CITY OF FRANKLIN

REPORT TO THE PLAN COMMISSION

Meeting of November 21, 2019

Special Use

RECOMMENDATION: City Development staff recommends approval of the proposed Special Use for The Franklin Mobile Estates culvert and flood plain impacts upon property located at 6361 S 27th St. subject to the conditions set forth in the draft Resolution.

Project Name:	Franklin Mobile Estates Special Use and Land Use Permit
Project Address:	6361 S 27th St.
Applicant:	David Steinberger, Franklin Mobile Home Park
Property Owner:	Franklin Mobile LLC
Current Zoning:	R-8 Multiple-Family Residence District and FW Floodway District
2025 Comprehensive Plan:	Commercial
Use of Surrounding Properties:	R-8 Mobile Home park to the southeast on 27th St. and to the northwest on College Ave.; B-2 General Business District to the northeast on 27th and College; FW Floodway District to the north and south of the swathe of FW on the subject property, and C-1 Conservancy District to the west.
Applicant Action Requested:	Recommendation of approval for the proposed Special Use and associated Land Use Permit for floodway impacts for the construction of a culvert bridge for Franklin Mobile Estates.

INTRODUCTION

On September 12, 2019, the applicant submitted completed applications for a Special Use and a Land Use Permit (Misc. Application), including a Natural Resource Protection Plan, to allow construction of a replacement bridge within the floodway associated with the East Branch of the Root River, which is located within the central portion of the subject property. Bridges and approaches are a Special Use in the FW Floodway District under § 15-3.0604.B.1.c. Changes to floodplain elevations require a Land Use Permit, subject to review and approval of the Zoning Administrator.

PROJECT DESCRIPTION AND ANALYSIS

The subject property contains an existing mobile home park, located on the west side of 27th St. A bridge was installed along the private road "West Westmoor Ave." serving the mobile homes, sometime between 1955 and 1958 according to the applicant. Aerial photographs from 1956

show the portion of the parcel east of the stream to be occupied by mobile homes; by 1963 these had expanded to the western portion of the lot.

The proposed culvert is intended to replace a temporary bridge (that is in disrepair and is failing) which in turn was recently constructed to replace the original bridge which had also been in disrepair. Neither the original nor the replacement bridge construction projects had obtained the required permits and approvals from the City of Franklin and the Wisconsin Department of Natural Resources for impacts to the floodway.

0.011 acres of stream bank and 0.004 acres of wetland will be permanently impacted by the proposed bridge replacement. No mitigation is proposed, however, all areas disturbed as part of the bridge replacement are proposed to be restored with native vegetation that will enhance the existing streambank.

The applicant is requesting that the Plan Commission and Common Council grant the proposed special use. Staff recommendations are contained in the attached draft Resolution.

Special Use

However, staff would note that twelve (12) mobile homes are currently located within the mapped floodway associated with the East Branch of the Root River. Although mobile homes have been present in this area since the 1950's, the City's Floodplain Zoning regulations which were first established by Ordinance No. 221 and adopted by the City of Franklin on February 6, 1968, do not allow such structures within the floodplain/floodway. Furthermore, based upon preliminary research of the City's historic records, since February 6, 1968, the 12 mobile homes appear to have not received any Building Permit approvals to be allowed within the floodway. In addition, should structures be allowed within a floodway, certain Building Code provisions and Floodplain Zoning regulations would apply.

In addition, the City's Zoning Ordinance No. 22(A), adopted in October 29, 1957, states in Section 22.03.E.1. "No principal building shall be erected, structurally altered, or placed on land which is not adequately drained at all times nor which is subject to periodic flooding." Lastly, § 15-3.0319.E of the City's current Unified Development Ordinance states that no mobile home, mobile home park, or trailer camp shall be placed or moved onto lands lying in the FW District.

Therefore, pursuant to Sections 15-3.0701D., staff recommends that all mobile homes which were placed within the floodway after February 6, 1968 without all proper permits and approvals be removed as soon as possible, but no later than from one year of the date of the subject replacement culvert Special Use approval. Staff suggests for resident safety purposes, that all mobile homes located within the floodway be removed within one year.

Land Use Permit (Misc. Application):

In regard to the Land Use Permit, it can be noted that the City of Franklin Zoning Administrator approved the proposed culvert/bridge replacement project subject to a number of conditions as noted below:

1. That the subject culvert/bridge replacement shall proceed as presented in the Miscellaneous and Special Use application materials date stamped by the City on September 20, 2019, and as may be revised by the City of Franklin, the Wisconsin Department of Natural Resources (DNR), and the Federal Emergency Management Agency (FEMA).
2. That the applicant shall verify if any private wells or private septic systems area located within the floodway. If so, the applicant shall properly abandon/remove such private wells and/or septic systems, or shall obtain all required permits and approvals for such private wells and/or septic systems, within six months of this conditional Land Use Permit approval.
3. That the subject culvert/bridge replacement does not increase the floodway/floodplain Base Flood Elevation at any location.
4. That the subject culvert/bridge replacement decreases the floodway/floodplain Base Flood Elevation by no more than the same 0.1' rounded as in the effective Base Flood Elevation.
5. That the applicant shall submit a copy of the updated Floodplain Study model (latest revision date) to the City of Franklin for transmittal to FEMA as the model of record within 6 months of project completion.
6. That the applicant shall be responsible for any fees or charges as may be required by FEMA or the DNR as part of the submittal of the Floodplain Study model.

It can also be noted that FEMA has determined that a Letter of Map Revision (LOMR) will not be required for this project subject to conditions #3, #4, and #5 noted above. In addition, FEMA and the DNR will jointly determine the submittal process for the Floodplain Study model as the model of record so that future floodplain projects/models will already have this new data in it.

Other permits or approvals:

By letter dated January 4, 2019, the applicant received pre-construction approval from the Army Corps of Engineers in regard to discharge of fill in wetlands and in the East Branch of the Root River for the proposed failed bridge replacement.

By letters dated March 18, 2019, the applicant obtained conditional approval from the DNR to construct the proposed culvert in the east branch of the Root River, and to fill certain wetlands.

By letter dated September 27, 2019, the applicant has received DNR approval of the floodplain analysis for the culvert project based upon a revised study dated September 25, 2019.

STAFF RECOMMENDATION

Staff has no objection to the proposed special use, subject to the conditions stipulated in the draft Resolution. Please note that the subject special use request, for which staff is recommending conditional approval, pertains solely to the proposed replacement culvert.

Staff suggests creation of a conservation easement to protect the stream and related natural resources in perpetuity, pursuant to § 15-7.0103.X. of the UDO.

STATE OF WISCONSIN CITY OF FRANKLIN MILWAUKEE COUNTY

[Redraft 11-15-19]

RESOLUTION NO. 2019-_____

A RESOLUTION IMPOSING CONDITIONS AND RESTRICTIONS FOR THE APPROVAL OF A SPECIAL USE FOR REPLACEMENT OF AN EXISTING FAILED BRIDGE AND ASSOCIATED CULVERT WITHIN A SHORELAND, FLOODWAY AND WETLANDS AREA ASSOCIATED WITH THE EAST BRANCH OF THE ROOT RIVER LOCATED ON A PRIVATE ROAD REFERRED TO AS WEST WESTMOOR AVENUE, IN THE FRANKLIN MOBILE HOME PARK, PROPERTY LOCATED AT 6361 SOUTH 27TH STREET (DAVID STEINBERGER, PRESIDENT OF FRANKLIN MOBILE, LLC, APPLICANT)

WHEREAS, David Steinberger, President of Franklin Mobile, LLC, having petitioned the City of Franklin for the approval of a Special Use within an R-8 Multiple-Family Residence District, FW Floodway District and B-2 General Business District to allow for replacement of an existing failed bridge (approximately 18 feet long by 16 feet wide) with an approximately 25 foot long by 20 foot wide bridge and associated culvert over the East Branch of the Root River in the Franklin Mobile Home Park (the bridge is located within the shoreland, floodway and wetlands associated with the East Branch of the Root River), located on a private road referred to as West Westmoor Avenue, property located at 6361 South 27th Street, bearing Tax Key No. 714-9993-004, more particularly described as follows:

> Parcel 2 of Certified Survey Map No. 5747, being a part of the Northeast 1/4 of Section 1, Township 5 North, Range 21 East, in the City of Franklin, Milwaukee County, Wisconsin, excepting those parts conveyed in Document No. 10351086 for street purposes; and

WHEREAS, such petition having been duly referred to the Plan Commission of the City of Franklin for a public hearing, pursuant to the requirements of §15-9.0103D. of the Unified Development Ordinance, and a public hearing having been held before the Plan Commission on the 21st day of November, 2019, and the Plan Commission thereafter having determined to recommend that the proposed Special Use be approved, subject to certain conditions, and the Plan Commission further finding that the proposed Special Use upon such conditions, pursuant to §15-3.0701 of the Unified Development Ordinance, will be in harmony with the purposes of the Unified Development Ordinance and the Comprehensive Master Plan; that it will not have an undue adverse impact upon adjoining property; that it will not interfere with the development of neighboring property; that it will be served adequately by essential public facilities and services; that it will not cause undue traffic congestion; and that it will not result in damage to property of significant importance to nature, history or the like; and

WHEREAS, the Common Council having received such Plan Commission recommendation and also having found that the proposed Special Use, subject to conditions, meets the standards set forth under §15-3.0701 of the Unified Development Ordinance.

NOW, THEREFORE, BE IT RESOLVED, by the Mayor and Common Council of the City of Franklin, Wisconsin, that the petition of David Steinberger, President of Franklin Mobile, LLC, for the approval of a Special Use for the property particularly described in the preamble to this Resolution, be and the same is hereby approved, subject to the following conditions and restrictions:

1. That this Special Use is approved only for the use of the subject property by David Steinberger, President of Franklin Mobile, LLC, successors and assigns, as a bridge replacement use, which shall be developed in substantial compliance with, and operated and maintained by David Steinberger, President of Franklin Mobile, LLC, pursuant to those plans City file-stamped September 20, 2019 and annexed hereto and incorporated herein as Exhibit A.

2. David Steinberger, President of Franklin Mobile, LLC, successors and assigns, shall pay to the City of Franklin the amount of all development compliance, inspection and review fees incurred by the City of Franklin, including fees of consults to the City of Franklin, for the David Steinberger, President of Franklin Mobile, LLC bridge replacement, within 30 days of invoice for same. Any violation of this provision shall be a violation of the Unified Development Ordinance, and subject to §15-9.0502 thereof and §1-19. of the Municipal Code, the general penalties and remedies provisions, as amended from time to time.

3. The approval granted hereunder is conditional upon David Steinberger, President of Franklin Mobile, LLC and the bridge replacement use upon the Franklin Mobile, LLC (Franklin Mobile Home Park) property located at 6361 South 27th Street: (i) being in compliance with all applicable governmental laws, statutes, rules, codes, orders and ordinances; and (ii) obtaining all other governmental approvals, permits, licenses and the like, required for and applicable to the project to be developed and as presented for this approval.

4. The applicant shall contact the Inspection Services Department pursuant to Section 6.1(2) of the Unified Development Ordinance UDO Attachment 1 Floodplain Zoning Ordinance which provides that existing legal nonconforming structures such as mobile homes may continue on condition that they are not modified beyond ordinary maintenance or stand unused for more than twelve (12) months, and cannot be replaced if more than 50% of the structure is destroyed, to arrange a process to provide them such data on an annual basis, prior to the issuance of any building permits.

5. The applicant shall remove all mobile homes which were placed within the floodway after February 6, 1968 without all proper permits and approvals as soon as possible, but no later than from one year of the date of the subject Special Use approval.

6. The applicant shall revise the site plan to include the addition of railings and paved and striped shoulders along the road over the culvert prior to the issuance of any building permits, and shall install such improvements concurrently with construction of the culvert and road.

7. The applicant shall revise the Natural Resource Protection Plan (NRPP) Map to depict all natural resource features adjacent to the stream extending to both the north and south property lines for City staff review and approval prior to the issuance of any building permits.

8. The applicant shall provide a revised project narrative including a brief opinion on why the structure does not impede drainage or cause ponding, for review and approval of the City Engineering Department, prior to the issuance of any building permits.

9. Pursuant to Sections 3.4(4) and 7.1(2)(b) of the Floodplain Ordinance, the applicant shall verify if any private wells or private septic systems are located within the floodway prior to the issuance of any building permits. If present, the applicant shall remove any such wells or septic systems, or alternatively, address the requirements of Wisconsin Administrative Code NR 811 and NR 812, within six months of the date of the subject Land Use Permit approval.

BE IT FURTHER RESOLVED, that in the event David Steinberger, President of Franklin Mobile, LLC, successors or assigns, or any owner of the subject property, does not comply with one or any of the conditions and restrictions of this Special Use Resolution, following a ten (10) day notice to cure, and failure to comply within such time period, the Common Council, upon notice and hearing, may revoke the Special Use permission granted under this Resolution.

BE IT FURTHER RESOLVED, that any violation of any term, condition or restriction of this Resolution is hereby deemed to be, and therefore shall be, a violation of the Unified Development Ordinance, and pursuant to §15-9.0502 thereof and §1-19. of the Municipal Code, the penalty for such violation shall be a forfeiture of no more than $2,500.00, or such other maximum amount and together with such other costs and terms as may be specified therein from time to time. Each day that such violation continues shall be a separate violation. Failure of the City to enforce any such violation shall not be a waiver of that or any other violation.

BE IT FURTHER RESOLVED, that this Resolution shall be construed to be such Special Use Permit as is contemplated by §15-9.0103 of the Unified Development Ordinance.

BE IT FURTHER RESOLVED, pursuant to §15-9.0103G. of the Unified Development Ordinance, that the Special Use permission granted under this Resolution shall be null and void upon the expiration of one year from the date of adoption of this Resolution, unless the Special Use has been established by way of completion of the Franklin Mobile Home Park bridge replacement.

BE IT FINALLY RESOLVED, that the City Clerk be and is hereby directed to obtain the recording of a certified copy of this Resolution in the Office of the Register of Deeds for Milwaukee County, Wisconsin.

