

**Individual Section 401 Application for
Ohio EPA Water Quality Certification**

TRU-534-24.32

**Transportation Improvements Project
Trumbull County, Ohio
PID No. 23967**

**Prepared For:
Ohio Department of Transportation
1980 West Broad Street
Columbus, Ohio 43223**

**Prepared By:
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August 2, 2012

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APPLICATION FOR OHIO EPA SECTION 401 WATER QUALITY CERTIFICATION

**Effective October 1, 1996
Revised August, 1998**

This application must be completed whenever a proposed activity requires an individual Clean Water Act Section 401 Water Quality Certification (Section 401 Certification) from Ohio EPA. A Section 401 certification from the State is required to obtain a federal Clean Water Act Section 404 permit from the U.S. Army Corps of Engineers, or any other federal permits or licenses for projects that will result in a discharge of dredged or fill material to any waters of the State. To determine whether you need to submit this application to Ohio EPA, contact the U.S. Army Corps of Engineers District Office with jurisdiction over your project, or other federal agencies reviewing your application for a federal permit to discharge dredged or fill material to waters of the State, or an Ohio EPA Section 401 Coordinator at (614) 644-2001.

The Ohio EPA Section 401 Water Quality Certification Program is authorized by Section 401 of the Clean Water Act (33 U.S.C. 1251) and the Ohio Revised Code Section 6111.03(P). Ohio Administrative Code (OAC) Chapter 3745-32 outlines the application process and criteria for decision by the Director of Ohio EPA. In order for Ohio EPA to issue a Section 401 certification, the project must comply with Ohio's Water Quality Standards (OAC 3745-1) and not potentially result in adverse long-term or short-term impact on water quality. Included in the Water Quality Standards in the Antidegradation Rule (OAC Rule 3745-1-05), effective October 1, 1996, revised October, 1997 and May, 1998. The Rule includes additional application requirements and public participation procedures. **Because there is a lowering of water quality associated with every project being reviewed for Section 401 certification, every Section 401 certification applicant must provide the information required in Part 10 (pages 3 and 4) of this application.** In addition, applications for projects that will result in discharges of dredged or fill material to wetlands must include a wetland delineation report approved by the Corps of Engineers, a wetland assessment with a proposed assignment of wetland category (ies), official documentation on evaluation of the wetland for threatened or endangered species, and appropriate avoidance, minimization, and mitigation as prescribed in OAC 3745-1-50 to 3745-1-54. Ohio EPA will evaluate the applicant's proposed wetland category assignment and make the final assignment.

Information provided with the application will be used to evaluate the project for certification and is a matter of public record. If the Director determines that the application lacks information necessary to determine whether the applicant has demonstrated the criteria set forth in OAC Rule 3745-32-05(A) and OAC Chapter 3745-1, Ohio EPA will inform the applicant in writing of the additional information that must be submitted. The application will not be accepted until the application is considered complete by the Section 401 Coordinator. An Ohio EPA Section 401 Coordinator will inform you in writing when your application is determined to be complete.

Please Submit the following to "Section 401 Supervisor, Ohio EPA/DSW, P.O. Box 1049, Columbus, Ohio 43216-1049:

- * Four (4) sets of the completed application form, including the location of the project (preferably on a USGS quadrangle) and 8-12 x 11" scaled plan drawings and sections.
- * One (1) set of original scaled plan drawings and cross-sections (or good reproducible copies).

(See Application Primer for detailed instructions)

1. The federal permitting agency has determined this project: (check appropriate box and fill in blanks)

- | | | | |
|----|-------|--|-------|
| a. | X | requires an individual 404 permit/401 certification - Public Notice # (if known) | _____ |
| b. | _____ | requires a Section 401 certification to be authorized by Nationwide Permit # | _____ |
| c. | _____ | requires a modified 404 permit/401 certification for original Public Notice # | _____ |
| d. | _____ | requires a federal permit under _____ jurisdiction identified by # | _____ |
| e. | _____ | requires a modified federal permit under _____ jurisdiction identified by # | _____ |

2. Application number (to be assigned by Ohio EPA):					
3. Name and address of applicant:			Telephone number during business hours:		
Jerry Wray, Director Ohio Department of Transportation			Tim Hill _____ (Residence)		
1980 West Broad Street, Columbus, Ohio 43223			(614) 644-0377 (Office)		
3a. Signature of Applicant:			Date:		
4. Name, address and title of authorized agent:			Telephone number during business hours:		
Adrienne Earley, ODOT-OES Waterway Permits Supervisor			_____ (Residence)		
1980 West Broad Street, Columbus, Ohio 43223			(614) 466-2159 (Office)		
4a. Statement of Authorization: I hereby designate and authorize the above-named agent to act in my behalf in the processing of this permit application, and to furnish, upon request, supplemental information in support of the application.					
Signature of Applicant: _____				Date: _____	
5. Location on land where activity exists or is proposed. Indicate coordinates of a fixed reference point at the impact site (if known) and the coordinate system and datum used.					
Address:					
The project is located along SR 534 in Mesopotamia Township, Trumbull County, Ohio. Specifically, the project limits are from just north of the north end of the Mesopotamia Township square to approximately 0.3-mile north of Donley Road, for a project length of approximately 6,410 feet.					
Street, Road, Route, and Coordinates, or other descriptive location					
Latitude: 41.46575 N , Longitude: -80.95385 W					
Watershed	County	Township	City	State	Zip Code
04110004-010-070 & 04110004-020-010	Trumbull	Mesopotamia	NA	Ohio	NA
6. Is any portion of the activity for which authorization is sought complete? _____ Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>					
If answer is "yes", give reasons, month and year activity was completed. Indicate the exiting work on the drawings.					
7. List all approvals or certifications and denials received from other federal, interstate, state or local agencies for any structures, construction, discharge or other activities described in this application.					
Issuing Agency	Type of Approval	Identification No.	Date of Application	Date of Approval	Date of Denial
USACE	Prelim. JD	LRH-2011-00499-GRA	1/18/2011	1/30/2012	-
OHPO	Section 106	23967	10/26/2011	11/10/2011	-
Ohio EPA	401	62627	4/1/2006	9/20/2006	
USACE	404	200600417	4/1/2006	1/12/2007	-
ODNR	Section 7	23967	1/18/2011	8/19/2011	-
USFWS	Section 7	23967	1/19/2011	11/19/2011	-
FHWA	NEPA (CE-2)	23967	1/20/2012	2/13/2012	-

8. DESCRIPTION OF THE ACTIVITY (fill in information in the following four blocks - 8a, 8b, 8c & 9)

8a. Activity: Describe the Overall Activity:

The Ohio Department of Transportation (ODOT) proposes to widen and resurface SR 534 a length of approximately 6,410 feet in Mesopotamia Township, Trumbull County, Ohio. The proposed undertaking involves widening the existing roadway pavement to accommodate 2-12' lanes with 8' paved shoulders on each side. The proposed project will also include the replacement of three bridges, culvert extensions and replacements and associated drainage work, minor channel realignment, the construction of five retaining walls, and upgrading signing and pavement markings. A total of six wetlands and five streams occurring in the Garden Creek and Grapevine Creek sub-basins (HUC's 04110004-020-010 and 04110004-010-070) will be impacted by the proposed project. Construction activities that will impact the wetlands and streams include filling to accommodate the widened roadway pavement and replacement/extension of bridge/culvert structures. The wetlands and streams were identified and evaluated in the Ecological Survey Report (Davey Resource Group, January 2011). The preliminary Jurisdictional Determination (January 30, 2012) is included in Appendix B. No temporary impacts to wetlands are proposed; however the use of temporary cofferdams in 6 locations will impact the 5 streams. Permanent impacts to the six wetlands, which include placement of roadway fill, total 0.479 acres. Permanent impacts to the five streams, which include replacement/extension of bridge/culvert structures and minor channel realignment total 0.178-acre (925 linear feet). A summary of the proposed impacts to these features is provided on Table A (Streams) and Table B (Wetlands), included in Appendix C. Project plan sheets/impact figures and a photograph log are included in Appendix A.

8b. Purpose: Describe the propose, need and intended use of the activity:

The purpose of the proposed project is to improve safety along SR 534 by separating slow-moving horse-drawn Amish vehicles (buggies) and higher speed motor vehicles in Mesopotamia Township, Trumbull County, Ohio based upon a substantially higher crash density, and undulating roadway profile, and fewer passing zones.

8c. Discharge of dredged or fill material: Describe type, quantity of dredged material (in cubic yards), and quantity of fill material (in cubic yards).

(OAC 3745-1-05(B)(2)(a))

774 CY of roadway fill into six wetlands. 307 CY of concrete, 1,048 CY of earthen fill, and 483 CY of ODOT Type B and Type C RCP into five streams. 175.9 cy of temporary fill into five streams. There will be no temporary wetland fill required. See a detailed description of impacts to each feature on Table A (streams) and Table B (wetlands), provided in Appendix C. Project plan sheets/impact figures and a photograph log are included in Appendix A.

9. Waterbody and location of waterbody or upland where activity exists or is proposed, or location in relation to a stream, lake, wetland, wellhead or water intake (if known). Indicate the distance to, and the name of and receiving stream, if appropriate.

The proposed TRU-534-24.32 Transportation Improvements Project will impact Garden Creek, Grapevine Creek, three un-named tributaries, and six adjacent wetlands in the Grand River watershed, sub-basins (HUC) 04110004-020-010 and 04110004-010-070. See Table A (streams) and Table B (wetlands) in Appendix C for location information, descriptions, and other characteristics of the impacted features.

10. To address the requirements of the Antidegradation Rule, your application must include a report evaluating the:

- * Preferred Design (your project) and Mitigative Techniques
- * Minimal Degradation Alternative(s) (scaled-down version(s) of your project) and Mitigative Techniques
- * Non-Degradation Alternative(s) (project resulting in avoidance of all waters of the state)

At a minimum, item a) below must be completed for the Preferred Design, the Minimal Degradation Alternative(s), and the Non-Degradation Alternative(s), followed by completion of item b) for each alternative, and so on, until all items have been discussed for each alternative (see Primer for specific instructions). (Application and review requirements appear at **OAC 3745-1-05(B)(2)**, **OAC 3745-1-05(C)(c)**, **OAC 3745-1-05(C)(1)** and **OAC 3745-1-54**).

10a) Provide a detailed description of any construction work, fill or other structures to occur or to be placed in or near the surface water. Identify all substances to be discharged, including the cubic yardage of dredged or fill material to be discharged to the surface water. **(OAC 3745-1-05(B)(2)(b))**

10b) Describe the magnitude of the proposed lowering of water quality. Include the anticipated impact of the proposed lowering of water quality on aquatic life and wildlife, including threatened and endangered species (include written comments from Ohio Department of Natural Resources and U.S. Fish and Wildlife Service), important commercial or recreational sport fish species, other individual species, and the overall aquatic community structure and function. Include a Corps of Engineers approved wetland delineation. **(OAC 3745-1-05(C)(6)(a,b)** and **OAC 3745-1-1-54**)

- 10c) Include a discussion of the technical feasibility, cost effectiveness, and availability. In addition, the reliability of each alternative shall be addressed (including potential recurring operational and maintenance difficulties that could lead to increased surface water degradation). **(OAC 3745-1-05(C)(6)(h, j-k) and OAC 3745-1-54)**

- 10d) For regional sewage collection and treatment facilities, include a discussion of the technical feasibility, cost effectiveness and availability, and long-term plans outlined in state or local water quality management planning documents and applicable facility planning documents. **(OAC 3745-1-05(C)(6)(i))**

- 10e) To the extent that information is available, list and describe any government and/or privately sponsored conservation projects that exist or may have been formed to specifically target improvement of water quality or enhancement of recreational opportunities on the affected water resource. **(OAC 3745-1-05(B)(2)(g))**

- 10f) Provide an outline of the costs of water pollution controls associated with the proposed activity. This may include the cost of best management practices to be used during construction and operation of the project. **(OAC 3745-01-05(C)(6)(g))**

- 10g) Describe any impacts on human health and the overall quality and value of the water resource **(OAC 3745-1-05(C)(6)(c) and OAC 3745-1-54)**

- 10h) Describe and provide an estimate of the important social and economic benefits to be realized through this project. Include the number and types of jobs created and tax revenues generated and a brief discussion of the condition of the local economy. **(OAC 3745-1-5(B)(2)(e), and OAC 3745-1-05(C)(6)(i))**

- 10i) Describe and provide an estimate of the important social and economic benefits that may be lost as a result of this project. Include the effect on commercial and recreational use of the water resource, including effects of lower water quality on recreation, tourism, aesthetics, or other use and enjoyment by humans. **(OAC 3745-1-05(B)(2)(e,f) and OAC 3745-1-05(C)(6)(e))**

- 10j) Describe environmental benefits, including water quality, lost and gained as a result of this project. Include the effects on the aquatic life, wildlife, threatened or endangered species. **(OAC 3745-1-05(B)(2)(e,f), OAC 3745-1-05(C)(6)(b) and OAC 3745-1-54)**

- 10k) Describe mitigation techniques proposed (except for the Non-Degradation Alternative):
 - * Describe proposed wetland Mitigation (see **OAC 3745-1-54** and Primer)

 - * Describe proposed Stream, lake, Pond Mitigation (see Primer)

11. Application is hereby made for a Section 401 Water Quality Certification. I certify that I am familiar with the information contained in this application and, to the best of my knowledge and belief, such information is true, complete and accurate. I further certify that I possess the authority to undertake the proposed activities or I am acting as the duly authorized agent of the applicant.

