must be filed with the Division of Hearings within 18 days of the mailing date of this notice. The petition should be addressed to:

Mr. Stephen L. Lucas, Director
Division of Hearings
Indiana Government Center North, Room N501A
100 North Senate Avenue
Indianapolis, Indiana 46204

The petition must contain specific reasons for the appeal and indicate the portion or portions of the permit to which the appeal pertains.

If an appeal is filed, the final agency determination will be made by the Natural Resources Commission following a legal proceeding conducted before an Administrative Law Judge. The Department of Natural Resources will be represented by legal counsel.

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

GENERAL CONDITIONS

APPLICATION #: FW- 24710

- (1) If any archaeological artifacts or human remains are uncovered during construction, federal law and regulations (16 USC 470, et seq.; 36 CFR 800.11, et al) and State Law (IC 14-21-1) require that work must stop and that the discovery must be reported to the Division of Historic Preservation and Archaeology within 2 business days.

Division of Historic Preservation and Archaeology
Room W274
402 West Washington Street
Indianapolis, IN 46204

Telephone: (317) 232-1646, FAX: (317) 232-8036

- (2) This permit must be posted and maintained at the project site until the project is completed.
- (3) This permit does not relieve the permittee of the responsibility for obtaining additional permits, approvals, easements, etc. as required by other federal, state, or local regulatory agencies. These agencies include, but are not limited to:

Agency	Telephone Number
*US Army Corps of Engineers, Detroit District	(313) 226-6828
Noble County Drainage Board	(260) 636-2131
Indiana Department of Environmental Management	(317) 233-8488 or (800) 451-6027
Local city or county planning or zoning commission	

- (4) This permit must not be construed as a waiver of any local ordinance or other state or federal law.
- (5) This permit does not relieve the permittee of any liability for the effects which the project may have upon the safety of the life or property of others.
- (6) This permit may be revoked by the Department of Natural Resources for violation of any condition, limitation or applicable statute or rule.
- (7) This permit shall not be assignable or transferable without the prior written approval of the Department of Natural Resources. To initiate a transfer contact:

Mr. Michael W. Neyer, PE, Director
Division of Water
Room W264
402 West Washington Street
Indianapolis, IN 46204

Telephone: (317) 232-4160, Toll Free: (877) 928-3755
FAX: (317) 233-4579

- (8) The Department of Natural Resources shall have the right to enter upon the site of the permitted activity for the purpose of inspecting the authorized work.
- (9) The receipt and acceptance of this permit by the applicant or authorized agent shall be considered as acceptance of the conditions and limitations stated on the pages entitled "General Conditions" and "Special Conditions".

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

SPECIAL CONDITIONS

APPLICATION #: FW- 24710

PERMIT VALIDITY : This permit is valid for 24 months from the "Approved On" date shown on the first page. If work has not been initiated by April 17, 2010 the permit will become void and a new permit will be required in order to continue work on the project.

This permit becomes effective 18 days after the "MAILED" date shown on the first page. If both a petition for review and a petition for a stay of effectiveness are filed before this permit becomes effective, any part of the permit that is within the scope of the petition for stay is stayed for an additional 15 days.

CONFORMANCE : Other than those measures necessary to satisfy the "General Conditions" and "Special Conditions", the project must conform to the information received by the Department of Natural Resources on: February 15, 2008, March 25, 2008 and March 27, 2008. Any deviation from the information must receive the prior written approval of the Department.

<u>Number</u>	<u>Special Condition</u>
(1)	revegetate all bare and disturbed areas with a mixture of grasses (excluding all varieties of tall fescue) and legumes as soon as possible upon completion; low endophyte tall fescue may be used in the ditch bottom and side slopes only
(2)	minimize and contain within the project limits inchannel disturbance and the clearing of trees and brush
(3)	do not work in the waterway from April 1 through June 30 without the prior written approval of the Division of Fish and Wildlife
(4)	appropriately designed measures for controlling erosion and sediment must be implemented to prevent sediment from entering the stream or leaving the construction site; maintain these measures until construction is complete and all disturbed areas are stabilized
(5)	except for the material used as backfill as shown on the above referenced project plans on file at the Division of Water, place all excavated material landward of the floodway *
(6)	do not leave felled trees, brush, or other debris in the floodway *
(7)	upon completion of the project, remove all construction debris from the floodway *
(8)	* NOTE: for regulatory purposes, the floodway is defined as that shown on Panel 100 of the Noble County Flood Boundary and Floodway Map dated January 3, 1979.

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

SERVICE LIST

APPLICATION #: FW- 24710

Skinner Lake Homeowners Association
Ed Sprague
2916 East Skinner Lake Drive
Albion, IN 46701-9797

JFNew
Tyson B Edwards
708 Roosevelt Road
Walkerton, IN 46574-1220

*US Army Corps of Engineers, Detroit District
John Konik
Regulatory Office
PO Box 1027
Detroit, MI 48231-1027

Noble County Drainage Board
Scott D Zeigler
2090 North State Road 9, Suite B
Albion, IN 46701-9577

Indiana Department of Natural Resources
Division of Law Enforcement
North Region Headquarters Dist 2
1124 North Mexico Road
Peru, IN 46970-7522

Mr. Steve Kirkpatrick
Plan Director
Noble County Plan Commission
2090 North State Road 9, Suite A
Albion, IN 46701

Noble County Area Plan Commission
2090 North State Road 9, Suite A
Albion, IN 46701-9594

Noble County Soil and Water Conservation
District
100 East Park Drive
Albion, IN 46701-1478

Staff Assignment:

Administrative : Jennifer L. Ware
Technical : Jennifer L. Ware
Environmental : Christie L. Stanifer

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

MAILED APR 18 2008

**CERTIFICATE OF APPROVAL
CONSTRUCTION IN A FLOODWAY**

APPLICATION # : FW-24682

STREAM : Rimmell Branch

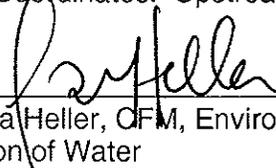
APPLICANT : Skinner Lake Homeowners Association
Ed Sprague
2916 East Skinner Lake Drive
Albion, IN 46701-9797

AGENT : JFNew
Tyson B Edwards
708 Roosevelt Road
Walkerton, IN 46574-1220

AUTHORITY : IC 14-28-1 with 312 IAC 10

DESCRIPTION : Approximately 40' of Rimmell Branch will be stabilized using native seed and erosion control blanket with a riprap toe to protect the bank from further erosion. The riprap will be keyed into the streambed at its base and will conform to the re-graded bank. It will have a maximum height of 2', a maximum streamward projection of 1' beyond the existing bank, and 1:1 sideslopes. A 21' long by 9' wide riprap grade control structure will be placed across the stream. The maximum height of the structure will not exceed 1' above the existing stream bottom. The structure will be keyed into the bed with a 2' by 3' trench. The grade control structure will utilize approximately 15 cubic yards of riprap. In addition, the overbank area along the bank stabilization site will be excavated and removed from the floodway. Details of the project are contained in information received electronically at the Division of Water on January 28, 2008 and in plans and information received at the Division of Water on February 22, 2008, March 25, 2008 and March 27, 2008.

LOCATION : **DOWNSTREAM:** Approximately 600' downstream of the County Road 500 East stream crossing near Albion, Jefferson Township, Noble County
SE¼, NE¼, NE¼, Section 23, T 34N, R 10E, Kendallville Quadrangle
UTM Coordinates: Downstream 4583580 North, 639627 East
UPSTREAM:
UTM Coordinates: Upstream 4583622 North, 639658 East

APPROVED BY : 
Larissa Heller, OFM, Environmental Scientist
Division of Water

APPROVED ON : April 17, 2008

Attachments: Notice Of Right To Administrative Review
General Conditions
Special Conditions
Service List

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

NOTICE OF RIGHT TO ADMINISTRATIVE REVIEW

APPLICATION #: FW- 24682

This signed document constitutes the issuance of a permit by the Department of Natural Resources, subject to the conditions and limitations stated on the pages entitled "General Conditions" and "Special Conditions".

The permit or any of the conditions or limitations which it contains may be appealed by applying for administrative review. Such review is governed by the Administrative Orders and Procedures Act, IC 4-21.5, and the Department's rules pertaining to adjudicative proceedings, 312 IAC 3-1.

In order to obtain a review, a written petition must be filed with the Division of Hearings within 18 days of the mailing date of this notice. The petition should be addressed to:

Mr. Stephen L. Lucas, Director
Division of Hearings
Indiana Government Center North, Room N501A
100 North Senate Avenue
Indianapolis, Indiana 46204

The petition must contain specific reasons for the appeal and indicate the portion or portions of the permit to which the appeal pertains.

If an appeal is filed, the final agency determination will be made by the Natural Resources Commission following a legal proceeding conducted before an Administrative Law Judge. The Department of Natural Resources will be represented by legal counsel.

**STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES**

GENERAL CONDITIONS

APPLICATION #: FW- 24682

- (1) If any archaeological artifacts or human remains are uncovered during construction, federal law and regulations (16 USC 470, et seq.; 36 CFR 800.11, et al) and State Law (IC 14-21-1) require that work must stop and that the discovery must be reported to the Division of Historic Preservation and Archaeology within 2 business days.

Division of Historic Preservation and Archaeology
Room W274
402 West Washington Street
Indianapolis, IN 46204

Telephone: (317) 232-1646, FAX: (317) 232-8036

- (2) This permit must be posted and maintained at the project site until the project is completed.
- (3) This permit does not relieve the permittee of the responsibility for obtaining additional permits, approvals, easements, etc. as required by other federal, state, or local regulatory agencies. These agencies include, but are not limited to:

<u>Agency</u>	<u>Telephone Number</u>
*US Army Corps of Engineers, Detroit District	(313) 226-6828
Noble County Drainage Board	(260) 636-2131
Indiana Department of Environmental Management	(317) 233-8488 or (800) 451-6027
Local city or county planning or zoning commission	

- (4) This permit must not be construed as a waiver of any local ordinance or other state or federal law.
- (5) This permit does not relieve the permittee of any liability for the effects which the project may have upon the safety of the life or property of others.
- (6) This permit may be revoked by the Department of Natural Resources for violation of any condition, limitation or applicable statute or rule.
- (7) This permit shall not be assignable or transferable without the prior written approval of the Department of Natural Resources. To initiate a transfer contact:

Mr. Michael W. Neyer, PE, Director
Division of Water
Room W264
402 West Washington Street
Indianapolis, IN 46204

Telephone: (317) 232-4160, Toll Free: (877) 928-3755
FAX: (317) 233-4579

- (8) The Department of Natural Resources shall have the right to enter upon the site of the permitted activity for the purpose of inspecting the authorized work.
- (9) The receipt and acceptance of this permit by the applicant or authorized agent shall be considered as acceptance of the conditions and limitations stated on the pages entitled "General Conditions" and "Special Conditions".

**STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES**

SPECIAL CONDITIONS

APPLICATION #: FW- 24682

PERMIT VALIDITY : This permit is valid for 24 months from the "Approved On" date shown on the first page. If work has not been initiated by April 17, 2010 the permit will become void and a new permit will be required in order to continue work on the project.

This permit becomes effective 18 days after the "MAILED" date shown on the first page. If both a petition for review and a petition for a stay of effectiveness are filed before this permit becomes effective, any part of the permit that is within the scope of the petition for stay is stayed for an additional 15 days.

CONFORMANCE : Other than those measures necessary to satisfy the "General Conditions" and "Special Conditions", the project must conform to the information received by the Department of Natural Resources on: January 28, 2008, February 22, 2008, March 25, 2008 and March 27, 2008. Any deviation from the information must receive the prior written approval of the Department.

Number	Special Condition
(1)	revegetate all bare and disturbed areas with a mixture of grasses (excluding all varieties of tall fescue) and legumes as soon as possible upon completion; low endophyte tall fescue may be used in the ditch bottom and side slopes only
(2)	minimize and contain within the project limits inchannel disturbance and the clearing of trees and brush
(3)	do not work in the waterway from April 1 through June 30 without the prior written approval of the Division of Fish and Wildlife
(4)	appropriately designed measures for controlling erosion and sediment must be implemented to prevent sediment from entering the stream or leaving the construction site; maintain these measures until construction is complete and all disturbed areas are stabilized
(5)	except for the material used as backfill as shown on the above referenced project plans on file at the Division of Water, place all excavated material landward of the floodway
(6)	all work must conform with the existing bank at the upstream and downstream limits of the project site
(7)	do not leave felled trees, brush, or other debris in the floodway
(8)	riprap placed for bank stabilization must conform to the bank
(9)	upon completion of the project, remove all construction debris from the floodway

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

SERVICE LIST

APPLICATION #: FW- 24682

Skinner Lake Homeowners Association
Ed Sprague
2916 East Skinner Lake Drive
Albion, IN 46701-9797

JFNew
Tyson B Edwards
708 Roosevelt Road
Waikerton, IN 46574-1220

*US Army Corps of Engineers, Detroit District
John Konik
Regulatory Office
PO Box 1027
Detroit, MI 48231-1027

Noble County Drainage Board
Scott D Zeigler
2090 North State Road 9, Suite B
Albion, IN 46701-9577

Indiana Department of Natural Resources
Division of Law Enforcement
North Region Headquarters Dist 2
1124 North Mexico Road
Peru, IN 46970-7522

Mr. Steve Kirkpatrick
Plan Director
Noble County Plan Commission
2090 North State Road 9, Suite A
Albion, IN 46701

Noble County Area Plan Commission
2090 North State Road 9, Suite A
Albion, IN 46701-9594

Noble County Soil and Water Conservation
District
100 East Park Drive
Albion, IN 46701-1478

Staff Assignment:

Administrative : Jennifer L. Ware
Technical : Jennifer L. Ware
Environmental : Christie L. Stanifer

APPENDIX C

SCOPE CHANGES

RIMMEL DITCH DESIGN/BUILD REPORT NOBLE COUNTY, INDIANA



Office Locations:

Chicago, Illinois
Walkerton, Indiana
Grand Haven, Michigan
Madison, Wisconsin

Indianapolis, Indiana
Ann Arbor, Michigan
Cincinnati, Ohio
www.jfnew.com

SCOPE CHANGE ORDER FORM

Project Name: Skinner Lake	Project Number / Phase:	051069.01
Date: 02/13/08	Change Order Number:	1
Prepared By: Tyson Edwards	Project Manager:	Tyson Edwards

Change Requested (describe in detail): During the survey for the pipe drop structure, JFNew noticed a large erosion area (6' deep x 15' long x 12' wide) on the south side of Rimmell Ditch on the Higginbotham's property. The erosion is likely being caused by overland flow from the grassed waterway directly to the south. There is a pipe drop structure on the south side of East 200 N that captures the water and directs it through a tile to Rimmell Ditch. The emergency overflow is through a culvert under East 200 N and then overland to Rimmell Ditch. Twice during the winter of 2007/08, water has topped the pipe drop structure, came over the road, and down through the erosion area. The area has eroded significantly during the months of January and February and will continue to get worse. A scope change is being requested to provide a preliminary design of a solution for the above mentioned site.

Resulting Change(s) to Project Schedule: No Change in Project Schedule

Resulting Budget Change (adjusted fee for change): The solution design will utilize \$1000 under the existing contract amount for JFNew of \$78,750.00. No change in budget is necessary.

Change Requested By: Ed Sprague & JFNew

Change Approved By (name and title): Ed Sprague, Chairman Water Clarity Committee

Ed Sprague 2/13/08
(Signature)

[Signature]
(RM or UM Signature)

Attach signed form to contract in project folder and forward to accounting department.

Chicago, Illinois
 Walkerton, Indiana
 Grand Haven, Michigan
 Madison, Wisconsin

Indianapolis, Indiana
 Ann Arbor, Michigan
 Cincinnati, Ohio
www.jfnew.com

SCOPE CHANGE ORDER FORM

Project Name: Skinner Lake	Project Number / Phase:	051069.01
Date: 09/08/08	Change Order Number:	2
Prepared By: Tyson Edwards	Project Manager:	Tyson Edwards

Change Requested (describe in detail): Upon approval of scope change #1, a design and cost estimate were completed for a washout on the south side of Rimmell Ditch located on Higginbotham's property. This site is approximately 400 ft upstream of site 115 and for future reference this new site will be identified as site 115A. The design includes installing a pipe drop structure with a stone lined outlet, grading the site to capture the surface water runoff, and seeding and blanketing the completed site.

This scope change #2 is being requested to remove the project associated with task 14 (sites 125 and 126, Bender property) in the current contract and replace with the construction and installation of the pipe drop structure at site 115A.

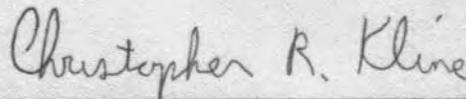
Resulting Change(s) to Project Schedule: No Change in Project Schedule

Resulting Budget Change (adjusted fee for change): The construction and installation will utilize the budgeted amount of \$11,000 (task 14) under the existing contract amount for JFNew of \$78,750.00. No change in budget is necessary.

Change Requested By: Ed Sprague & JFNew

Change Approved By (name and title): Ed Sprague, Chairman Water Clarity Committee

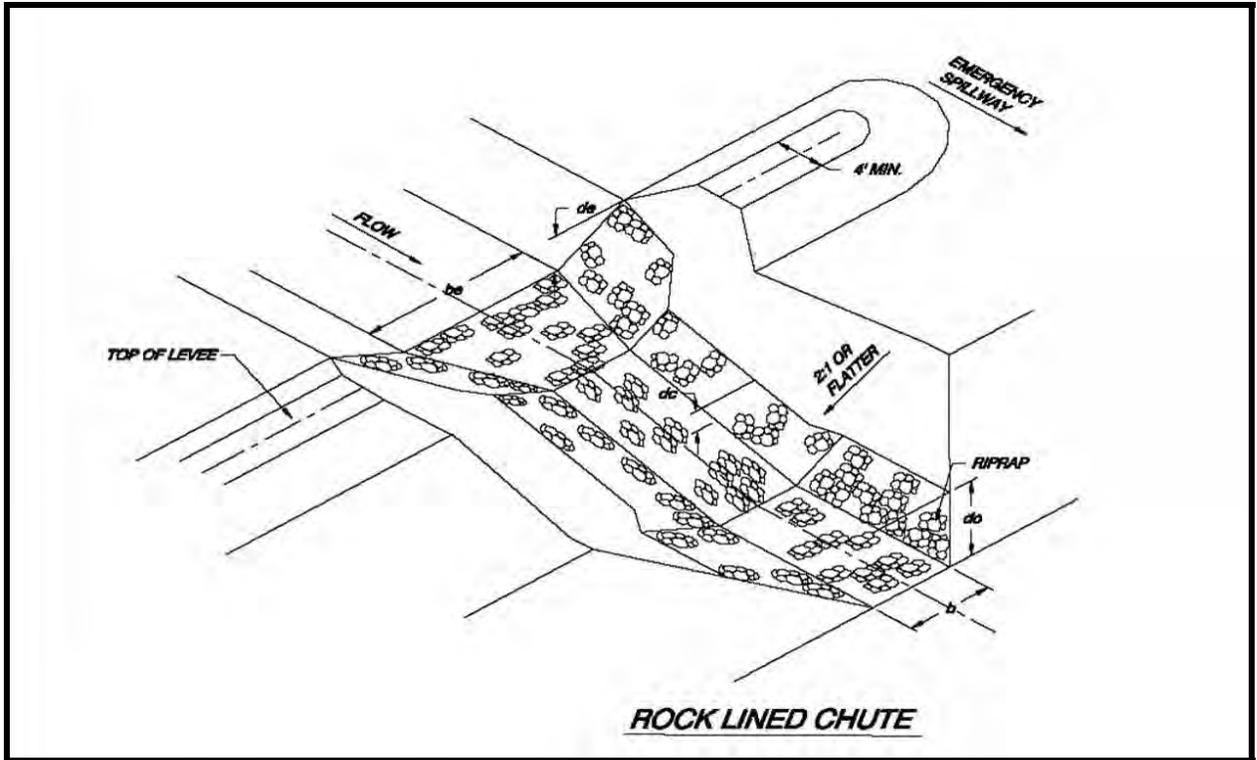

 (Signature) CHAIRMAN WATER CLARITY


 (RM or UM Signature)

APPENDIX D

TYPICAL DESIGN OF ROCK CHUTE

**RIMMEL DITCH DESIGN/BUILD REPORT
NOBLE COUNTY, INDIANA**



Conceptual design of a rock-lined chute.

APPENDIX E

GRADE CONTROL STRUCTURE DESIGN - SITE 114

**RIMMEL DITCH DESIGN/BUILD REPORT
NOBLE COUNTY, INDIANA**

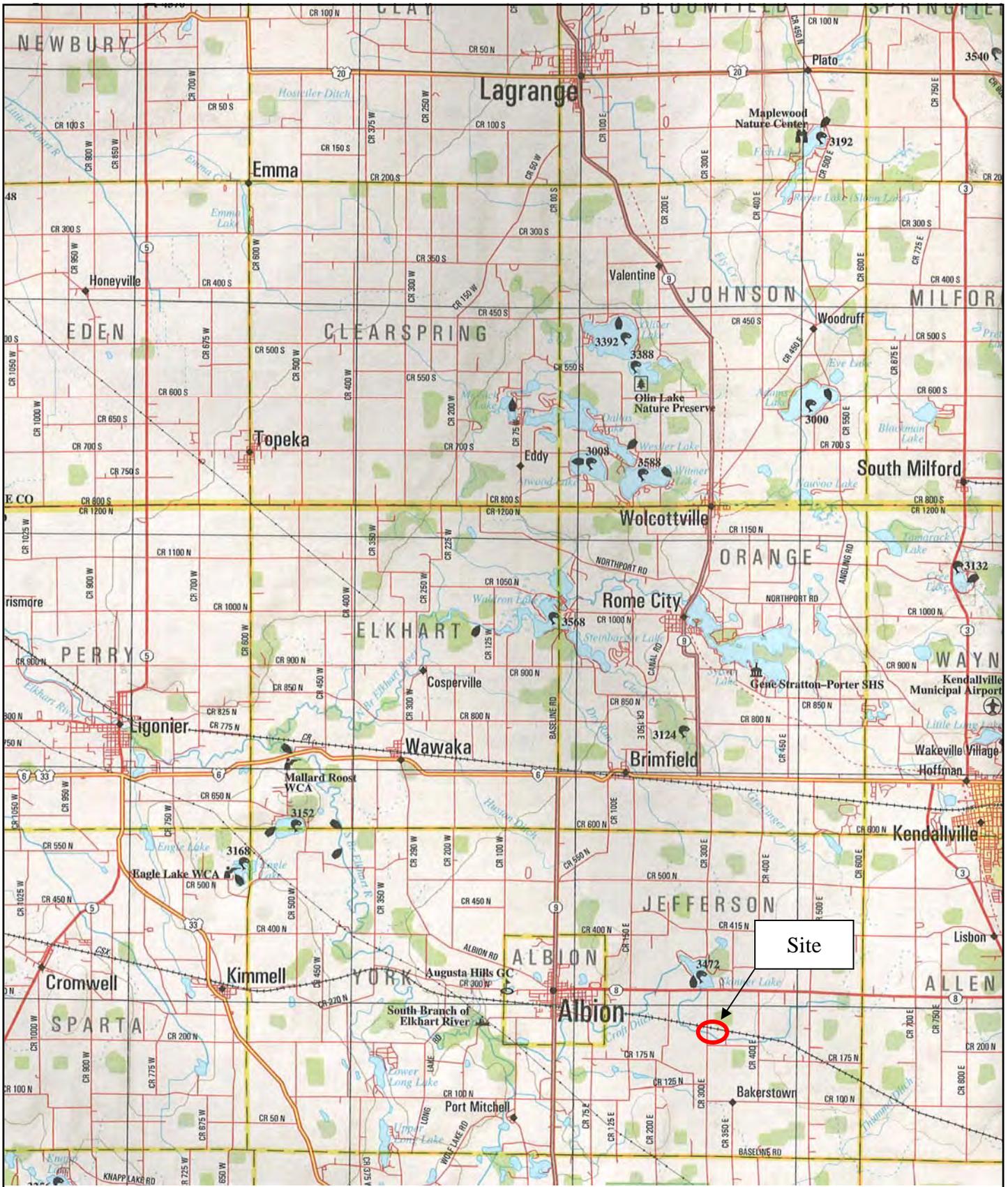
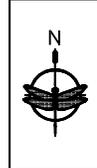


Figure 1: Location Map
Rimmell Ditch—Skinner Lake
Homeowners Association
Noble County, Indiana



Scale: 1" = 2.5 mi.
 JFNew #
 051069.01

708 Roosevelt Road, Walkerton, IN 46574
 Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com



**Figure 2: Location of Photos
Rimmell Ditch - Skinner Lake
Homeowners Association
Noble County, Indiana**



JFNew #
051069.01



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Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com



Image 1 - May 2007
Looking downstream at area to be protected. Overview of eroding banks.