Introduced at a regular meeting of the Common Council of the City of Franklin this _____ day of _____, 2019.

Passed and adopted at a regular meeting of the Common Council of the City of Franklin this _____ day of _____, 2019.

APPROVED:

_____
Stephen R. Olson, Mayor

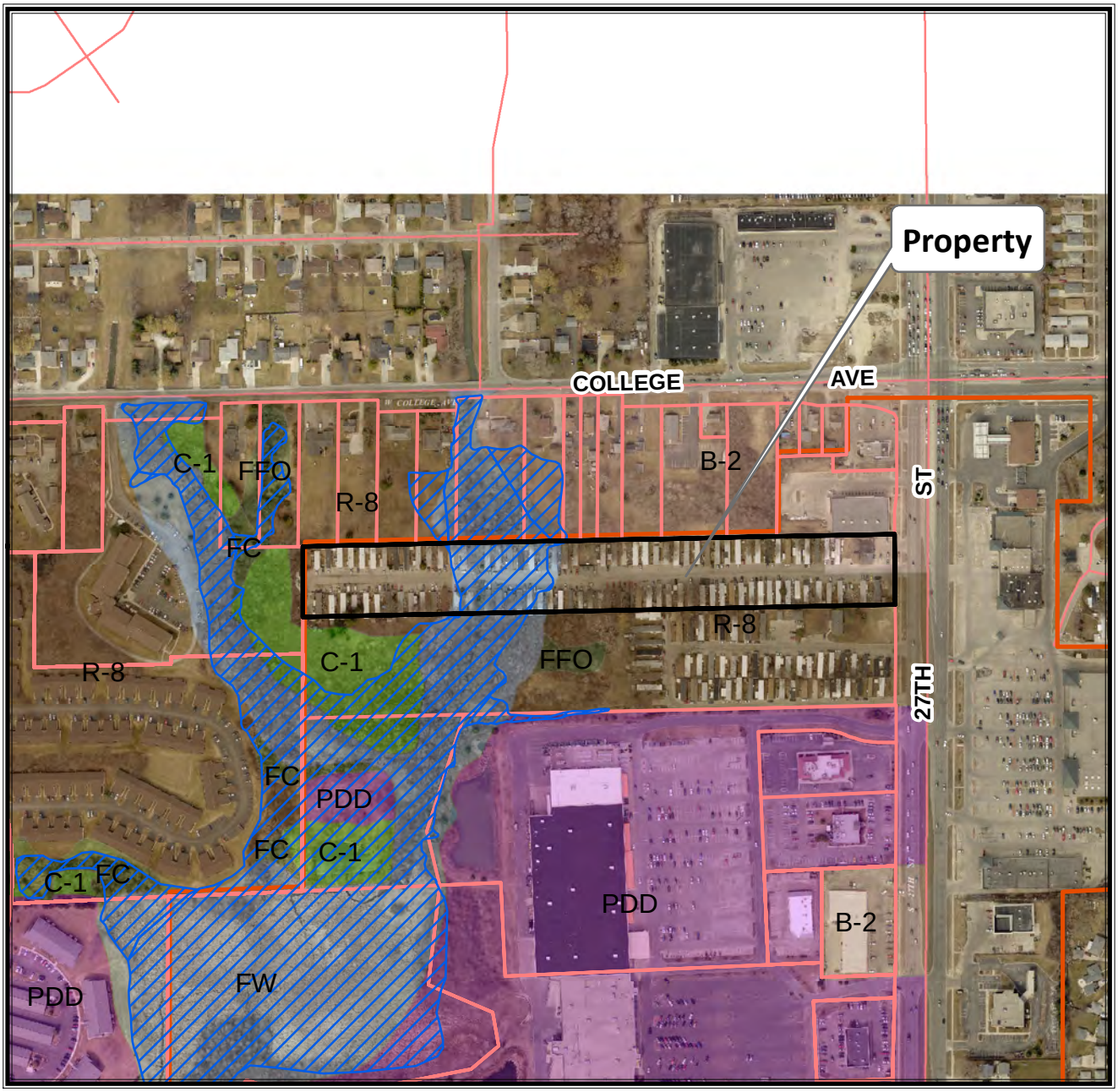
ATTEST:

_____
Sandra L. Wesolowski, City Clerk

AYES _____ NOES _____ ABSENT _____

City of Franklin

6361 S. 27th Street
TKN: 714 9993 004



Planning Department
(414) 425-4024

0 255 510 1,020 Feet

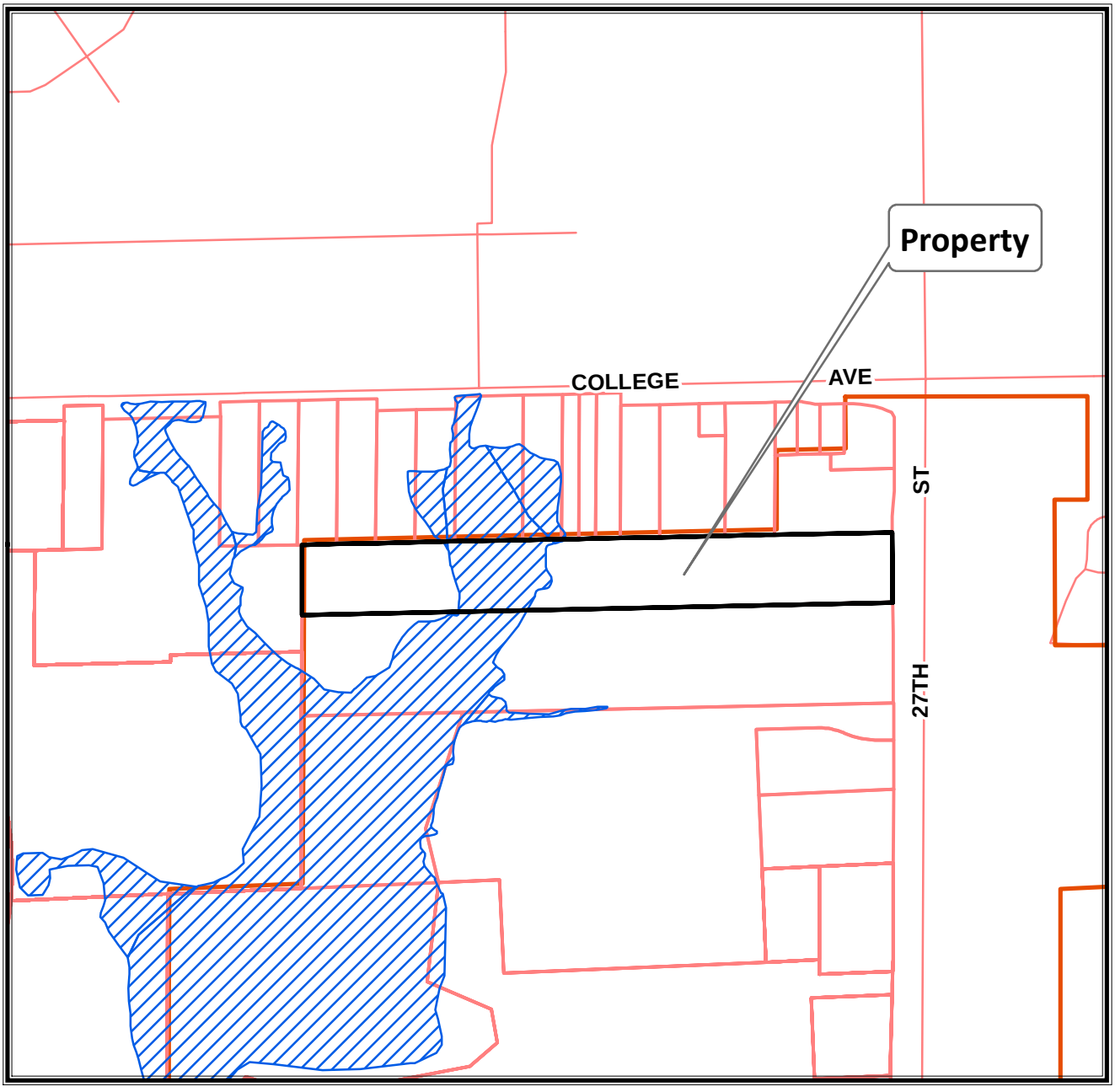
NORTH

2017 Aerial Photo

This map shows the approximate relative location of property boundaries but was not prepared by a professional land surveyor. This map is provided for informational purposes only and may not be sufficient or appropriate for legal, engineering, or surveying purposes.

City of Franklin

6361 S. 27th Street
TKN: 714 9993 004



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STORMWATER SOLUTIONS ENGINEERING LLC

247 W. Freshwater Way, Suite 410
Milwaukee, WI 53204
Tel 414.810.1245

August 30, 2019

Mr. Joel Dietl, AICP *sent via e-mail (jdietl@franklinwi.gov)*
Planning Manager
Department of City Development
City of Franklin
9229 W. Loomis Road
Franklin, Wisconsin 53132

Ms. Michelle Hase, P.E. *sent via e-mail (michelle.hase@wi.gov)*
Department of Water Management
Wisconsin Department of Natural Resources
141 NW Barstow St., Sutie 180
Waukesha, WI 53188

RE: City of Franklin Special Use Permit Application Report for the Franklin Estates Mobile Home Park Bridge Replacement
WDNR Permit No. GP-SE-2019-41-00734
Army Corps Regulatory File No. 2018-03670-AIS

Dear Mr. Dietl and Ms. Hase,

This letter report accompanies a Special Use Permit Application for Franklin Estates, LLC's replacement of an existing bridge that carries West Westmoor Avenue over the East Branch of the Root River. The properties along West Westmoor Avenue at the project location are zoned R-8 Multiple Family Residence District and FW Floodway District. The City of Franklin allows bridges and approaches to be constructed in a Floodway District as a Special Use.

The results of a hydraulic analysis documented in this report found that the proposed culvert that replaces the existing failed bridge does not result in any increase in the base flood elevation either upstream or downstream of West Westmoor Avenue.

The Wisconsin Department of Natural Resources (WDNR) and U.S. Army Corps of Engineers have previously reviewed the proposed project and issued permits or letters of approval. A copy of this letter report is being provided to Michelle Hase at the WDNR per the request by the City of Franklin that she be kept up to date on the project progress.

STORMWATER SOLUTIONS ENGINEERING LLC

247 W. Freshwater Way, Suite 410
Milwaukee, WI 53204
Tel 414.810.1245

Please do not hesitate to reach out to Sarah Pasquesi at 414.810.1245 if you have any questions regarding this report.

Sincerely,

Carrie Bristoll-Groll, P.E., CFM
Principal Civil Engineer

Sarah Pasquesi, P.E., CFM
Senior Project Engineer

Attachments:
Attachment A – WDNR and Army Corps Permit Approval Letters
Attachment B – Flood Insurance Rate Map FIRMette
Attachment C – Proposed Culvert Replacement Plans
Attachment D – Natural Resource Protection Plan
Attachment E – HEC RAS Model Output
Attachment F – Wetland Delineation Report

1 INTRODUCTION AND BACKGROUND

1.1 Introduction and Purpose

Stormwater Solutions Engineering, LLC (SSE) has been contracted by Franklin Mobile, LLC to submit the City of Franklin application for Special Use Permit for a proposed bridge replacement at the Franklin Estates Mobile Home property. This permit submittal includes our hydraulic analysis of the proposed bridge designed by Himalayan Consultants, LLC.

The existing bridge is in a progressive state of failure. As shown in the below photograph, a temporary timber mat access way has been installed to allow access to the residential homes on the west end of West Moorland Avenue. The proposed bridge would replace both the existing failed bridge and temporary timber mat and will not adversely affect the existing drainage way.

The properties along West Westmoor Avenue at the project location are zoned R-8 Multiple Family Residence District and FW Floodway District. A bridge or accessway installed in a FW Floodway District requires a Special Use permit in the City of Franklin.

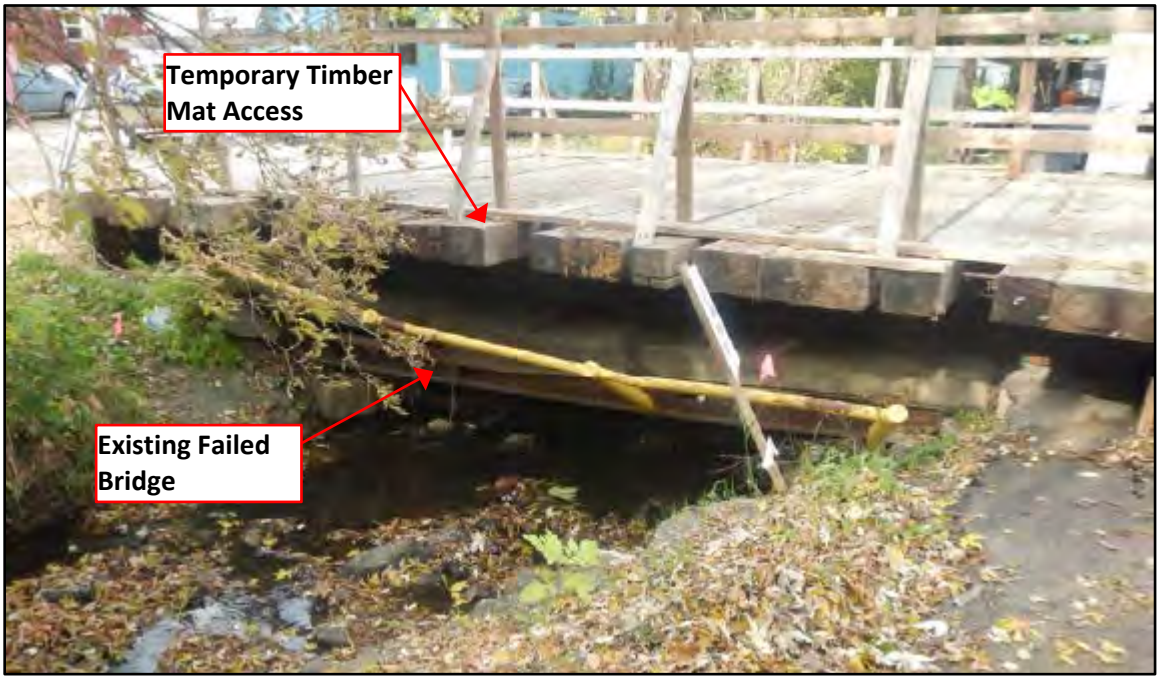


Figure 1: Existing Conditions

1.2 Location

The proposed project is located in the City of Franklin, Milwaukee County, Wisconsin and found on the Greendale, WI quandrangle map at the northeast quarter of Section 01, Township 05 North, Range 21 East. The tax key number for the property is 714-9993-004 and the legal description of the property is as follows:

> *Parcel 2 of Certified Survey Map No. 5747, being a part of the Northeast 1/4 of Section 1, Township 5 North, Range 21 East, in the City of Franklin, Milwaukee County, Wisconsin, excepting those parts conveyed in Document No. 10351086 for street purposes.*

A location map for the project is provided in **Figure 2** below.