Signature of Applicant	Date	Signature of Agent
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The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in Block 3 has been filled out and signed.

Do not send a certification processing fee with this application. The appropriate fee will be assessed when a certification is issued.

**Application for Ohio EPA
Section 401 Water Quality Certification
TRU-534-24.32
Transportation Improvements Project
Trumbull County, Ohio
PID 23967**

ANTIDEGRADATION ANALYSIS

GENERAL DESCRIPTION OF ALTERNATIVES

The aquatic impacts associated with the proposed project were originally evaluated and presented in a joint Section 404 and Individual Section 401 Permit Application, prepared for the project in April of 2006 by MS Consultants, Inc. Those permit applications were reviewed by the United States Army Corps of Engineers (USACE) and the Ohio Environmental Protection Agency (Ohio EPA), and subsequently, permit authorization was granted by both agencies; USACE- 200600417 (1/12/2007) and Ohio EPA – 062627 (9/20/2006). Due to project delays, a reduction in the scope of the proposed project, and the expiration of the previously-granted Individual Section 401 Water Quality Certification, re-evaluation of the aquatic impacts and the preparation of this Application for Individual Section 401 Water Quality Certification was required.

The current design of the Preferred Design Alternative evolved through the NEPA process with emphasis, in part, on avoiding and minimizing impacts to wetlands and streams in the project area. The purpose and need for the transportation improvement, as well as the anticipated impacts to the natural and human environment, have been documented in the Categorical Exclusion Level 2 Document for the proposed project, approved at the ODOT District 4 Office on February 13, 2012.

Design efforts were considered that minimized proposed impacts by the project yet provided an acceptable project. Total avoidance of all wetlands is not practicable because the wetlands are located on both sides of SR 534 and widening for the addition of buggy lanes cannot be done without impact to them. Shifting the roadway alignment to one side or the other is also not practicable, as minimizing wetland impacts on one side would increase impacts on the other. Furthermore, each stream within the project area crosses under SR 534 through a bridge or culvert structure. Therefore, roadway widening without impacting these features (culvert/bridge extensions/replacements and Rock Channel Protection (RCP) placement) is also not practicable.

The no-build alternative, although it would avoid wetland and stream impacts, would not improve safety along SR 534 by separating slow-moving horse-drawn Amish vehicles (buggies) and higher speed motor vehicles. Therefore, the no-build alternative was eliminated from consideration because it does not satisfy the purpose and need of the transportation improvement.

PREFERRED DESIGN ALTERNATIVE

The Preferred Design Alternative proposes to widen and resurface SR 534 a length of approximately 6,410 feet in Mesopotamia Township, Trumbull County, Ohio. The Preferred Design Alternative involves widening the existing roadway pavement to accommodate 2-12' lanes with 8' paved shoulders on each side. The Preferred Design Alternative will also include the replacement of three bridges, culvert extensions and replacements and associated drainage work, the construction of five retaining walls, and upgrading signing and pavement markings.

A total of six wetlands and five streams occurring in the Garden Creek and Grapevine Creek sub-basins (HUC's 04110004-020-010 and 04110004-010-070) will be impacted by the Preferred Design Alternative. Construction activities that will impact the wetlands and streams include filling to accommodate the widened roadway pavement and replacement/extension of bridge/culvert structures. The wetlands and streams were identified and evaluated in the Ecological Survey Report (Davey Resource Group, January 2011). The preliminary Jurisdictional Determination (January 30, 2012) is included in Appendix B.

No temporary impacts to wetlands are proposed; however, six temporary cofferdams will be placed within the five streams to facilitate construction. Permanent impacts to the six wetlands, which include placement of roadway fill, total 0.479 acres. Permanent impacts to the five streams, which include replacement/extension of bridge/culvert structures, minor channel realignment, and subsequent placement of RCP, total 0.178-acre (925 linear feet). A summary of the proposed impacts to these features is provided on the Tables included in Appendix C. Project plan sheets/impact figures and a photograph log are included in Appendix A.

Best Management Practices (BMPs) will be used to control impacts due to erosion of exposed soils in accordance with ODOT's "Construction and Material Specifications" (CMS) and the project Stormwater Pollution Prevention Plan (SWPPP). See Block 10b for a detailed description of the anticipated impacts to water quality as a result of the Preferred Design Alternative. Mitigative techniques proposed for impacts to wetlands and streams by the Preferred Design Alternative are described in Block 10K.

MINIMAL DEGRADATION ALTERNATIVE

The Minimal Degradation Alternative is similar to the Preferred Design Alternative with the exception that permanent impacts to four wetlands would be reduced. Specifically, four retaining walls would be constructed in lieu of standard roadway embankment to minimize impacts to wetlands A, B, E, and D. The total aerial extent of the reduced impacts would total 0.092-acre (0.479-acre of total impacts under the Preferred Design Alternative and 0.387-acre of total impacts under the Minimal Degradation Alternative). Impacts to the five streams within the project area are identical under the Preferred Design Alternative and the Minimal Degradation Alternative. A summary of the proposed impacts to the aquatic environment resulting from the Minimal Degradation Alternative is provided on the Tables included in Appendix C, and preliminary project plan sheets/impact figures are included in Appendix A.

The use of retaining walls in lieu of standard roadway embankment, according to ODOT's Office of Estimating, would increase project cost by approximately \$392,360.00 to \$488,700.00, depending on the type of retaining wall constructed. Therefore, although the Minimal Degradation Alternative is feasible, it is not considered practicable.

NON-DEGRADATION ALTERNATIVE

There are no feasible and practicable alternatives for the project that would result in no impacts to the aquatic environment. A number of build alternatives were evaluated for the proposed project, as described in the Level 2 Categorical Exclusion Document, approved at the ODOT District 4 Office on February 13, 2012. Total avoidance of all wetlands was determined not to be practicable because the wetlands are located on both sides of SR 534 and widening for the addition of buggy lanes cannot be done without impact to them. Specifically, shifting the roadway alignment to one side or the other is not practicable, as minimizing wetland impacts on one side would increase impacts on the other. Furthermore, each stream within the project area crosses under SR 534 through a bridge or culvert structure. Therefore, roadway widening without impacting these features (culvert/bridge extensions/replacements and RCP placement) is also not practicable. Only a no-build alternative would avoid stream and wetland impacts. Therefore, the no-build alternative is the Non-Degradation Alternative.

The Non-Degradation Alternative, although it would avoid wetland and stream impacts, would not improve safety along SR 534 by separating slow-moving horse-drawn Amish vehicles (buggies) and higher speed motor vehicles. Therefore, the Non-Degradation Alternative is not considered prudent or feasible for the proposed project.

10a. Provide a detailed description of any construction work, fill or other structures to occur or to be placed in or near the surface water. Identify all substances to be discharged, including the cubic yardage of dredged or fill material to be discharged to the surface water.

PREFERRED DESIGN ALTERNATIVE

The Preferred Design Alternative proposes to widen and resurface SR 534 a length of approximately 6,410 feet in Mesopotamia Township, Trumbull County, Ohio. The Preferred Design Alternative involves widening the existing roadway pavement to accommodate 2-12' lanes with 8' paved shoulders on each side. The Preferred Design Alternative will also include the replacement of three bridges, culvert extensions and replacements and associated drainage work, the construction of five retaining walls, and upgrading signing and pavement markings.

The Preferred Design Alternative will not result in any temporary impacts to wetlands and streams. Below is a summary of the anticipated permanent impacts to the aquatic environment that will result from the Preferred Design Alternative.

Wetlands - A total of 0.479-acre of permanent fill are proposed for six wetlands. 774 CY of permanent roadway fill is required to accommodate the widened roadway pavement.

Streams – A total of 925 linear feet (0.178-acre) of permanent channel disturbance is proposed for the five streams. Additionally, an approximate 10' temporary earthen cofferdam will be constructed at each location to facilitate construction. Each stream is discussed separately below:

Garden Creek (depicted on plan sheet 118, STA 79+34.31). The Preferred Design Alternative will replace the existing culvert structure with a 62' long, 22'x7' concrete culvert. 55 CY of concrete and 95 CY of earthen fill will be placed below the Ordinary High Water Mark (OHWM) of Garden Creek for the culvert replacement, and 163 CY of ODOT Type C Rock (non-erodible, 6-18", average 12") will be placed below the OHWM for channel protection. The temporary cofferdam at this location will result in the placement of approximately 25.9 CY of clean, temporary fill.

Stream 1 (depicted on plan sheets 115 and 91, STA 65+42.81 and STA 62+63.54). Stream 1 will be impacted in 3 locations. The Preferred Design Alternative will replace an existing culvert structure with a 111' long, 8'x4' concrete culvert, a second existing culvert with a 72' long, 42" concrete culvert, and realignment of approximately 239' of existing channel located within the roadside ditch. 68 CY of concrete will be placed below the OHWM of Stream 1 for the 1st culvert replacements, and 38 CY of ODOT Type C Rock (non-erodible, 6-18", average 12") will be placed below the OHWM for channel protection. Additionally, 618 CY of clean roadway fill will be placed below the OHWM for the channel realignment. The temporary cofferdams at the culvert locations will result in the placement of approximately 48.9 CY of clean, temporary fill.

Grapevine Creek (depicted on plan sheet 113, STA 49+72.52). The Preferred Design Alternative will replace the existing culvert structure with a 60' long, 12'x5' concrete culvert. 61 CY of concrete will be placed below the OHWM of Grapevine Creek for the culvert replacement, and 77 CY of ODOT Type C Rock (non-erodible, 6-18", average 12") will be placed below the OHWM for channel protection. The temporary cofferdam at this location will result in the placement of approximately 25.9 CY of clean, temporary fill.

Stream 2 (depicted on plan sheet 88, STA 47+16.66). The Preferred Design Alternative will extend the existing culvert structure; the existing 108" concrete culvert will be extended 10' on either side with similar 108" concrete culvert sections. 97 CY of concrete will be placed below the OHWM of Stream 2 for the culvert extension, and 173 CY of ODOT Type B Rock (non-erodible, 12-24", average 18") will be placed below the OHWM for channel protection. The temporary cofferdam at this location will result in the placement of approximately 44.4 CY of clean, temporary fill.

Stream 3 (depicted on plan sheet 85, STA 43+72.12). The Preferred Design Alternative will extend the existing culvert structure; the existing 7'x4' concrete culvert will be extended 22' on either side with similar 7'x4' concrete culvert sections. 28 CY of concrete will be placed below the OHWM of Stream 3 for the culvert extension, and 32 CY of ODOT Type C Rock (non-erodible, 6-18", average 12") will be placed below the OHWM for channel protection. The temporary cofferdam at this location will result in the placement of approximately 17.8 CY of clean, temporary fill.

Summary information for all of the wetland and stream features, as well as a summary of the proposed impacts to these features is provided on the Tables included in Appendix C, and project plan sheets/impact figures are included in Appendix A.

MINIMAL DEGRADATION ALTERNATIVE

The Minimal Degradation Alternative is similar to the Preferred Design Alternative with the exception that permanent impacts to four wetlands would be reduced. Specifically, four retaining walls would be constructed in lieu of standard roadway embankment to minimize impacts to wetlands A, B, E, and D. The total aerial extent of the reduced impacts would total 0.092-acre. Therefore, under the Minimal Degradation Alternative, a total of 0.387-acre of permanent fill would be proposed for six wetlands. 625 CY of permanent roadway fill would be required to accommodate the widened roadway pavement.

Impacts to the five streams within the project area are identical under the Preferred Design Alternative and the Minimal Degradation Alternative. A summary of the proposed impacts to the aquatic environment resulting from the Minimal Degradation Alternative is provided on the Tables included in Appendix C, and preliminary project plan sheets/impact figures are included in Appendix A.

NON-DEGRADATION ALTERNATIVE

The Non-Degradation Alternative is a no-build alternative; therefore, there would be no construction work, fill or other structures placed within the aquatic environment.