Image 2 - May 2007
Looking upstream at existing grade control structure

Figure 3: Photo Page 1
Rimmell Ditch Grade Control
Skinner Lake Homeowners Association
Noble County, Indiana

JFNew #
051069.01



708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com



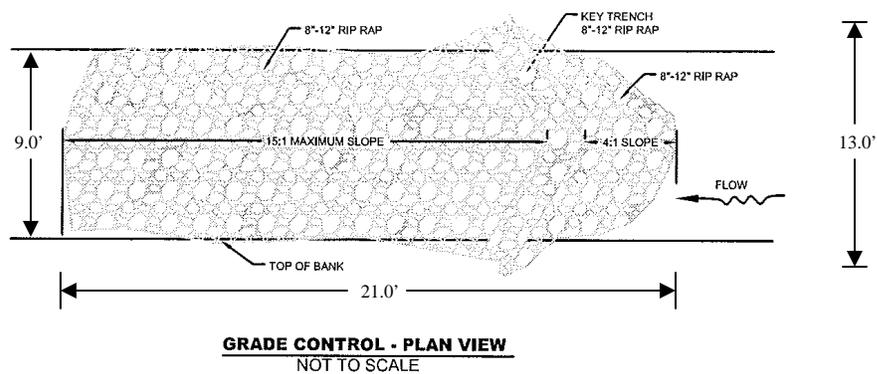
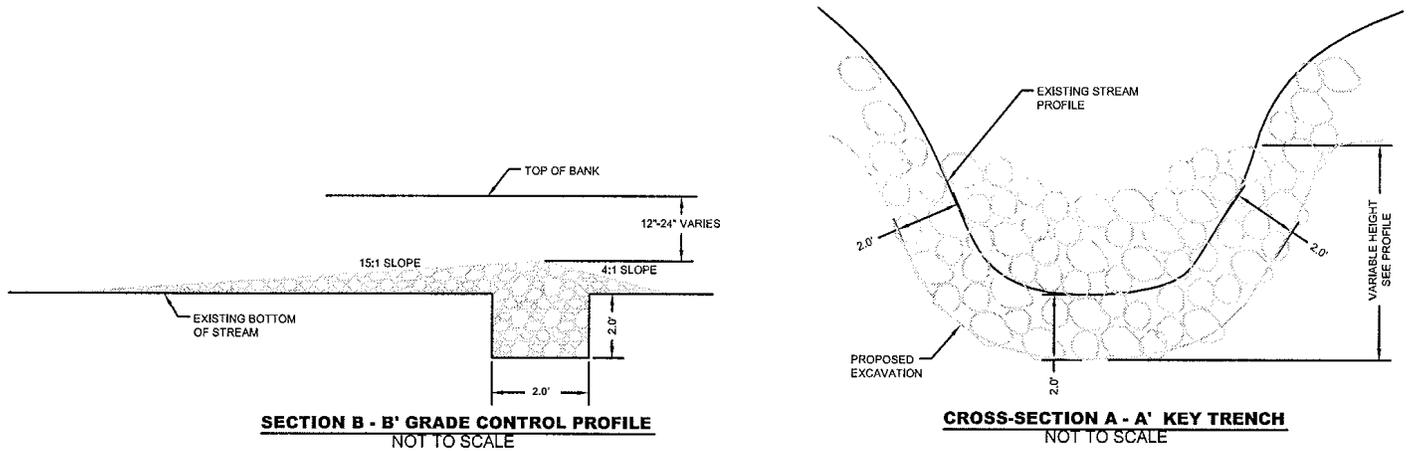
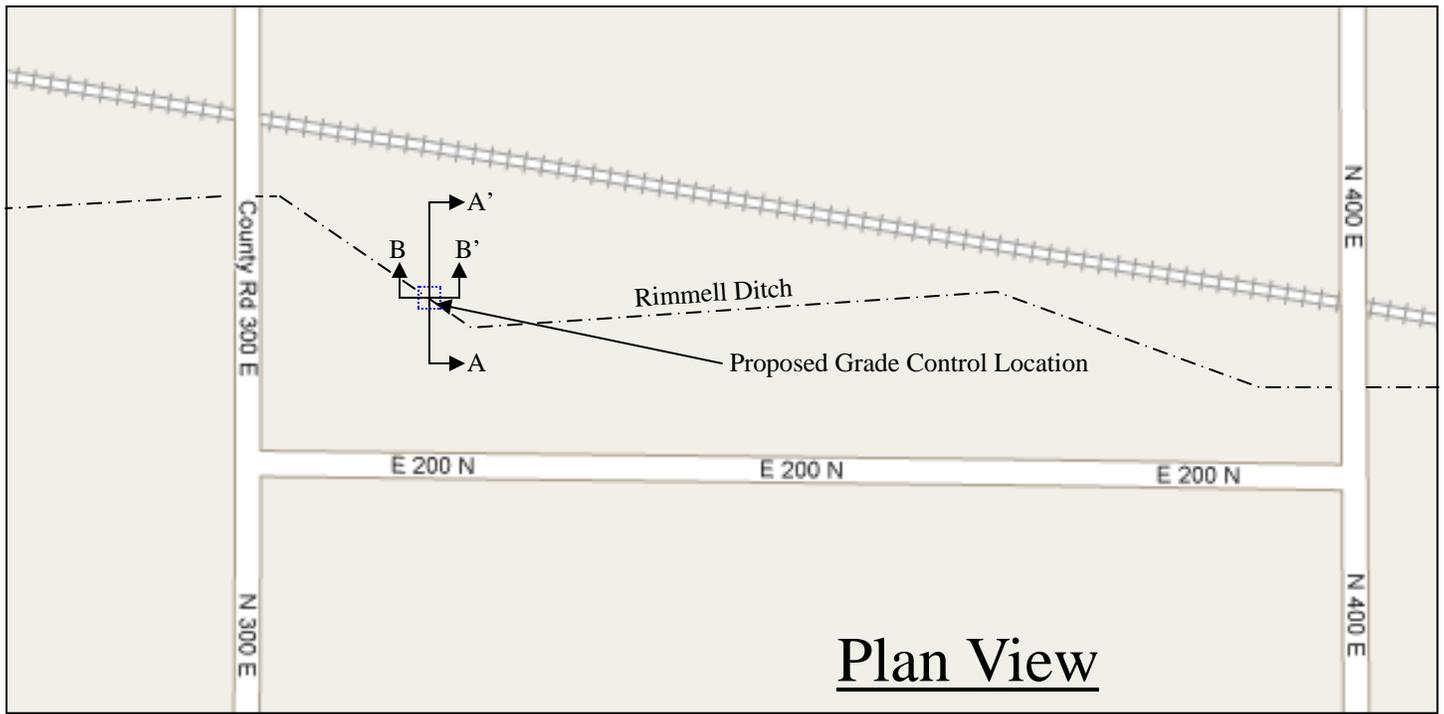
Image 3 - May 2007
Looking across at existing grade control structure

Figure 4: Photo Page 2
Rimmell Ditch Grade Control
Skinner Lake Homeowners Association
Noble County, Indiana

JFNew #
051069.01



708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com



<p>Figure 5: Grade Control Detail Rimmell Ditch Grade Control Skinner Lake Homeowners Association Noble County, Indiana</p>	<p>JFNew # 051069.01</p>	<p>708 Roosevelt Road, Walkerton, IN 46574 Phone 574-586-3400 / Fax 574-586-3446 www.jfnew.com</p>
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APPENDIX F

PIPE DROP STRUCTURE/GRASSED WATERWAYS DESIGN - SITE 115

RIMMEL DITCH DESIGN/BUILD REPORT NOBLE COUNTY, INDIANA

Relief well at connection to 15" tile

New 15" tile

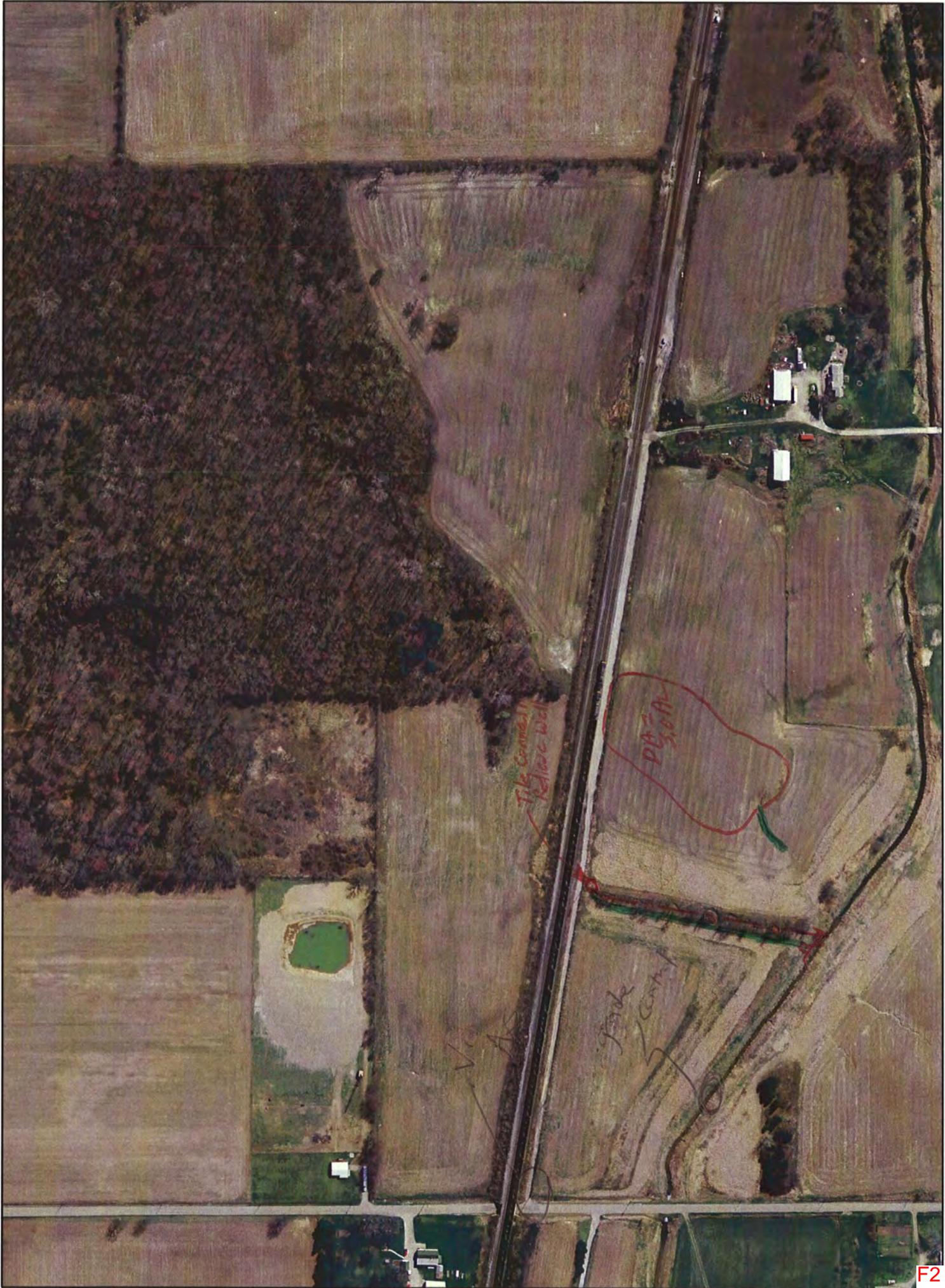
Subproject 1—Pipe drop structures, waterway and tile line

Grassed waterway

Location of new (yellow) and existing (blue) pipe drop structure

Subproject 2—New grassed waterways





Gross Waterway

Structure
Tile Connection
Relieve Well

Sites 1 & 2

F2

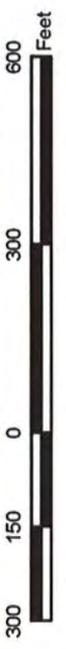


1 sq in = 90,000 sq ft.
 1 unit = 900 sq ft

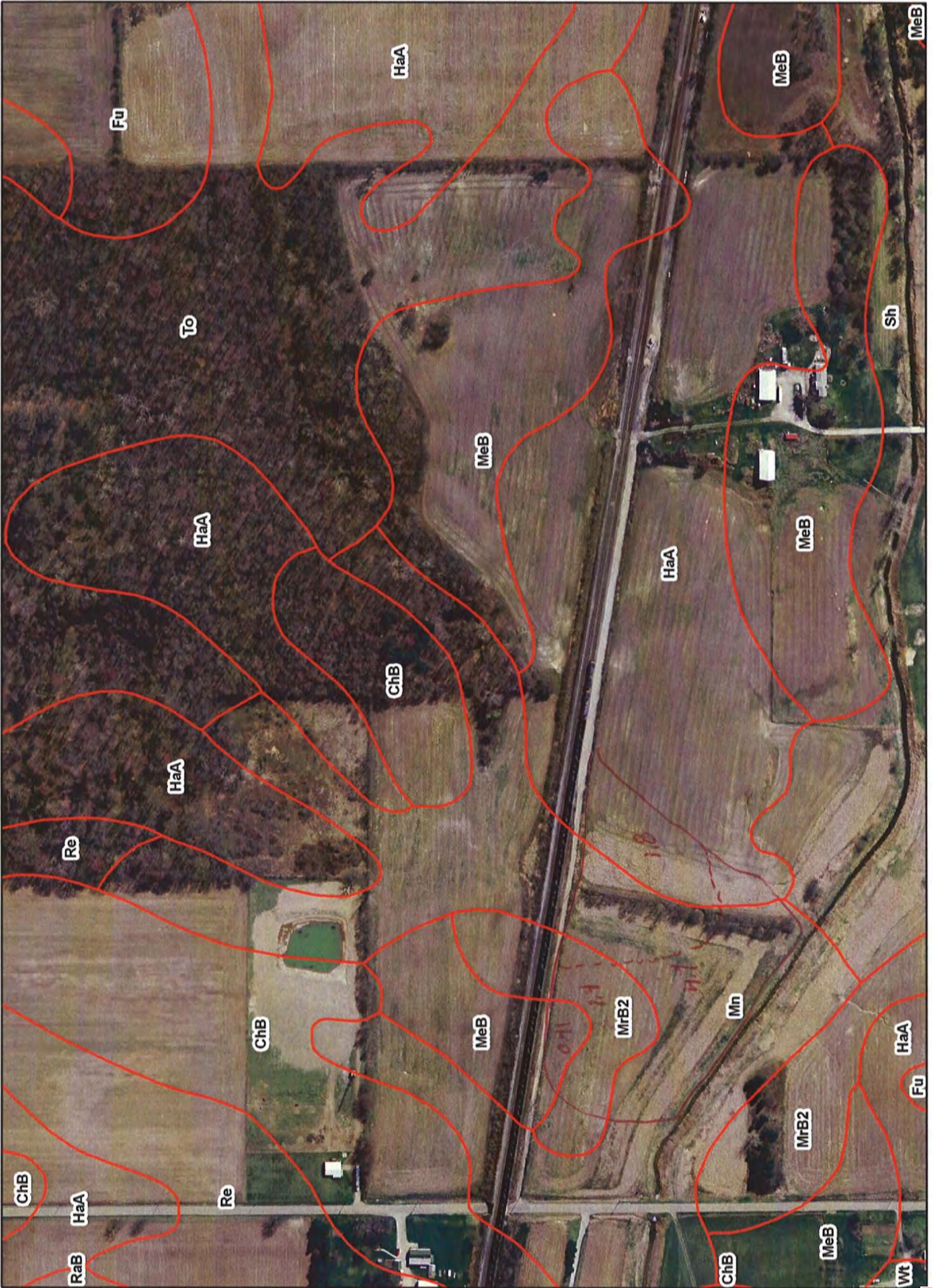
DA = 3.0 Acres

Sites 1 & 2

132



F3



Sites 1 & 2

Aa Soils

WORKSHEET IN-1: RUNOFF CURVE NUMBER (CN)

Client Tom & Billie Higginbottom Practice and ID Water way Outletting Into Structure
Skinner Lake North side of open Ditch
Noble County, Indiana County Soil and Water Conservation District, Indiana

By _____ Date _____ Checked by _____ Date _____

COVER TYPE	TREATMENT 1/	HYDROLOGIC CONDITION 2/	CURVE NUMBER (CN)				AREA, ACRES	PRODUCT OF CN X ACRES
			Hydrologic Soil Group (EFM Table IN-2-2)					
			A	B	<i>Hastings</i>	<i>M96d</i>		
Row Crops - Straight Row		poor	72	81	88	91		
		good	67	78	85	89		
- Straight Row + CR		poor	71	80	87	90	1.1 x 95	
		good	64	75	82	85	1.9 x 82	
- Contoured + CR		poor	69	78	83	87		
		good	64	74	81	85		
Small Grain - Straight Row		poor	65	76	84	88		
		good	63	75	83	87		
Pasture or Grassland		poor	68	79	86	89		
		good	39	61	74	80		
Meadow - Not Grazed		--	30	58	71	78		
Woods		poor	45	66	77	83		
		good	30	55	70	77		
Farmsteads		--	59	74	82	86		
Streets and Roads - Paved w/ Curb		--	98	98	98	98		
		--	83	89	92	93		
Residential 3/	- 1/4 acre lots	--	61	75	83	87		
	- 1/2 acre lots	--	54	70	80	85		
	- 1 acre lots	--	51	68	79	84		
Other (Specify) <i>Railroad Gravel</i>					95	0.75 x 95	71	
1/ Crop residue cover (CR) applies if residue is on at least 5% of the surface throughout the year.						TOTALS	3.75	321
2/ See EFM Table 2-3 for definitions.								
3/ Includes subdivision streets and driveways.								

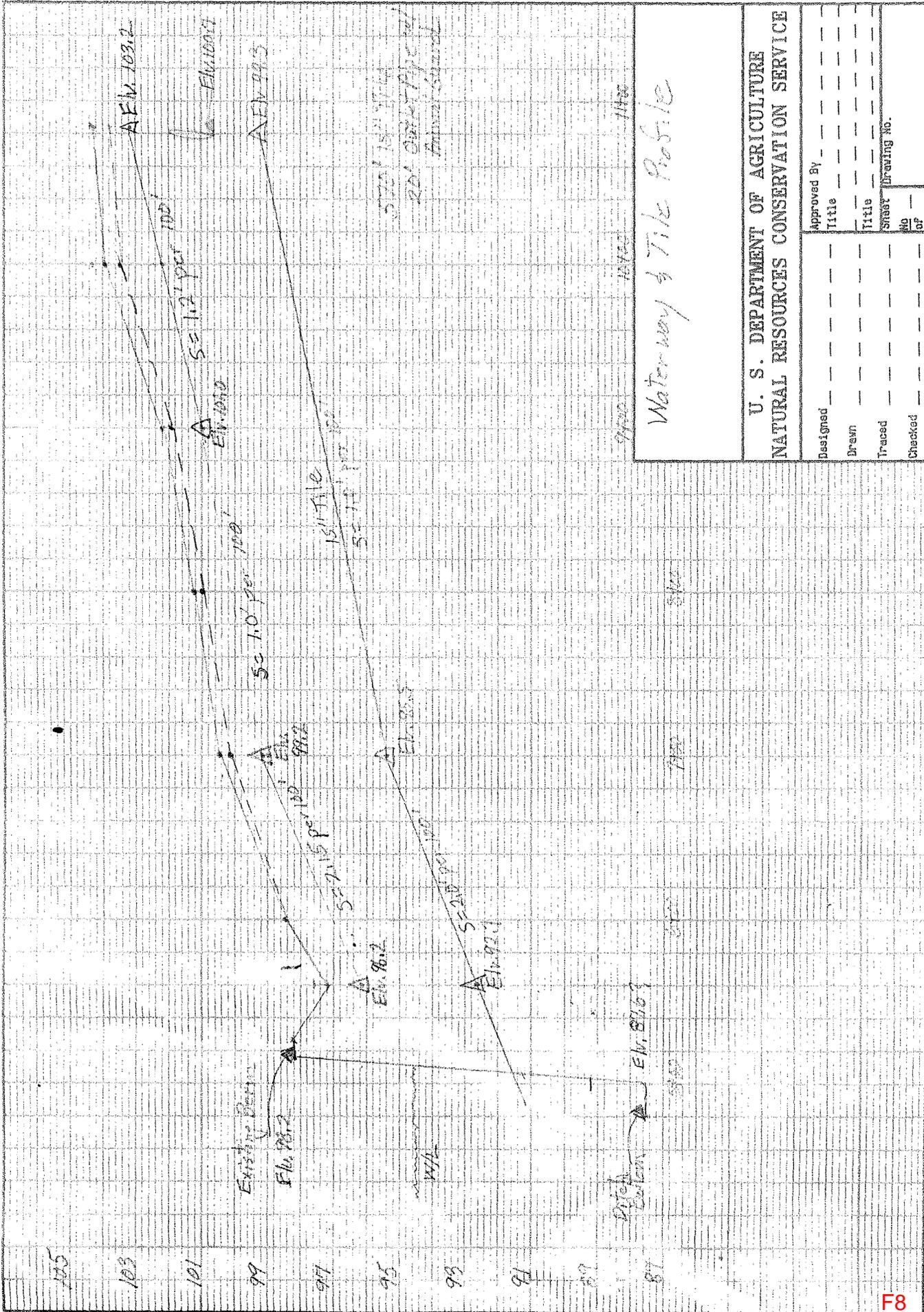
Product Total
Weighted CN = 321 ; Use CN = 85.6 Use 86
Total Acres 3.75
(Do not use less than CN 60 without approval of area engineer)

WORKSHEET IN-1: RUNOFF CURVE NUMBER (CN)

Client Tom & Billie Higginbottom Practice and ID Structure - North of Ditch
Skinner Lake
Noble County, Indiana County Soil and Water Conservation District, Indiana