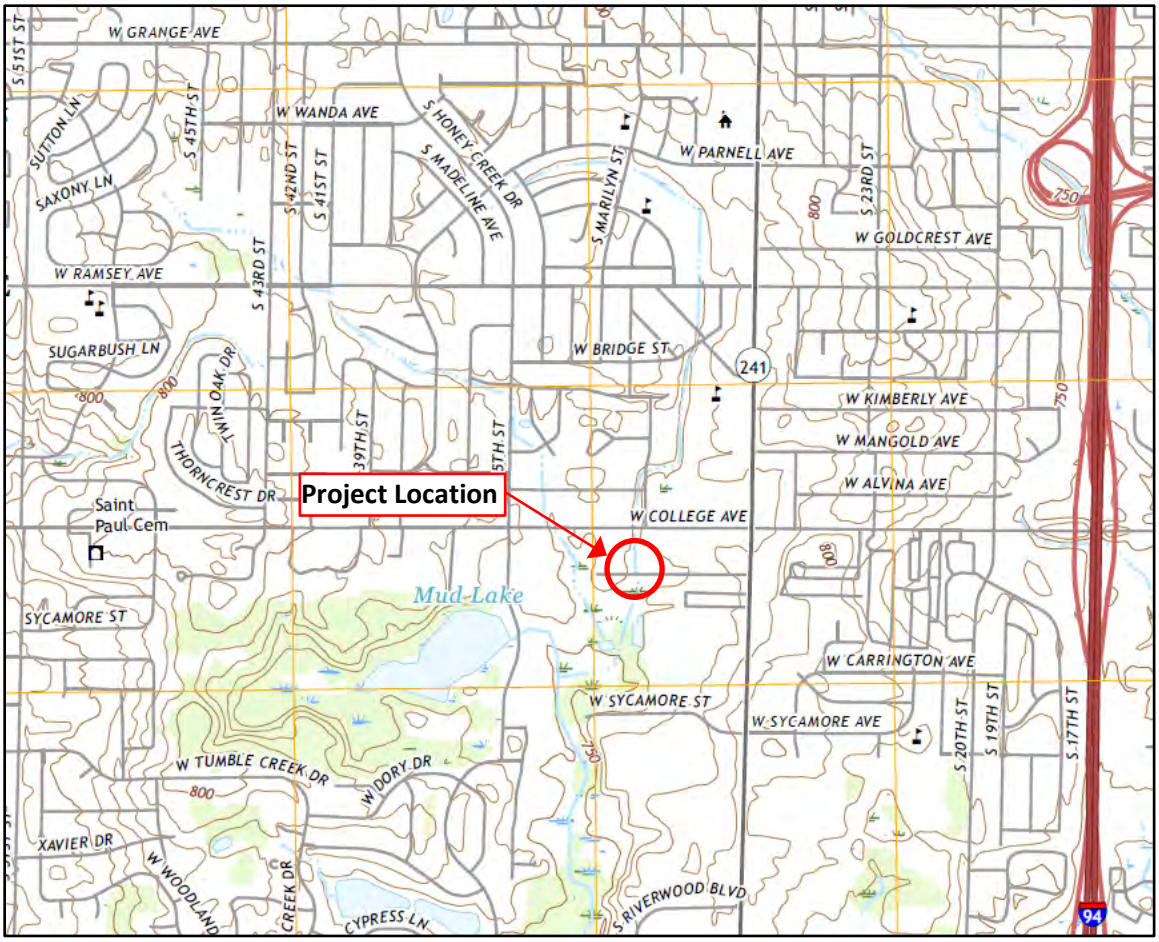


Figure 2: Project Location Map

1.3 Existing Drainage Setting

An aerial photograph investigation shows that the mobile homes on the east end of West Westmoor Avenue have been in place since before 1955. Between 1955 and 1958, the bridge over the East Branch of the Root River was installed and mobile homes were constructed to the west end of West Westmoor Avenue. In 1958, the vast majority of the watershed both upstream and downstream of the West Westmoor Avenue bridge was farmland.

Today the watershed upstream of the proposed bridge replacement is approximately 2.5 square miles and consists primarily of quarter acre residential lots.

The existing bridge crosses the East Branch of the Root River in a studied floodplain Zone AE. A copy of the Flood Insurance Rate Map FIRMette at the location of the Franklin Estates Mobile Home Park is provided with this report as **Attachment B**.

1.4 Proposed Drainage System Overview

The proposed project replaces the existing bridge with a 48” x 76” horizontal elliptical reinforced concrete culvert with tapered end walls. The culvert invert is proposed to be partially buried below the bed elevation per DNR requirements. The road over the culvert will be crowned with a centerline elevation of 756.0.

The proposed bridge replacement will involve fill below the mean and ordinary high water mark (OHWM). Approval from the Army Corps of Engineers for this fill was obtained in a letter dated January 4, 2019 under the Transportation Regional General Permit (RGP) with a regulatory file number of 2018-03670-AIS. A Transportation RGP may be applied to the replacement of a previously authorized structure as long as there are only minor deviations to the configuration or filled area and any culvert extension does not include any slope or shoulder widening.

Permit approval has been previously obtained from WDNR on March 18, 2019. This permit is filed under number GP-SE-2019-41-00734 and expires in March of 2022. The proposed wetland impacts of 1,590 square feet are covered under a separate wetland docket number 00736.

Copies of all permit approval letters obtained for this project are included as **Attachment A** to this report.

2 SPECIAL USE STANDARDS AND REGULATIONS

The applicant for a special use permit must show compliance with the following general standards in order to be issued a permit. Below is a list of each standard from Part 3, Division 15-3.0700 of the City of Franklin Unified Development Ordinance followed by a response that addresses how the bridge replacement at Franklin Estates Mobile Park has addressed each of these standards.

1. **Ordinance and Comprehensive Master Plan Purposes and Intent.**

   The proposed bridge replacement is designed in accordance with zoning regulations and meets the intent of the City of Franklin Comprehensive Master Plan.

   The proposed bridge replacement in Franklin Estates meets the intent of the City of Franklin 2025 Master Plan by maintaining a safe and efficient transportation system within the City. This bridge is the only entrance and exit for more than two dozen homes on the west end of West Westmoor Avenue. These residents count on the proposed bridge to provide safe and efficient access in and out of their homes.

   The 2025 Mater Plan also has a commitment to the protection of natural resources. The existing bridge is collapsing into the river. This not only causes a serious safety concern for residents, but if the bridge completely fails it becomes a potential restriction to the river flows. The proposed bridge will provide a similar flow capacity to the original bridge before it's failed state and preserves the base flow capacity of the east branch of the Root River.

2. **No Undue Adverse Impact.**

   The proposed bridge will have a similar flow capacity to the existing bridge and does not result in any increase in base flood elevation upstream or downstream. The proposed bridge will improve access for pedestrians and vehicles by including shoulders and gently sloped terraced areas.

3. **No Interference with Surrounding Development.**

   The project, as designed, will be constructed, arranged, and operated as to not dominate the immediate vicinity or to interfere with the use and development of neighboring property. The Contractor, by means and methods, is required to provide pedestrian access to the west half of the parcel throughout construction. The Contractor will only be allowed to close vehicular access to the west half of the parcel for a maximum of three (3) days to facilitate the cross-culvert installation.

4. **Adequate Public Facilities.**

   The proposed bridge replacement will be served adequately by essential public facilities. If the existing bridge is not replaced, there will be no access to the west end of West Westmoor Avenue for public facilities or residents.

5. **No Traffic Congestion.**

   The proposed bridge will preserve the existing traffic flows along West Westmoor Avenue and will not result in any kind of increase in vehicular traffic or traffic congestion. The proposed use and population density is to remain consistent with existing conditions.

6. **No Destruction of Significant Features.**

   A wetland delineation completed as part of this project shows wetland vegetation within the banks of the East Branch of the Root River. These wetlands will be disturbed only as necessary to complete the replacement of the existing bridge. Due to the proposed culvert being partially buried, over time sediment will be allowed to accumulate in the culvert and riprap areas, thus restoring the creek bed to a natural state.

7. **Compliance with Standards.**

   The existing mobile homes at Franklin Estates have been in place since 1958 and pre-date the City's delineation of the FW Floodway District. The installation of a culvert within a waterway lying in a Floodway District (FW) is a permitted special use per §15-3.0604B.1.c. as long as it does not cause a rise in flood elevations by more than 0.01 feet either upstream or downstream. The proposed bridge will not cause an increase in flood elevations per the hydraulic analysis discussed in Section 3 of this report.

The Plan Commission and Common Council also consider the following in their review of a Special Use Permit: Public Benefit, Alternative Locations, Mitigation of Adverse Impacts, and Establishment of Precedent. Below are responses that address how the bridge replacement at Franklin Estates Mobile Park has addressed each of these four considerations.

1. **Public Benefit:** From the Unified Development Ordinance Public Benefit considers "Whether and to what extent the proposed use and development at the particular location requested is necessary or desirable to provide a service or a facility that is in the interest of the public convenience or that will contribute to the general welfare of the neighborhood or community."

   Response: The failed bridge replacement is necessary to provide permanent access for the residents west of the East Branch of Root River to public facilities.

2. **Alternative Locations:** From the Unified Development Ordinance Alternative Locations considers "Whether and to what extent such public goals can be met by the location of the proposed use and development at some other site or in some other area that may be more appropriate than the proposed site."

   Response: A list of alternatives investigated for this project in addition to the proposed plans are included below with a description of why they are not feasible.

   1) Relocation of the bridge along West Westmoor Avenue: Relocating this bridge would require re-routing the East Branch of the Root River. Altering the river in this way would result in additional river bends. These river bends would need to be protected with hard armor as

erosion is frequently accelerated at the bend in a river. Even with armoring, it is possible that once moved, the river would attempt to erode back to its original configuration.

2) Removing the Bridge: Eliminating the bridge entirely would result in loss of access to the homes on the West end of West Westmoor Avenue.

3) Removing the Bridge and constructing a new road to provide access to the west end of West Westmoor Ave: A new north-south road could connect West College Avenue to the west end of West Westmoor Avenue thus eliminating the need for a bridge, but a road in this location would impact the floodplain for the Unnamed Tributary No. 1 to the East Branch Root River and likewise require a special use permit from the City of Franklin.

4) Increasing the height of West Westmoor Ave to bring it out of the FW Floodway District: Increasing the height of the road to bring the bridge out of the Floodway District would create a restriction in the floodway which in turn would form a pool upstream of the bridge. This pool has the potential to increase the flood risk for the single family homes upstream of Franklin Estates. To prevent a restriction, the bridge needs to increase in width which will require relocating the homes adjacent to the bridge, or the bridge needs to overtop as it currently does. It is unknown if there are empty R-8 Multiple Family Residence District zones in the vicinity of Franklin Estates to accommodate the relocation of the 10-12 homes currently within the FW Floodway District.

3. **Mitigation of Adverse Impacts:** From the Unified Development Ordinance Mitigation of Adverse Impacts considers “Whether and to what extent all steps possible have been taken to minimize any adverse effects of the proposed use and development on the immediate vicinity through building design, site design, landscaping, and screening.”

   The proposed project will impact existing wetlands only as necessary to complete the installation of the proposed culvert. The proposed culvert does not increase the base flood elevations upstream or downstream. During construction the Contractor will be required to provide pedestrian access to the west half of West Westmoor Avenue. The Contractor will only be allowed to close vehicular access to the west for a maximum of three (3) days to facilitate the cross-culvert installation. The proposed culvert will improve the access from the existing bridge by providing shoulders and gently sloped terraced areas.

4. **Establishment of Precedent:** From the Unified Development Ordinance Establishment of Precedent of Incompatible Uses in the Surrounding Area considers “Whether the use will establish a precedent of, or encourage, more intensive or incompatible uses in the surrounding area.”

   The installation of a culvert within a waterway lying in a FW Floodway District is a permittable special use per §15-3.0604B.1.c. An incompatible use standard is not being set.

3 HYDRAULIC ANALYSIS

An existing hydraulic model (FAD ID 11106) is available for the project area approved by WDNR and FEMA in July of 1981. The HEC-2 input for this effective model was obtained from the WDNR library and imported into the U.S. Army Corps of Engineer's Hydrologic Engineering Center's River Analysis System (HEC-RAS) software version 5.0.7.

The model consists of the entire East Branch of the Root River. The downstream ends at the confluence with the Root River and the upstream limit of the model ends approximately 520 feet upstream of the proposed bridge replacement at a location just upstream of the bridge at W College Ave.

3.1 Corrected Effective Model

Updates to the imported effective model needed to be made before analyzing the impact of the proposed reconstructed bridge. These updates included adjustments to the HEC-2 imported bridges, additional cross sections added upstream and downstream of the bridge over West Westmoor Avenue, and adjustments to the cross sections near West Westmoor Avenue to reflect recent survey data collected in the project area.