- 10b. Describe the magnitude of the proposed lowering of water quality. Include the anticipated impact of the proposed lowering of water quality on aquatic life and wildlife, including threatened and endangered species (include written comments from Ohio Department of Natural Resources and U.S. Fish and Wildlife Service), important commercial or recreational sport fish species, other individual species, and the overall aquatic community structure and function. Include a Corps of Engineers approved wetland delineation.**

PREFERRED DESIGN ALTERNATIVE

Existing Conditions

Existing conditions of the wetlands and streams to be impacted by the Preferred Design Alternative are summarized on the Tables provided in Appendix C. Project plan sheets/impact figures and a photograph log are included in Appendix A. Ecological information presented below is summarized from data and conclusions reported in the Ecological Survey Report prepared for the project by Davey Resources Group in January of 2011, and as coordinated by ODOT-OES with the ODNR, USACE, OEPA and USFWS via the July 18 and July 19, 2011 MOA project notification. Copies of the ecological coordination completed for the project are included in Appendix B.

Stream and Wetland Habitats – The project area occurs in the Grand River watershed in the Garden Creek and Grapevine Creek sub-basins (HUC's 04110004-020-010 and 04110004-010-070). An Ecological Survey completed for the project area by Davey Resources Group in January of 2011 identified eight freshwater wetlands and six stream features within the project study area. The United States Army Corps of Engineers, via the January 30, 2012 Preliminary Jurisdictional Determination (Appendix B) concurred with the spatial boundaries and jurisdictional status of these features. Two of the identified wetland features and one of the identified stream features are being avoided by the Preferred Design Alternative. The remaining six wetland features and five stream features, which will be permanently impacted by the Preferred Design Alternative, were determined to be under the jurisdiction of the USACE. The wetland and stream features and the proposed impacts to these features are summarized on the Tables provided in Appendix C.

ORAM evaluations completed during the Ecological Survey classified the wetlands that will be impacted by the Preferred Design Alternative as Provisional Category 1 (Wetlands B and G), Modified Category 2 (Wetlands C, D, and E), and Category 2 (Wetland A) Wetlands. HHEI and QHEI evaluations completed during the Ecological Survey classified the streams as Provisional Modified Class II PHWH (Streams 1, 2, and 3), Modified Warmwater Habitat (Grapevine Creek), and Warmwater Habitat (Garden Creek) Streams.

Copies of the Wetland Data, ORAM, QHEI, and HHEI Field Forms completed during the Ecological Survey are included in Appendix D.

Upland Habitats and Terrestrial Wildlife - Based on the field investigations completed during preparation of the Ecological Survey, no unique or high quality terrestrial habitat exists within the project study area. The project study area includes maintained right-of-way and marginal forested/riparian habitats. The Preferred Design Alternative will not impact any unique or high quality terrestrial habitat. Additionally, no unique or rare populations of terrestrial wildlife are located within the project area. Photographs of the project area are included in Appendix A.

Threatened and Endangered Species - The following are federally listed species for Trumbull County, according to the USFWS's *Federally Listed Species by Ohio Counties* (April 5, 2012): Indiana Bat (*Myotis sodalis*), endangered; Clubshell Mussel (*Pleuroblema clava*), endangered; Snuffbox Mussel (*Epioblasma triquetra*), endangered; Eastern Massasauga (*Sistrurus catenatus*), candidate; and Bald Eagle (*Haliaeetus leucoce*), species of concern.

Based on the project scope of work, project location, on-site habitat in the project study area and field review conducted during preparation of the Ecological Survey, none of these species or their preferred habitat, except for the Indiana Bat, would be expected within the project study area and no impacts to these species are expected as a result of the Preferred Design Alternative.

The Indiana Bat while roosting during summer months can be found in living and/or standing dead trees or snags that may provide suitable habitat for roosting. These trees are commonly referred to as potential roost trees (PRTs). The Preferred Design Alternative will remove approximately seven PRTs, with three exhibiting maternity habitat for the species. As discussed

in the Level 2 Categorical Exclusion Document, ODOT is implementing conservation measures to avoid, minimize, and mitigate adverse impacts to the Indiana Bat.

In addition to the federally listed species with known ranges in Trumbull County, records exist for the state listed endangered Northern Brook Lamprey (*Ichthyomyzon fossor*) approximately 1-mile from the project area, the state listed threatened Water Avens (*Geum rivale*) approximately 0.5-mile from the project area, and the state listed species of concern Great Lakes Crayfish (*Orconectes propinquus*) approximately 0.4-mile from the project area. Based upon the findings of the Ecological Survey, these species are not present within the project area and no impacts to these species are expected as a result of the Preferred Design Alternative.

Commercial or Recreational Sport Fish Species or Other Important Species – The Preferred Design Alternative is not expected to impact any commercial or recreational sport fish species or other important species.

Magnitude of the Proposed Lowering of Water Quality on Streams and Aquatic Habitats

A total of 925 linear feet (0.178-acre) of permanent channel disturbance is proposed for the five streams. The channel disturbance will result from the replacement/extension of existing culvert structures and subsequent placement of RCP. Specifically, 307 CY of concrete, 1,048 CY of earthen fill, and 483 CY of RCP will be placed below the OHWM of the five streams to construct the Preferred Design Alternative. An additional 175.9 CY of clean, temporary fill will be placed at six locations on the five streams to facilitate construction.

The minor amount of impact associated with the proposed replacement/extension of the existing culvert structures and subsequent placement of RCP is not anticipated to result in any long-term degradation to the aquatic communities of Garden Creek, Grapevine Creek, and the three unnamed tributaries. During preparation of the Ecological Survey, the fish species observed in the streams were common species that are tolerant of pollution. Similarly, the majority of aquatic macroinvertebrate species identified in the streams are tolerant of pollution, with only limited numbers of sensitive species identified in Garden Creek and Grapevine Creek. Both short- and long-term impacts to the biological communities likely present within the project area are discussed below.

Short-term impacts to the biological communities include temporary displacement of mobile species during construction, and reduced biological capacity resulting from the temporary increase of suspended and deposited sediments during construction. These short-term impacts will be minimized by the use of sediment and erosion controls in accordance with ODOT *Construction Materials and Specifications*. It is anticipated that any displaced species will be able to re-colonize either upstream or downstream of the proposed work, and following construction, the un-impacted portion of Garden Creek, Grapevine Creek, and the three unnamed tributaries should return to pre-construction biological condition.

The only evident long-term impacts to the biological communities will be as a result of stream “blackout” caused by the placement of the proposed culvert extensions. Typically, this type of change to a stream results in species displacement, and as discussed, any displaced species will be able to re-colonize either upstream or downstream of the proposed work, and following

construction, the un-impacted portion of Garden Creek, Grapevine Creek, and the three unnamed tributaries should return to pre-construction biological condition.

Finally, the proposed replacement/extension of the existing culvert structures and subsequent placement of RCP will not act as a barrier to the migration of aquatic fauna, and the Preferred Design Alternative will not result in the extirpation of any taxa from the area.

Magnitude of the Proposed Lowering of Water Quality on Wetland Habitats

Wetlands - A total of 0.479-acre of permanent fill are proposed for six wetlands. 774 CY of permanent roadway fill is required to accommodate the widened roadway pavement. As depicted on the Tables in Appendix C, none of the impacted wetlands will be completely filled as a result of the Preferred Design Alternative.

ORAM evaluations completed during the Ecological Survey classified the wetlands that will be impacted by the Preferred Design Alternative as Provisional Category 1 (Wetlands B and G), Modified Category 2 (Wetlands C, D, and E), and Category 2 (Wetland A) Wetlands.

Potential short-term impacts include a temporary reduction in the abundance and diversity of the wetland fauna within the project area. All wildlife occupying the permanently-impacted areas may be displaced as a result of habitat removal. However, since the fill activities will be relatively small and the impacted wetlands are of relatively low quality, it is assumed that the impact to wetland fauna on a local or regional scale as a result of the Preferred Design Alternative will be minimal.

Magnitude of the Proposed Lowering of Water Quality on Upland Habitats and Terrestrial Wildlife

Based on the field investigations completed during preparation of the Ecological Survey, no unique or high quality terrestrial habitat exists within the project study area. The project will not impact any unique or high quality terrestrial habitat. Additionally, no unique or rare populations of terrestrial wildlife are located within the project area.

All wildlife occupying the impacted areas may be displaced, and the abundance and diversity of the terrestrial communities may be temporarily reduced as a result of this habitat removal. However, since the clearing activities will be relatively small and no regionally rare habitat types and/or species were identified within the project area, it is assumed that the potential impacts associated with the Preferred Design Alternative, on a local or regional scale, will be minimal. Additionally, it is assumed that during construction, the terrestrial fauna will utilize the similar adjacent habitats, and following construction, the abundance and diversity of mammal, bird, reptile, and amphibian populations will return to pre-construction conditions. Finally, it is not anticipated that the Preferred Design Alternative will result in the extirpation of any taxa from the area.

Magnitude of the Proposed Lowering of Water Quality on Threatened and Endangered Species

This project meets the criteria of the *Memorandum of Agreement (MOA) for Interagency Coordination for Highway Projects which involve Stream Crossings and/or Minor Wetland Fills and the Programmatic Consultation (PC) between the Ohio Department of Transportation, Federal Highway Administration, and United States Fish and Wildlife Services*. ODOT-OES notified the ODNR, USACE, Ohio EPA, and USFWS of the project via the July 18 and July 19, 2011 MOA project notification. Copies of the ecological coordination completed for the project are included in Appendix B.

Based on the project scope of work, project location, on-site habitat in the project study area and field review conducted during preparation of the Ecological Survey, the Clubshell Mussel, Snuffbox Mussel, Eastern Massasauga, and Bald Eagle, or their preferred habitat, are not expected within the project study area and no impacts to these species are expected as a result of the Preferred Design Alternative.

The Preferred Design Alternative will remove approximately seven Indiana Bat PRTs, with three exhibiting brood-rearing habitat for the species. As discussed in the Level 2 Categorical Exclusion Document, ODOT is implementing conservation measures to avoid, minimize, and mitigate adverse impacts to the Indiana Bat.

Regarding state listed species, based upon the findings of the Ecological Survey, the Northern Brook Lamprey, Water Aven, and Great Lakes Crayfish are not present within the project area and no impacts to these species are expected as a result of the Preferred Design Alternative.

MINIMAL DEGRADATION ALTERNATIVE

Impacts to upland habitats, terrestrial fauna, and threatened and endangered species resources would be identical to the Preferred Design Alternative. Impacts to aquatic habitats would be very similar to the Preferred Design Alternative, with the exception that permanent impacts to four wetlands would be reduced by utilizing retaining walls in lieu of standard roadway embankment. Impacts to the remaining wetland features and the five streams within the project area would be the same as the Preferred Design Alternative.

NON-DEGRADATION ALTERNATIVE

The Non-Degradation Alternative is a no-build alternative; therefore, there would be no lowering of water quality and subsequently no impacts to aquatic and terrestrial habitat or fauna.

- 10c. Include a discussion of the technical feasibility, cost effectiveness, and availability. In addition, the reliability of each alternative shall be addressed (including potential recurring operational and maintenance difficulties that could lead to increased surface water degradation).**

PREFERRED DESIGN ALTERNATIVE

The Preferred Design Alternative has undergone detailed engineering and drainage review in accordance with current ODOT design and construction standards (Stage 3 design plans have been completed and approved for the project), and is, therefore, considered to be a technically feasible and available design. The techniques to be used to construct the Preferred Design Alternative have been accomplished on numerous occasions with other transportation projects. The techniques used for culverts and drainage facilities have proven to be both reliable and cost-effective. The Ohio Department of Transportation will be the entity responsible for maintenance of all structures after construction is complete.

Operation and maintenance activities for the widened roadway will be similar to existing, and will result in some amount of oil, grease, and particulates from vehicular traffic, de-icing salts, and pesticides and herbicides eventually reaching the aquatic environment. These impacts, overall, are considered to be minor and already occur in the project area along the existing roadway. Additionally, there is no additional cleanup or maintenance necessary for the buggy lanes, only typical roadway maintenance is expected.

Since the Preferred Design Alternative is expected to reduce vehicular delays and improve safety, the project may actually reduce the magnitude of these impacts from operation and maintenance, due to improved traffic flow, fewer accidents and reduced potential for incidents such as hazardous spills.

Furthermore, the Preferred Design Alternative may result in a reduction in roadway repair costs within the project area. Specifically, horse and buggy traffic, which currently shares the roadway with the motoring public, is detrimental to asphalt surfaces. The steel horseshoes and steel buggy wheels cut into the asphalt. By removing the horse-drawn buggies from the roadway a reduction in roadway repair costs may be realized.

MINIMAL DEGRADATION ALTERNATIVE

The Minimal Degradation Alternative has not been developed to the same engineering detail as the Preferred Design Alternative; however, conceptual design was approximated using information based on similarly-designed retaining walls used on other projects. Although the Minimal Degradation Alternative is technically feasible, it is not necessarily practicable from a cost standpoint.

While construction of this alternative is technically possible, only a marginal ecological benefit (less water quality degradation) would be anticipated compared to the Preferred Design Alternative, since features impacted by the project have limited biological value.

Specifically, four retaining walls would be constructed in lieu of standard roadway embankment to minimize impacts to wetlands A, B, E, and D. The total aerial extent of the reduced impacts would total 0.092-acre (0.479-acre of total impacts under the Preferred Design Alternative and 0.387-acre of total impacts under the Minimal Degradation Alternative). Impacts to the five streams within the project area are identical under the Preferred Design Alternative and the Minimal Degradation Alternative.