By _____ Date _____ Checked by _____ Date _____

COVER TYPE	TREATMENT 1/	HYDROLOGIC CONDITION 2/	CURVE NUMBER (CN)				AREA, ACRES	PRODUCT OF CN X ACRES
			Hydrologic Soil Group (EFM Table IN-2-2)					
			A	B ₁ <i>Moorea</i>	B ₂ <i>Hobbs</i>	D <i>Morley</i>		
Row Crops - Straight Row		poor good	72 67	81 78	88 85	91 89		
- Straight Row + CR		poor good	71 64	80 75	87 82	90 85	75 x 0.40 = 30 82 x 3.2 = 262 85 x 4.7 = 400	
- Contoured + CR		poor good	69 64	78 74	83 81	87 85		
Small Grain - Straight Row		poor good	65 63	76 75	84 83	88 87		
Pasture or Grassland		poor good	68 39	79 61	86 74	89 80		
Meadow - Not Grazed		--	30	58	71	78		
Woods		poor good	45 30	66 55	77 70	83 77		
Farmsteads		--	59	74	82	86		
Streets and Roads - Paved w/ Curb		--	98	98	98	98		
- Paved w/ Ditches		--	83	89	92	93		
Residential - 1/4 acre lots		--	61	75	83	87		
3/ - 1/2 acre lots		--	54	70	80	85		
- 1 acre lots		--	51	68	79	84		
Other (Specify) <i>Railroad</i>								
<i>Gravel</i>						95	0.75 x 95 = 71	
1/ Crop residue cover (CR) applies if residue is on at least 5% of the surface throughout the year.						TOTALS	9.05	763
2/ See EFM Table 2-3 for definitions.								
3/ Includes subdivision streets and driveways.								
Product Total								
Weighted CN = _____ = <u>763</u>								
Total Acres = <u>9.05</u>								
Use CN = <u>84.3</u> Use <u>84</u>								
(Do not use less than CN 60 without approval of area engineer)								



Waterway & Tile Profile

U. S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Designed	---	Approved By	---
Drawn	---	Title	---
Traced	---	Title	---
Checked	---	Sheet	---
	---	Drawing No.	---
	---	No	---
	---	of	---

1000

98

96

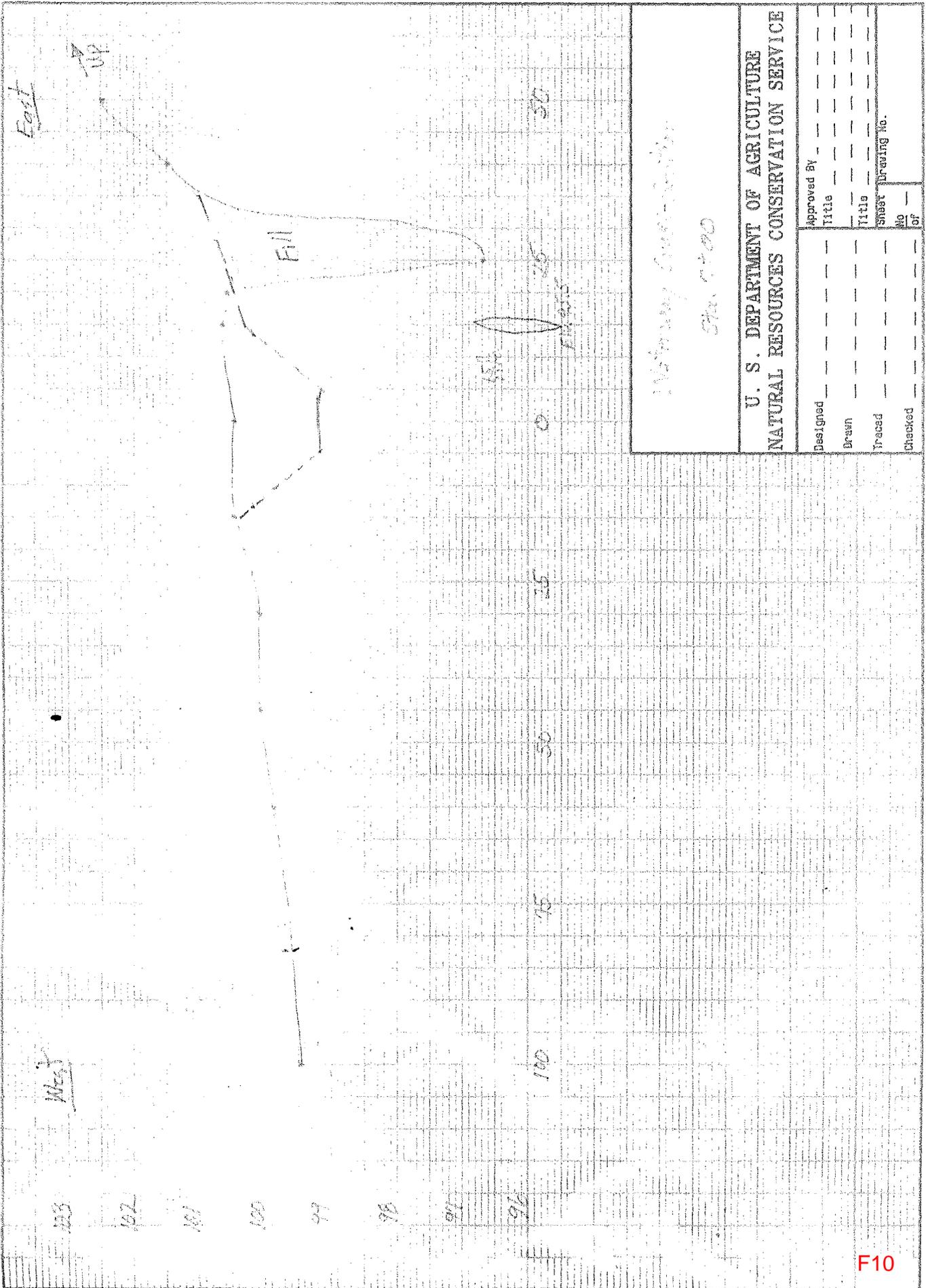
95



Waterway Cross - Section
Sta. 5+60

U. S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Designed	---	Approved By	---
	---		Title
Drawn	---	Title	---
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Traced	---	Sheet	---
	---		---
Checked	---	Drawing No.	---
	---		No
	---	OF	---



West

East

105

104

103

102

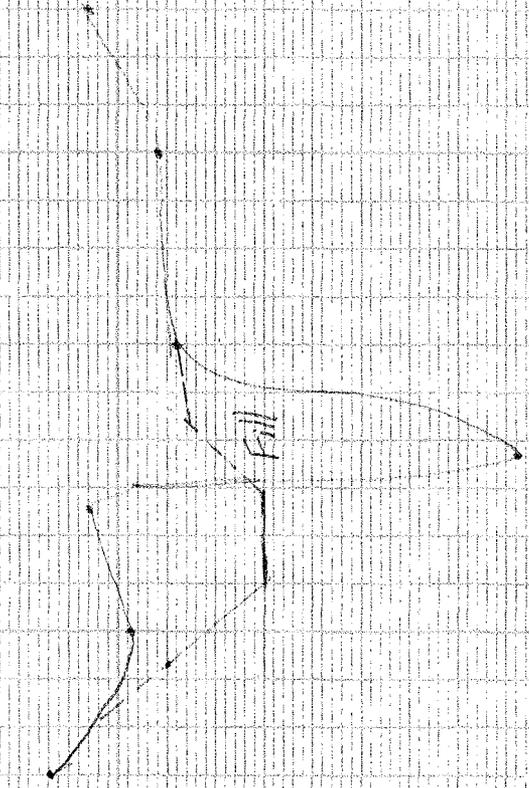
101

100

99

98

47



25

50

0

25

50

75

47.95

Waterway Cross-Section

Sta. 10+00

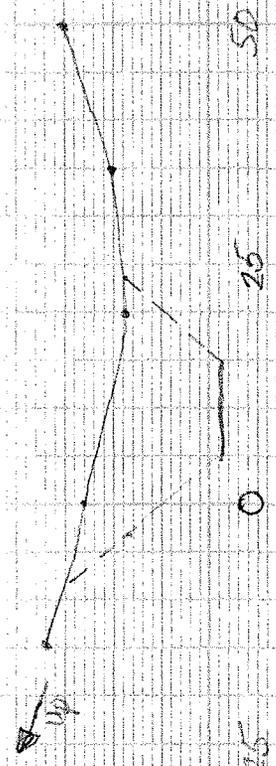
U. S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Designed	---	Approved By	---
Drawn	---	Title	---
Traced	---	Title	---
Checked	---	Sheet	---
		Drawing No.	---
		File	---
		Lot	---

East

West

105
104
103
102
101
100

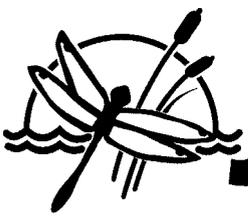


Waterway Cross-section
Sta. 10+85

Flowline
Shy file - E.M.
E.M. 100-7

U. S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Assigned	---	Approved By	---
Drawn	---	Title	---
Traced	---	Title	---
Checked	---	Sheet	---
		No.	---
		of	---



JFN New

JOB Tam & Billie Higgin bottom - Skinner Lake

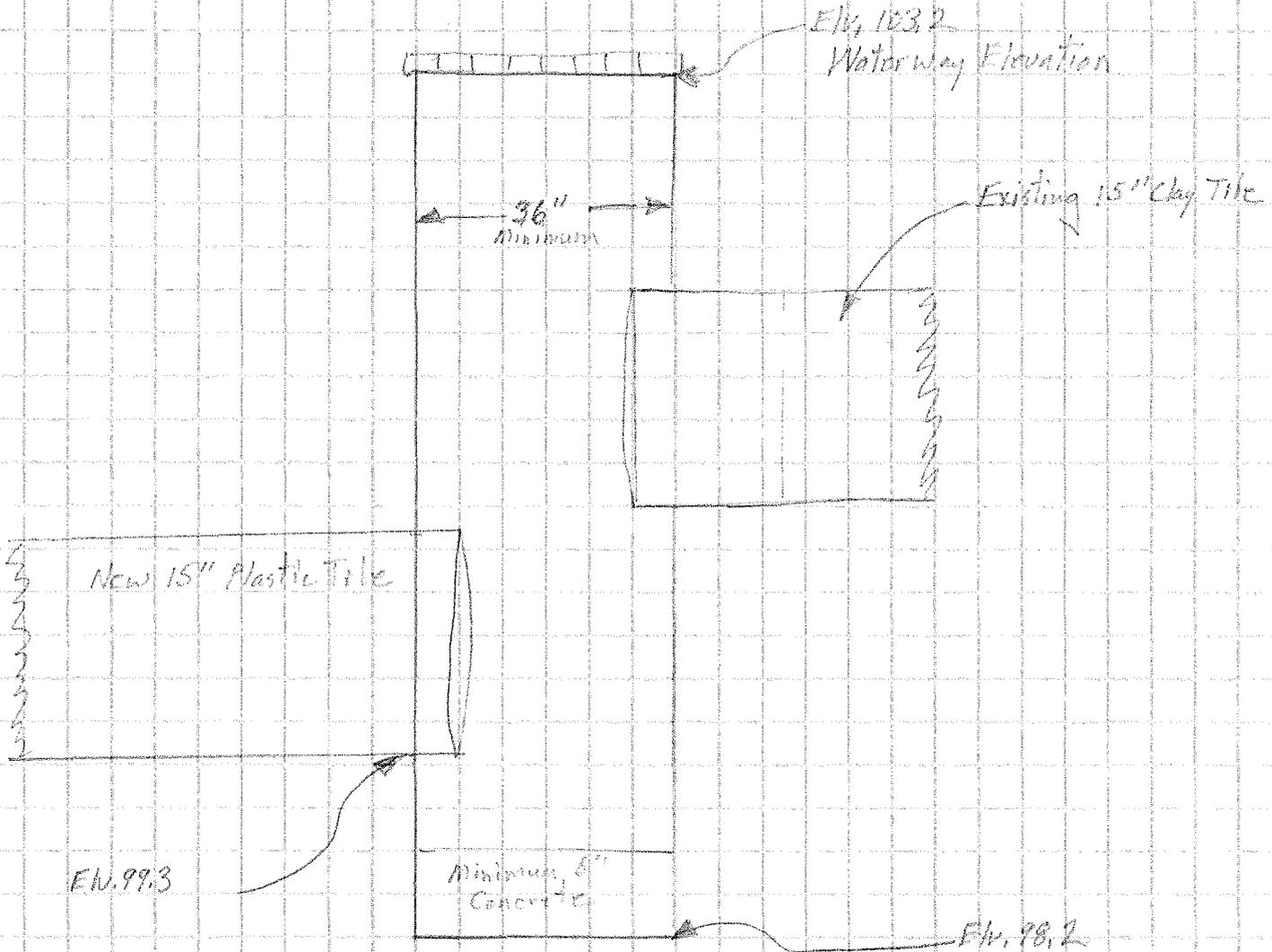
SHEET NO. _____ OF _____

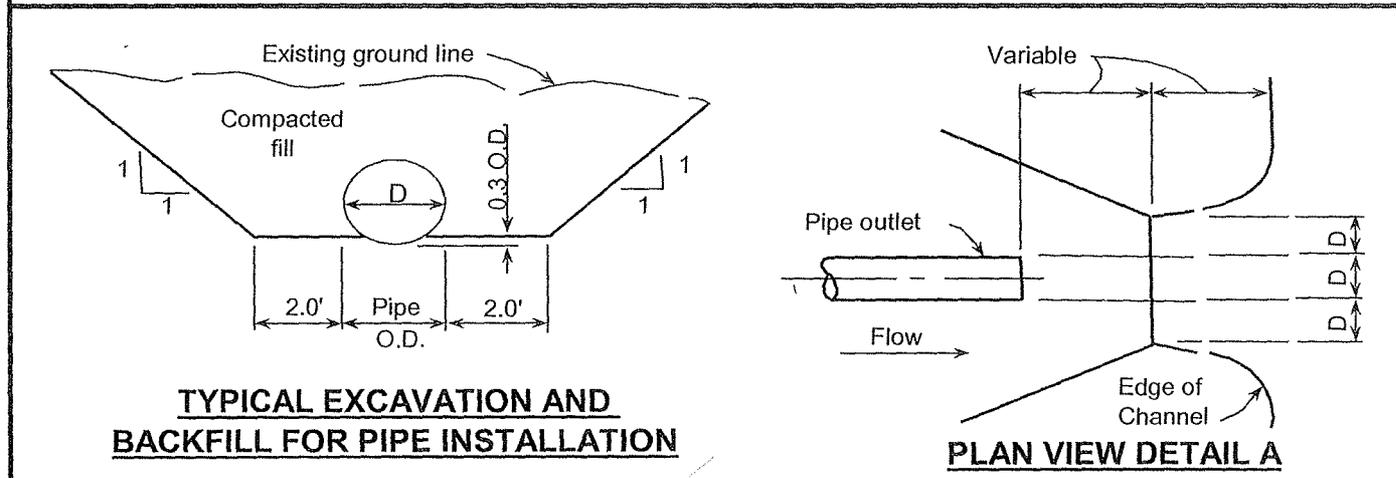
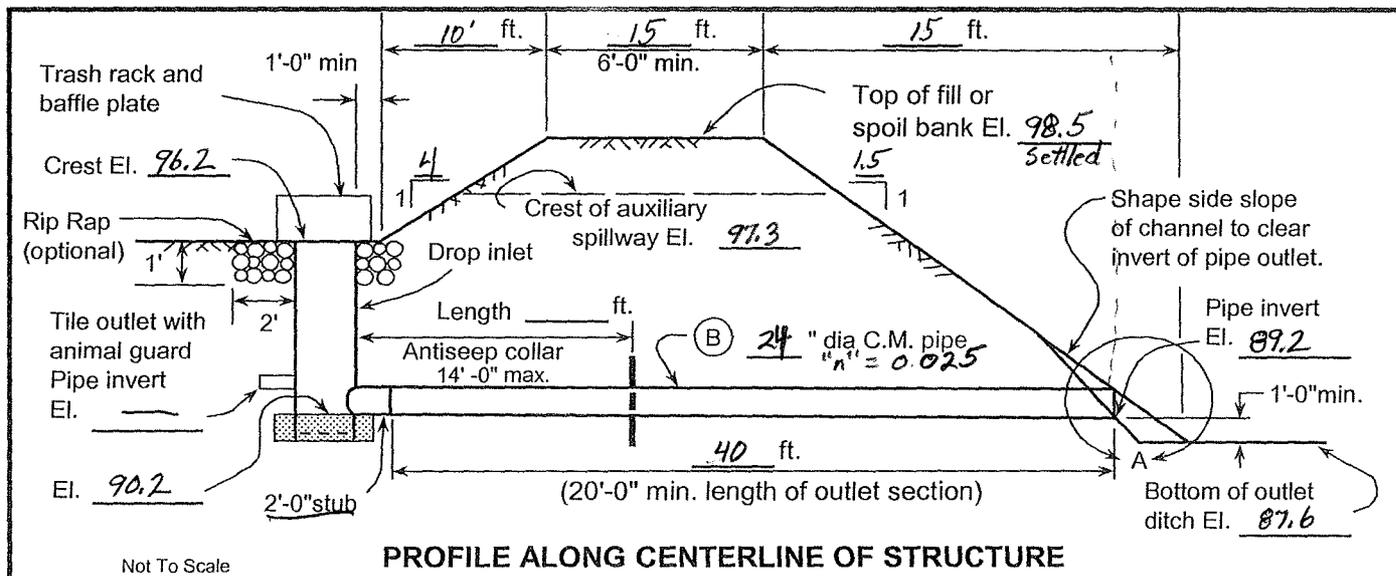
CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

Tile Connection and Relief Well at Sta. 10+90





ESTIMATE OF MATERIALS	
ITEM	QUANTITY
Excavation	_____ Cu. Yds
Earth Fill	_____ Cu. Yds
Pipe <u>24</u> inch diameter (B) C.M. metal thickness 0.06" (16 ga.)	<u>40</u> Lin. Ft.
Riser <u>30</u> inch diameter (A) C.M. metal thickness 0.06" (16 ga.) C.M. (G)	<u>7</u> Lin. Ft.
Tile stub _____ inch diameter	<u>2-0</u> Lin. Ft.
Animal guard _____ inch diameter	<u>1</u> Each
Baffle plate	<u>1</u> Each
Trash Rack	<u>1</u> Each
Antiseep collar	<u>1</u> Each
Concrete	<u>1.1</u> Cu. Yds
Seeding and mulching	<u>0.15</u> Acres
Rip Rap <u>D_{50-5"}</u>	<u>2</u> Tons

SOIL INVESTIGATION REPORT		
LOCATION OF BORINGS	DEPTH FEET	UNIFIED SOIL CLASSIFICATION

DRAWING NO. IN-ENG-27.XLS 1(2).(REV. 5/03)

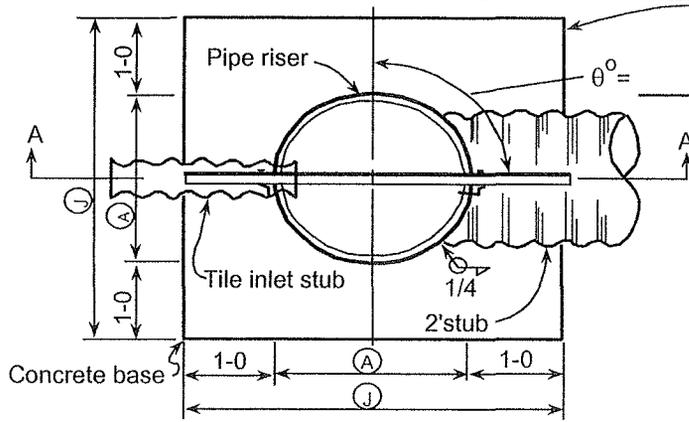


CORRUGATED METAL PIPE DROP STRUCTURE

Landuser Tom & Billie Higginbottom
 Location Skinner Lake - Noble County
County SWCD, INDIANA
 Section T R

	Date
Designed	3/04
Drawn	_____
Checked	_____
Approved	_____

Concrete shall have a minimum compressive strength at 28 days equal to a minimum of 2500 lb./sq.in. (5 bag mix)



PLAN VIEW

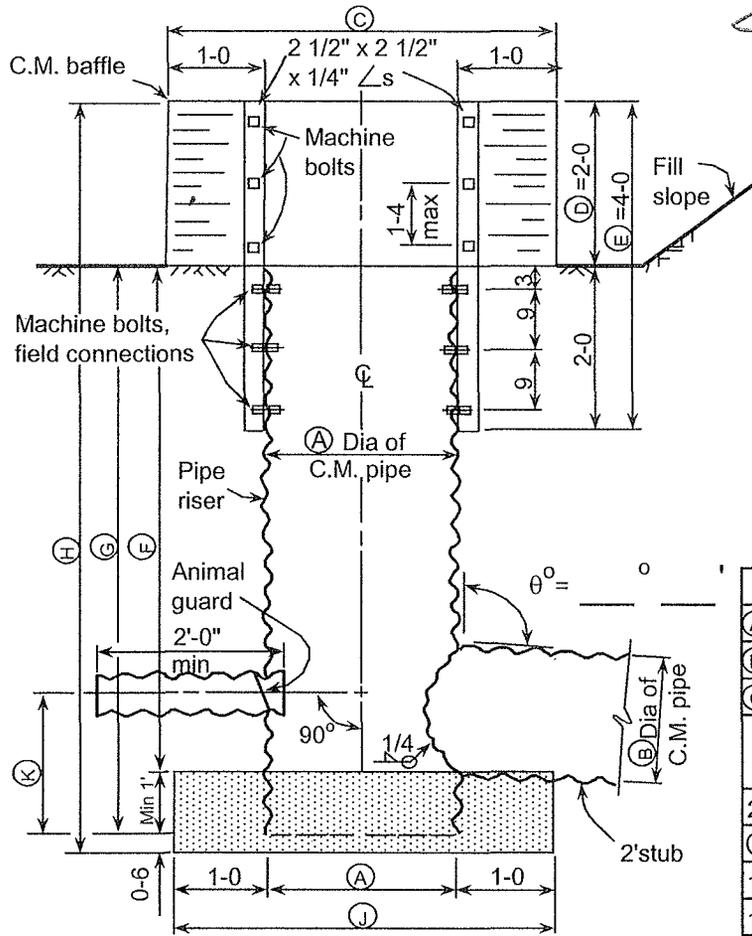
TABLE OF QUANTITIES FOR CONCRETE RISER BASE

DIA. OF RISER IN INCHES	18"	21"	24"	30"
CONCRETE, CU.YD.	0.68	0.78	0.89	1.12

INLET PROPORTIONS (MIN.)		ANTIVORTEX BAFFLE
PIPE DIA. CONDUIT (B)	RISER DIA. (A)	LENGTH FEET (C)
8 TO 12	18	3-6
15	24	4-0
18	24	4-0
(21) AND 24	(30)	(4-6)

NOTES:

- CORRUGATED METAL PIPE MAY BE MADE OF ALUMINUM OR ZINC-COATED IRON OR STEEL AND MEET FEDERAL SPECIFICATIONS, WW-P-402C OR WW-P-405A AND SHALL BE CLASS I OR II, SHAPE 1. USE 16 GAGE (THICKNESS 0.06")
- ALL ACCESSORIES AND FASTENERS SHALL BE OF COMPATIBLE METALS THROUGHOUT STRUCTURE. GALVANIZED OR CADMIUM PLATED BOLTS, NUTS, AND WASHERS MAY BE USED.
- ALL HOLES FOR BOLTS SHALL BE 1/16" LARGER THAN DIAMETER OF BOLTS.
- DROP INLET SHALL BE SHOP FABRICATED.
- ZINC-COATED METALS, AFTER WELDING OR CUTTING SHALL BE REPAIRED AS FOLLOWS:
 - (A) THOROUGHLY CLEAN THE DAMAGED AREAS ON BOTH SIDES OF THE PIPE WITH WIRE BRUSH
 - (B) PAINT THE CLEANED AREAS WITH TWO COATS OF ZINC OXIDE - ZINC DUST PAINT.
 - (C) APPLY A HEAVY COAT OF ASPHALT OVER THE PAINTED AREAS.