It is not uncommon for HEC-2 input to need post processing once it has been imported into HEC-RAS. Some additional functionality available to HEC-RAS requires the user to carefully review all bridge data to confirm if information needs to be modified or added. Six bridges are included in the East Branch of the Root River model. Three of the six bridges needed the geometry of the bottom chord of the bridge adjusted to properly reflect the opening area and bridge width defined in HEC-2. These bridges included South 51st Street bridge over the East Branch of the Root River, West Rawson Avenue bridge over the East Branch of the Root River, and West Westmoor Avenue over the East Branch of the Root River.

Because the existing bridge is in a failed state, and the temporary bridge had already been installed at the time of the survey, the geometry of the existing bridge from the effective model has been preserved with only minor post-processing to the low chord necessary due to the HEC-2 to HEC-RAS conversation. The elevations of the channel bottom for the cross sections at the upstream and downstream face of the bridge have been updated to reflect recent survey data.

An approach cross section 20 feet upstream of the bridge face and a cross section 20 feet downstream of the bridge face have been added to the model with elevations that reflect the survey data collected for the bridge replacement. The HEC-RAS stations for these new cross sections are 67.5 and 65.5.

It was found that all of the cross sections imported from the HEC-2 model contained contraction and expansion coefficients of 0.3 and 0.5. These values are typically only used for cross sections near a bridge. Cross section with gradual transitions were corrected to have contraction and expansion coefficients of 0.1 and 0.3 respectively.

The model flows remain unchanged from the flows imported from the HEC-2 model. From the Flood Insurance Study (FIS) Report for Milwaukee County:

Table 1: Summary of Discharges (cfs)

Location	10-Percent Annual Chance	2-Percent Annual Chance	1-Percent Annual Chance	0.2-Percent Annual Chance
About 630 Feet Upstream of the Root River East Branch Root River	490	800	940	1350
About 300 Feet Upstream of W. Rawson Ave Fish Creek	440	720	850	1200

The HEC-RAS output table for the Corrected Effective Model is provided in **Attachment E** to this report. The results of the Corrected Effective model for the 100-year storm event are compared to the values documented in the FIS for the area in the vicinity of the bridge over West Westmoor Ave. in **Table 2**.

3.2 Proposed Drainage System

The existing bridge is proposed to be replaced by a 48" x 76" elliptical culvert buried 1.7 feet below the natural stream bed. The road over the culvert will be crowned with a top elevation 756.0. This top elevation is consistent with the existing elevations provided in the HEC-RAS model which indicates a top of the bridge elevation between 755.66 and 756.01. The details for the proposed bridge replacement are available in the proposed plan set provided in **Attachment C** to this report.

The previous section discussed the addition of an approach section located 20 feet upstream of the face of the existing bridge and another new section added 20 feet downstream of the downstream face of the existing bridge. For the proposed model, these two cross section channel geometries were edited to reflect the proposed contours as shown in the proposed plan set.

The bridge opening under West Westmoor Avenue was removed from the model and replaced by an elliptical culvert 48" x 76". An entrance loss of 0.2 was applied for parallel wingwalls with tapered inlet. A manning's roughness of 0.013 represented the concrete culvert. A manning's roughness of 0.035 was applied to the bottom of the culvert to represent the natural streambed due to the culvert being buried. This roughness matches the manning's number used for the cross sections upstream and downstream of the bridge which also indicate a roughness of 0.035 for the channel bottom

The corrected effective model included cross sections at the upstream and downstream face of the existing bridge. Because the proposed culvert is 31.8 feet long while the existing bridge is approximately 16 feet wide, the proposed culvert will extend into these two cross sections. For the proposed model, these cross sections were deleted and the proposed culvert section is left to cover these stations. Cross section 67.5 and 65.5 added to be 20 feet upstream and downstream of the existing bridge are outside of the limits of the proposed culvert and thus describe the change in water surface immediately upstream and downstream.

The City of Franklin's Unified Development Ordinance (UDO) Floodplain Zoning Ordinance requires that a proposed project in the FW Floodway District not increase flood elevations upstream or downstream by 0.01 foot or more. **Table 2** provides a comparison of peak water surface elevations for the 1% annual chance flood and illustrates that the proposed bridge replacement does not result in any increase in flood elevations for cross sections upstream or downstream therefore meeting the City of Franklin's requirement.

Table 2: Peak Water Surface Elevation Summary for the 1% Annual Chance Flood TABLE VOID

FIS Cross Section Designation	Distance* (ft)	Distance* (mi)	HEC-RAS River Station	Effective W.S. Elev[1] (ft)	Corrected Effective W.S. Elev[2] (ft)	Δ^{2-1} (ft)	Proposed W.S. Elev[3] (ft)	Δ^{3-2} (ft)
	25951	4.92	71		761.69		761.69	0.00
Bridge over W College Ave			70.5					
BJ	25925	4.91	70	760.60	760.51	-0.09	760.51	0.00
BI	25714	4.87	69	760.40	760.16	-0.24	760.16	0.00
BH	25608	4.85	68	758.30	759.51	1.21	759.49	-0.02
	25370	4.81	67.5		757.89		757.85	-0.04
	25370	4.81	67		757.74			
Bridge over W Westmoor Ave			66.5					
BG	25344	4.80	66	757.50	757.73	0.23		
	25344	4.80	65.5		757.24		757.25	0.01
BF	25238	4.78	65	757.00	757.11	0.11	757.11	0.00
BE	24763	4.69	64	753.90	753.86	-0.04	753.86	0.00
BD	24235	4.59	63	751.70	751.75	0.05	751.75	0.00
BC	23654	4.48	62	751.60	751.63	0.03	751.63	0.00
BB	23179	4.39	61	751.30	751.36	0.06	751.36	0.00
BA	22757	4.31	60	751.50	750.55	-0.95	750.55	0.00
AZ	22334	4.23	59	749.90	749.99	0.09	749.99	0.00
AY	22018	4.17	58	749.40	749.46	0.06	749.46	0.00
AX	21490	4.07	57	748.30	748.37	0.07	748.37	0.00
AW	20962	3.97	56	747.20	747.25	0.05	747.25	0.00
AV	20592	3.90	55	746.50	746.42	-0.08	746.42	0.00
AU	20222	3.83	54	746.30	746.21	-0.09	746.21	0.00
AT	19694	3.73	53	746.20	746.05	-0.15	746.05	0.00
AS	19615	3.72	52	745.90	745.97	0.07	745.97	0.00
Bridge over W Rawson Ave			51.5					

* Distance is measured in feet or miles upstream of the confluence with the Root River.

11/12/2019 HEC RAS model was revised based on input from the WDNR and the revised output is available in the Attachment to this letter and superceds the above table.

4 CONCLUSIONS

Franklin Estates, LLC proposes to replace an existing failed bridge over the East Branch of the Root River with a 40”x76” elliptical culvert under West Westmoor Avenue. The existing bridge is the only entrance and exit for residents who live on the west end of West Westmoor Avenue and the proposed culvert will allow for safe access for residents and any essential public utilities. The proposed bridge replacement does not cause any increase in the base flood elevation either upstream or downstream of the bridge and complies with the City of Franklin standards for Special Use permit.

ATTACHMENT A

WDNR and Army Corps Permit Approval Letters

Army Corps Approval

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, ST. PAUL DISTRICT
180 FIFTH STREET EAST, SUITE 700
ST. PAUL, MN 55101-1678

January 4, 2019

Regulatory File No. 2018-03670-AIS

Franklin Mobile LLC
c/o David Steinberger
6361 South 27th Street
Franklin, Wisconsin 53132

Dear Mr. Steinberger:

This correspondence is in regard to your pre-construction notification (PCN) requesting Department of the Army (DA) authorization to discharge fill material below the plane of the ordinary high water mark (OHWM) of the East Branch Root River along 15 linear feet and into 1,590 square feet of wetlands for the purpose of replacing a failed bridge. The project site is in Section 1, Township 5 North, Range 21 East, Milwaukee County, Wisconsin.

Certain minor activities are eligible for authorization by general permits, which include Nationwide (NWP) and Regional General (RGP) permits. The work that you describe appears to fit the general activity information described in the Transportation RGP, category 2. Based on the information submitted to our agency, it appears that no application or notification to the St. Paul District Corps of Engineers is required for your project. Your project consists of 1 single and complete linear project.

This letter is not a verification of DA eligibility, but an indication that your project may meet the requirements for DA eligibility. It is your responsibility to ensure that the work is performed in accordance with the RGP terms and General Conditions before starting work. **It is also incumbent on you to verify that your activity has received a required 401 water quality certification or waiver from the Wisconsin Department of Natural Resources (WDNR) prior to the start of work in waters of the U.S.** If a 401 water quality certification has not been issued for your activity, you are responsible for contacting the 401 certifying agency listed below. A full list of applicable RGP terms, conditions and all issued 401 water quality certifications may be found by visiting our website at http://www.mvp.usace.army.mil/Missions/Regulatory/Permitting-Process-Procedures/.

Failure to comply with any of the listed conditions could result in the Corps initiating an enforcement action.

We did not determine whether wetlands or other waters in the site are subject to Corps jurisdiction. You may request a jurisdictional determination from the Corps contact indicated below. It is not necessary to request a jurisdictional determination.

Regulatory Branch (File No. 2018-03670-AIS)

If you have any questions, please contact me in our St. Paul office at (651) 290-5266 or by email at Aiden.Schore@usace.army.mil. In any correspondence or inquiries, please refer to the Regulatory file number shown above.

Sincerely,

Aiden Schore
Regulatory Specialist

cc:
Mahmoud Malas, Malas Engineering LLC
Joshua Wied, WDNR (IP-SE-2018-41-04352, 04353)

WDNR Culvert Construction Approval

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
141 NW Barstow, Room 180
Waukesha, WI 53188

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

March 18, 2019 GP-SE-2019-41-00734

Franklin Mobile LLC
David Steinberger
6361 South 27th Street
Franklin, WI 53132

Dear Mr. Steinberger:

The Department of Natural Resources has completed its review of your application for a permit to construct a culvert designed by an engineer in the east branch of the Root River, in the City of Franklin, Milwaukee County. You will be pleased to know your application is approved with a few limitations.

Please take this time to re-read the permit eligibility standards and conditions. The eligibility standards can be found on your application checklist (found at http://dnr.wi.gov/topic/waterways/ - keyword: general permits). The permit conditions are attached to this letter which lists the conditions which must be followed.

A copy of this letter and the attached permit conditions must be posted for reference at the project site. Please read your permit conditions carefully so that you are fully aware of what is expected of you. You are responsible for meeting all general permit eligibility standards and permit conditions.

Please note you are required to submit photographs of the completed project within 7 days after you've finished construction. This helps both of us to document the completion of the project and compliance with the permit conditions.

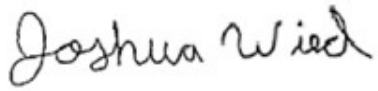
Be sure to contact your local zoning office and U.S. Army Corps of Engineers for any local or federal permits that may be required for your project.

Your next step will be to notify me of the date on which you plan to start construction and again after your project is complete.

For project details, maps, and plans related to this decision, please see application number on the Department's permit tracking website at https://permits.dnr.wi.gov/water/SitePages/Permit%20Search.aspx.

If you have any questions about your permit, please call me at (262) 574-2132 or email Joshua.Wied@wisconsin.gov.

Sincerely,



Joshua Wied
Water Management Specialist
cc: U.S. Army Corps of Engineers
City of Franklin
Warden
WDNR

WDNR Culvert Construction Approval

STATE OF WISCONSIN **GENERAL PERMIT - Culvert w/ Engineering**
DEPARTMENT OF NATURAL RESOURCES **GP-SE-2019-41-00734**

David Steinberger is hereby granted under Section 30.123(7), Wisconsin Statutes, a permit to construct a culvert designed by an engineer in the east branch of the Root River, in the City of Franklin, Milwaukee County, also described as being in the NE1/4 of the NE1/4 of Section 01, Township 05 North, Range 21 East, subject to the following conditions:

PERMIT

1. You must notify Joshua Wied at phone (262) 574-2132 or email Joshua.Wied@wisconsin.gov before starting construction and again not more than 5 days after the project is complete.

2. You must complete the project as described on or before 03/18/2022. If you will not complete the project by this date, there is no opportunity for an extension and you must apply for a new permit.

3. This permit does not authorize any work other than what you specifically describe in your application and plans, and as modified by the conditions of this permit. If you wish to alter the project or permit conditions, you must first obtain written approval of the Department.

4. **Before you start your project, you must first obtain any permit or approval that may be required for your project by local zoning ordinances and by the U.S. Army Corps of Engineers. You are responsible for contacting these local and federal authorities to determine if they require permits or approvals for your project. These local and federal authorities are responsible for determining if your project complies with their requirements.**

5. Upon reasonable notice, you shall allow access to your project site during reasonable hours to any Department employee who is investigating the project's construction, operation, maintenance or permit compliance.

6. The Department may modify or revoke this permit for good cause, including if the project is not completed according to the terms of the permit or if the Department determines the activity is detrimental to the public interest.

7. You must post a copy of this permit at a conspicuous location on the project site, visible from the waterway, for at least five days prior to construction, and remaining at least five days after construction. You must also have a copy of the permit and approved plan available at the project site at all times until the project is complete.

8. Your acceptance of this permit and efforts to begin work on this project signify that you have read, understood and agreed to follow all conditions of this permit.

9. The permittee shall maintain the project in good condition and in compliance with the terms and conditions of the permit, NR 320, Wis. Admin. Code and s. 30.206, Stats.

10. This project shall comply with all conditions identified in Wisconsin Administrative Code NR 320, and identified in the Instructions for the General Permit application.

11. You must submit a series of photographs to the Department, within one week of completing work on the site. The photographs must be taken from different vantage points and depict all work authorized by this permit.

12. You, your agent, and any involved contractors or consultants may be considered a party to the violation pursuant to Section 30.292, Wis. Stats., for any violations of Chapter 30, Wisconsin Statutes, or this permit.

13. Construction shall be accomplished in such a manner as to minimize erosion and siltation into surface waters. Erosion control measures (such as silt fence and straw bales) must meet or exceed the technical standards of ch. NR 151, Wis. Admin. Code. The technical standards are found at: http://dnr.wi.gov/topic/stormwater/standards/const_standards.html.