Implementation of the Minimal Degradation Alternative would require construction of the four retaining walls in lieu of using standard-sloped roadway embankment. The use of retaining walls in lieu of standard roadway embankment, according to ODOT's Office of Estimating, would increase project cost by approximately \$392,360.00 to \$488,700.00, depending on the type of retaining wall constructed. As demonstrated, the Minimal Degradation Alternative is considered to be technically feasible, but not practicable from a cost standpoint.

NON-DEGRADATION ALTERNATIVE

The Non-Degradation Alternative has no costs, except those associated with current maintenance activities conducted along the existing roadway. Although this alternative would have no impacts to aquatic resources, it would not meet the purpose and need for the project and long-term maintenance and operational difficulties would continue to increase with no improvements to the transportation facility.

10d. For regional sewage collection and treatment facilities, include a discussion of the technical feasibility, cost effectiveness and availability, and long-term plans outlined in state or local water quality management planning documents and applicable facility planning documents.

The proposed project does not involve sewage collection or treatment facilities.

10e. To the extent that information is available, list and describe any government and/or privately sponsored conservation projects that exist or may have been formed to specifically target improvement of water quality or enhancement of recreational opportunities on the affected water resource.

PREFERRED DESIGN ALTERNATIVE, MINIMAL DEGRADATION ALTERNATIVE AND NON-DEGRADATION ALTERNATIVE

A Review of Ohio EPA, ODNR, and a number of private conservation group websites identified one watershed group currently targeting improvements for surface waters within the project area. Grand River Partners, Inc. (GRPI) is organized and operated with the goals of preserving the open space and the natural, recreational, agricultural, and scenic resources of the Grand River Watershed in Ashtabula, Geauga, Lake, Portage and Trumbull Counties. GRPI's goals are achieved by uniting residents, landowners, businesses, and communities in the stewardship and permanent protection of the Grand River Watershed. It is not anticipated that implementation of the proposed project will have an adverse affect on any of the projects sponsored by GRPI.

A review of the 2012 Integrated Water Quality Monitoring and Assessment Report (Ohio EPA), specifically the Monitoring and TMDL Schedules for Ohio's Watershed and Large River Assessment Units, indicated that the streams within the project area, within the Garden Creek and Grapevine Creek Sub-basins, are not currently scheduled for assessment of TMDL evaluation.

Short-term water quality impacts resulting from runoff from disturbed areas during construction will be minimized through the use of sediment and erosion controls in accordance with the ODOT *Construction and Materials Specifications*. Longer duration water quality impacts associated with roadway runoff will be minimized through the implementation of post-construction Best Management Practices in accordance with the ODOT *Location and Design Manual*.

- 10f. Provide an outline of the costs of water pollution controls associated with the proposed activity. This may include the cost of best management practices to be used during construction and operation of the project.**

PREFERRED DESIGN AND MINIMAL DEGRADATION ALTERNATIVE

The construction plans for the proposed project will call for the use of Best Management Practices (BMP's) to discourage sediment from the active construction area from reaching the aquatic environment, specifically Garden Creek, Grapevine Creek, and the three un-named tributaries.

Soil and erosion control will be accomplished in accordance with ODOT's *Construction and Materials Specifications, Location and Design Manual, and Supplemental Specifications*. The Preferred Design Alternative and Minimal Degradation Alternative include the following estimated costs for sediment and erosion control:

Element	Preferred Des. Alt.	Minimal Deg. Alt.
Inlet Protection	\$3,000	\$3,000
Ditch Checks	\$2,200	\$2,200
Perimeter Filter Fabric Fence	\$10,000	\$10,000
Construction Seeding and Mulching	\$400	\$400
Basins and dams	\$2,000	\$2,000
Rock Channel Protection	\$6,000	\$6,000
Sediment Removal	\$600	\$600
Total:	\$24,200	\$24,200

ODOT estimates that the components of the Stormwater Pollution Prevention Plan (SWPPP) would be identical for the Preferred Design Alternative and the Minimal Degradation Alternative.

NON-DEGRADATION ALTERNATIVE

There would be no water pollution control costs associated with this alternative.

10g. Describe any impacts on human health and the overall quality and value of the water resource.

PREFERRED DESIGN ALTERNATIVE

A Level 2 Categorical Exclusion Document, which was approved at the ODOT District 4 Office on February 13, 2012, was prepared for the proposed project. Based on the information contained within that document, the Preferred Design Alternative will have no significant impact on drinking water resources, floodplains, farmland, noise, air pollution, or potential hazardous materials.

The Preferred Design Alternative is not anticipated to result in any substantial adverse impacts to the overall quality and value of surface waters within the project area, and it is not expected to result in the lowering of the existing aquatic life uses for the streams and wetlands within the project area based on the following conclusions:

- ORAM evaluations completed during the Ecological Survey classified the wetlands that will be impacted by the Preferred Design Alternative as Provisional Category 1 (Wetlands B and G), Modified Category 2 (Wetlands C, D, and E), and Category 2 (Wetland A) Wetlands. HHEI and QHEI evaluations completed during the Ecological Survey classified the streams as Provisional Modified Class II PHWH (Streams 1, 2, and 3), Modified Warmwater Habitat (Grapevine Creek), and Warmwater Habitat (Garden Creek) Streams. As a result, only a minor lowering of water quality is expected for these features from loss of habitat by fill placement, culvert replacement/extension, and the placement of RCP.
- Impacts to the physical structure of the streams within the project area are expected to be localized. Physical stream modifications will be limited to the footprint of the proposed impact areas, with no adverse effects to stream function (including flow pattern, velocity or sediment carrying capabilities), drainage area, or the aquatic community expected upstream or downstream of the proposed culvert replacements/extensions.
- During construction, impacts due to erosion of exposed stream banks and channel work will be controlled utilizing BMP's in accordance with ODOT's *Construction and Materials Specifications, Location and Design Manual, and Supplemental Specifications*. Additionally, the contractor will adhere to the conditions of the NPDES permit that will be issued by the Ohio EPA.
- The contractor will also be required to exercise reasonable precautions necessary during construction to prevent pollution of Garden Creek, Grapevine Creek, the three un-named tributaries, and downstream waterways. Construction discharge will be adequately filtered prior to discharge into the waterways and will meet the requirements of all applicable laws, ordinances, and regulations.
- Impacts to Garden Creek, Grapevine Creek, the three un-named tributaries, and the six wetlands are expected to be offset by proposed mitigation measures.
- The Preferred Design Alternative is not expected to result in the lowering of aquatic use designations in any of the streams outside of the project area.

MINIMAL DEGRADATION ALTERNATIVE

Impacts on human health and the overall quality and value of the water resources within the project area would be similar to the Preferred Design Alternative. As this alternative would require nearly the same construction activities, impacts to human health related to water quality would be relatively the same. Overall, only a marginal ecological benefit (less water quality degradation) would be anticipated with the Minimal Degradation Alternative compared to the Preferred Design Alternative since features impacted by the project have limited aquatic value.

NON-DEGRADATION ALTERNATIVE

No direct impacts to water resources in the project area occur with the Non-Degradation Alternative. However, as traffic and safety problems are exacerbated along the existing roadway, continued operational and maintenance activities are conducted, and possible spot improvements to address critical transportation problem areas are needed, a lowering of water quality can still be expected over time.

10h. Describe and provide an estimate of the important social and economic benefits to be realized through this project. Include the number and types of jobs created, and tax revenues generated, and a brief discussion on the condition of the local economy.

PREFERRED DESIGN ALTERNATIVE

Condition of the Local Economy

According to the Office of Policy, Research and Strategic Planning with the Ohio Department of Development, the population in Trumbull County has remained relatively stable over the past several decades and had a 2010 Census population of 210,312. The largest concentration of population in Trumbull County is within the limits of the City of Warren (41,557 individuals). Additionally, land use in Trumbull County is primarily forest (42.26%), cropland (28.43%), and urban (16.47%). Open water and wetlands comprise approximately 9.36% of the total land use.

The majority of the civilian labor force in Trumbull County is employed in the private sector, with manufacturing, education, health services, and transportation/utility trade industries being the leading employers. Major employers in Trumbull County include the Delphi Corporation, General Motors Corporation, Giant Eagle, Inc., HM Health Services, and Sears Holding/Kmart Corporation.

The median household income in 2010 was \$42,296.00, which is slightly below the median Ohio State household income of \$47,358.00. The per capita personal income in Trumbull County in 2010 was \$30,579.00, compared to the 2010 State of Ohio per capita personal income of \$25,113.00.

The Ohio Department of Development reports that the unemployment rate has steadily decreased in recent years, going from 13.6% in 2009 to 11.9% in 2010 to 9.6% in 2011. The Ohio Department of Development also reports that the percentage of family incomes that fall below the national poverty level in 2010 was 11.5% compared to the State of Ohio average of 14.2%.

Economic Benefits Realized

No jobs will be directly created by the Preferred Design Alternative; however, economic opportunities are expected to remain stable or increase through improved accessibility in the general area. Local businesses may experience a short-term employment increase related to the demands of the construction project. Such establishments include local eateries, service stations, and other businesses offering construction-related goods and services.

State and Local Tax Revenues Generated by the Project

The Preferred Design Alternative will result in a loss in property tax from the conversion of private property to highway right-of-way (approximately 3.18 acres). Tax revenues overall, however, are not expected to see a substantial loss.

Recreational Opportunities

No recreational opportunities are expected to be realized as a result of the Preferred Design Alternative.

Social Benefits Realized

The Preferred Design Alternative is not expected to directly support any major social benefits, although several indirect positive impacts are to be expected relating to separating the slow-moving horse-drawn Amish vehicles (buggies) and higher speed motor vehicles, as discussed below.

The proposed project is funded by ODOT's Amish Buggy Safety Program. The Amish Buggy Safety Program provides funding for transportation improvement projects on priority state routes and off-road trails adjacent to priority state routes that improve safety for motorists and horse drawn vehicles. The priority state routes were identified and selected based on ODOT buggy/motorized vehicle crash data. The TRU-534 route was identified as a priority roadway in Section 5.2 of ODOT's Amish Buggy Safety on Ohio's Roadway System Report (Sept 2000). District routes identified were evaluated and prioritized based on the criteria of 5.2.2 of that report.

The Preferred design Alternative will construct the wider Slow Moving Vehicles (SMV) shoulders through a 6,410 feet segment north of the Mesopotamia Square extending over the hill north of the Donley Road intersection. On this segment, SR 534 rolls through several hills where the vertical grades and profile prevent passing zones due to constrained sight distance. There is an apparent established concentration of Amish population in the area that generates buggy traffic along this section SR 534. The rural area evidently also produces the occasional slow moving agricultural vehicle on this route also. The route's existing narrow lane width and lack of shoulder and deep ditches exacerbate a hazardous condition with occasional stretches of minimally offset guardrail hemming in the pedestrians who commonly traverse the edges of the roadway.

Despite the very low traffic volumes of this high speed (55 mph) route, the section has a very high percentage of large truck traffic of 10% to 12% (rural routes may experience 2% to 4% trucks on average) which is an important aspect to consider regarding the hazardous speed and

size differential which the vehicle types regularly using this section of SR 534 create. An aggregate company located on SR 534, approximately 2.5 miles north of Mesopotamia Square can generate many of the heavy, large trucks traveling this section.

Also notwithstanding the low traffic volumes, crash data through 2007 shows that of the 57 crashes reported within this section (not including an additional 14 animal crashes), 16 crashes (28%) involved an Amish buggy (14), farm vehicle (1) or pedestrian (1) occurring within this section since 1990. The majority of the buggy related crashes were rear-end (6) crashes or sideswipe (7) crashes. All but two of these crashes occurred during daylight hours and, only one occurred on wet pavement. Regarding all crashes within this short section, at 4.55 crashes per MVM (million vehicle miles) the crash rate for this section is twice the statewide mean crash rate for a 2-lane rural state route (2.23 crashes/MVM).

Additionally, by providing additional roadway width for errant vehicle recovery and crash avoidance maneuvers, it is also recognized that widened paved shoulders exact reduction of crash types other than those created by conflict with SMV's on high speed rural routes. Over half (23) of the remaining crashes (41) occurring within the section were fixed object crashes (run-off-road), with an equal mixture of head-on, rear-end and, sideswipe crashes comprising the rest. It is anticipated that the Preferred Design Alternative will also reduce these type of crashes within the project area.

MINIMAL DEGRADATION ALTERNATIVE

The Minimal Degradation Alternative would be expected to have the same effects on economic and social benefits as the Preferred Design Alternative.

NON-DEGRADATION ALTERNATIVE

No social or economic benefits would be realized with the Non-Degradation Alternative. This alternative would not address the transportation need in the area for improving safety by separating slow-moving horse-drawn Amish vehicles (buggies) and higher speed motor vehicles and does not provide opportunity for an improved regional economic base related to improved traffic flow and safety in the area.