SECTION ON CENTERLINE SECTION A-A

DETAILS OF INLET

DIMENSIONS (FEET)			
A	30'	D	2-0
B	21"	E	4-0
C	4.5'	F	6.0'
G	7.0'	H	7.3'
J	4.5'	K	—
MATERIAL ITEMS		QUANTITY REQUIRED	
2 1/2" X 2 1/2" X 1/4" ANGLE X (E) 4-0		2	
(C) X (D) C.M. SHEET		1	
1/2" X 1 1/4" MACHINE BOLTS		12	
1/2" STEEL SPLIT LOCKWASHERS		12	
1/2" NUTS		12	
2 1/2" Couplers - Bands		2	

DRAWING NO. IN-ENG-27.XLS 2(2), (REV. 5/03)



CORRUGATED METAL PIPE DROP STRUCTURE

Landuser Tom & Billie Higginbottom
 Location Noble County - Skinner Lake
 County SWCD, INDIANA
 Section T R

Designed _____ Date 3/04
 Drawn _____
 Checked _____
 Approved _____
 Title _____

Sheet _____ of _____

East Grassed Waterway - North of open Ditch

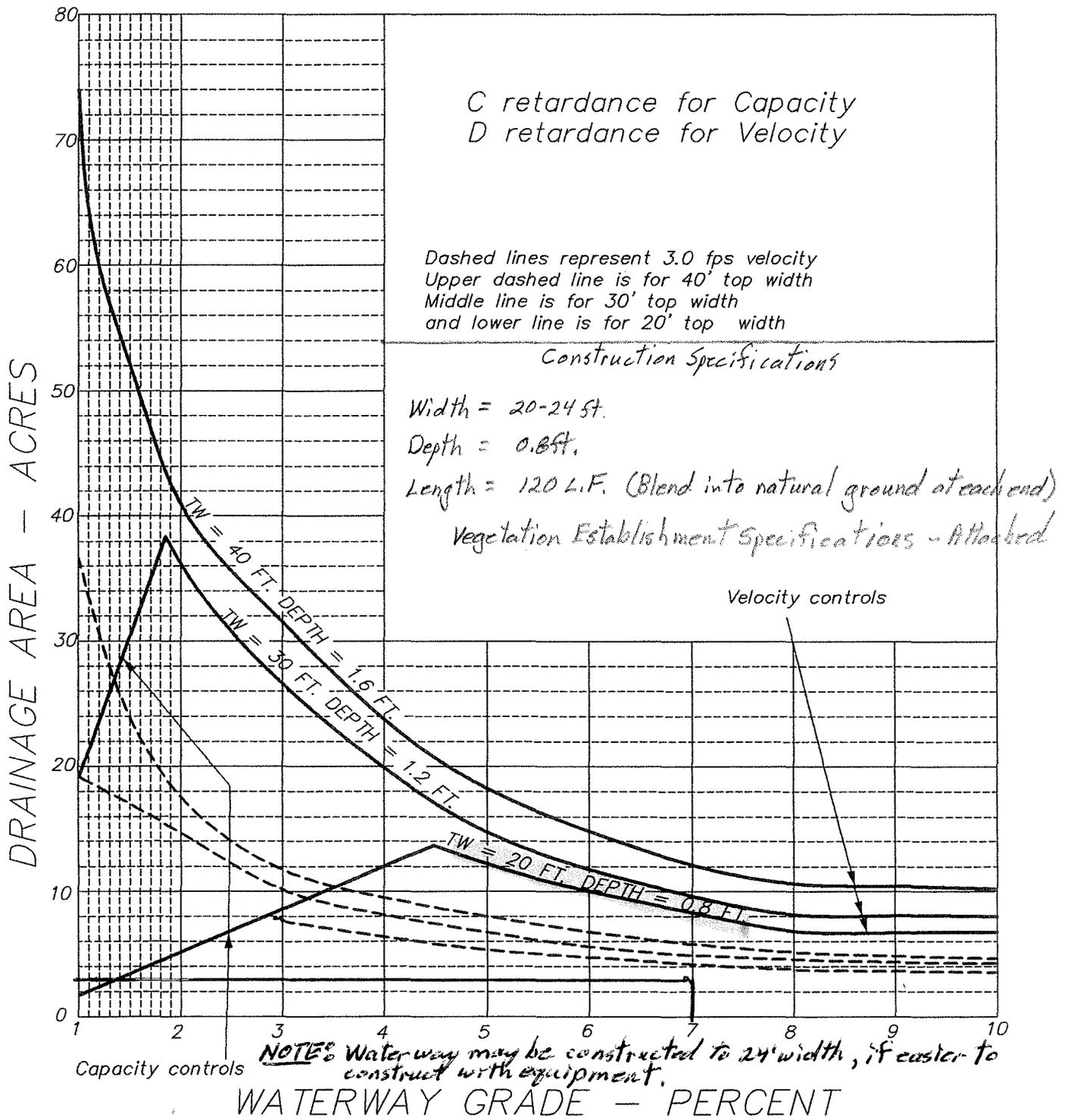


Figure 1. Alternative Waterway Design

(EFH Notice IN-64 - 02/03)

Tom & Billie Higginbotham
 Skinner Lake Watershed
 Noble County, Indiana



Grossed Water w/
(South of Open Ditch)
Tom's B. Mc Higginsbottoms
Skinner Lake Watershed
Hills County, Indiana

DA = 5.0 Acres

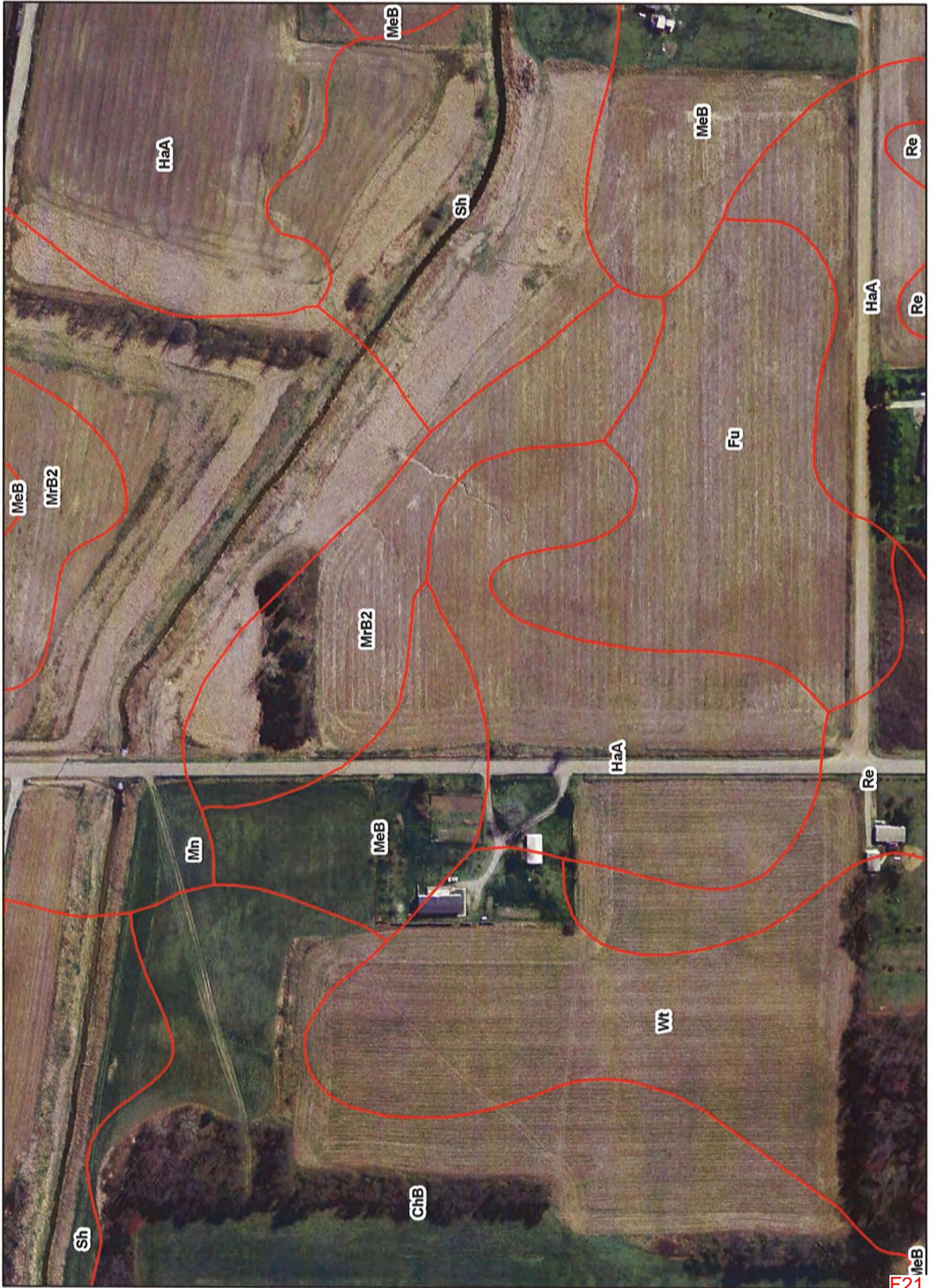


F19

Site 3



5 A - Drainage Area 40,000 sq ft / sq in
400 sq ft / unit



200 100 0 200 400 Feet

Aa Soils

Site 3

F21

Grassed Waterway - South of Open Ditch

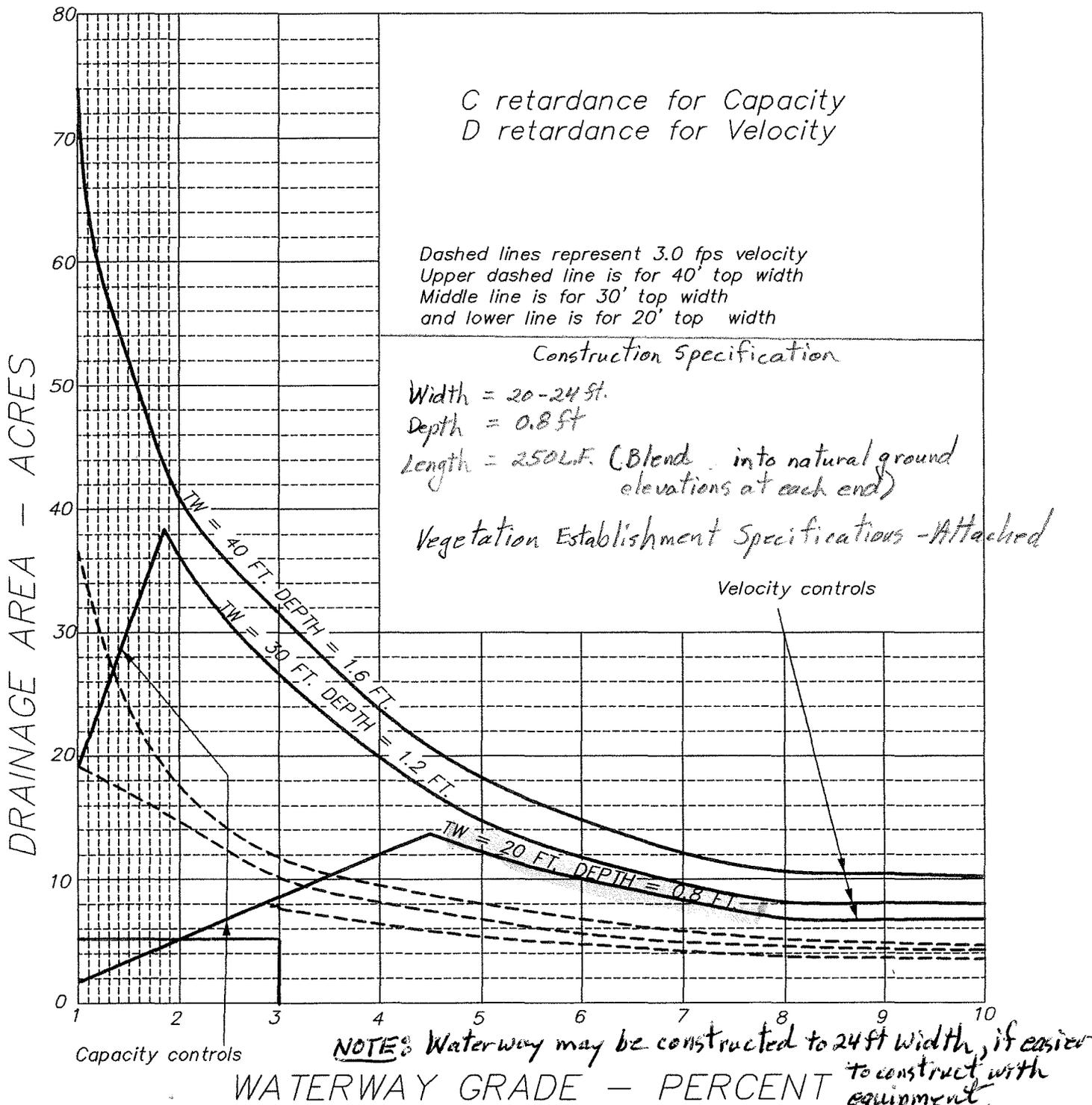


Figure 1. Alternative Waterway Design

(EFH Notice IN-64 - 02/03)

Tom & Billie Higginbottom
Skinner Lake Watershed
Noble County, Indiana

Establishing Waterway Vegetation

Seeding Dates

- Seed the waterway immediately after construction when construction occurs between March 1st to May 10th or August 1st to September 30th.
- No seeding will be done from September 30th to February 28th.

Site preparation after Waterway Construction

- Shape to final design grade, including installation of all measures to provide surface and subsurface drainage (such as tile lines) and needed erosion control practices (such as outlet to structures).
- Work the seedbed to a depth of 2-3 inches with a disc or field cultivator to create a seedbed and incorporate lime and fertilizer.
- Remove large debris, such as rocks and roots, before and after disking or field cultivating.
- After working the seedbed, pack it prior to seeding to firm the seedbed. Seed with a drill, packer-seeder or broadcast the seed. Pack again after seeding if the seed is broadcast. Use caution in broadcasting different size seed in the same pass. Mixing seed with fertilizer and broadcasting is not recommended. The prepared seedbed must be loose enough to permit good soil to seed soil contact yet firm enough to prevent burying seeds too deep. Maximum seeding depth is 1/4th to 1/2 inch deep.
- All drill and packer operations will be perpendicular to the flow of the waterway or done in a “figure 8” pattern to reduce rill erosion in the waterway channel.
- Consider delaying seeding or seed with temporary seed when soil conditions are extremely dry.

Lime and Fertilizer

- Apply lime and fertilizer based on recent soil test of the field where the waterway is located, otherwise:
- Apply 500 lbs. / acre of 12-12-12 or equivalent.
- Apply lime as needed to adjust soil pH to at least 6.0. (2 ton/acre without soil test)

Erosion Control Blanket

- Erosion control blanket is required. The erosion control blanket shall be straw and equivalent to North American Green 150.
- The erosion control blanket shall cover the waterway width to at least half of the design depth.
- The erosion control blanket shall be installed according to the manufacturer's specifications.

Permanent Seeding Mixture

- 35 lbs. of Tall Fescue per acre PLS
- 8 lbs. of Perennial Ryegrass per acre PLS

APPENDIX G

PIPE DROP STRUCTURE DESIGN - SITE 115 A

**RIMMEL DITCH DESIGN/BUILD REPORT
NOBLE COUNTY, INDIANA**

Tom & Billie Higginbottom
Skinner Lake Watershed
Noble County, Indiana

Grade Stabilization Structure - South (Pipe Drop Structure)

- Situation:
1. Large watershed - 518 Ac. - 10 yr - 24 HR storm = 328 cfs
 2. Runoff restricted by 24" CMP road culvert at county road. Capacity w/ 3ft Head = 26 cfs.
 3. Inlet to 24" tile on south side of road - Relieve outlet (18") on north side of road when flow capacity is overloaded. Approximately 13 cfs at peak relieve
 4. Average watershed slope of 1.2%
 5. County road overtops at least once per year,
 6. Existing 21" Flared inlet structure at ditch with approximate capacity of 25 cfs prior to gully.
* 6ft Head - Emergency at pre-gully elevation of 100.5
 7. Site observation indicates prior to new gully, which was largely started by tile damage, the existing ^{gully} was functioning but not adequate. The gullied area has not enlarged significantly since early February, even with the county road overtopping several times (Tom Higginbottom) this spring and early summer.

- Assumptions:
1. Noble County Highway Dept will not replace 24" road culvert with more than a 36" in the future.

Recommendations: Based on site observations and the fact the land slope of 1.2% is very close to the acceptable design based on "B" drainage curve (1.0%) or 65 cfs. It is recommended the "B" curve be used as a minimum capacity for the structures principle spillway and the 10 yr - 24 HR storm be used for the emergency design.

The principle spillway shall be designed to allow for replacing the county road culvert to a 36" Dia.

Existing 21" Flared inlet structure to be utilized as part of the capacity.

Recommendations Con't:

Minimum design will be:
(Principle spillway)

36" CMP Roadculvert w/3' head
18" Relief for 24" Tile
(Some assumption)

65cfs

13cfs

Total

78cfs

The minimum peak discharge design of 78cfs exceeds the "B" drainage curve of 65cfs.

Structure Design Calculations

- Existing 21" Flared Inlet Structure Capacity:

$$\text{Head} = \text{Emergency Elev. } 101.0 - 94.0 (\text{Invert Outlet}) + 0.9' (\frac{1}{2} \text{ Dia. of } 21'')$$

$$= 6.1 \text{ ft} \quad 50 \text{ ft length} = 22.4 \text{ cfs} \times 1.09 (\text{Pipe length adjustment})$$

$$= 24.4 \text{ cfs capacity}$$

- Required Capacity of new structure:

$$\begin{array}{r} 78 \text{ cfs} - \text{Minimum design} \\ - 24 \text{ cfs} - \text{Existing } 21'' \\ \hline 51 \text{ cfs} - \text{Needed} \end{array}$$

$$1. \text{ Available Head } \circ \quad \frac{101.0 (\text{Emergency Elev.}) - 94.0 (\text{Invert Outlet}) - 1.25' =}{\text{outlet central} \quad \text{or} \quad 6.75'}$$

$$101.0 - 94.5 (\text{Test water}) = 6.50 \text{ ft Use}$$

$$2. \text{ CFS Provided } \circ \quad \text{Assumed } 30'' \text{ Barrel} \times 55 \text{ ft} \\ 42'' \text{ Riser} \\ "n" = 0.025$$

$$* 48 \text{ cfs} \times 1.065 (\text{Length adjustment}) = 51 \text{ cfs} \quad (\text{Pg 6-41})$$

$$3. \text{ Pipe Full Flow Check } \circ \quad \text{critical slope (Pg 3-82c)} = 0.022 \\ \text{Actual Pipe slope} = 0.015$$

* Pipe will flow full - Actual slope less than critical slope

$$4. \text{ Hydraulic Head at Inlet } \circ \quad \text{Weir} = 101.0 \text{ Emergency} - 99.5 = 1.5' \text{ Weir Flow}$$

$$\text{Weir Capacity} = 55.1 \text{ cfs OK} \quad 42'' \text{ Riser}$$

Structure Design Calculations Cont'd

5. Emergency Spillway

$$10\text{yr. } - 24\text{HR Storm} = 328\text{cfs}, - 75\text{cfs (Structures)} = 249\text{cfs}$$

3.9"

$$\text{Max. Velocity} = 4\text{ft/s}$$

Retardance "C"

Length 25ft

Discharge 249 cfs

$$\text{Bottom Width} = \frac{249}{2} = 125\text{ft.}$$

$$\text{Depth of Flow} = 1.1\text{ft}$$

$$\text{Freeboard} = 1.0\text{ft.}$$

Note: Future field observations may indicate a need for rip-rap to stabilize back slope to emergency.

Every effort should be made during installation to not disturb bank vegetation at emergency outlet.

Emergency may be relocated during construction based on elevations.