14. All equipment used for the project, including but not limited to tracked vehicles, barges, boats, silt or turbidity curtain, hoses, sheet pile, and pumps shall be de-contaminated for invasive and exotic viruses and species prior to use and after use.

    The following steps must be taken *every time* you move your equipment to avoid transporting invasive and exotic viruses and species. To the extent practicable, equipment and gear used on infested waters shall not be used on other non-infested waters.

    1. **Inspect and remove** aquatic plants, animals, and mud from your equipment.

    2. **Drain all water** from your equipment that comes in contact with infested waters, including but not limited to tracked vehicles, barges, boats, silt or turbidity curtain, hoses, sheet pile and pumps.

    3. **Dispose** of aquatic plants, animals in the trash. Never release or transfer aquatic plants, animals or water from one waterbody to another.

    4. **Wash your equipment** with hot (>104º F) and/or high pressure water,

       - OR -

       Allow your equipment to **dry thoroughly for 5 days**.

WDNR Culvert Construction Approval

FINDINGS OF FACT

1. David Steinberger has filed an application for a permit to construct a culvert designed by an engineer in the east branch of the Root River, in the City of Franklin, Milwaukee County, also described as being in the NE1/4 of the NE1/4 of Section 01, Township 05 North, Range 21 East.

2. The project will consist of the replacement of a bridge with a 48” x 76” horizontal elliptical reinforced concrete culvert with tapered end walls. The culvert invert will be partially buried below the bed elevation. The wetland impacts of 1,590 square feet will be covered under a separate wetland docket-00736.

3. The Department has completed an investigation of the project site and has evaluated the project as described in the application and plans.

4. The east branch of the Root River is a navigable water

5. The proposed project, if constructed in accordance with this permit will not adversely affect water quality, will not increase water pollution in surface waters and will not cause environmental pollution as defined in s. 283.01(6m), Wis. Stats.

6. The proposed project, if constructed in accordance with this permit will not adversely affect wetlands.

7. The Department of Natural Resources and the applicant have completed all procedural requirements and the project as permitted will comply with all applicable requirements of Sections 1.11, 30.123(7), Wisconsin Statutes and Chapters NR 102, 103, 150, 299, NR 320 of the Wisconsin Administrative Code.

8. The structure or deposit will not materially obstruct navigation.

9. The structure or deposit will not be detrimental to the public interest.

CONCLUSIONS OF LAW

1. The Department has authority under ch. 30, Wis. Stats., and ch. NR 320, Wis. Adm. Code, to issue a permit for the construction and maintenance of this project.

2. The Department has complied with s. 1.11, Wis. Stats.

WDNR Culvert Construction Approval

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that the Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions shall be filed. For judicial review of a decision pursuant to sections 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

Dated at Waukesha Service Center, Wisconsin on 03/18/2019.

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES
For the Secretary

By Joshua Wied

Joshua Wied
Water Management Specialist

WDNR Wetland Disturbance Approval

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
141 NW Barstow, Room 180
Waukesha, WI 53188

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

March 18, 2019 GP-SE-2019-41-00736

Franklin Mobile LLC
David Steinberger
6361 South 27th Street
Franklin, WI 53132

RE: Coverage under the wetland statewide general permit for wetland fill or disturbance for residential, commercial, or industrial development, located in the City of Franklin, Milwaukee County, also described as being in the NE1/4 of the NE1/4 of Section 01, Township 05 North, Range 21 East.

Dear Mr. Steinberger:

Thank you for submitting an application for coverage under the wetland statewide general permit for wetland fill or disturbance for residential, commercial, or industrial development, s. 281.36, Wis. Stats.

You have certified that your project meets the eligibility criteria and conditions for this activity. Based upon your signed certification you may proceed with your project to fill 0.037 acres of wetlands. Please take this time to re-read the permit eligibility standards and conditions. The eligibility standards can be found on your application checklist or in the statewide general permit WDNR-GP1-2017 (found at http://dnr.wi.gov/topic/waterways/construction/wetlands.html). The permit conditions are attached to this letter. You are responsible for meeting all general permit eligibility standards and permit conditions. This includes notifying the Department before starting the project, and submitting photographs within one week of project completion. Please note your coverage is valid for 5 years from the date of the department's determination or until the activity is completed, whichever occurs first. This permit coverage constitutes the state of Wisconsin's wetland water quality certification under USCS s. 1341 (Clean Water Act s. 401).

The Department conducts routine and annual compliance monitoring inspections. Our staff may follow up and inspect your project to verify compliance with state statutes and codes. If you need to modify your project please contact your local Water Management Specialist, Joshua Wied at (262) 574-2132 or email Joshua.Wied@wisconsin.gov to discuss your proposed modifications.

The Department of Natural Resources appreciates your willingness to comply with wetland regulations, which help to protect the water quality, fish and wildlife habitat, natural scenic beauty and recreational value of Wisconsin's wetland resources for future generations. Please be sure to obtain any other local, state or federal permits that are required before starting your project.

If you have any questions, please call me at (262) 574-2132 or email Joshua.Wied@wisconsin.gov.
Sincerely,

Joshua Wied

Joshua Wied
Water Management Specialist
cc: U.S. Army Corps of Engineers
City of Franklin
Warden
WDNR

You agree to comply with the following conditions:

1. **Application**. You shall submit a complete application package to the Department as outlined in the application materials and section 2 of this permit. If requested, you shall furnish the Department, within a reasonable timeframe, any information the department needs to verify compliance with the terms and conditions of this permit.

2. **Certification**. Acceptance of general permit WDNR-GP1-2017 and efforts to begin work on the activities authorized by this general permit signifies that you have certified the project meets all eligibility standards outlined in Section 1 of this permit and that you have read, understood and have agreed to follow all terms and conditions of this general permit.

3. **Reliance on Applicant's Data.** The determination by this office that a confirmation of authorization is not contrary to wetland water quality standards will be based upon the information provided by the applicant and any other information required by the DNR.

4. **Project Plans**. This permit does not authorize any work other than what is specifically described in the notification package and plans submitted to the Department and you certified is in compliance with the terms and conditions of WDNR-GP1-2017

5. **Expiration**. This WDNR-GP1-2017 expires on October 31, 2022. The time limit for completing work authorized by the provisions of WDNR-GP1-2017 ends 5 years after the date on which the discharge is considered to be authorized under WDNR-GP1-2017 or until the discharge is completed, whichever occurs first.

6. **Other Permit Requirements**. You are responsible for obtaining any other permit or approval that may be required for your project by local zoning ordinances, other local authority, other state permits and by the U.S. Army Corps of Engineers before starting your project.

7. **Authorization Distribution**. You must supply a copy of the permit coverage authorization to every contractor working on the project.

8. **Project Start**. You shall notify the Department before starting construction.

9. **Permit Posting**. You must post a copy of this permit coverage letter at a conspicuous location on the project site prior to the execution of the permitted activity, and remaining at least five days after stabilization of the area of permitted activity. You must also have a copy of the permit coverage letter and approved plan available at the project site at all times until the project is complete.

10. **Permit Compliance**. The department may modify or revoke coverage of this permit if the project is not constructed in compliance with the terms and conditions of this permit, or if the Department determines the project will be detrimental to wetland water quality standards. Any act of noncompliance with this permit constitutes a permit violation and is grounds for enforcement action. Additionally, if any applicable conditions of this permit are found to be invalid or unenforceable, authorization for all activities to which that condition applies is denied.

11. **Construction Timing**. Once wetland work commences, all wetland construction activities must be continuous until the permitted activity is completed and the site is stabilized.

12. **Construction**. No other portion of the wetland may be disturbed beyond the area designated in the submitted plans.

13. **Project Completion**. Within one week of completion of the regulated activity, you shall submit to the Department a statement certifying the project is in compliance with all the terms and conditions of this permit, and photographs of the activities authorized by this permit. This statement must reference the Department-issued docket number, and be submitted to the Department staff member that authorized coverage.

14. **Proper Maintenance**. You must maintain the activity authorized by WDNR-GP1-2017 in good condition and in conformance with the terms and conditions of this permit utilizing best management practices. Any structure or fill authorized shall be properly maintained to ensure no additional impacts to the remaining wetlands.

15. **Site Access**. Upon reasonable notice, you shall allow access to the site to any Department employee who is investigating the project's construction, operation, maintenance or permit compliance with the terms and conditions of WDNR-GP1-2017 and applicable laws.

16. **Erosion and siltation controls**. The project site shall implement erosion and sediment control measures that adequately control or prevent erosion, and prevent damage to wetlands as outlined in NR 151.11(6m), Wis. Adm. Code.

17. **Equipment use**. The equipment used in the wetlands must be low ground weight equipment as specified by the manufacturer specifications.

18. **Invasive Species**. All project equipment shall be decontaminated for removal of invasive species prior to and after each use on the project site by utilizing other best management practices to avoid the spread of invasive species as outlined in NR 40, Wis. Adm. Code. For more information, refer to http://dnr.wi.gov/topic/Invasives/bmp.html.

19. **Federal and State Threatened and Endangered Species**. WDNR-GP1-2017 does not affect the DNR's responsibility to insure that all authorizations comply with Section 7 of the Federal Endangered Species Act, s. 29.604, Wis. Stats and applicable State Laws. No DNR authorization under this permit will be granted for projects found not to comply with these Acts/laws. No activity is authorized 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 and/or State law or which is likely to destroy or adversely modify the critical habitat of a species as identified under the Federal Endangered Species Act.

20. **Special Concern Species**. If the Wisconsin National Heritage Inventory lists a known special concern species to be present in the project area you will take reasonable action to prevent significant adverse impacts or to enhance the habitat for the species of concern.

21. **Historic Properties and Cultural Resources**. WDNR-GP1-2017 does not affect the DNR's responsibility to insure that all authorizations comply with Section 106 of the National Historic Preservation Act and s. 44.40, Wis. Stats. No DNR authorization under this permit will be granted for projects found not to comply with these Acts/laws. Information on the location and existence of historic resources can be obtained from the State Historic Preservation Office and the National Register of Historic Places. If cultural, archaeological, or historical resources are unearthed during activities authorized by this permit, work must be stopped immediately and the State Historic Preservation Officer must be contacted for further instruction.

22. **Preventive Measures**. Measures must be adopted to prevent potential pollutants from entering a wetland or waterbody. Construction materials and debris, including fuels, oil, and other liquid substances, will not be stored in the construction area in a manner that would allow them to enter a wetland or waterbody as a result of spillage, natural runoff, or flooding. If a spill of any potential pollutant should occur, it is the responsibility of the permittee to remove such material, to minimize any contamination resulting from this spill, and to immediately notify the State Duty Officer at **1-800-943-0003**.

23. **Suitable fill material.** All fill authorized under this permit must consist of clean suitable soil material, as defined by s. NR 500.03(214), Wis. Admin. Code, free from hazardous substances as defined by s. 289.01(11), Wis. Stats., and free from solid waste as defined by s. 289.01(11) and (33), Wis. Stats.

24. **Standard for Coverage**. Wetland impacts from the project will cause only minimal adverse environmental impacts as determined by the Department.

25. **Transfers**. Coverage under this permit is transferable to any person upon prior written approval of the transfer by the Department.

26. **Limits of State Liability**. In authorizing work, the State Government does not assume any liability, including for the following:
    a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
    b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the State in the public interest.
    c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
    d. Design or construction deficiencies associated with the permitted work.
    e. Damage claims associated with any future modification, suspension, or revocation of this WDNR-GP1-2017.

27. **Reevaluation of Decision**. The Department may suspend, modify or revoke authorization of any previously authorized activity and may take enforcement action if any of the following occur:

    a. The applicant fails to comply with the terms and conditions of WDNR-GP1-2017.
    b. The information provided by the applicant in support of the permit application proves to have been false, incomplete, or inaccurate.
    c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

ATTACHMENT B

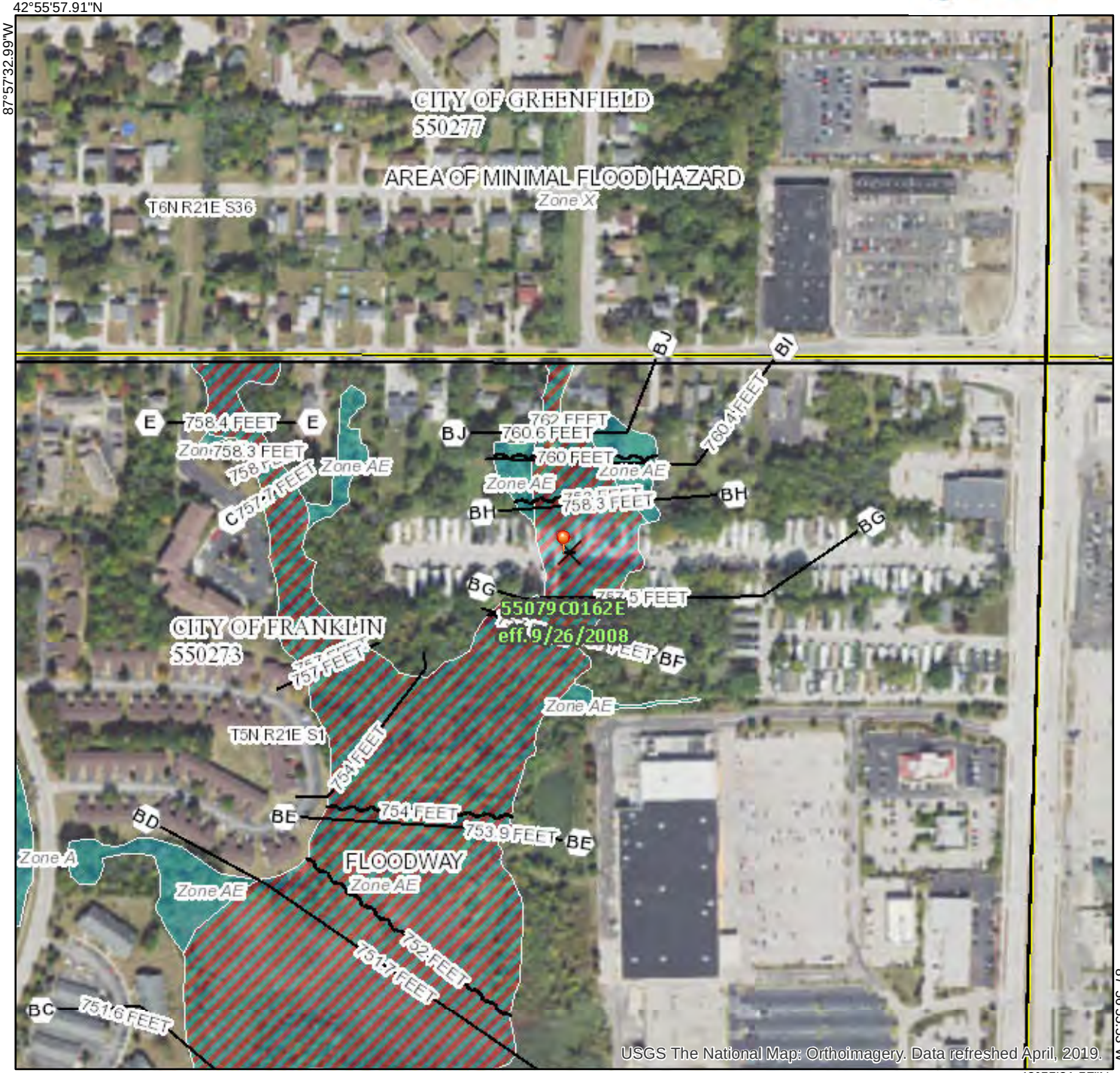
Flood Insurance Rate Map FIRMette

National Flood Hazard Layer FIRMette

FEMA

42°55'57.91"N

87°57'32.99"W



USGS The National Map: Orthoimagery. Data refreshed April, 2019.