10i. Describe and provide an estimate of the important social and economic benefits that may be lost as a result of this project. Include the effect on commercial and recreational use of the water resource, including effects of lower water quality on recreation, tourism, aesthetics, or other use and enjoyment by humans.

PREFERRED DESIGN ALTERNATIVE

No substantial adverse economic impacts will result from the Preferred Design Alternative. The Preferred Design Alternative will result in a loss in property tax from the conversion of areas to highway right-of-way. No jobs will be directly lost by the construction of the Preferred Design Alternative and no residence, business, farm, or institutional relocations are proposed.

No substantial adverse social impacts are expected as a result of construction of the Preferred Design Alternative. To the contrary, overall safety and operation along the project area is expected to improve as a result of the project.

MINIMAL DEGRADATION ALTERNATIVE

The Minimal Degradation Alternative would be expected to have the same effects on economic and social conditions as the Preferred Design Alternative.

NON-DEGRADATION ALTERNATIVE

The Non-Degradation Alternative would not address the transportation need in the area for improving safety by separating slow-moving horse-drawn Amish vehicles (buggies) and higher speed motor vehicles. The main benefits that would be lost as a result of this alternative are the opportunity to improve travel safety and efficiency, as well as improving traffic flow and reducing accidents. It is anticipated that vehicular delays and traffic accidents would be exacerbated as a result of the Non-Degradation Alternative.

10j. Describe environmental benefits, including water quality, lost and gained as a result of this project. Include the effects on the aquatic life, wildlife, threatened or endangered species.

PREFERRED DESIGN ALTERNATIVE

Environmental benefits lost as a result of the project are described in detail in Block 10b and 10g of this Antidegradation Evaluation (including a discussion of impacts to aquatic habitat, fauna, and threatened and endangered species). In general, environmental benefits lost as a result of the Preferred Design Alternative consist of only a minor lowering of water quality to the wetlands and streams within the project area since they exhibit limited aquatic value.

Environmental benefits gained as a result of the Preferred Design Alternative include preservation of wetland and stream habitats, in perpetuity, as a result of off-site stream and wetland mitigation. Stream and wetland mitigation techniques to be implemented for this project are described in detail in Block 10k of this Antidegradation Evaluation.

MINIMAL DEGRADATION ALTERNATIVE

By comparison to the Preferred Design Alternative, the Minimal Degradation Alternative provides a slightly better impact scenario; however, water quality impacts will still occur from unavoidable impacts to the wetland and stream resources within the project area. Overall, only a marginal ecological benefit (less water quality degradation) would be anticipated compared to the Preferred Design Alternative since the features impacted by the project have limited biological value.

NON-DEGRADATION ALTERNATIVE

The Non-Degradation Alternative would not directly impact any water resources and would not result in any direct environmental loss or gain. This alternative, however, does not meet the transportation need in the project area for improving safety by separating slow-moving horse-drawn Amish vehicles (buggies) and higher speed motor vehicles. As traffic and safety problems are exacerbated, continued operational and maintenance activities are conducted, and possible spot improvements to address critical transportation problem areas are needed, a lowering of water quality can still be expected over time.

10k. Describe the mitigation techniques proposed (except for the Non-Degradation Alternative).

PREFERRED DESIGN ALTERNATIVE

It is the intent of this application to demonstrate that the adverse impacts to the aquatic environment, should they be authorized, are unavoidable. Throughout the development of the Preferred Design Alternative, all efforts have been made to avoid and minimize discharges to the maximum extent practicable.

The Preferred Design Alternative will not result in any temporary impacts to streams and wetlands. All areas that will be impacted during construction are within the footprint of the permanent fills that are proposed. This includes all structure replacements and clearing/grading areas within the wetlands where permanent roadway fill is proposed. Additionally, Best Management Practices (BMPs) will be used to control any temporary impacts due to erosion of exposed soils in accordance with ODOT's "Construction and Material Specifications" (CMS) and the project Stormwater Pollution Prevention Plan (SWPPP).

The aquatic impacts associated with the proposed project were originally evaluated and presented in a joint Section 404 and Individual Section 401 Permit Application, prepared for the project in April of 2006 by MS Consultants, Inc. Those permit applications were reviewed by the United States Army Corps of Engineers (USACE) and the Ohio Environmental Protection Agency (Ohio EPA), and subsequently, permit authorization was granted by both agencies; USACE- 200600417 (1/12/2007) and Ohio EPA – 062627 (9/20/2006). Due to project delays, a reduction in the scope of the proposed project, and the expiration of the previously-granted Individual Section 401 Water Quality Certification, re-evaluation of the aquatic impacts and the preparation of this Application for Individual Section 401 Water Quality Certification was required. Likewise, re-evaluation of the proposed mitigation techniques was deemed appropriate as the scope of aquatic resource impacts has changed.

Specifically, stream impacts under the Preferred Design Alternative have increased from 817 linear feet in the 2006 Application to 925 linear feet in this Application, while wetland impacts were reduced from 1.26 acres in the 2006 Application to 0.479-acre in this Application. Therefore, the proposed mitigation for the currently proposed impacts have been revised and adjusted accordingly. Further information is provided in Appendix D.

Below is a summary of the anticipated permanent impacts to the aquatic environment that will result from the Preferred Design Alternative.

Streams - A total of 925 linear feet (0.178-acre) of permanent channel disturbance is proposed for the five streams.

Wetlands - A total of 0.479-acre of permanent fill are proposed for six wetlands. 774 CY of permanent roadway fill is required to accommodate the widened roadway pavement.

To offset the permanent impacts to the aquatic environment, compensatory mitigation has been incorporated into the proposed project. Specifically, all permanent wetland impacts will be mitigated through the utilization of wetland credits at Cherry Valley Wetland Mitigation Bank. Permanent stream impacts will be mitigated through utilization of credits at ODOT's North River Road Dam Pooled Stream Mitigation Area. Details regarding the proposed measures are provided below. Appendix D contains copies of ODOT's latest balance-sheets for the banks/pooled mitigation areas being utilized for this project.

Streams

The Preferred Design Alternative will result in 925 linear feet of permanent channel disturbance to Garden Creek, Grapevine Creek, and three un-named tributaries. Permanent impacts will be mitigated off-site by utilizing credits at ODOT's North River Road Dam Pooled Stream Mitigation Area at a 1.5:1 ratio. 1,388 linear-feet of stream credits will be utilized (925x1.5).

Wetlands

The Preferred Design Alternative will result in the placement of permanent fill within 0.479-acre of six wetlands. Permanent wetland impacts will be mitigated off-site by utilizing credits at Cherry Valley Wetland Mitigation Bank. Specifically, the Preferred Design Alternative will permanently impact 0.068-acre of Category 1 wetlands, and 0.411-acre of Category 2 wetlands. Using a 1.5:1 ratio for Category 1 and a 2.0:1 ratio for Category 2, a total of 0.924-acre of mitigation are required. To satisfy this requirement, ODOT will utilize 0.924-acre from their available balance.

MINIMAL DEGRADATION ALTERNATIVE

The Minimal Degradation Alternative is similar to the Preferred Design Alternative with the exception that permanent impacts to four wetlands would be reduced. Specifically, four retaining walls would be constructed in lieu of standard roadway embankment to minimize impacts to wetlands A, B, E, and D. The total aerial extent of the reduced impacts would total 0.092-acre (0.479-acre of total impacts under the Preferred Design Alternative and 0.387-acre of total impacts under the Minimal Degradation Alternative).

Permanent impacts to the streams within the project area would be mitigated the same as the Preferred Design Alternative. Permanent impacts to wetlands would also be the same as the

Preferred Design Alternative, except the amount of credits that ODOT would utilize would be reduced because of the reduction in permanent impacts.

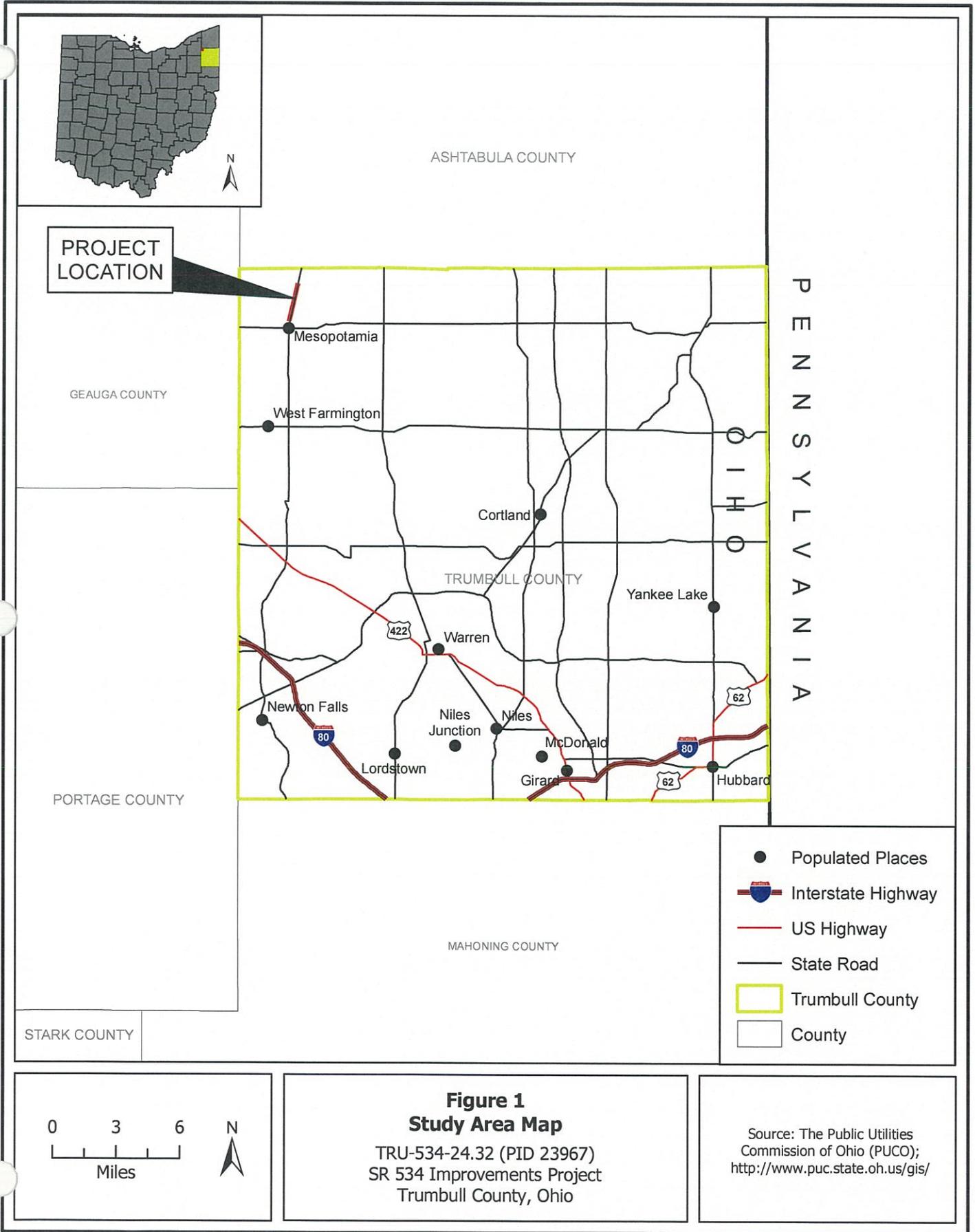
Appendix A - Figures

State of Ohio County Map

Project Location Map – West Farmington, Ohio USGS Topographic Quadrangle

Project Plan Sheets (Preferred Design and Minimal Degradation Alternative)

Photographic Log



PROJECT LOCATION

ASHTABULA COUNTY

GEAUGA COUNTY

TRUMBULL COUNTY

PORTAGE COUNTY

MAHONING COUNTY

STARK COUNTY

P E N N S Y L V A N I A

- Populated Places
- Interstate Highway
- US Highway
- State Road
- Trumbull County
- County

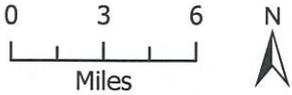


Figure 1
Study Area Map
 TRU-534-24.32 (PID 23967)
 SR 534 Improvements Project
 Trumbull County, Ohio

Source: The Public Utilities Commission of Ohio (PUCO);
<http://www.puc.state.oh.us/gis/>