Worksheet 1: Runoff curve number (CN)

Client Tom & Billie Higginbottom - Skinner Lake W/S By _____ Date _____

County Noble State Indiana Checked _____ Date _____

Practice Grade Stabilization Structure

Soil name and hydrologic group (table 2-1)	Cover description (cover type, treatment, and hydrologic condition)	CN (table 2-3)	Area (acres or %)	Product of CN x area
Toledo Fulton D	Cropland - Conservation Tillage Straight Rows - Good	85	43	3655
C	Woods - Fair	79	42	3318
Whitaker Harkins C	Cropland - Conservation Tillage Straight Rows - Good	82	313	25,626
C	Woods - Fair	73	19	1387
C	Dirt Roads	87	2	174
Ransom B	Cropland - Conservation Tillage Straight Rows - Good	75	34	2550
B	Farmsteads	60	5	300
B	Roads	74	5	370
Totals =			518	42080

CN (weighted) = $\frac{42080}{518} = 81.2$;

Use CN = 81

Worksheet 2: Time of concentration and peak discharge

Client Tom & Billie Higinbotham - Skiver Lake By _____ Date _____
 County Noble State Indiana Checked _____ Date _____
 Practice Grade Stabilization Structure

Estimating time of concentration

1. Data:

Rainfall distribution type = II (I, IA, II, III)
 Drainage area A = 513 ac
 Runoff curve number CN = 81 (Worksheet 1)
 Watershed slope Y = 1.2 %
 Flow length l = 6930 ft

2. T_c using l , Y, CN and figure 2-27 = 23 hrs
 or using equation 2-5

$$T_c = \frac{l^{0.8} \left[\frac{1000}{CN} - 9 \right]^{0.7}}{1140 Y^{0.5}} = \frac{(\quad)^{0.8} (\quad)^{0.7}}{1140 (\quad)^{0.5}} = \underline{\hspace{2cm}} \text{ hrs}$$

Estimating peak discharge

	Storm #1	Storm #2	Storm #3
1. Frequency yr	10	25	
2. Rainfall, P (24-hour) in	3.9	4.5	
3. Initial abstraction, I_a in (Use CN with table 2-4)	0.469	0.469	
4. Compute I_a/P ratios	0.120	0.104	
5. Unit peak discharge q_u cfs/ac/in (Use T_c and I_a/P with exhibit 2-11)	0.91	0.32	
6. Runoff, Q in (Use P and CN with figure 2-26 or table 2-2)	2.04	2.55	
7. Peak discharge, q_p cfs (Where $q_p = q_u AQ$)	328	423	

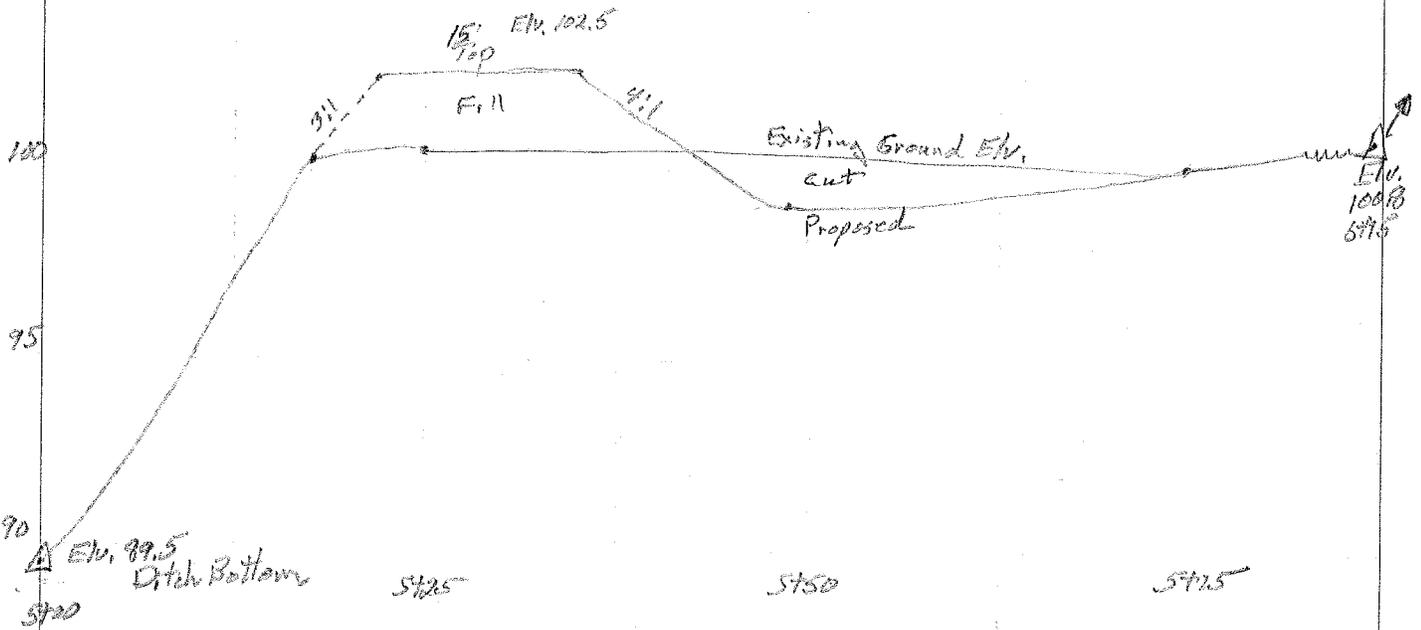
"B" Drainage Curve 65 cfs
 Use when flow type is 20% or less

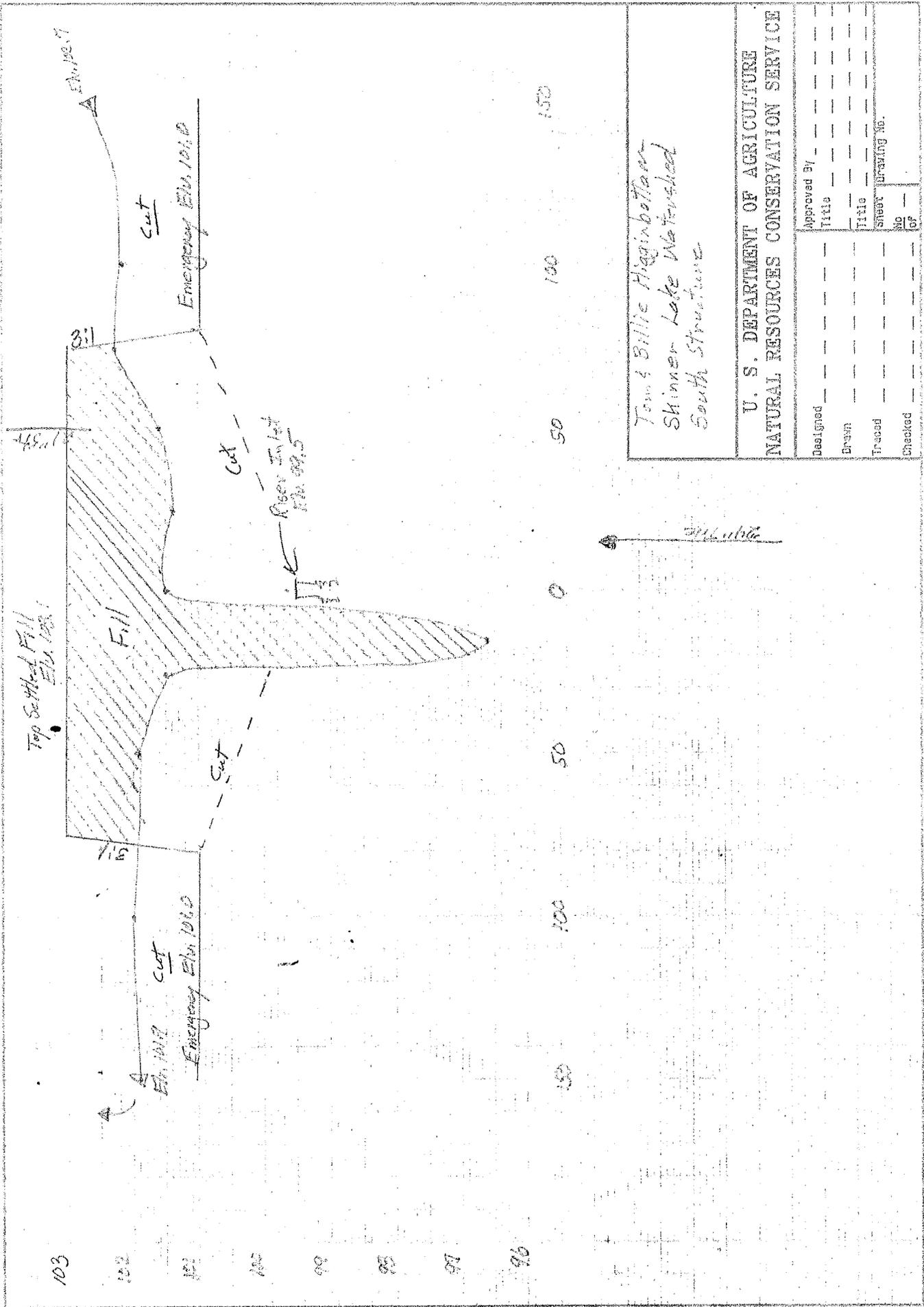
Tom & Billie Higginbottom
Skinner Lake Watershed
South Structure

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS



145
100
95
90
5700
5725
5750
5775





Tom & Billie Higginbottom
 Skinner Lake Watershed
 South Structure

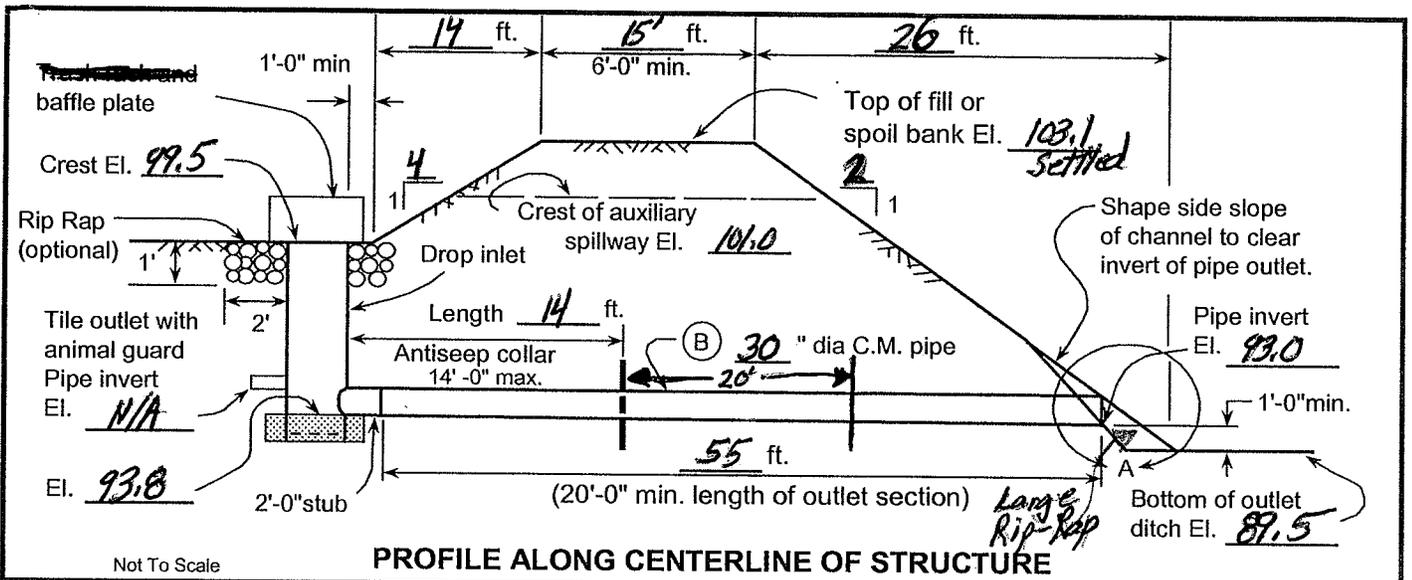
U. S. DEPARTMENT OF AGRICULTURE
 NATURAL RESOURCES CONSERVATION SERVICE

Designed	---	Approved By	---
Drawn	---	Title	---
Traced	---	Title	---
Checked	---	Sheet	---
		Drawing No.	---
		No	---
		of	---

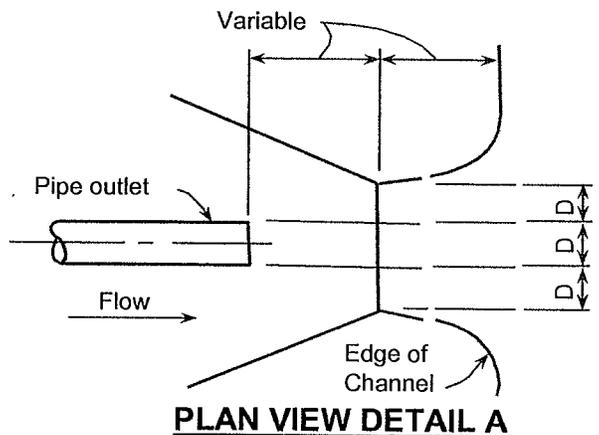
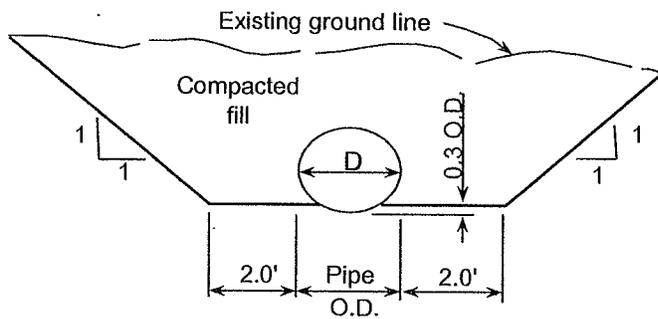
APPENDIX H

STREAMBANK STABILIZATION/GRADE CONTROL DESIGN - SITE 131

RIMMEL DITCH DESIGN/BUILD REPORT NOBLE COUNTY, INDIANA



Not To Scale



ESTIMATE OF MATERIALS		
ITEM	QUANTITY	
Excavation	_____	Cu. Yds
Earth Fill	_____	Cu. Yds
Pipe 30 inch diameter (B) C.M. metal thickness 0.06" (16 ga.)	55	Lin. Ft.
Riser 42 inch diameter (A) C.M. metal thickness 0.06" (16 ga.) C.M. (G)	7	Lin. Ft.
Tile stub _____ inch diameter	2-0	Lin. Ft.
Animal guard _____ inch diameter	1	Each
Baffle plate	1	Each
Trash Rack	_____	Each
Antiseep collar 5x5	2	Each
Concrete	1.4	Cu. Yds
Seeding and mulching	0.5	Acres
Rip Rap	3	Tons
	5	Tons

Inlet-Riser
Outlet

D₅₀ - 5"
D₂₀ - 9"

SOIL INVESTIGATION REPORT		
LOCATION OF BORINGS	DEPTH FEET	UNIFIED SOIL CLASSIFICATION

TBM#1 - Elev. 100.0
Top of first rib on 21" surface inlet pipe.

DRAWING NO. IN-ENG-27 XLS 1(2)(REV. 5/03)



CORRUGATED METAL PIPE DROP STRUCTURE

Landuser _____
 Location _____
 Section _____ T _____ R _____

Designed _____ Date 3/04
 Drawn _____
 Checked _____
 Approved _____
 Title _____

Sheet _____ of _____

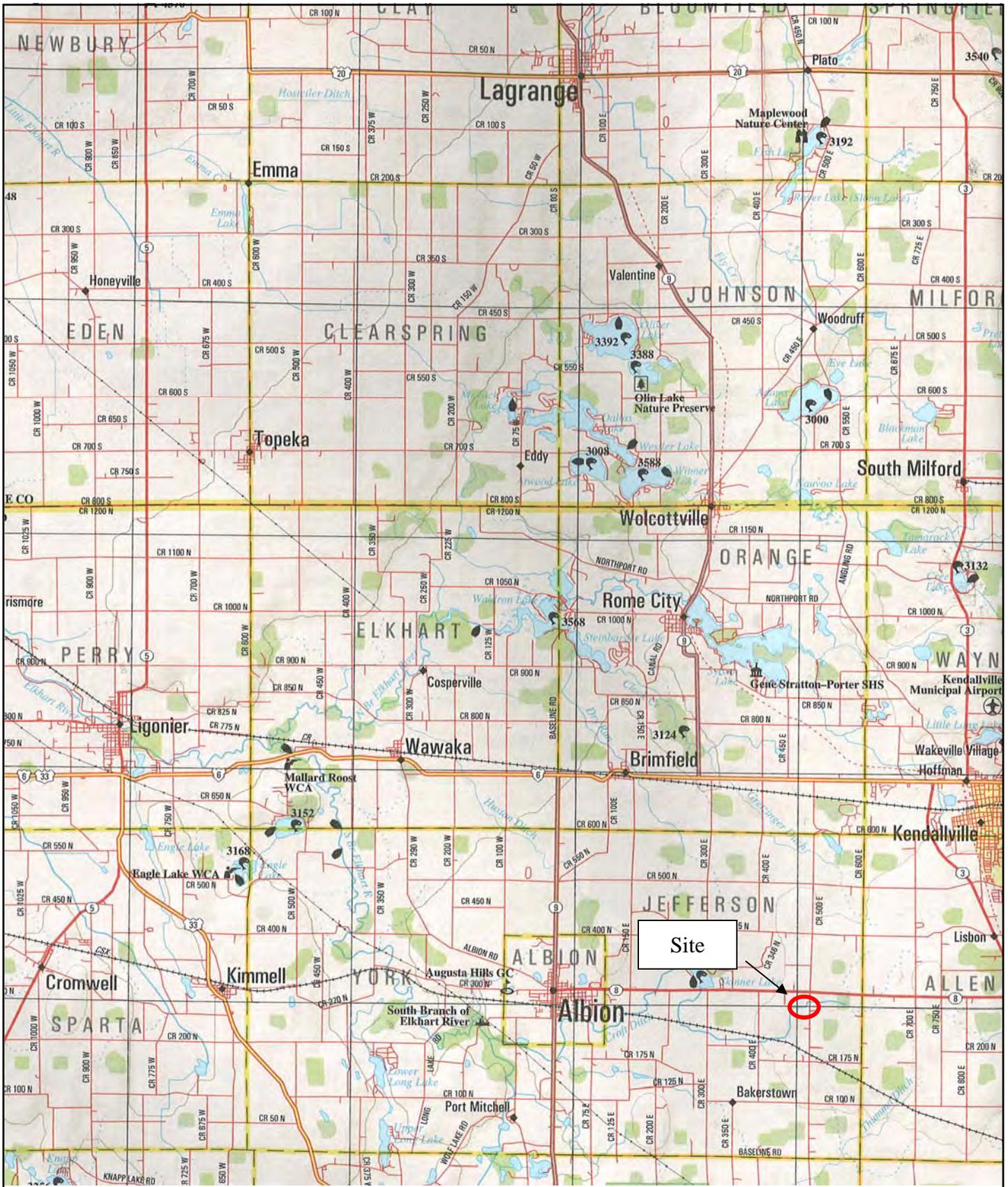


Figure 1: Location Map
Rimmell Ditch—Skinner Lake
Homeowners Association
Noble County, Indiana



Scale: 1" = 2.5 mi.

JFNew # 99-01-02



708 Roosevelt Road, Walkerton, IN 46574
 Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com



Image IndianaMap Framework Data
 © 2008 Tele Atlas
 © 2008 Europa Technologies

Figure 2: Location of Photos
 Rimmell Ditch—Skinner Lake
 Homeowners Association
 Noble County, Indiana



JFNew #
 051069.01



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 www.jfnew.com



Image 1 - October 2007
Downstream of project looking upstream at area to be protected Overview of eroding banks



Image 2 - January 2008
Looking downstream to location of grade control structure

Figure 3: Photo Page 1
Rimmell Ditch Streambank Stabilization
Skinner Lake Homeowners Association
Noble County, Indiana

JFNew #
051069.01



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www.jfnew.com



Image 3 - October 2007
Looking upstream toward culvert on 500 E

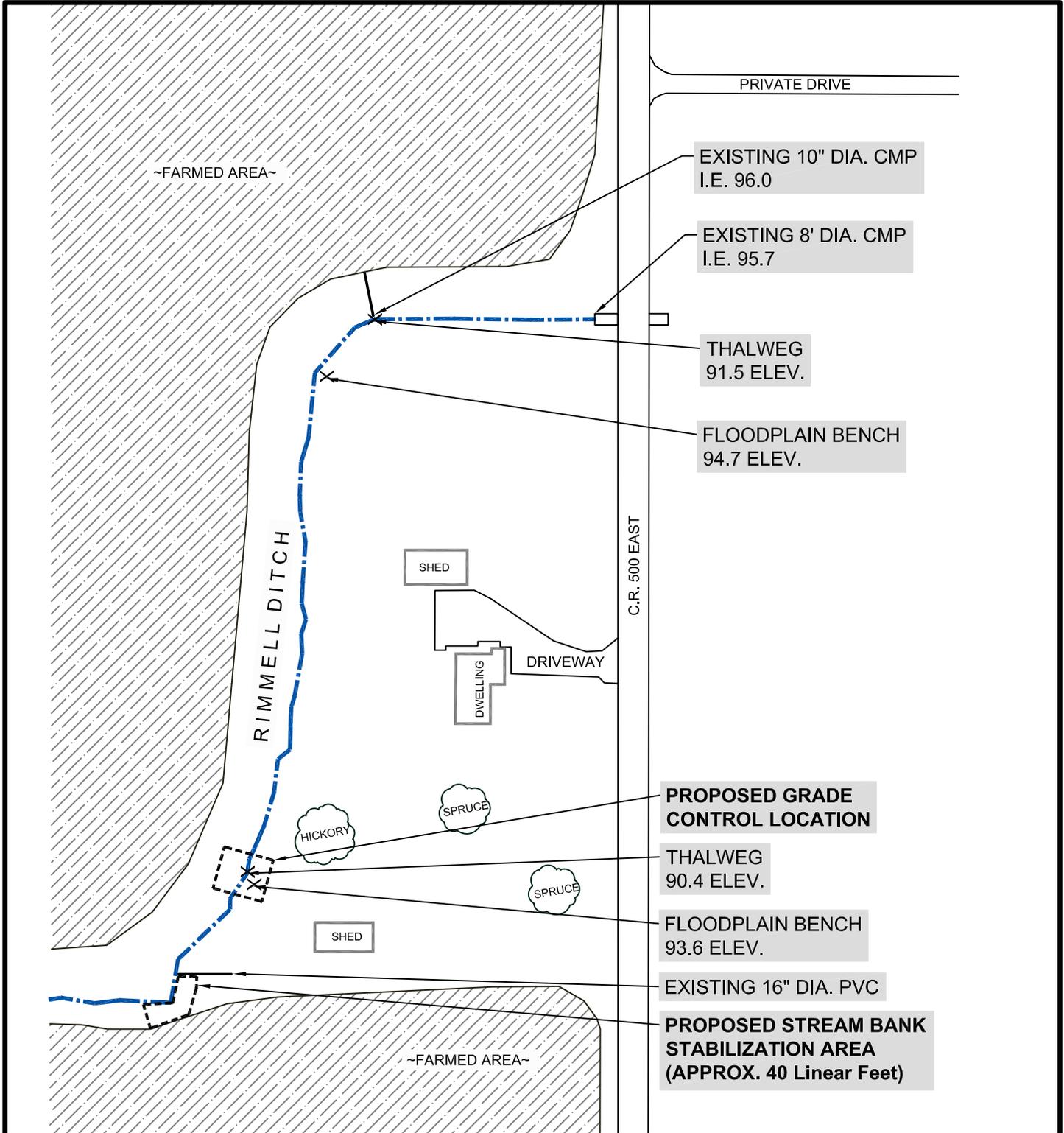
Figure 4: Photo Page 2
Rimmell Ditch Streambank Stabilization
Skinner Lake Homeowners Association
Noble County, Indiana

JFNew #
051069.01



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Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

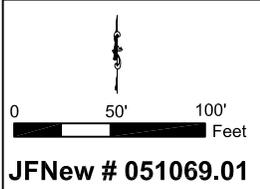
Location: S:\Water\proj\PROJECTS\051069_SkinnetLake_LARE\01_RimmellDitch_Design_Build\CAD\20080205_fig5SitePlan.dwg Plotted By:Chelaine Dittmar Plotted:February 5, 2008 4:39:46 PM



NOTES:

- 1.) Elevational data collected by JFNew on January 24, 2008.
- 2.) Elevations are relative.