87°56'55.53"W

42°55'31.57"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/28/2019 at 2:13:04 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

ATTACHMENT C

Proposed Culvert Replacement Plans

GENERAL NOTES:

1. THE UNDERGROUND UTILITY INFORMATION AS SHOWN HEREON IS BASED, IN PART, UPON INFORMATION FURNISHED BY UTILITY COMPANIES AND THE LOCAL MUNICIPALITY. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, IT'S ACCURACY AND COMPLETENESS CANNOT BE GUARANTEED OR CERTIFIED TO.
2. PRIOR TO EXCAVATION CALL TOLL FREE, DIGGERS HOTLINE, 1-800-242-8511. COST OF REPLACEMENT OR REPAIR OF EXISTING UTILITIES DAMAGED AS A RESULT OF THE CONTRACTOR'S OPERATION SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
3. ELEVATIONS SHOWN ON THIS PLAN ARE REFERENCED TO NAVD88.
4. HORIZONTAL DATUM IS REFERENCED TO NAD83.
5. CONTRACTOR SHALL PROTECT EXISTING SITE IMPROVEMENTS TO REMAIN FROM DAMAGE DURING CONSTRUCTION. COST TO RESTORE DAMAGED IMPROVEMENTS TO THEIR ORIGINAL CONDITION, AS ACCEPTABLE BY THE OWNER, WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
6. CONTRACTOR SHALL MINIMIZE INTERFERENCE WITH ADJOINING ROADS, STREETS, WALKS, AND OTHER ADJACENT OCCUPIED OR USED FACILITIES DURING CONSTRUCTION OPERATIONS. DO NOT CLOSE OR OBSTRUCT STREETS, WALKS, DRIVEWAYS, OR OTHER ADJACENT OCCUPIED OR USED FACILITIES WITHOUT PERMISSION FROM OWNER AND AUTHORITIES HAVING JURISDICTION. PROVIDE ALTERNATE ROUTES AROUND CLOSED OR OBSTRUCTED TRAFFIC WAYS IF REQUIRED BY OWNER OR AUTHORITIES HAVING JURISDICTION.
7. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL PROPERTIES AT ALL TIMES.
8. CONTRACTOR MAY CLOSE VEHICULAR ACCESS TO THE WEST SIDE OF EAST BRANCH ROOT RIVER FOR A MAXIMUM OF 2 DAYS. PEDESTRIAN ACCESS SHALL BE MAINTAINED ACROSS THE RIVER UTILIZING A CATWALK OR PLATFORM, A MINIMUM OF 4-FEET WIDE WITH 42" HIGH RAILING MEETING ADA ACCESSIBILITY REQUIREMENTS.
9. SLOPE INTERCEPT LINE DEFINES SLOPE & REMOVAL AND GRADING LIMITS.
10. IF EXCAVATION BELOW SUBGRADE (EBS) IS REQUIRED, IT WILL BE MEASURED AND PAID FOR AS COMMON EXCAVATION. THE LIMITS OF EBS WILL BE DETERMINED BY THE ENGINEER IN THE FIELD. THE FACTOR USED FOR EXPANDING THE FILLS TO COMPUTE THE VOLUME OF MATERIAL REQUIRED IS 1.3.
11. CONTRACTOR TO MAINTAIN POSITIVE SITE DRAINAGE WITHIN THE PROJECT LIMITS AT ALL TIMES.
12. MATERIAL CERTIFICATION FOR ALL MATERIALS USED ON SITE SHALL CONFORM TO THE PROJECT SPECIFICATIONS AND SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND RECORD.
13. TOTAL DISTURBED AREA AS DEFINED BY THE SLOPE INTERCEPT = 3,900 S.F.
14. TOTAL WETLAND AREA DISTURBED AS DEFINED BY THE SLOPE INTERCEPT = 1,590 S.F. (THE VEGETATED AREA BETWEEN THE ORDINARY HIGH WATERMARK (OHWM) AND THE PAVEMENT EDGE ON BOTH SIDES OF THE CREEK ARE ASSUMED TO BE WETLANDS.)
15. THE STRUCTURE AND CONSTRUCTION SHALL MEET ALL APPLICABLE STATUTES AND ADMINISTRATIVE CODES.
16. THE STANDARD SPECIFICATIONS FOR THIS PROJECT SHALL BE THE FOLLOWING:
    - 16.1. THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION,
    - 16.2. THE WISCONSIN STATE PLUMBING CODE,
    - 16.3. THE CITY OF FRANKLIN PLUMBING CODE,
    - 16.4. WISDOT 2018 STANDARD SPECIFICATIONS,
    - 16.5. WISDOT BRIDGE MANUAL CHAPTER 36, AND
    - 16.6. WISDOT LIST OF APPROVED PRODUCTS.
17. ANY PRODUCTS NOT ON THE WISDOT APPROVED LIST SHALL BE SUBMITTED IN ADVANCE TO THE ENGINEER FOR APPROVAL.
18. CONTRACTOR SHALL SUBMIT STAMPED CALCULATIONS AND SHOP DRAWINGS FOR THE CONCRETE PIPE AND ENDWALLS TO THE ENGINEER FOR REVIEW PRIOR TO PIPE PLACEMENT.
19. CONTRACTOR SHALL PROVIDE TEMPORARY BYPASS MEANS FOR INCOMING FLOWS AROUND THE WORK AREA. BYPASS METHOD SHALL BE SUBMITTED IN ADVANCE TO THE ENGINEER FOR APPROVAL PRIOR TO ANY CONSTRUCTION ACTIVITIES TAKING PLACE.
20. DO NOT COMMENCE SITE DISTURBANCE OPERATIONS UNTIL THE TEMPORARY BYPASS MEASURES ARE IN PLACE.
21. THE CONTRACTOR SHALL BE REQUIRED TO REMOVE ANY MUD, DIRT, OR DEBRIS RESULTING FROM CONSTRUCTION TRAFFIC ENTERING OR EXITING THE SITE PRIOR TO THE END OF EACH WORKING DAY.
22. DESIGN DATA: VEHICLE LOAD - HS 20. REINFORCED CULVERT PIPE SHALL BE DESIGNED TO WITHSTAND HS 20 VEHICULAR LOADING.
23. WETLAND DELINEATION WAS PERFORMED BY THOMPSON AND ASSOCIATES WETLAND SERVICES, LLC ON OCTOBER 30, 2018, BY ALICE THOMPSON.
24. SEEDING FOR TURF RESTORATION SHALL BE AGRECOL'S FLOOD PLAIN SEED MIX

PROJECT CONTACTS:

OWNER: DAVID STEINBERGER
FRANKLIN MOBILE LLC
FRANKLIN MOBILE HOME PARK
6361 SOUTH 27TH STREET
FRANKLIN, WI 53132-9429
(414) 841-9005

PROJECT MANAGER: MAHMOUD (MAC) N. MALAS, P.E.
MALAS ENGINEERING LLC
W148 N6912 TERRIWOOD DRIVE
MENOMONEE FALLS, WI 53051
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mmalas@malasengineering.com

Malas Engineering LLC
Integrated Innovative Solutions and Excellence in Engineering

WDNR: JOSHUA WIED
WATER REG. & ZONING SPEC. - SENIOR
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141 NW BARSTOW STREET, SUITE 180
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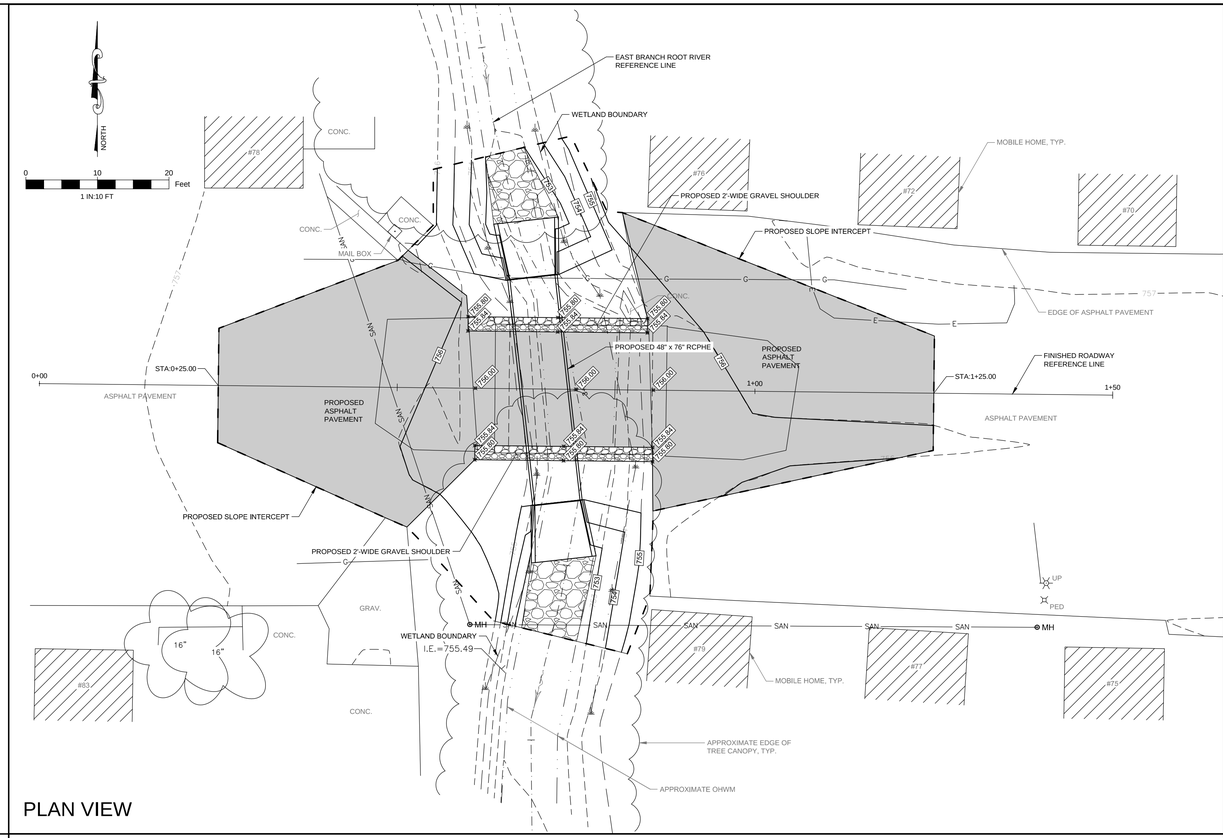
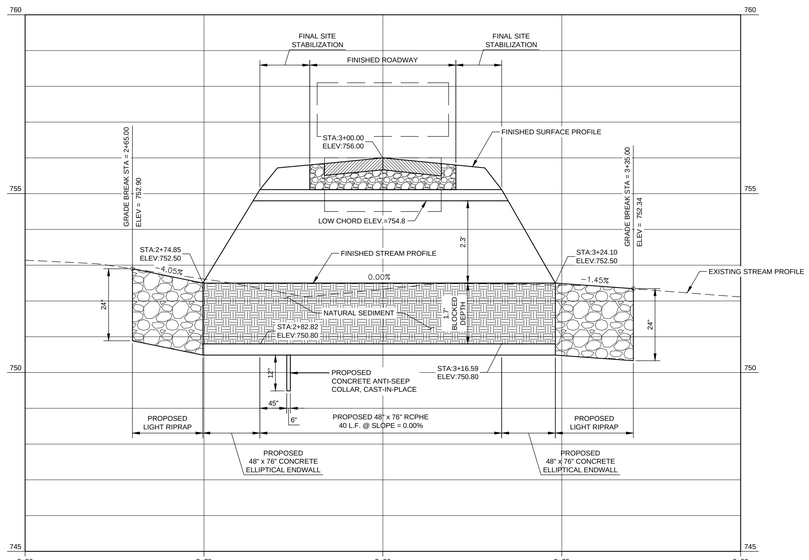
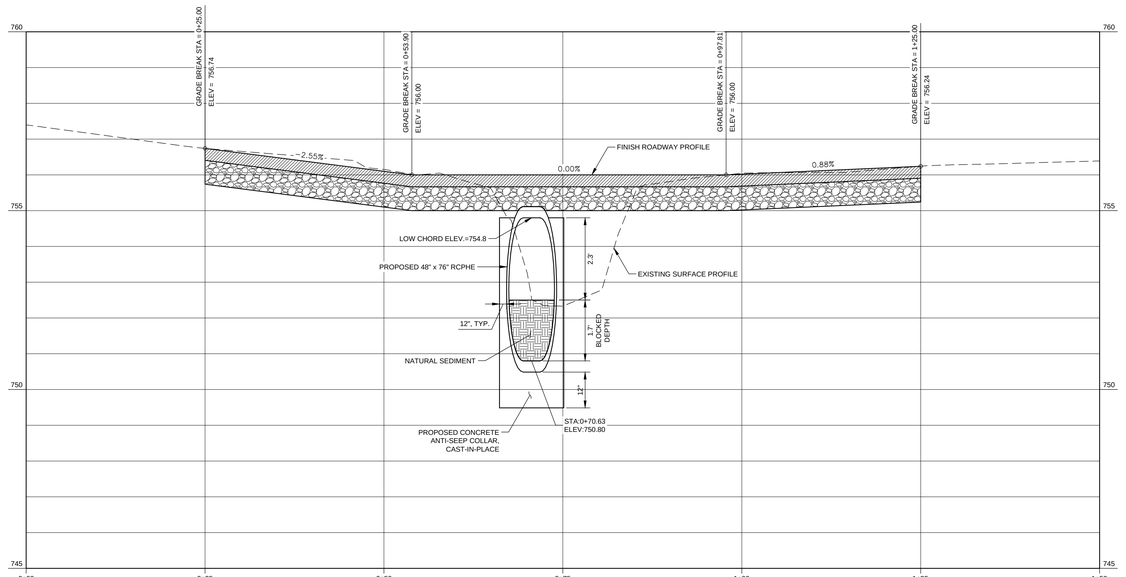