Legend
USA Topo Maps



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PROJECT NUMBER

FIGURE

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DRAWN BY

SHEET TITLE

E. CURTIS

**TRU-534-24.32
 PROJECT LOCATION MAP**

DATE

10.26.11

Preferred Design Alternative



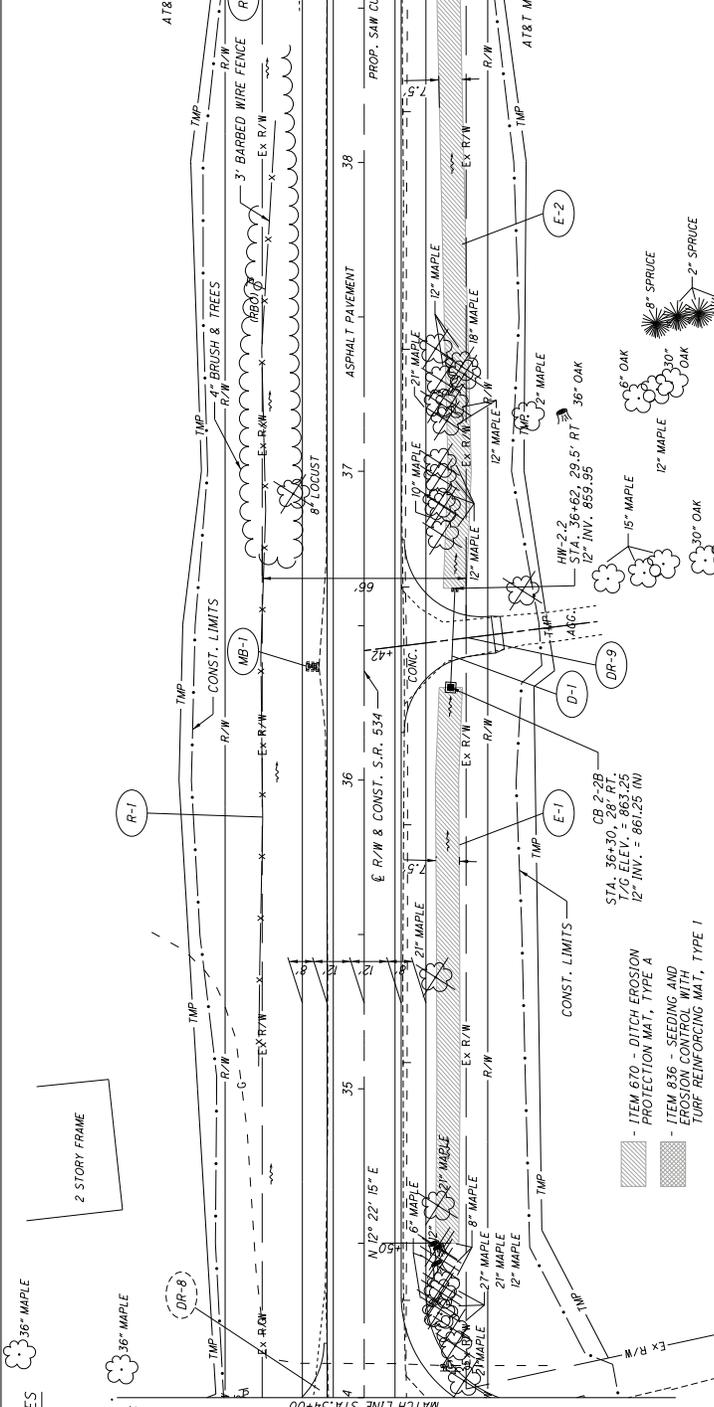
CHECKED _____
 SCALE IN FEET
 HORIZONTAL
 CALCULATED

PLAN AND PROFILE
 STA. 34+00 TO STA. 39+00

TRU-534-24.32

23
 149

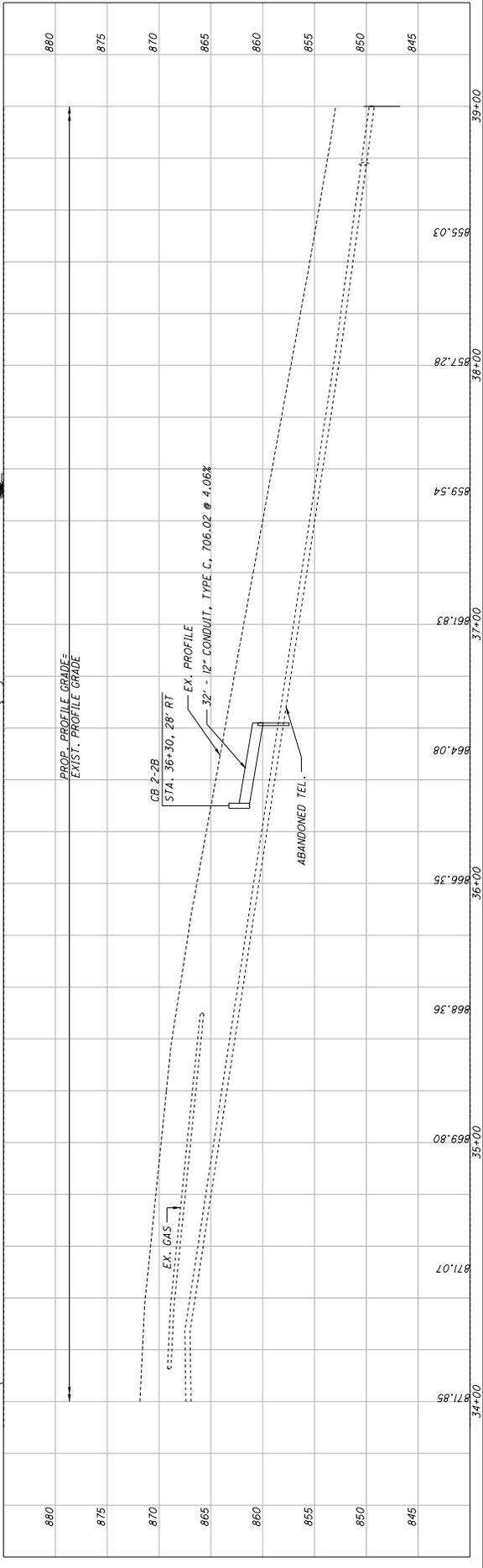
BENCHMARK NO. 12
 STA. 40+72.50', 15.88' RT.
 3/8" REBAR WITH COTY CAP AT SOUTH EDGE
 1/2" REBAR WITH COTY CAP AT NORTH EDGE
 LEADING WEST TO
 RESIDENT # 8083.
 ELEV. = 846.99



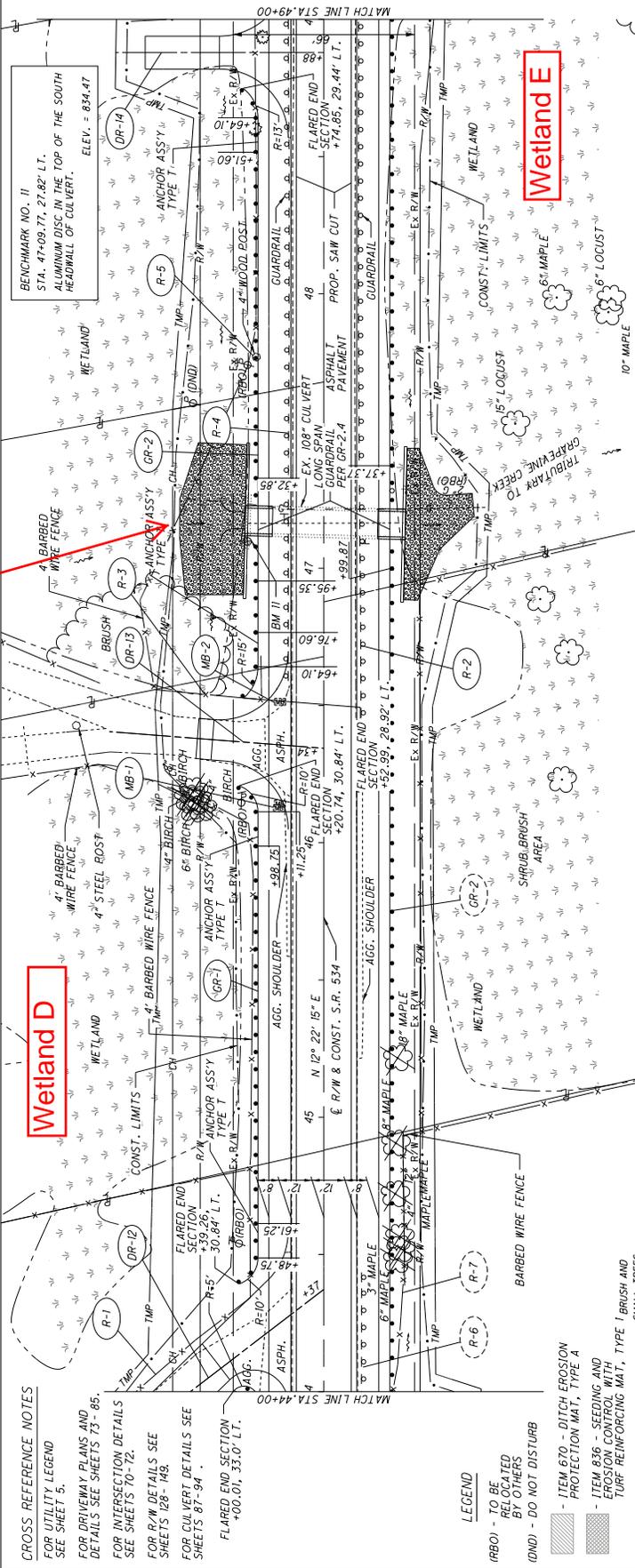
CROSS REFERENCE NOTES
 FOR UTILITY LEGEND SEE SHEET 5.
 FOR DRIVEWAY PLANS AND DETAILS SEE SHEETS 73-86.
 FOR INTERSECTION DETAILS SEE SHEETS 70-72.
 FOR R/W DETAILS SEE SHEETS 128-148.
 FOR CULVERT DETAILS SEE SHEETS 87-94.

LEGEND
 (RBO) - TO BE RELOCATED BY OTHERS
 (DND) - DO NOT DISTURB

ITEM 670 - DITCH EROSION PROTECTION MAT, TYPE A
ITEM 836 - SEEDING AND EROSION CONTROL WITH TURF REINFORCING MAT, TYPE 1

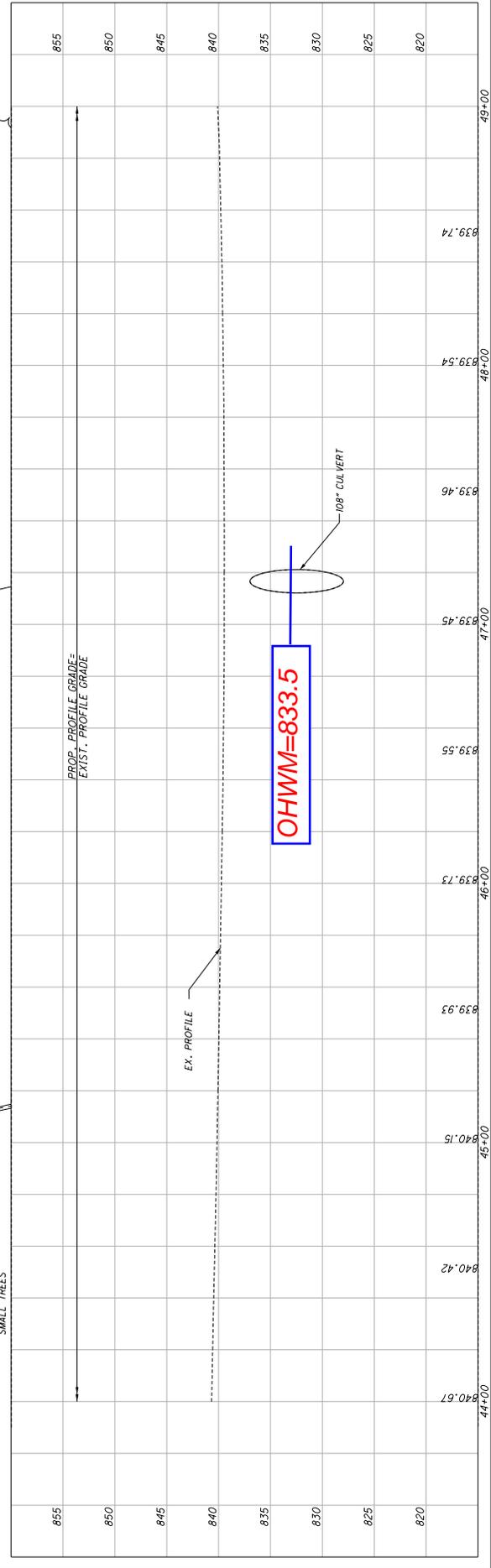


34+00 35+00 36+00 37+00 38+00 39+00



CROSS REFERENCE NOTES
 FOR UTILITY LEGEND
 SEE SHEET 5.
 FOR DRIVEWAY PLANS AND
 DETAILS SEE SHEETS 73-85
 FOR INTERSECTION DETAILS
 SEE SHEETS 70-72.
 FOR R/W DETAILS SEE
 SHEETS 128-149.
 FOR CULVERT DETAILS SEE
 SHEETS 87-94.
 FLARED END SECTION
 +00.01, 33.10' LT.