Figure 5: Site Plan
Rimmell Ditch
Skinner Lake Homeowners Association
Noble County, Indiana



JFNew
 708 Roosevelt Road, Walkerton, IN 46574
 Phone 574-586-3400 / Fax 574-586-3446
 www.jfnew.com

COD

Location: S:\Hickory\PROJECTS\051069_SkinnetLake_LARE\01_Rimmel Ditch Design_Build\CAD\20080205_fig6.dwg Plotted By:Chelaine Dittmar Plotted:February 5, 2008 - 4:39:25 PM

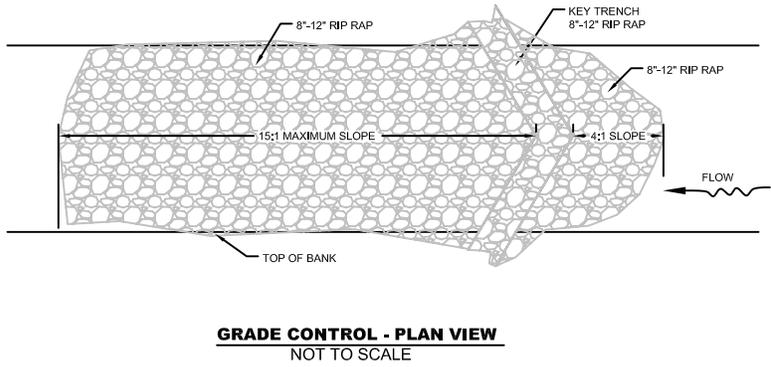
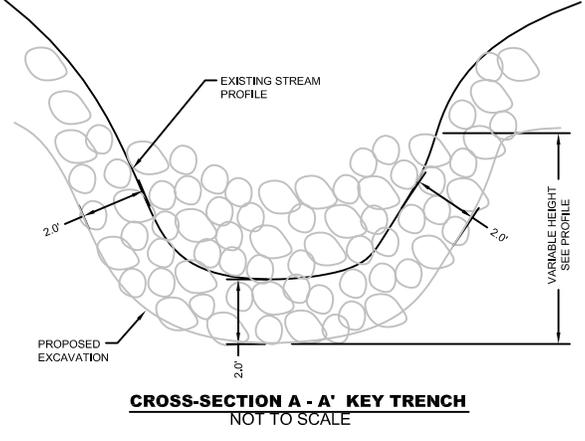
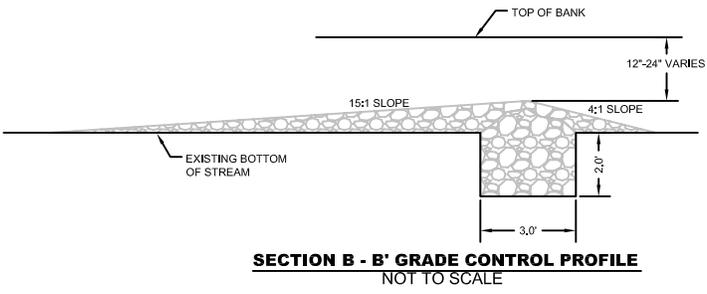
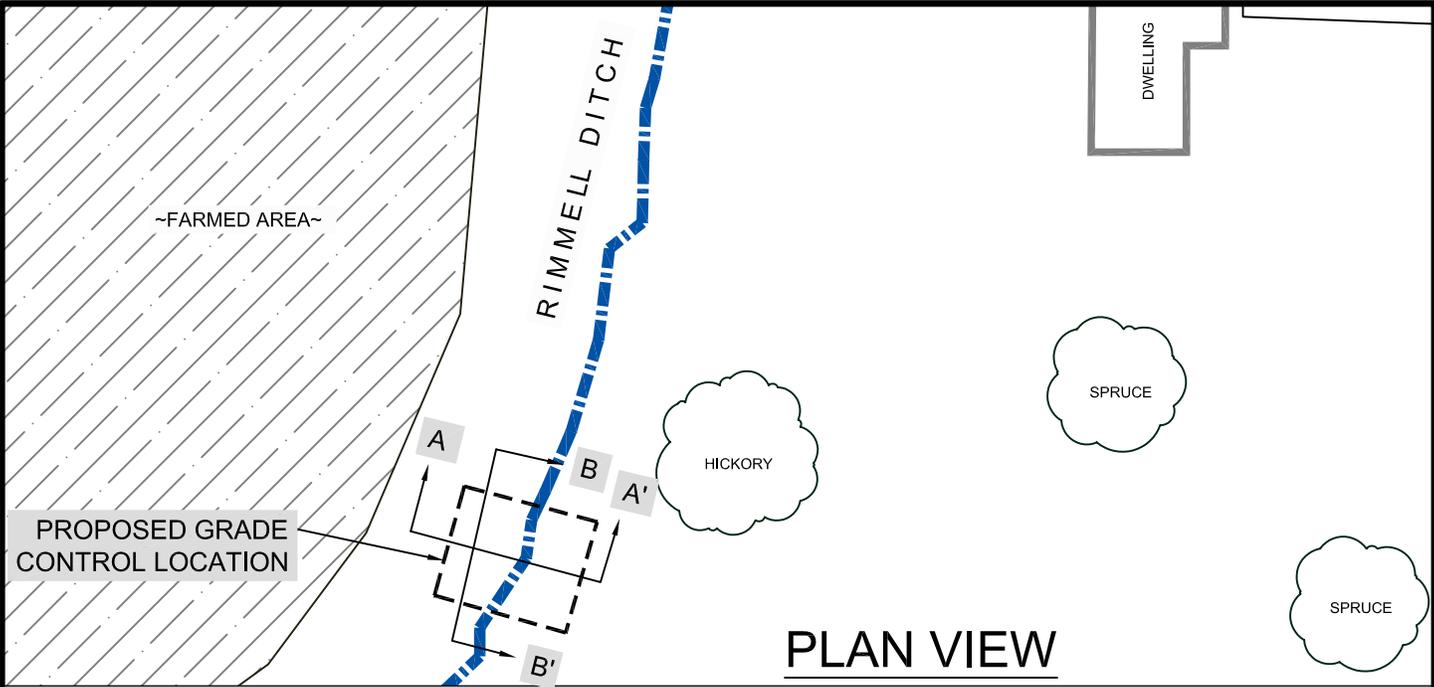


Figure 6: Grade Control Detail
Rimmell Ditch
Skinner Lake Homeowners Association
Noble County, Indiana

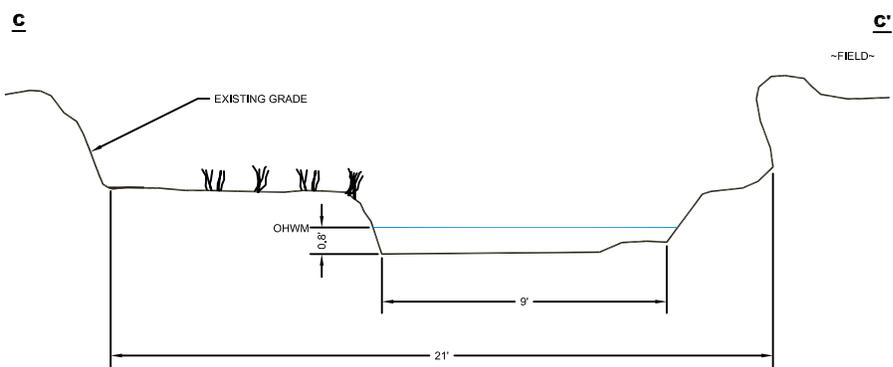
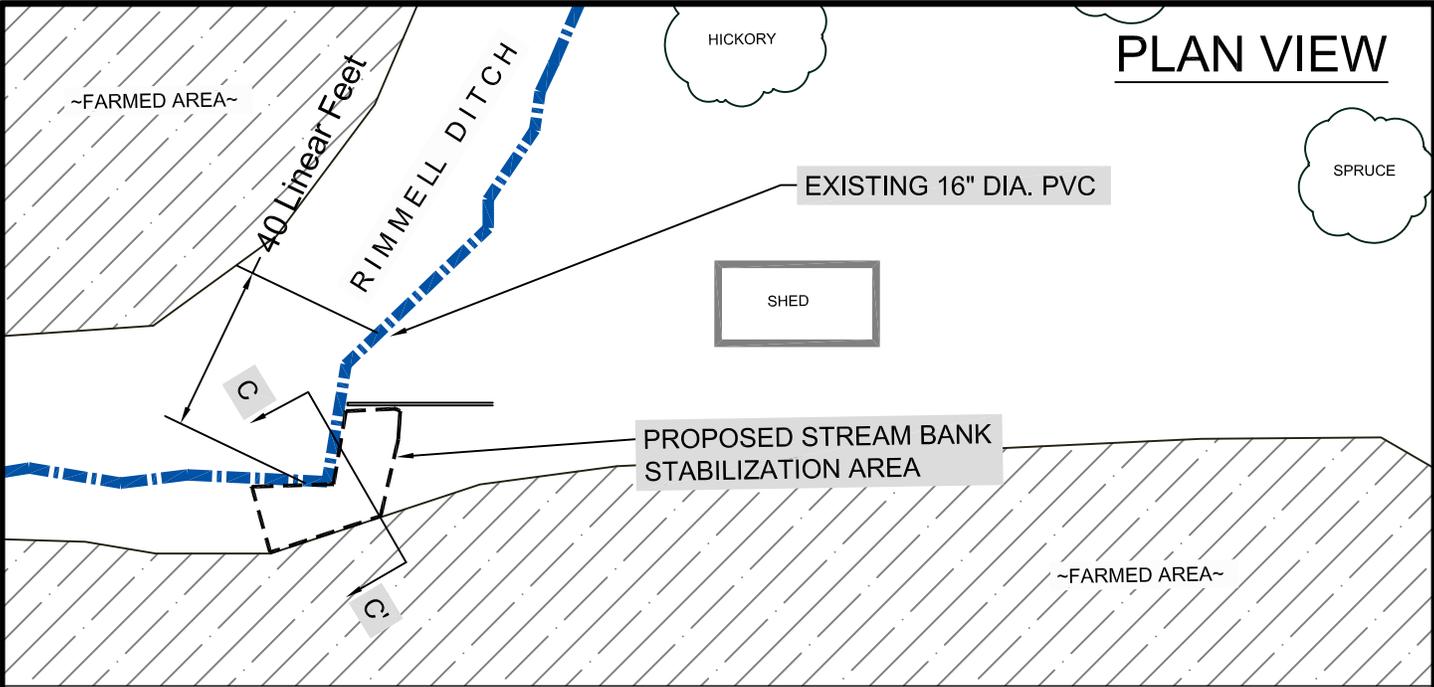
0 25' 50' Feet

JFNew # 051069.01

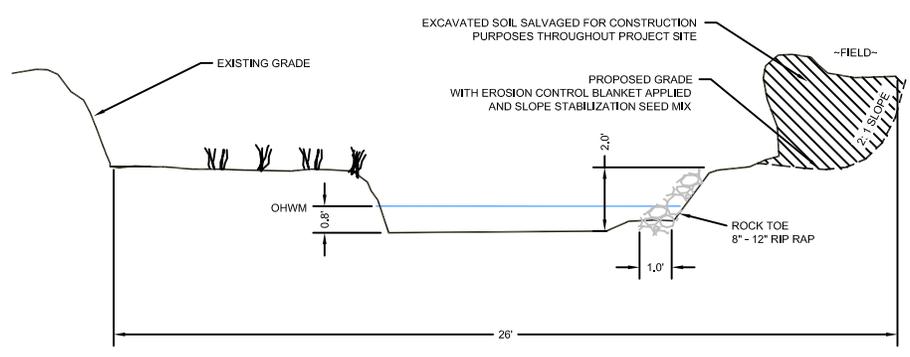
JFNew

708 Roosevelt Road, Walkerton, IN 46574
 Phone 574-586-3400 / Fax 574-586-3446
 www.jfnew.com

COD



SECTION C - C' EXISTING CONDITIONS
NOT TO SCALE



SECTION C - C' PROPOSED GRADE / STABILIZATION
NOT TO SCALE

Location: S:\Hickory\PROJECTS\051069_Skinnet Lake_LARE\01_Rimmell Ditch Design_Build\CAD\20080205_051069.dwg Plotted By: Chelaine Dittmar Plotted February 5, 2008 - 4:38:50 PM

Figure 7: Slope Stabilization
Rimmell Ditch
Skinner Lake Homeowners Association
Noble County, Indiana

JFNew # 051069.01

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

APPENDIX I

SEED MIXES

**RIMMEL DITCH DESIGN/BUILD REPORT
NOBLE COUNTY, INDIANA**

SLOPE STABILIZATION SEED MIX

JFNEW OFFERS FULL INSTALLATION SERVICES! VISIT JFNEW.COM OR CONTACT YOUR LOCAL JFNEW OFFICE FOR MORE INFORMATION.

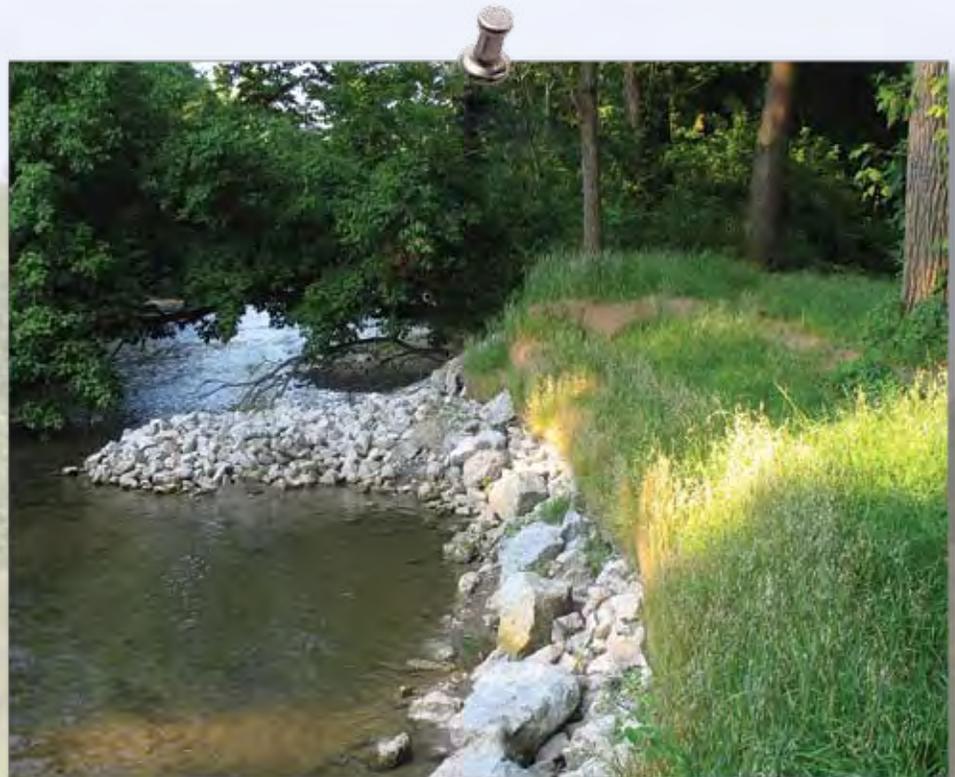
This grass mix is best suited for sites with slopes where erosion control is needed. Applications include embankments, dams and levees. This seed mix will include at least 5 of 7 native permanent grass species. To install this seed mix, see the "Installation Instructions for Seed Mixes" section.



Botanical Name	Common Name	Oz./Acre
Permanent Grasses		
<i>Andropogon gerardii</i>	Big Bluestem	48.00
<i>Bouteloua curtipendula</i>	Side-Oats Grama	32.00
<i>Carex sparganoides v. cephaloidea</i>	Rough-Clustered Sedge	4.00
<i>Elymus canadensis</i>	Canada Wild Rye	32.00
<i>Panicum virgatum</i>	Switch Grass	8.00
<i>Schizachyrium scoparium</i>	Little Bluestem	32.00
<i>Sorghastrum nutans</i>	Indian Grass	32.00
	Total	188.00
Temporary Cover		
<i>Avena sativa</i>	Common Oat	512.00
<i>Lolium multiflorum</i>	Annual Rye	222.00
	Total	734.00

Mix Statistics				
Native Component	PLS lbs./Acre	PLS Seeds/Acre	PLS Seeds/Sq. Ft.	% of Native Mix
Forbs				0.00%
Grasses	11.75	2230272	51.2	100%
Total Natives	11.75	2230272	51.2	100%
Non-Native Forbs				
Cover	45.88	7634761.2	175.27	
Totals	57.63	9865033.2	226.47	

Sold In 1/4 Acre Increments		
1 or More Acres	1/2 Acre	1/4 Acre
\$275.00	\$165.00	\$88.00



ALL PURPOSE GRASS SEED MIXTURE

LOT # SSL-7-ALLP1

PURE SEED	KIND	GERM	ORIGIN
34.15 %	FAWN TALL FESCUE	90 %	OR
24.21 %	CREEPING RED FESCUE*	85 %	CAN
20.09 %	ANNUAL RYEGRASS*	90 %	OR
14.74 %	LINN PERENNIAL RYEGRASS	90 %	OR
4.82 %	KENTUCKY BLUEGRASS*	80 %	WA
0.17 %	OTHER CROP		
1.79 %	INERT MATTER		
0.03 %	WEED SEED		

TEST DATE 3/07
NET WT. 50 LBS
AMS 722

NOXIOUS WEED : NONE FOUND

* VARIETY NOT STATED

HOHAM, SMITH & CO., INC.

104 WALNUT STREET
AUBURN, IN 46706

APPENDIX J

RIMMELL OPEN/ MELVIN SYSTEM DESIGN

**RIMMELL DITCH DESIGN/BUILD REPORT
NOBLE COUNTY, INDIANA**

GILBERT DRAINAGE & EXC.
 9492 N. 275 W.
 LIGONIER, IN 46767

427716

CUSTOMER'S ORDER NO.

DEPARTMENT

DATE 4-9-08

NAME

ADDRESS

CITY, STATE, ZIP

Noble Co Surveyor
 Melvin system Annell open

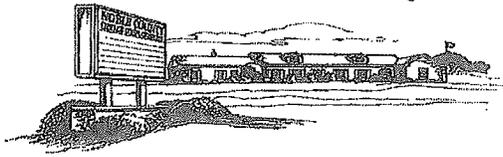
QTY	DESCRIPTION	PRICE	AMOUNT
1	Remove Bridge		
2	Replace with Culvert		
3			
4	12hr Excavator	130	1560.00
5			
6	5hr Std loader	70	350.00
7			
8	Mod. location		100.00
9			
10			
11	Limestone 4778 ton 1.0 day		
12	95.65 hrs 453		\$2012.42
13			
14	8hr	30	240.00
15			
16			
17	APR 2008		
18			
19			
20			
Total			\$4582.42

5805

KEEP THIS SLIP FOR REFERENCE

HIGHWAY RESTAURANT
 BRIDGE
 TOTAL
 \$16,038.23
 REPAIRMENT COST

Noble County Surveyor's Office



2090 N. State Road 9 – Suite B
Albion IN 46701

PHONE: 260-636-2131
FAX: 260-636-3512
CASE 904

MINOR CONTRACTOR REPAIR FORM

LANDOWNER: TOM HIGGINBOTHAM PHONE: _____
 NAME OF DRAIN: RIMMELL OPEN SYSTEM: MELVIN
 TOWNSHIP NAME: JEFFERSON SECTION 22 QUAD: 300
 PROJECT DESCRIPTION: REPLACE EXISTING BRIDGE WITH A CULVERT
 CONTRACTOR: GILBERT CONTACTED DATE: 2/29/08

TYPE OF EQUIPMENT USED ON REPAIR

1. EXCAVATOR	\$ <u>130</u>	PER HOUR + USED#: <u>12</u>	HOURS = \$ <u>1560</u>
2. BACKHOE	\$ _____	PER HOUR + USED#: _____	HOURS = \$ _____
3. BULLDOZER, SKID LOADER	\$ <u>70</u>	PER HOUR + USED#: <u>5</u>	HOURS = \$ <u>350</u>
4. DRAGLINE	\$ _____	PER HOUR + USED#: _____	HOURS = \$ _____
5. DUMP TRUCK	\$ _____	PER HOUR + USED#: _____	HOURS = \$ _____
6. LABORER	\$ <u>30</u>	PER HOUR + USED#: <u>5</u>	HOURS = \$ <u>240</u>
7. SUPPLIES PICKUP	\$ _____	PER HOUR + USED#: _____	HOURS = \$ _____
8. MOBILIZATION FEE (MOVE-IN)	\$ <u>200</u>		\$ <u>200</u>
9. BARGE	\$ _____	PER HOUR + USED # _____	HOURS = \$ _____

MATERIAL USED

TILE SIZE: _____ TYPE: _____ AMOUNT REPLACED: \$ _____
 MISC MATERIALS: limestone 47.78 ton Rip/Rap 95.65 ton \$ 2,012.42
 TOTAL REPAIR COST: FF53 ~~\$4,122.42~~
 COMMENTS: \$4,362.42

PLEASE RETURN THIS COMPLETED FORM WITH YOUR BILL-THANK YOU

INVESTIGATOR

APR 04 2008

FILED

Doc's Do-it-Best Hardware
122 N. Orange Street
Albion, IN 46701
260-636-2790

Doc's Do-it-Best Hardware
122 N. Orange Street
Albion, IN 46701
260-636-2790

Transaction#: A75711

Associate: Duber

Date: 03/20/2008

Time: 03:30:46 PM

Due Date: 04/28/2008

*** SALE ***

Bill To:
Customer # 255
Noble County Drainage Board
2090 N. State Rd. 9 Suite B
Albion, IN 46701

Payment Open
Payment
(H. B. Swartz)

Transaction#: A75705

Associate: Bruce

Date: 03/20/2008

Time: 02:56:57 PM

Due Date: 04/28/2008

*** SALE ***

Bill To:
Customer # 255
Noble County Drainage Board
2090 N. State Rd. 9 Suite B
Albion, IN 46701

Payment Open
Payment
(H. B. Swartz)

TAPE PLAS 3/4X60 - 506705

2.00 EACH @ \$0.79 N

MISC. MDSE. -

1.00 EACH @ \$0.99 N

\$1.58

\$0.99

FILED

PAID
MAR 25 2008
T.M. EXEMPT

TOTAL: \$2.57

MAR 25 2008

INVOICE: \$2.57
CHANGE: \$0.00

Scott
NOBLE COUNTY SUPERVISOR

(X) Scott

PLIER, 8" LINEMAN - 303874

1.00 EACH @ \$12.49 N

STRIPPER, WIRE - 317837

1.00 EACH @ \$10.49 N

\$12.49

\$10.49

Subtotal: \$22.98

TAX EXEMPT

TOTAL: \$22.98

INVOICE: \$22.98

CHANGE: \$0.00

FILED
MAR 25 2008

Scott
NOBLE COUNTY SUPERVISOR

(X) Scott

Thank You!
www.docsdobest.com
"Give us a call. We have it all!"

Thank You!
www.docsdobest.com
"Give us a call. We have it all!"



FORKER EXCAVATING, INC.

5677 North State Road 9
 P.O. Box 96
 Albion, IN 46701

Voice: 260-636-2334
 Fax: 260-636-2334

INVOICE

Invoice Number: 3920
 Invoice Date: 3/25/08
 Customer ID: NO.CO.SURVEYOR

Bill To:
Noble County Surveyor 2090 N. State Road 9 Suite B Albion, IN 46701

Customer PO	Payment Terms	Contractor	Due Date
	Net 15 Days	ALAN	4/9/08
Description			Amount
*	RE: Rimmell Open / Melvin System Higginbotham Driveway		
*	March 20, 2008 Hauled 1 load of pea gravel from Hixson's to job site. trucking only		95.00
*	3 semi loads of bank run gravel delivered		450.00
*	3 single axle loads of bank run gravel delivered		150.00

*RIMMELL OPEN /
 MELVIN SYSTEM
 (HIGGINBOTHAM
 PROPERTY)*

FILED
 MAR 27 2008

 NOBLE COUNTY SURVEYOR

FILED
 MAR 28 2008

 NOBLE COUNTY DRAINAGE BOARD

Thank You! We appreciate your business.