PLAN VIEW



PROFILE VIEW: THROUGH CULVERT

HORIZONTAL SCALE: 1"=10'
VERTICAL SCALE: 1"=1'



PROFILE VIEW: THROUGH ROADWAY

HORIZONTAL SCALE: 1"=10'
VERTICAL SCALE: 1"=1'

Himalayan Consultants, LLC
Engineers and Hydrogeologists

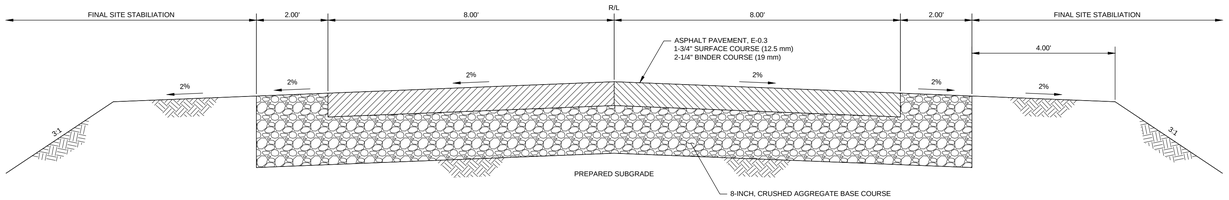
REVISION | DATE

FRANKLIN MOBILE ESTATES
6361 S. 27TH STREET
FANKLIN, WI

CULVERT PLAN & PROFILE

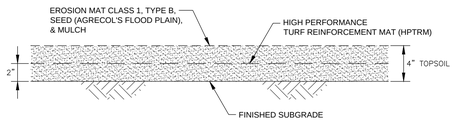
DATE:	10/15/2018
JOB NO.:	18056.029
DESIGNED BY:	MAB
CHECKED BY:	DMB

SHEET NUMBER
C1.0



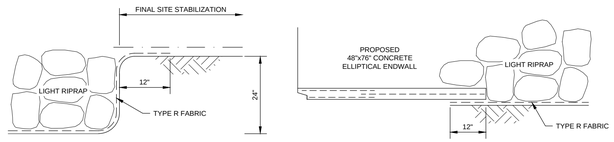
TYPICAL ROADWAY SECTION OVER CREEK

N.T.S.



TYPICAL SECTION, FINAL SITE STABILIZATION

N.T.S.



ENDWALL OUTLET PROTECTION

N.T.S.

Category	Item	Quantity	Unit
Miscellaneous	Mobilization / Demobilization	1	LS
	Clearing & Grubbing	1	LS
	Structure Removal	1	LS
Earthworks	Rough Grading	1	LS
	Finish Grading	1	LS
Roadway	Asphalt Pavement, E-0.3		
	Surface Course (12.5 mm)	14	CY
	Binder Course (19 mm)	18	CY
	Crushed Aggregate Base Course	62	CY
	Gravel Shoulder	4	CY
Storm Sewer	48" x 76" RCPHE	40	LF
	48" x 76" Concrete Elliptical Endwall w/ Bulkhead	2	EA
	Concrete Anti-Seep Collar	1	EA
Erosion Control	Cofferdam & Bypass Pumps	1	LS
	Best Management Practices (i.e. Silt Fence, Tracking Pad, etc.)	1	LS
	Light Riprap	12	CY
	Type R Fabric	44	SY
	Final Site Stabilization	134	SY

THE MISCELLANEOUS QUANTITIES SHOWN IN THE TABLE ABOVE ARE FOR REFERENCE ONLY AND NOT FOR BIDDING. CONTRACTOR SHALL VERIFY ALL QUANTITIES.

MISCELLANEOUS QUANTITIES

EXISTING CONDITIONS

River Station (RS)	Storm Event	Flow (cfs)	Water Surface Elevation (ft)	Channel Velocity (ft/s)
65	10-year (PF 1)	445	756.43	3.01
	50-year (PF 2)	720	756.93	3.29
	100-year (PF 3)	850	757.13	3.35
	500-year (PF 4)	1200	757.57	3.51
66	10-year (PF 1)	445	756.63	3.75
	50-year (PF 2)	720	757.14	4.28
	100-year (PF 3)	850	757.34	4.45
	500-year (PF 4)	1200	757.78	4.86
66.5	Bridge			
67	10-year (PF 1)	445	756.89	3.13
	50-year (PF 2)	720	757.20	4.12
	100-year (PF 3)	850	757.39	4.32
	500-year (PF 4)	1200	757.82	4.75
68	10-year (PF 1)	445	757.78	8.78
	50-year (PF 2)	720	758.26	9.70
	100-year (PF 3)	850	758.48	9.68
	500-year (PF 4)	1200	758.96	9.35

PROPOSED CONDITIONS

River Station (RS)	Storm Event	Flow (cfs)	Water Surface Elevation (ft)	Change in Water Surface Elevation (ft)	Channel Velocity (ft/s)
65	10-year (PF 1)	445	756.43	0.00	3.01
	50-year (PF 2)	720	756.93	0.00	3.29
	100-year (PF 3)	850	757.13	0.00	3.35
	500-year (PF 4)	1200	757.57	0.00	3.51
66	10-year (PF 1)	445	756.62	-0.01	3.28
	50-year (PF 2)	720	757.14	0.00	3.75
	100-year (PF 3)	850	757.34	0.00	3.90
	500-year (PF 4)	1200	757.78	0.00	4.25
66.5	Culvert				
67	10-year (PF 1)	445	756.82	-0.07	2.87
	50-year (PF 2)	720	757.20	0.00	3.60
	100-year (PF 3)	850	757.34	-0.05	3.89
	500-year (PF 4)	1200	757.78	-0.04	4.23
				0.00	
68	10-year (PF 1)	445	757.78	0.00	8.77
	50-year (PF 2)	720	758.20	-0.06	10.14
	100-year (PF 3)	850	758.46	-0.02	9.87
	500-year (PF 4)	1200	758.93	-0.03	9.51

HYDRAULIC SUMMARY

Malas Engineering LLC
Integrated Innovative Solutions and Excellence in Engineering

Himalayan Consultants, LLC
Engineers and Hydrogeologists

REVISION

DATE

FRANKLIN MOBILE ESTATES
6361 S. 27TH STREET
FANKLIN, WI

CULVERT PLAN DETAILS

DATE: 10/15/2018

JOB NO.: 18056.029

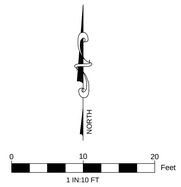
DESIGNED BY: MAB

CHECKED BY: DMB

SHEET NUMBER
C1.1

ATTACHMENT D

Natural Resource Protection Plan



PROJECT CONTACTS:

OWNER: DAVID STEINBERGER
FRANKLIN MOBILE LLC
FRANKLIN MOBILE HOME PARK
6361 SOUTH 27TH STREET
FRANKLIN, WI 53132-9429
(414) 841-9005

PROJECT MANAGER: MAHMOUD (MAC) N. MALAS, P.E.
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W148 N6912 TERRIWOOD DRIVE
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WDNR: JOSHUA WIED
WATER REG. & ZONING SPEC. - SENIOR
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141 NW BARSTOW STREET, SUITE 180
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(262) 574-2132
Joshua.Wied@wisconsin.gov

FRANKLIN MOBILE ESTATES BRIDGE REPLACEMENT-NATURAL RESOURCES PRESERVATION PLAN

THE PROJECT IS LOCATED WITHIN FRANKLIN ESTATES MOBILE HOME PARK IN THE CITY OF FRANKLIN, WISCONSIN (NW ¼, SECTION 29, T5N, R21E). THE PROJECT PROPOSES TO REPLACE THE EXISTING FAILED BRIDGE THAT CARRIES WEST WESTMOOR AVENUE OVER THE EAST BRANCH OF THE ROOT RIVER WITH A PROPOSED ELLIPTICAL CULVERT AS SHOWN ON THE PROJECT PLANS.

FLOODPLAIN/FLOODWAY, STREAM, WETLANDS, WETLAND BUFFERS, AND SHORE BUFFERS WILL BE DISTURBED AS PART OF THIS PROJECT. THESE DISTURBED AREAS ARE QUANTIFIED IN THE TABLE PROVIDED ON THIS PLAN. THE TOTAL AREA DISTURBED AS PART OF THIS PROJECT IS PROPOSED TO BE 0.09 ACRES.

DISTURBED AREAS WILL BE RESTORED WITH A DEEP ROOTED NATIVE SEED MIX AS INDICATED ON THE CONSTRUCTION PLAN VIEW.

PERTINENT INFORMATION RELATED TO THE NATURAL RESOURCE PRESERVATION PLAN INCLUDE:

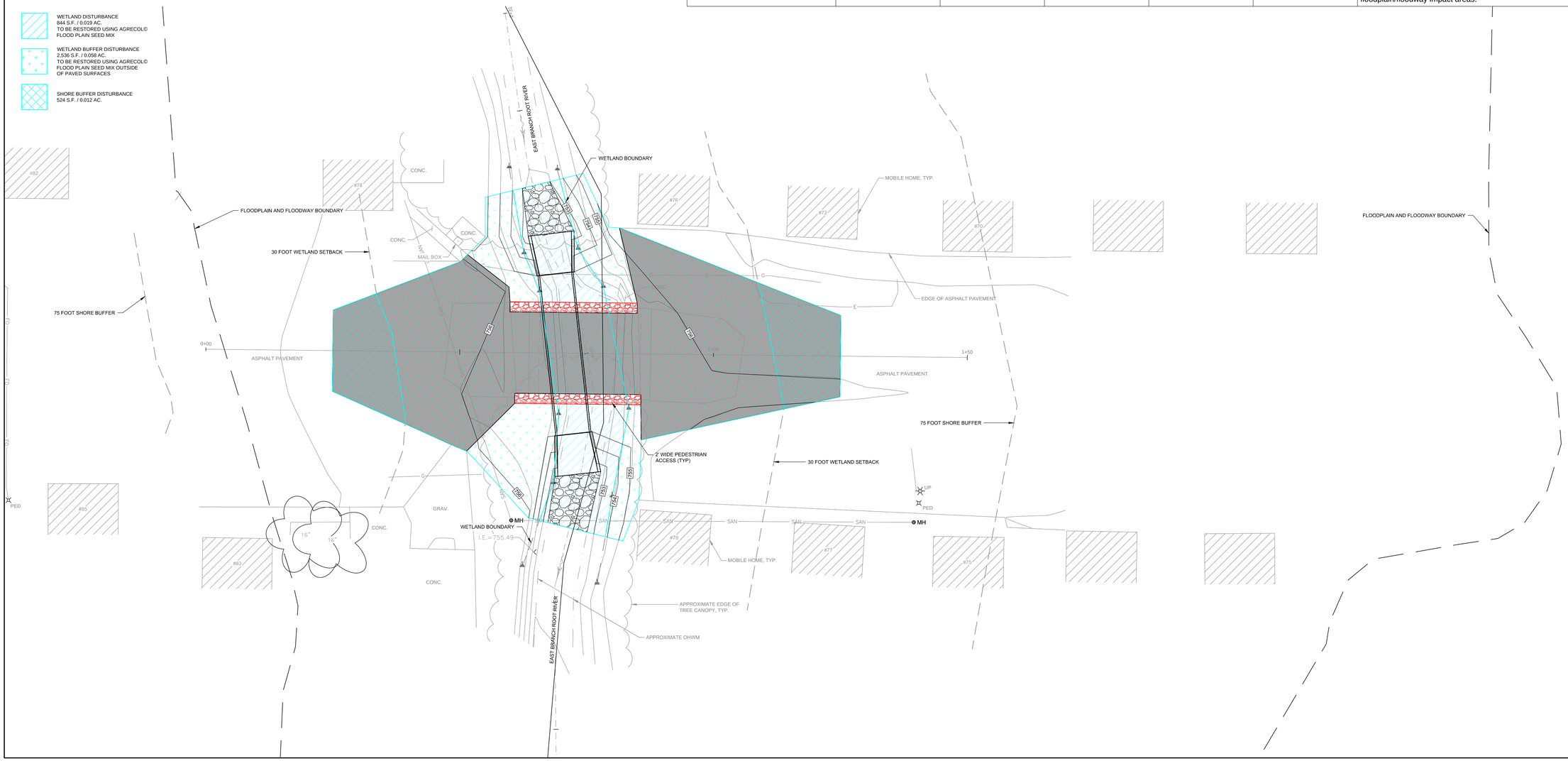
1. DISTURBED AREAS ARE SHOWN ON THE PLANS. THE PRESERVED AREAS INCLUDE ALL AREAS NOT DISTURBED BY PROPOSED ACTION.
2. ACCESS TO THE PROJECT AREAS WILL FOLLOW WEST WESTMOOR AVENUE. THERE WILL BE MINIMAL, TO NO DISTURBANCE ACCESSING THE SITE.
3. ALL WORK IS REQUIRED TO TAKE PLACE WITHIN WETLAND SETBACK, WETLAND BUFFERS, AND SHORE BUFFERS AS SHOWN ON THE PLAN.
4. UPON COMPLETION OF THE PROJECT, THE NATURAL RESOURCES WILL CONTINUE TO BE PRESERVED/PROTECTED WITHIN THE WETLAND BOUNDARY ALONG THE EAST BRANCH OF THE ROOT RIVER. NO PERMANENT EASEMENT WILL BE CREATED AS PART OF THIS PROJECT.
5. WETLAND DISTURBANCE/MITIGATION IS SUBJECT TO WDNR APPROVAL.