LEGEND
 (RBO) - TO BE
 RELOCATED
 BY OTHERS
 (DND) - DO NOT DISTURB
 - ITEM 670 - DITCH EROSION
 PROTECTION MAT, TYPE A
 - ITEM 836 - SEEDING AND
 EROSION CONTROL WITH
 TURF REINFORCING MAT, TYPE I BRUSH AND
 SMALL TREES

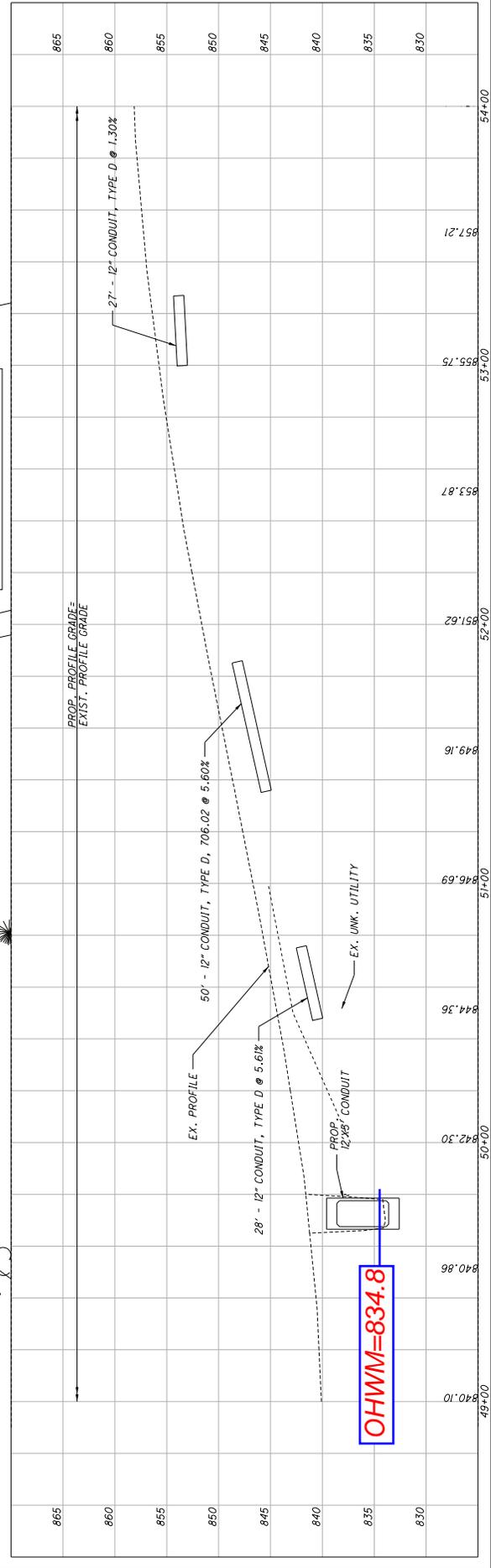
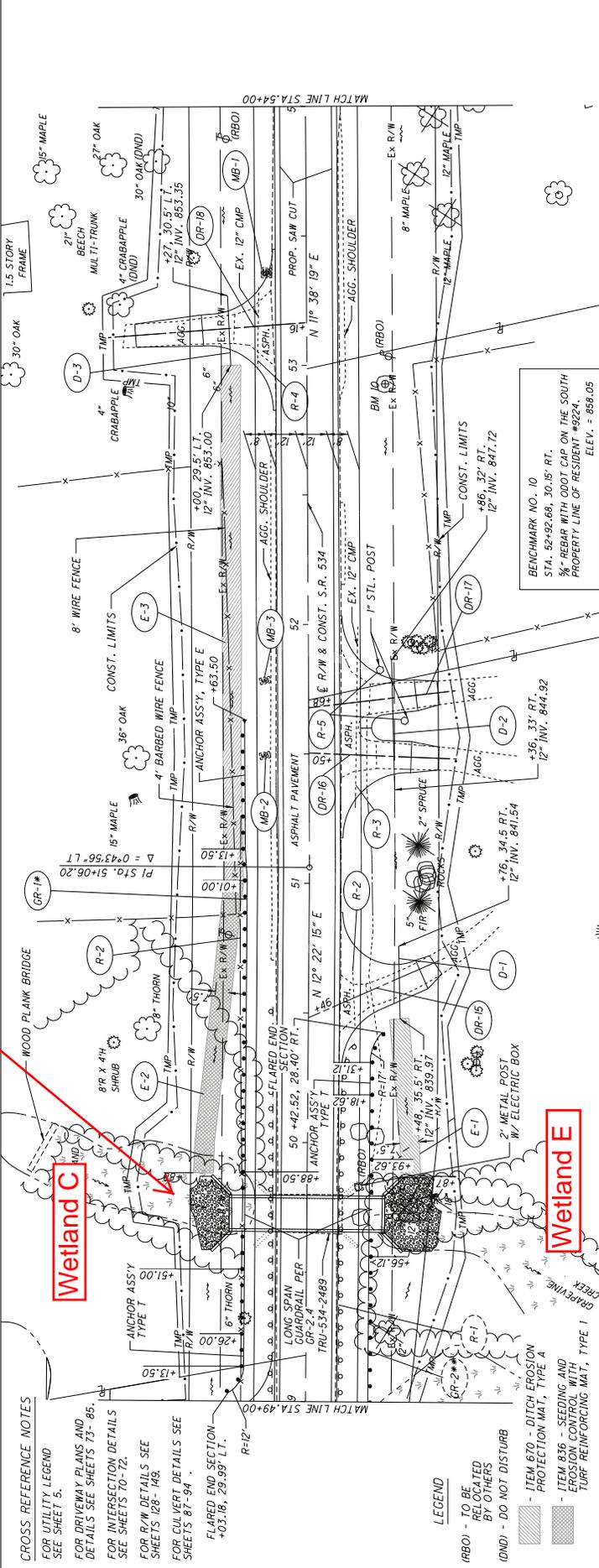


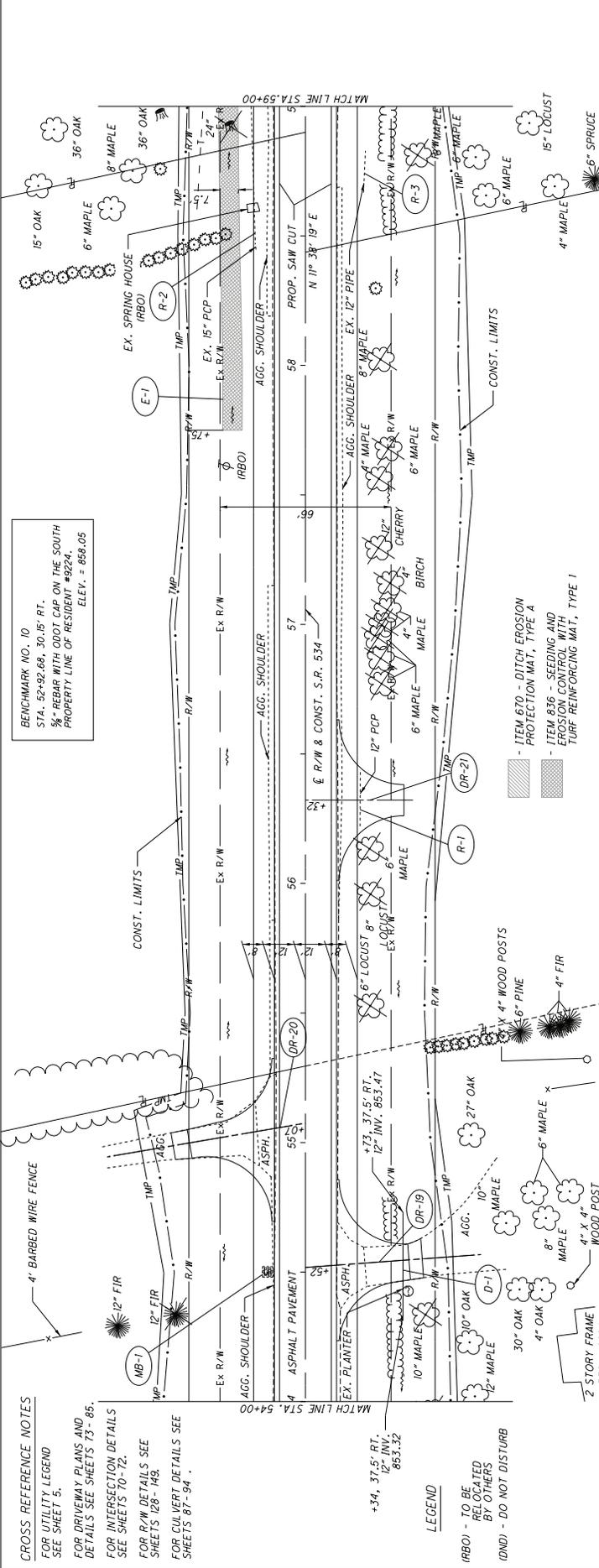
Stream 2

Wetland D

Wetland E

OHWM=833.5

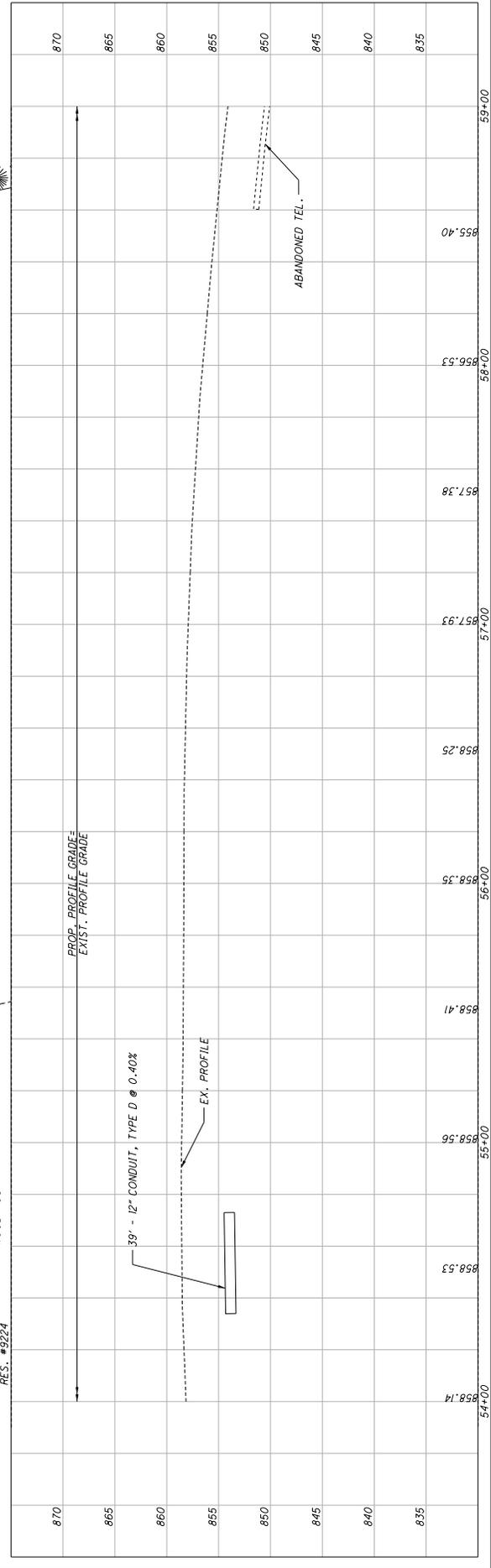




CROSS REFERENCE NOTES
FOR UTILITY LEGEND
SEE SHEET 5.
FOR DRIVEWAY PLANS AND
DETAILS SEE SHEETS 73-85.
FOR INTERSECTION DETAILS
SEE SHEETS 70-72.
FOR R/W DETAILS SEE
SHEETS 128-149.
FOR CULVERT DETAILS SEE
SHEETS 87-94.