Total Invoice	695.00
Payment Applied	
TOTAL	695.00

HIKSON SAND & GRAVEL, INC.
Crushed Limestone & Culvert Pipe

Drain & Sewer Tile
6178CR7, GARRETT, IN 46738
Garrett Pk (260) 357-4477
Kimmell Pk (260) 635-2280
Fax (260) 357-0447

SOLD TO Wells & Drainage DATE 3-20-08
ADDRESS _____

DELIVERED BY Wells & Drainage

WEIGHED BY Wells & Drainage CASH _____ C.O.D. _____ CHARGE _____
MATERIAL Gravel

	TON	PRICE PER TON	
GROSS	865.00	26.0	
TARE	345.00		
NET	520.00		
			SUB. TOTAL
			SALES TAX
			TOTAL

REC'D BY [Signature]
191335

HIKSON SAND & GRAVEL, INC.
Crushed Limestone & Culvert Pipe

Drain & Sewer Tile
6178CR7, GARRETT, IN 46738
Garrett Pk (260) 357-4477
Kimmell Pk (260) 635-2280
Fax (260) 357-0447

SOLD TO Wells & Drainage DATE 3-18-08
ADDRESS 3367E 6000W

DELIVERED BY Wells & Drainage

WEIGHED BY Wells & Drainage CASH _____ C.O.D. _____ CHARGE _____
MATERIAL Gravel

	TON	PRICE PER TON	
GROSS	687.00	61.95	
TARE	270.00		
NET	417.00		
			SUB. TOTAL
			SALES TAX
			TOTAL

REC'D BY [Signature]
191283

HIXSON SAND & GRAVEL, INC.

Crushed Limestone & Culvert Pipe
 Drain & Sewer Tile
 6178 CR 7 GARRETT, IN 46738
 GARRETT PK (260) 357-4477
 Kimmel Pk (260) 635-2280

CUSTOMER'S ORDER NO.		PHONE		DATE			
NAME		MOBILE & DEWATER		3/10/08			
ADDRESS		RIMMERS OPEN / MEDIUM SYSTEM (Hixson bottom 100')					
SOLD BY	CASH	C.O.D.	CHARGE	ON ACCT.	INDE. RET. D.	PAID OUT	
24							NT
DESCRIPTION							PER OF AMOUNT
410' 141" x 91" CAMP 1054 25328							10/31/20
FILED							
APR 07 2008							
MOBILE COUNTY DRAINAGE BOARD							
RECEIVED BY							TOTAL
TAX							

68951
 All claims and returned goods must be accompanied by this bill.
 Thank You

754176

STATEMENT

TO

DATE 9-10-07

TERMS

ADDRESS

Noble Co. Surveyor
Rimmer Open
Melvin System

IN ACCOUNT WITH

GREG OWENS
4008 C.R. 750 E.
KENDALVILLE, IN 46755

Remain 300' Open
Bottom Dip Remains
Per Contract 43,405.50

FILLED

SEP 10 2007

[Signature]
NOBLE CO. SURVEYOR

3,075

Rimmer Open
TOTAL 118.30
\$82.1

754179

STATEMENT

DATE 10-10-07

TERMS

TO

NORKE Co. Surveyor

12 months 11 Open

IN ACCOUNT WITH

MELVIN SYSTEMS

GREG OWENS

4008 C.R. 750 E.

KENDALLVILLE, IN 46755

Balance DE CONTRACT

26,219.50

FILED

OCT 10 2007

NOBLE CO. SURVEYOR

754183

STATEMENT

DATE 11-8-07

TERMS

TO

NOBLE CO. SUPERVISOR

ADDRESS Kimmel Drive

IN ACCOUNT WITH MELVIN SYSTEM

GREG OWENS

4008 C.R. 750-B

KENDALVILLE, IN 46755

Remove Sumps - Fill in Old Ditch

95 Excavator Labor 105 997 50

14 Driller Labor 70 988 00

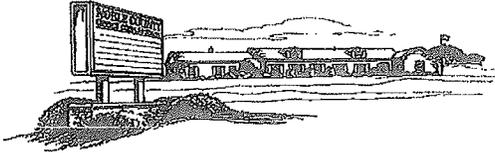
8 Gasoline Baskets / Fuel / Equipment 2800 00

FILED

NOV 09 2007

NOBLE CO. SUPERVISOR

Noble County Surveyor's Office



2090 N. State Road 9 -- Suite B
Albion IN 46701

PHONE: 260-636-2131
FAX: 260-636-3512

MINOR CONTRACTOR REPAIR FORM

LANDOWNER: LOGAN PHONE: _____
 NAME OF DRAIN: RIMMELL OPEN SYSTEM: MELVIN
 TOWNSHIP NAME: JEFFERSON SECTION 24 QUAD: 100
 PROJECT DESCRIPTION: INSTALL GABION BASKETS AND FILL OLD CHANNEL
 CONTRACTOR GREG OWENS CONTACTED DATE: 11/08/2007

TYPE OF EQUIPMENT USED ON REPAIR

1. EXCAVATOR	\$ <u>105.⁰⁰</u>	PER HOUR + USED#: <u>9.5</u>	HOURS = \$ <u>997.⁵⁰</u>
2. BACKHOE	\$ _____	PER HOUR + USED#: _____	HOURS = \$ _____
3. BULLDOZER, SKID LOADER	\$ <u>70.⁰⁰</u>	PER HOUR + USED#: <u>14</u>	HOURS = \$ <u>980.⁰⁰</u>
4. DRAGLINE	\$ _____	PER HOUR + USED#: _____	HOURS = \$ _____
5. DUMP TRUCK	\$ _____	PER HOUR + USED#: _____	HOURS = \$ _____
6. LABORER	\$ _____	PER HOUR + USED#: _____	HOURS = \$ _____
7. SUPPLIES PICKUP	\$ _____	PER HOUR + USED#: _____	HOURS = \$ _____
8. MOBILIZATION FEE (MOVE-IN)	\$ _____		\$ _____
9. BARGE	\$ _____	PER HOUR + USED # _____	HOURS = \$ _____

MATERIAL USED

TILE SIZE: _____ TYPE: _____ AMOUNT REPLACED: \$ _____
 MISC MATERIALS: 8 GABION BASKETS \$ 2,800.⁰⁰
 TOTAL REPAIR COST: \$ 4,777.⁵⁰
 COMMENTS: _____

PLEASE RETURN THIS COMPLETED FORM WITH YOUR BILL-THANK YOU

G.P.Z.

SPECIFICATIONS FOR THE RIMMELL OPEN DRAIN \ MELVIN SYSTEM OPEN PROJECT

INSTRUCTIONS TO QUOTERS

◆ DESCRIPTION OF PROJECT

The project shall include any work necessary to complete the project as described herein, in the pre-quote meeting or the site visit. The project shall be known as the “Rimmell Open / Melvin System.

This project will include bottom dipping, channel re-alignment, bank re-sloping, bank stabilization, spoils leveling and seeding on approximately 5,600 feet of the Rimmell Open / Melvin System. This project will begin at County road 500 East and continue upstream to County Road 600 East.

Bottom Dipping. The contractor shall bottom dip the entire length of this project. On average, approximately eighteen inches of sediment will be removed from the entire length of this project. The banks on the majority of this project are steep (in the range of a 1:1 slope) extreme care should be taken to avoid any under cutting of the banks that would result in the bank sliding into the ditch bottom. An average bottom width of between four and six feet will be maintained throughout the project. On average, approximately twelve inches of sediment will be removed from the channel bottom on this project.

Bank Re-Sloping. The contractor will be required to re-slope a total of 2,800 lineal feet of bank on both sides of the drain. The specific areas will be identified by the Noble County Surveyor at the time of commencing work on the project. Most of the work will require that both banks be re-sloped. The average area in which the banks will be re-sloped will contain a channel depth of 6 (six) feet. The existing banks are generally at a 1:1 slope or steeper. All banks that are re-sloped shall be no steeper than a 1:2 slope (one foot of vertical rise for each 2 feet of horizontal run). An average of 1 (one) yard of material per lineal foot, will be removed. Where the channel is relocated a “rip-rap dam” should be installed along the areas that immediately adjoin the old channel. This dam should be a minimum of two feet high and four feet wide at the base with 1:1 side slopes. Fill shall then be placed behind the rock dam. The fill may include tree stumps provided that enough soil is placed around the stumps and the area compacted with a dozer to insure minimal future settling. Erosion control blankets, with a minimum width of 8 (eight) feet, shall be placed per manufacturer specifications on both sides of the channel. The erosion control blankets shall be a GreenFix WS-072 (NAG S-150) or equal as approved by the Noble County Surveyor. The bank area from the erosion control blanket to the top of bank and including the first 5 (five) feet over the bank shall be hydro seeded using the seeding and fertilizer rates listed under the “seeding” section.

Spoils Leveling. The spoils shall be placed so that they do not re-enter the channel and preferably no deeper than one foot. The spoils shall be placed so that the landowner can continue to either farm or mow the area as is now the case. All spoils shall be placed no closer than 10 (ten) feet from the top of bank unless otherwise directed by the Noble County Surveyor. Both the new spoils and those from previous jobs shall be leveled within the area being de-brushed. The spoils shall be leveled such that a 4x4 pickup truck could travel the area in normal weather conditions.

Channel Straightening. Where possible the channel shall be straightened and small meanderings shall be removed. In no case should a stable bank be jeopardized unless it is planned to re-slope that bank.

Minor Bank Repairs. All minor bank repairs shall also be made as part of this project. A minor bank repair includes any individual area of less than 15 (fifteen) lineal feet that has a slope steeper than 1:1, is unstable, contains no vegetation, is part of a bank slide, or as identified by the Noble County Surveyor.

Bank Stabilization. Certain areas on this project may require that the banks be stabilized with aggregate material. In these areas, the contractor shall install rip-rap a minimum of 18 (eighteen) inches in depth over a suitable geotextile fabric. Each ton of stone should equate to approximately 30 square feet of fabric needed.

Seeding. Any bank area disturbed by re-sloping of the banks or normal bottom dipping shall be seeded a minimum of twice each day (once in the middle of the work day and once at the end of the work day). The spoils will not need to be seeded until they have dried and are leveled. Any areas in which row crops (corn, soybeans, wheat or alfalfa) were grown in the most recent crop year will not be required to be seeded. All other disturbed areas shall be seeded with the Noble County ditch bank seed mix. The county will provide the seed mix for this project. The seed shall be applied at a rate of 30 (thirty) pounds per acre. All seeded areas shall have a 12-12-12 fertilizer applied at a rate of 100 pounds per acre. Final grade shall be established and the seed applied within a maximum of 3 (three) hours after the surface has been prepared using a "spike tooth harrow" or similar tool to scratch the surface and expose enough moisture to help the seed to germinate.

Lateral Drains. Any laterals, which are encountered shall be repaired and re-connected unless otherwise specified by the Noble County Surveyor's Office. The quantity of outlets that will be replaced as part of this project are identified on the quote sheet. The sizes will vary between 4-inch and 12-inch in diameter. Twenty feet of solid plastic pipe (PVC) with animal guards shall be used on each outlet. The new tile should be appropriately connected to the existing tile to insure a soil tight joint.

Surface Pipes. Surface pipes will be replaced or installed as part of this project. The quantity of surface pipes that will be replaced or installed are identified on the quote sheet. Each surface pipe shall include 40 (forty) feet of corrugated metal pipe, any necessary bands and one flared end section. The price quotes should include all labor to install and adequately re-grade the surrounding area.

Quote documents will show a maximum quantity of material to be used and labor to be performed. Any reduction of these amounts will be approved by the Noble County Surveyor and the contract price reduced accordingly. Any addition to these amounts that will result in an increase in the contract price shall first be approved by the Noble County Drainage Board. Quote documents shall be submitted in a sealed envelope and shall bear the name of the person or firm submitting the Quote and shall be titled with the appropriate drain and system name.

QUOTES WILL BE RECEIVED IN THE NOBLE COUNTY SURVEYORS OFFICE UNTIL:

1:15 P.M. LOCAL TIME, MONDAY, MAY 14, 2007.

QUOTES WILL BE OPENED BY THE NOBLE COUNTY DRAINAGE BOARD AT THEIR MEETING BEGINNING AT 1:30 P.M. LOCAL TIME, ON MONDAY, MAY 14, 2007.

◆ **CONDITIONS AT SITE**

Prior to bidding contractors shall personally visit the sites of the proposed work and thoroughly familiarize themselves as to the nature and location of work, topography, character, quality, and quantity of material to be encountered, affected utilities, and kind of equipment needed during the required work.

◆ **COMPLETION DATE**

The project shall be completed no later than November 1, 2007. The project completion date may be extended for inclement weather only and at the sole discretion of the Noble County Surveyor.

◆ **PROJECT PAYMENT**

The contractor may submit a claim for payment of material once the material has been delivered to the job site. The contractor agrees to take full responsibility and liability for all material once it is delivered to the job site. The contractor may also request a progress payment upon the completion of 50 (fifty) percent of the project. Upon the final completion of the project and acceptance by the Noble County Drainage Board, the contractor shall be paid an amount equaling 85 (eighty-five) percent of the contract price less all progress payments. The final 15 (fifteen) percent payment will be made 60 (sixty) days after the above mentioned 85 (eighty-five) percent of the contract price has been paid and following final approval and acceptance of the project by the Noble County Drainage Board. If final grading or seeding is required after the above mentioned 60 (sixty) days, then the final payment will be held until all required work is completed and approved. No more than a total of four payments will be issued for a contract, unless otherwise specified in the contract. Unless otherwise stated in the contract, the maximum four allowable claims will be for the following: material, 50 (fifty) percent completion, completion, and the final 15 (fifteen) percent. If the project does not involve any material, then only three progress payments will be allowed.

PLEASE NOTE THE FOLLOWING:

1. If a claim is submitted for any of the four progress payment in anticipation of the work being completed by the time the claims are approved, AND the work is not completed by the time the claims are approved, THEN the check for that work will be held until the work is completed and approved.
2. All total dollar amounts due on invoices shall match the amounts submitted for claim approval.
3. All approved extras on contract jobs shall be invoiced separate from the contract amounts. All approved extras will be paid at full price with no amount retained.
4. The final 15 (fifteen) percent payment shall also be invoiced separately.
5. All invoices must be received at the Noble County Surveyor's Office by the 10th (tenth) of each month to insure payment during the week following the first Monday of the next month. Any invoices received after the 10th (tenth) of the month are not guaranteed payment as mentioned above, but would be paid the following month.

QUOTE FORM FOR LABOR AND MATERIALS

PROJECT NAME: RIMMELL OPEN

SYSTEM NAME: MELVIN SYSTEM

ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	AMOUNT
1	BOTTOM DIPPING, BANK RE-SLOPING, AND SPOILS LEVELING	2,800	LF	\$	\$
2	CHANNEL RE-ALIGNMENT, FILLING OLD CHANNEL, AND SPOILS LEVELING	2,800	LF	\$	\$
3	EROSION CONTROL BLANKETS GREENFIX WS-072 OR EQUAL AS APPROVED BY SURVEYOR (16,650 L.F. X 8' wide) INSTALLED PER MANUFACTURER SPECIFICATIONS	166	ROLLS	\$	\$
4	RIP-RAP INSTALLED AS DIKE ON NON-WORKING SIDE OF NEW CHANNEL PER SPECIFICATIONS	560	TONS	\$	\$
5	SEEDING OF AREA UNDERNEATH EROSION CONTROL BLANKETS (30 LB/AC OF SEED PROVIDED BY DRAINAGE BOARD) AND 100 LB/AC 12-12-12 FERTILIZER	2.05	ACRES	\$	\$
6	HYDRO-SEEDING OF BANKS FROM EROSION CONTROL BLANKETS TO TOP OF BANK PLUS 5 FEET OVER BANK (30 LB/AC OF SEED PROVIDED BY DRAINAGE BOARD) AND 100 LB/AC 12-12-12 FERTILIZER	2.44	ACRES	\$	\$
7	SEEDING OF DISTURBED AREAS / SPOILS AREA / FILTER STRIPS (MINIMUM OF 40 FEET ON WORKING SIDE AND 25 FEET ON NON-WORKING SIDE) (30 LB/AC OF SEED PROVIDED BY DRAINAGE BOARD) AND 100 LB/AC 12-12-12 FERTILIZER	8.35	ACRES	\$	\$
8	LABOR TO INSTALLED CULVERT PIPE FOR PRIVATE CROSSING	4	EA	\$	\$
	TOTAL FOR PAGE ONE				\$

9	20 FEET OF 4-INCH DIA. PVC WITH ANIMAL GUARD AND COUPLER – INSTALLED FOR OUTLET PIPE	4	LF	\$	\$
10	20 FEET OF 6-INCH DIA. PVC WITH ANIMAL GUARD AND COUPLER – INSTALLED FOR OUTLET PIPE	2	EA	\$	\$
11	18-INCH DIA. SURFACE PIPE INSTALLED	4	EA	\$	\$
12				\$	\$
13				\$	\$
14				\$	\$
15	SUB TOTAL FROM PAGE ONE				\$
16	MOBILIZATION / DEMOBILIZATION			\$	\$
	GRAND TOTAL				\$

LETTING DATE: May 14, 2007

QUOTE FOR LABOR AND MATERIALS

PROJECT NAME: RIMMELL OPEN DRAIN

SYSTEM NAME: MELVIN SYSTEM

SUBMITTED BY: _____

TITLE: _____

Project:

Rimmell Open Project

Drainage System:

Melvin System

Date: January 22, 2007

Designed By: SDZ

Drawn By: DJR

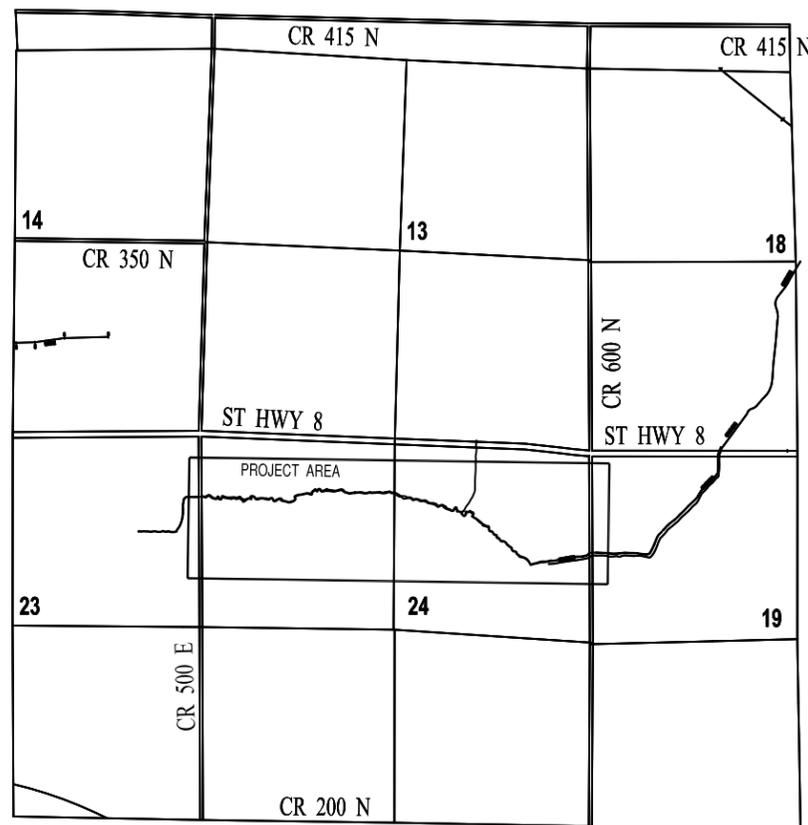
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Table of Contents:

- PAGE 1 PLAN VIEW & PROFILE (STATIONS 0+00 THRU 18+00)
- PAGE 2 PLAN VIEW & PROFILE (STATIONS 18+00 THRU 36+00)
- PAGE 3 PLAN VIEW & PROFILE (STATIONS 36+00 THRU 55+00)
- PAGE 4-5 CROSS SECTION @ 500 FT. INTERVALS
- PAGE 6 DETAILS

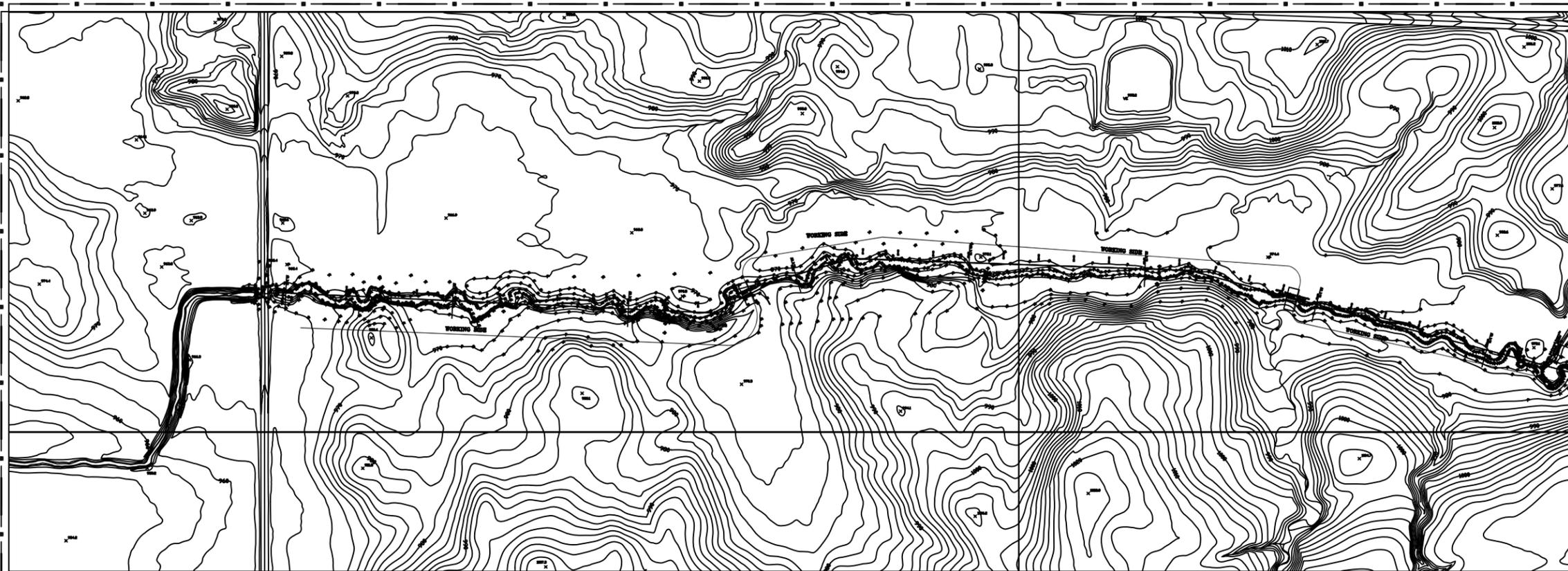
Project Location

Parts of the North 1/2 of Sec. 24, Township 34 N, 9 E
& 2 nd. P.M., in Jefferson Township, Noble County, Indiana.



Scott D. Zeigler, PLS

2090 N. State Road 9, Suite B
Albion, Indiana 46701
Phone (260) 636-2131

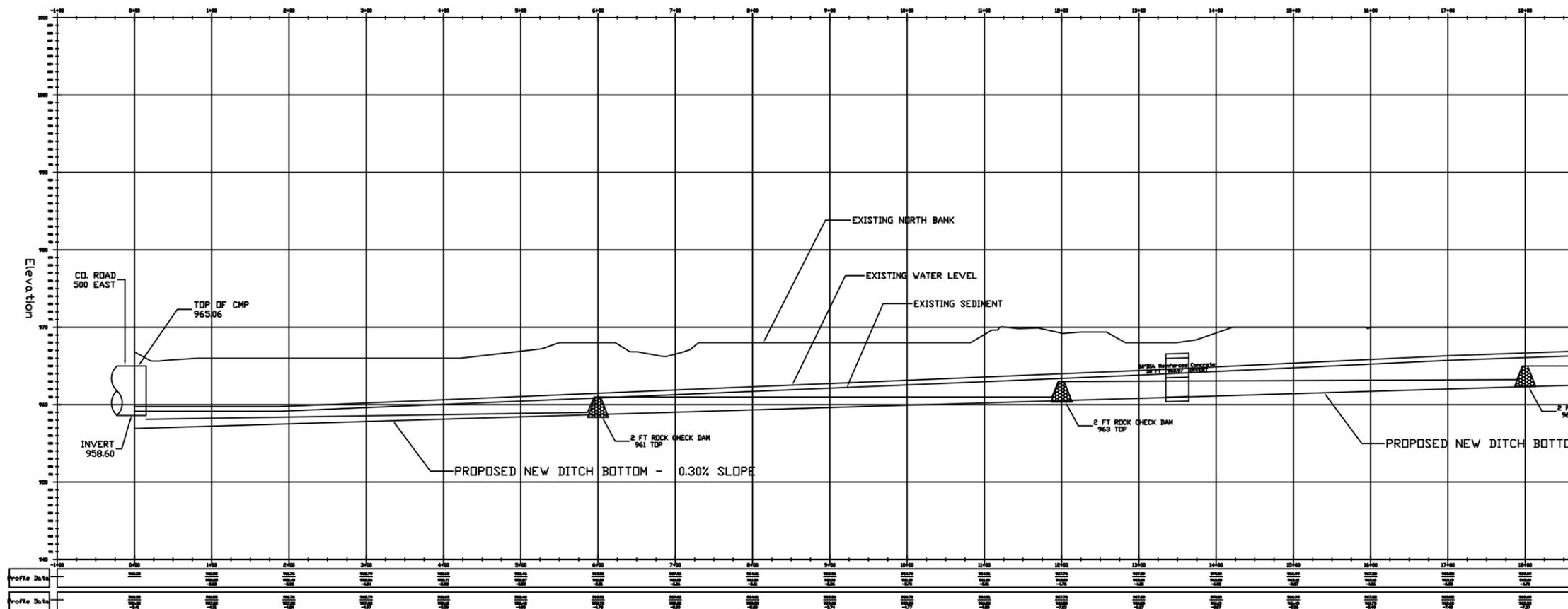


RIMMEL OPEN PROJECT
MELVIN SYSTEM

PROJECT NAME:
SYSTEM NAME:

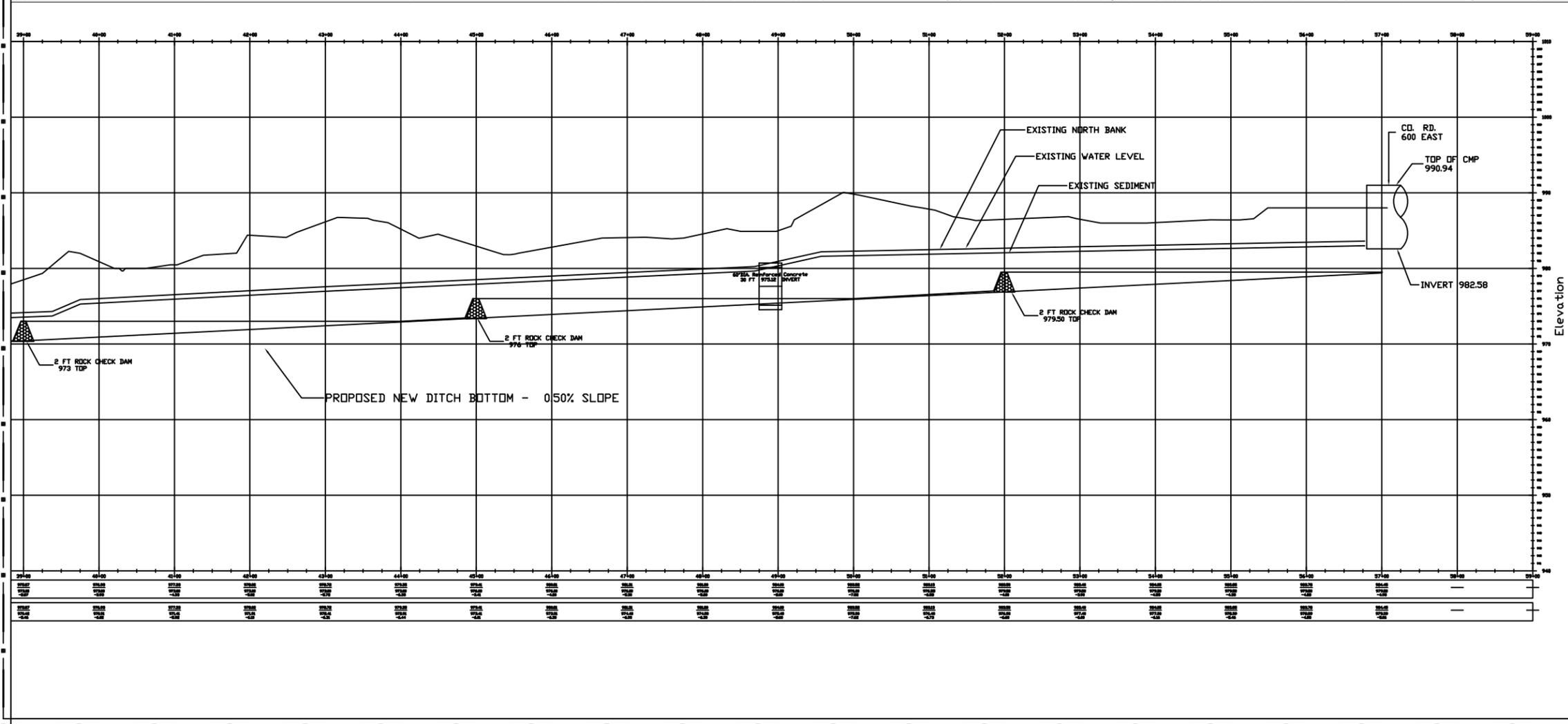
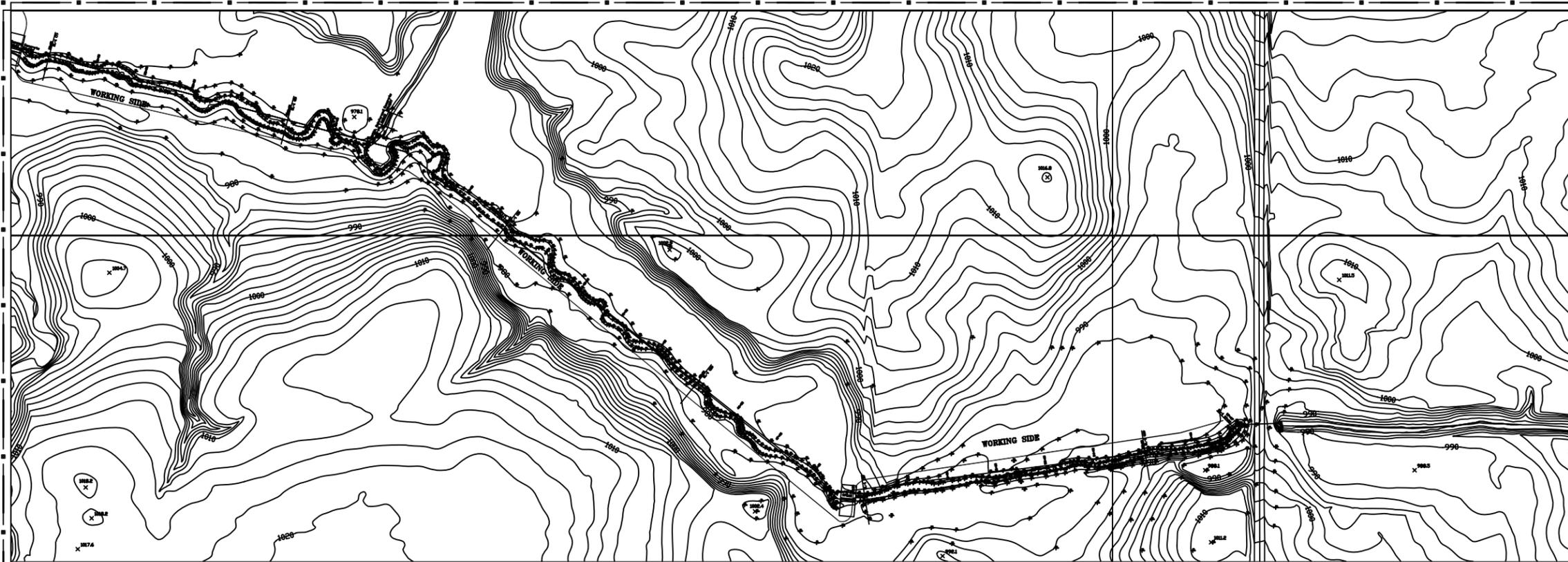
PROFILE & PLAN VIEW

NOBLE COUNTY SURVEYOR
2090 NORTH STATE ROAD 9
ALBION, IN 46701
(260) 636-2131



REVISIONS	DESCRIPTION

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VERTICAL SCALE: 1"=5'
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1-22-2007
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SDZ
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DJR
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RIMMEL OPEN PROJECT
MELVIN SYSTEM

PROJECT NAME:
SYSTEM NAME:

PROFILE & PLAN VIEW

NOBLE COUNTY SURVEYOR
2090 NORTH STATE ROAD 9
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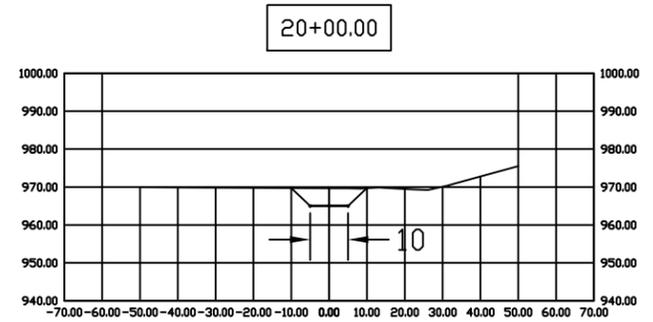
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CROSS SECTIONS

NOBLE COUNTY SURVEYOR
2090 NORTH STATE ROAD 9
ALBION, IN 46701
(260) 636-2131

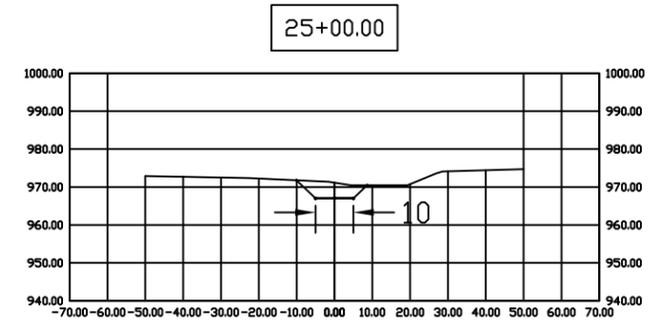
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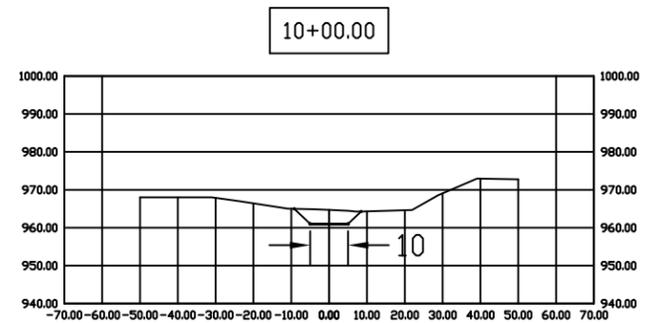
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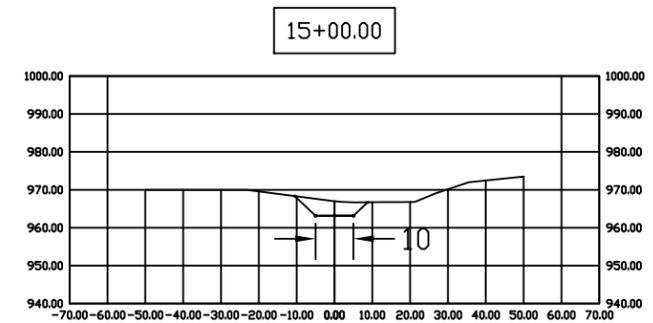
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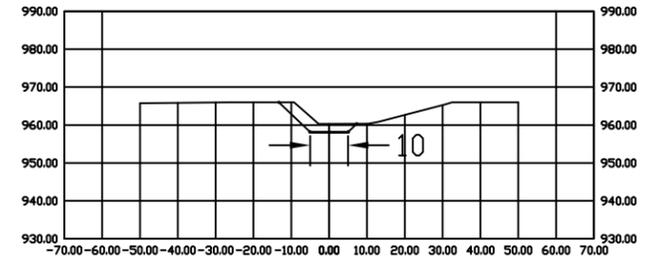
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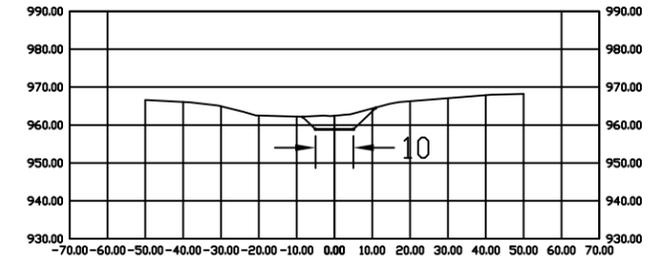
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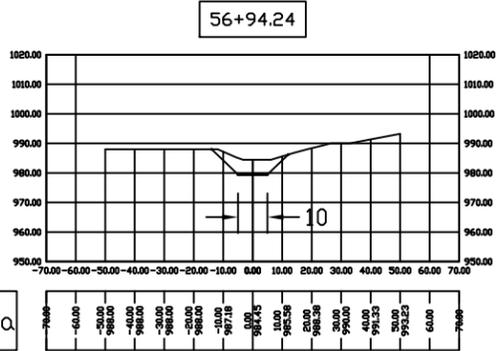
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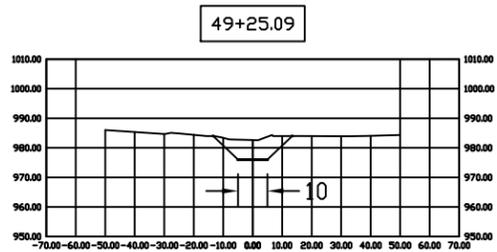
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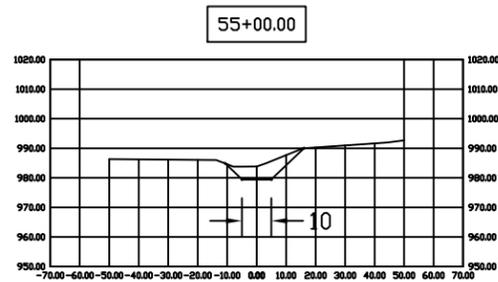
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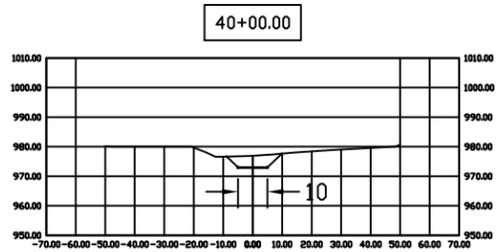
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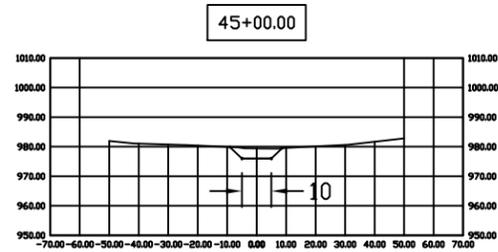
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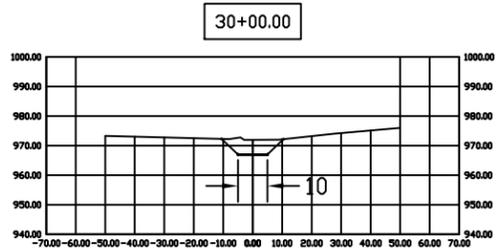
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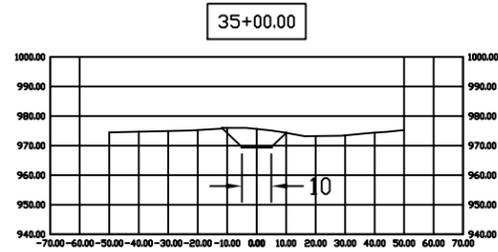
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RIMMEL OPEN PROJECT
MELVIN SYSTEM

PROJECT NAME:
SYSTEM NAME:

PROFILE & PLAN VIEW

NOBLE COUNTY SURVEYOR
2090 NORTH STATE ROAD 9
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REVISIONS	DESCRIPTION
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DETAILS

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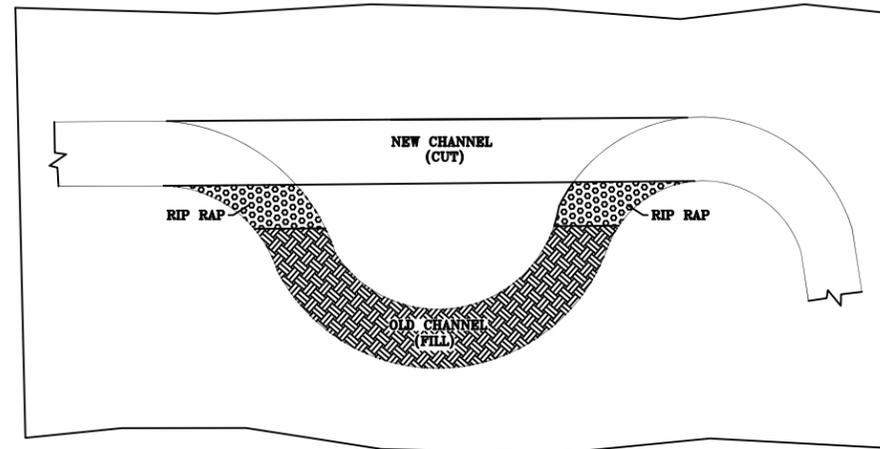
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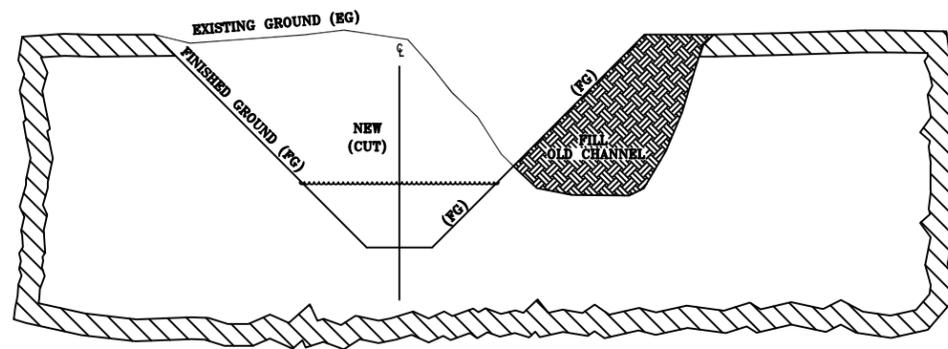
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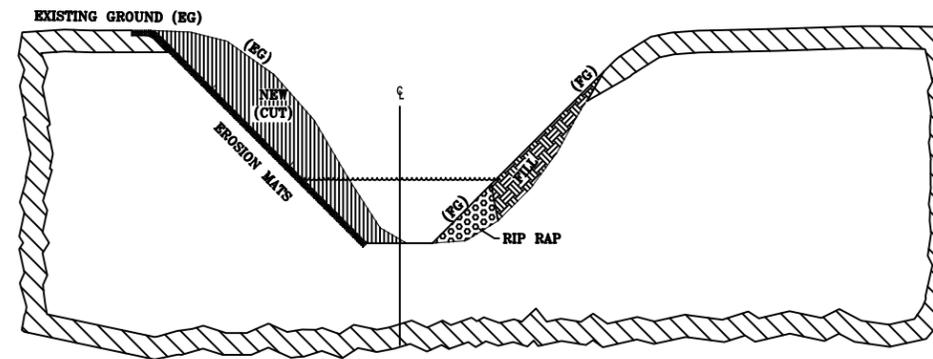
PAGE NUMBER
6 OF **6**



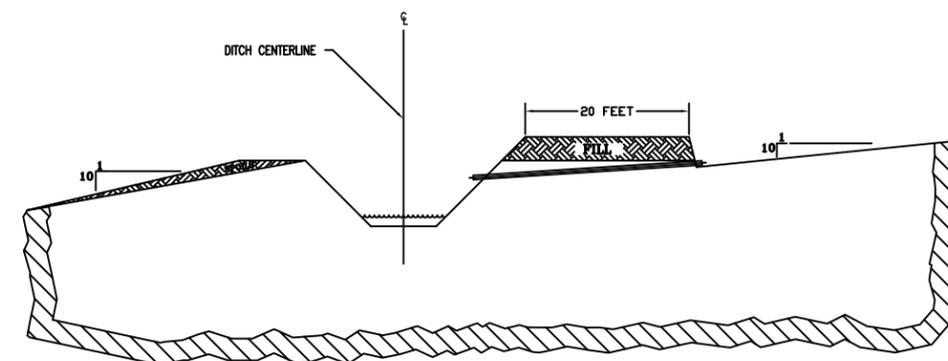
BANK STABILIZATION PLAN VIEW (TYPICAL)



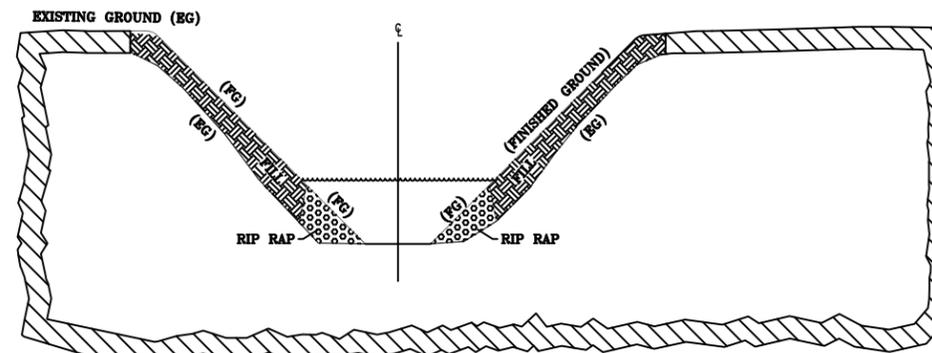
CHANNEL REALIGNMENT PROFILE (TYPICAL)



**BANK STABILIZATION PROFILE (TYPICAL)
NEW CUT**



SPOIL PLACEMENT PROFILE (TYPICAL)



BANK STABILIZATION PROFILE (TYPICAL)