LEGEND
(RBO) - TO BE
RELOCATED
BY OTHERS
(DND) - DO NOT DISTURB

ITEM 670 - DITCH EROSION
PROTECTION MAT, TYPE A
ITEM 836 - SEEDING AND
EROSION CONTROL WITH
TURF REINFORCING MAT, TYPE 1



PROP. PROFILE GRADE
EXIST. PROFILE GRADE

39" - 12" CONDUIT, TYPE D @ 0.40%

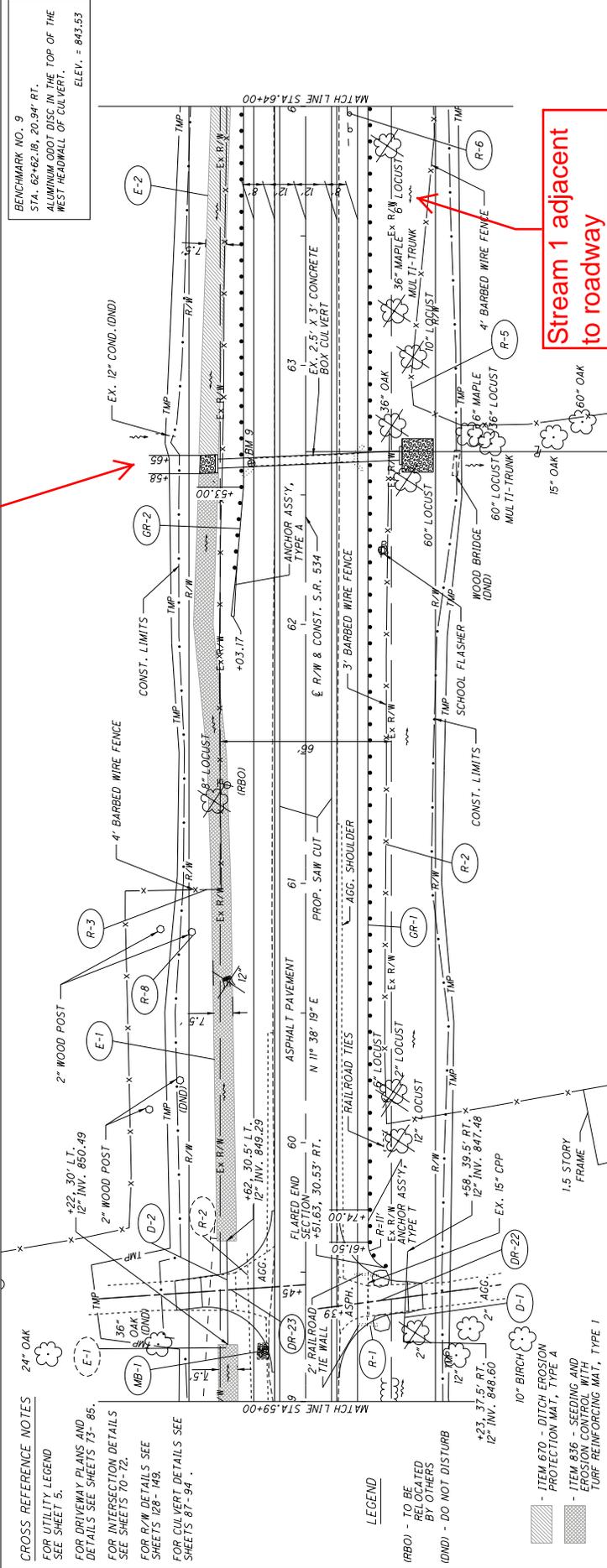
EX. PROFILE

ABANDONED TEL.

BENCHMARK NO. 9
 STA. 62+62.18, 20.94' RT.
 ALUMINUM ODOT DISC IN THE TOP OF THE
 WEST HEADWALL OF CULVERT.
 ELEV. = 842.53

Roadside Ditch

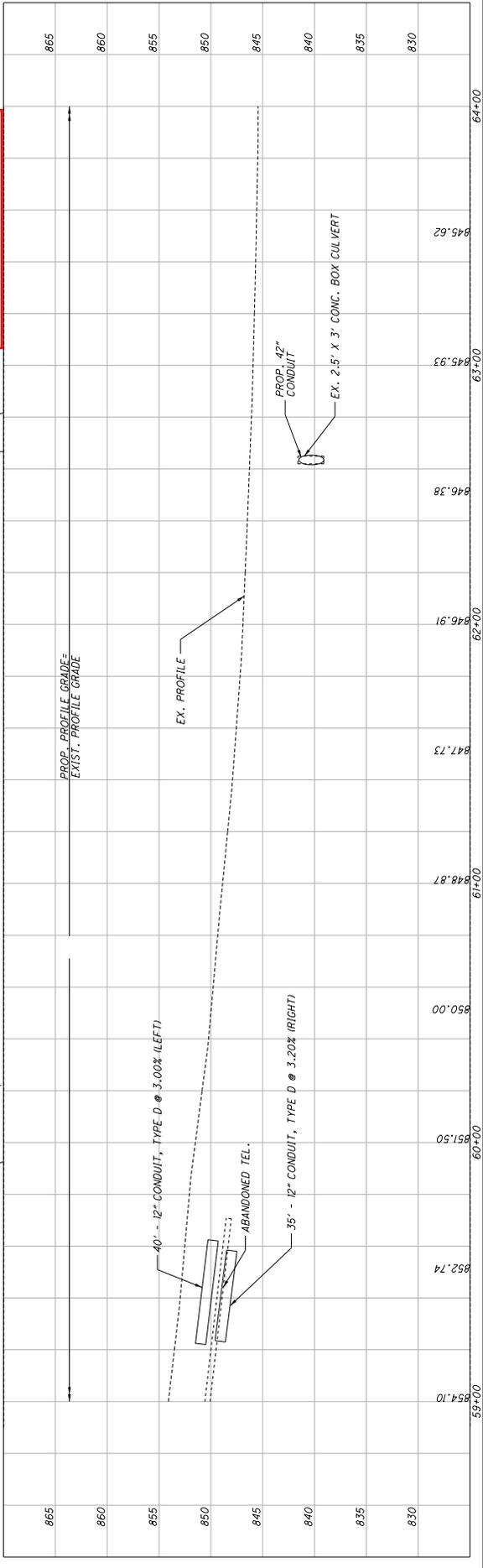
Stream 1 adjacent
 to roadway

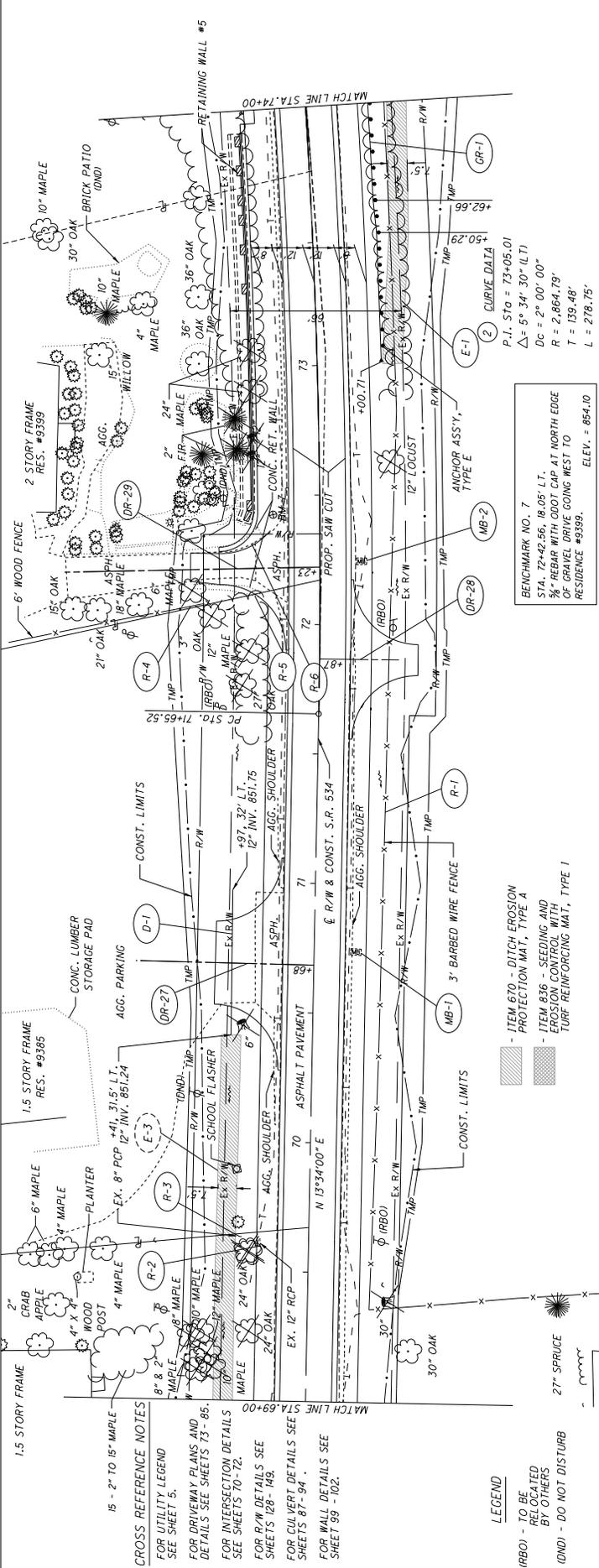


CROSS REFERENCE NOTES
 FOR UTILITY LEGEND
 SEE SHEET 5.
 FOR DRIVEWAY PLANS AND
 DETAILS SEE SHEETS 73-86.
 FOR INTERSECTION DETAILS
 SEE SHEETS 70-72.
 FOR R/W DETAILS SEE
 SHEETS 128-148.
 FOR CULVERT DETAILS SEE
 SHEETS 87-94

LEGEND
 (RBO) - TO BE
 RELOCATED
 BY OTHERS
 (INDI) - DO NOT DISTURB

ITEM 670 - DITCH EROSION
 PROTECTION MAT, TYPE A
 ITEM 836 - SEEDING AND
 EROSION CONTROL WITH
 TURF REINFORCING MAT, TYPE 1





CROSS REFERENCE NOTES

FOR UTILITY LEGEND SEE SHEET 5.

FOR DRIVEWAY PLANS AND DETAILS SEE SHEETS 73 - 85.

FOR INTERSECTION DETAILS SEE SHEETS 10 - 12.

FOR R/W DETAILS SEE SHEETS 28 - 148.

FOR CURB DETAILS SEE SHEETS 87 - 94.

FOR WALL DETAILS SEE SHEET 98 - 102.

LEGEND

(RBO) - TO BE RELOCATED BY OTHERS

(DND) - DO NOT DISTURB

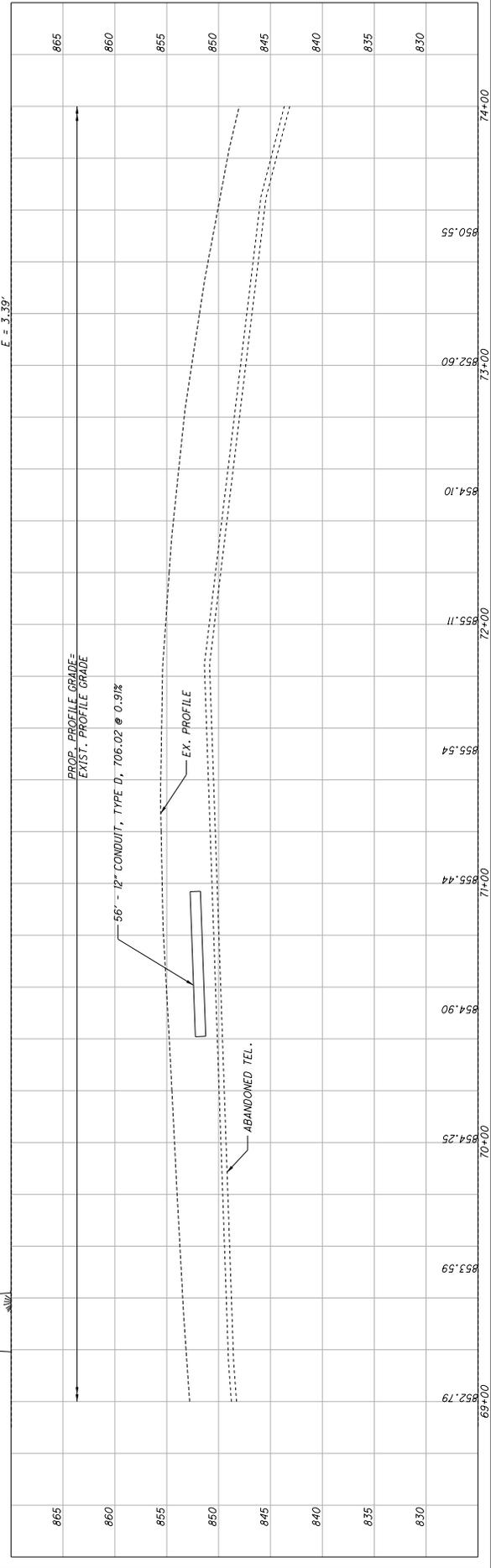
- ITEM 670 - DITCH EROSION PROTECTION MAT, TYPE A

- ITEM 836 - SEEDING AND EROSION CONTROL WITH TURF REINFORCING MAT, TYPE 1

BENCHMARK NO. 7
STA. 72+42.56, 18.05' LT.
3/4" REBAR WITH ODOT CAP AT NORTH EDGE OF GRAVEL DRIVE GOING WEST TO RESIDENCE #9399.
ELEV. = 864.10

CURVE DATA

P.I. Sta = 73+05.01
 $\Delta = 5^\circ 34' 30''$ (LTI)
 $Dc = 2^\circ 00' 00''$
 $R = 2,864.79'$
 $T = 139.48'$
 $L = 218.75'$
 $E = 3.33'$



PROP. PROFILE GRADE
EXIST. PROFILE GRADE

56' - 12" CONDUIT, TYPE D, 706.02 @ 0.91%

ABANDONED TEL.