GENERAL NOTES:

1. WETLAND DELINEATION WAS PERFORMED BY THOMPSON AND ASSOCIATES WETLAND SERVICES, LLC ON OCTOBER 30, 2018, BY ALICE THOMPSON WITH AN ADDENDUM ON JULY 3, 2019.
2. WETLAND BUFFER IS 30' LANDWARD OF THE DELINEATED WETLAND BOUNDARY.
3. SHORE BUFFER IS 75' LANDWARD OF THE ORDINARY HIGH WATER MARK.
4. ELEVATIONS SHOWN ON THIS PLAN ARE REFERENCED TO NAVD88.
5. HORIZONTAL DATUM IS REFERENCED TO NAD83.
6. FLOODPLAIN/FLOODWAY LIMITS SHOWN WERE OBTAINED VIA SHAPEFILES DOWNLOADED FROM FEMA FLOOD MAP SERVICE CENTER

Natural Resource Impacts

	Exists on Site (Y/N)	Area Disturbed (square feet)	Area Disturbed (acres)	Area Permanently Removed (square feet)	Area Permanently Removed (acres)	Notes
Steep Slopes:						
10-19%	N	0	0.00	0	0.00	
20-30%	N	0	0.00	0	0.00	
30%	N	0	0.00	0	0.00	
Woodlands & Forests:						
Mature	N	0	0.00	0	0.00	
Young	N	0	0.00	0	0.00	
Lakes & Ponds	N	0	0.00	0	0.00	
Streams	Y	1,312	0.03	488	0.01	The limits of the stream are considered the top of banks per the topographic information collected for the purposes of this project. Permenent impact includes stream bank area removed due to replacing the existing bridge with a culvert which is more narrow than the banks of the stream. The channel through the culvert will maintain a natural stream bottom, and the existing stream centerline will remain unchanged.
Shore Buffers	Y	3,904	0.09	0	0.00	The existing shore buffer includes asphalt pavement which will remain in the proposed conditions and is not considered permenent shore buffer impact due to this project.
Flood- plains/ Flood- ways	Y	3,904	0.09	0	0.00	
Wetlands & Shoreland Wetlands	Y	844	0.02	187	0.00	Includes the areas immediately upstream and downstream of the existing bridge. Permenant impact is due to the culvert extending beyond the existing bridge limits.
Wetland Buffers	Y	2,536	0.06	0	0.00	The existing wetland buffer includes asphalt pavement which will remain in the proposed conditions and is not considered permenent wetland buffer impact.
Wetland Setback	Y	524	0.01	0	0.00	The area of impact includes the 20 feet that the wetland setback extends beyond the limits of the wetland buffer. This area overlaps with the shore buffer and floodplain/floodway impact areas.



REVISION

DATE

FRANKLIN MOBILE ESTATES
6361 S. 27TH STREET
FANKLIN, WI

NATURAL RESOURCE PROTECTION PLAN

DATE: 10/15/2018
JOB NO.: 18056.029
DESIGNED BY: MAB
CHECKED BY: DMB

SHEET NUMBER
NRPP

ATTACHMENT E

HEC-RAS Model Output

HEC-RAS River: RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	71	10%	Proposed	445.00	753.16	760.29	756.55	760.62	0.001486	4.61	96.63	120.86	0.31
Reach-1	71	10%	Effective	445.00	753.16	760.46	756.55	760.78	0.001368	4.49	99.07	125.78	0.30
Reach-1	71	10%	Corr Eff	445.00	753.16	760.29	756.55	760.62	0.001485	4.60	96.66	120.92	0.31
Reach-1	71	2%	Proposed	720.00	753.16	761.25	757.74	761.67	0.001852	5.61	261.90	201.17	0.35
Reach-1	71	2%	Effective	720.00	753.16	761.57	757.74	761.71	0.000843	3.89	559.92	227.12	0.24
Reach-1	71	2%	Corr Eff	720.00	753.16	761.25	757.74	761.67	0.001851	5.61	262.00	201.24	0.35
Reach-1	71	1%	Proposed	850.00	753.16	761.69	758.25	761.87	0.001088	4.46	586.38	236.36	0.27
Reach-1	71	1%	Effective	850.00	753.16	761.72	758.25	761.90	0.001066	4.42	593.56	238.81	0.27
Reach-1	71	1%	Corr Eff	850.00	753.16	761.69	758.25	761.87	0.001087	4.45	586.57	236.43	0.27
Reach-1	71	0.2%	Proposed	1200.00	753.16	761.97	759.49	762.28	0.001791	5.85	656.43	259.25	0.35
Reach-1	71	0.2%	Effective	1200.00	753.16	761.99	759.49	762.29	0.001768	5.82	661.52	260.83	0.35
Reach-1	71	0.2%	Corr Eff	1200.00	753.16	761.96	759.49	762.28	0.001796	5.85	655.46	258.94	0.35
Reach-1	70.5			Bridge									
Reach-1	70	10%	Proposed	445.00	753.16	759.61	756.55	759.77	0.001140	3.76	266.06	101.61	0.27
Reach-1	70	10%	Effective	445.00	753.16	759.77	756.55	759.92	0.001012	3.61	283.44	106.34	0.25
Reach-1	70	10%	Corr Eff	445.00	753.16	759.61	756.55	759.77	0.001138	3.76	266.24	101.66	0.27
Reach-1	70	2%	Proposed	720.00	753.16	760.27	757.72	760.56	0.001885	5.18	339.24	120.27	0.35
Reach-1	70	2%	Effective	720.00	753.16	760.45	757.72	760.71	0.001666	4.95	361.76	125.45	0.33
Reach-1	70	2%	Corr Eff	720.00	753.16	760.27	757.72	760.56	0.001884	5.17	339.38	120.30	0.35
Reach-1	70	1%	Proposed	850.00	753.16	760.51	758.24	760.86	0.002230	5.76	369.44	127.17	0.38
Reach-1	70	1%	Effective	850.00	753.16	760.65	758.24	760.99	0.002078	5.63	388.00	139.01	0.37
Reach-1	70	1%	Corr Eff	850.00	753.16	760.51	758.24	760.87	0.002227	5.76	369.71	127.23	0.38
Reach-1	70	0.2%	Proposed	1200.00	753.16	760.96	758.97	761.55	0.003505	7.52	436.52	174.40	0.48
Reach-1	70	0.2%	Effective	1200.00	753.16	761.08	758.97	761.64	0.003261	7.33	457.77	187.20	0.47
Reach-1	70	0.2%	Corr Eff	1200.00	753.16	760.96	758.97	761.56	0.003501	7.52	436.92	174.67	0.48
Reach-1	69	10%	Proposed	445.00	754.76	759.34		759.62	0.005862	6.94	220.67	109.47	0.57
Reach-1	69	10%	Effective	445.00	754.76	759.58		759.81	0.004446	6.26	248.65	117.24	0.50
Reach-1	69	10%	Corr Eff	445.00	754.76	759.34		759.63	0.005842	6.93	220.99	109.56	0.57
Reach-1	69	2%	Proposed	720.00	754.76	759.93		760.35	0.008028	8.81	291.45	128.23	0.68
Reach-1	69	2%	Effective	720.00	754.76	760.24		760.55	0.005888	7.85	332.32	137.90	0.59
Reach-1	69	2%	Corr Eff	720.00	754.76	759.93		760.35	0.008010	8.81	291.72	128.29	0.68
Reach-1	69	1%	Proposed	850.00	754.76	760.16		760.63	0.008884	9.54	321.38	135.38	0.73
Reach-1	69	1%	Effective	850.00	754.76	760.44	759.38	760.81	0.006751	8.61	360.76	144.25	0.64
Reach-1	69	1%	Corr Eff	850.00	754.76	760.16		760.63	0.008843	9.53	322.00	135.52	0.72
Reach-1	69	0.2%	Proposed	1200.00	754.76	760.69		761.26	0.010429	11.01	397.30	148.00	0.80
Reach-1	69	0.2%	Effective	1200.00	754.76	760.87	760.00	761.35	0.008660	10.23	423.51	148.00	0.73
Reach-1	69	0.2%	Corr Eff	1200.00	754.76	760.69		761.27	0.010385	10.99	397.89	148.00	0.80
Reach-1	68	10%	Proposed	445.00	753.76	758.64		758.72	0.002883	4.48	441.74	314.00	0.36
Reach-1	68	10%	Effective	445.00	753.76	757.78	757.78	758.25	0.014506	8.78	212.87	211.12	0.79

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	68	10%	Corr Eff	445.00	753.76	758.75		758.82	0.002297	4.06	477.83	314.00	0.33
Reach-1	68	2%	Proposed	720.00	753.76	759.31		759.37	0.002378	4.44	651.58	314.00	0.34
Reach-1	68	2%	Effective	720.00	753.76	758.26	758.18	758.71	0.015131	9.70	328.94	274.26	0.82
Reach-1	68	2%	Corr Eff	720.00	753.76	759.32		759.38	0.002336	4.41	655.32	314.00	0.34
Reach-1	68	1%	Proposed	850.00	753.76	759.48		759.55	0.002575	4.73	707.37	314.00	0.35
Reach-1	68	1%	Effective	850.00	753.76	758.49		758.89	0.014057	9.67	394.52	304.19	0.80
Reach-1	68	1%	Corr Eff	850.00	753.76	759.51		759.58	0.002483	4.66	715.78	314.00	0.35
Reach-1	68	0.2%	Proposed	1200.00	753.76	759.92		760.00	0.002972	5.34	843.48	314.00	0.39
Reach-1	68	0.2%	Effective	1200.00	753.76	758.96		759.27	0.011490	9.34	542.40	314.00	0.74
Reach-1	68	0.2%	Corr Eff	1200.00	753.76	759.94		760.02	0.002896	5.28	850.48	314.00	0.38
Reach-1	67.5	10%	Proposed	445.00	752.75	757.24	756.25	757.64	0.003329	5.35	123.22	139.01	0.51
Reach-1	67.5	10%	Corr Eff	445.00	752.75	756.94	756.64	757.55	0.006116	6.55	87.70	74.92	0.68
Reach-1	67.5	2%	Proposed	720.00	752.75	757.62	757.62	758.21	0.004815	6.90	193.74	234.81	0.62
Reach-1	67.5	2%	Corr Eff	720.00	752.75	757.70	757.70	758.24	0.004778	6.76	209.93	256.53	0.62
Reach-1	67.5	1%	Proposed	850.00	752.75	757.85	757.85	758.39	0.004448	6.91	256.40	294.88	0.60
Reach-1	67.5	1%	Corr Eff	850.00	752.75	757.89	757.89	758.41	0.004678	6.91	263.31	304.79	0.62
Reach-1	67.5	0.2%	Proposed	1200.00	752.75	758.23	758.23	758.74	0.004446	7.33	386.27	387.43	0.61
Reach-1	67.5	0.2%	Corr Eff	1200.00	752.75	758.25	758.25	758.74	0.004741	7.38	387.16	391.03	0.63
Reach-1	67	10%	Effective	445.00	752.46	756.81	755.96	756.86	0.001116	3.30	332.86	241.00	0.30
Reach-1	67	10%	Corr Eff	445.00	752.10	757.19	756.07	757.25	0.000703	2.73	360.93	277.80	0.24
Reach-1	67	2%	Effective	720.00	752.46	757.20	756.07	757.27	0.001517	4.12	435.74	283.80	0.36
Reach-1	67	2%	Corr Eff	720.00	752.10	757.60	756.53	757.69	0.000939	3.37	486.70	325.60	0.28
Reach-1	67	1%	Effective	850.00	752.46	757.39	756.20	757.46	0.001580	4.33	490.30	304.06	0.37
Reach-1	67	1%	Corr Eff	850.00	752.10	757.74	756.69	757.84	0.001057	3.65	533.94	341.83	0.30
Reach-1	67	0.2%	Effective	1200.00	752.46	757.82	756.50	757.90	0.001672	4.76	631.71	351.18	0.39
Reach-1	67	0.2%	Corr Eff	1200.00	752.10	758.08	757.03	758.20	0.001308	4.26	654.96	381.84	0.34
Reach-1	66.5			Culvert									
Reach-1	66	10%	Effective	445.00	752.46	756.62	755.72	756.69	0.001553	3.76	289.90	220.68	0.36
Reach-1	66	10%	Corr Eff	445.00	752.50	757.17	756.18	757.23	0.000828	2.89	349.68	276.41	0.26
Reach-1	66	2%	Effective	720.00	752.46	757.15	756.07	757.23	0.001639	4.25	422.29	278.58	0.37
Reach-1	66	2%	Corr Eff	720.00	752.50	757.59	756.60	757.67	0.001067	3.51	475.33	324.20	0.30
Reach-1	66	1%	Effective	850.00	752.46	757.34	756.22	757.42	0.001691	4.45	477.08	299.28	0.38
Reach-1	66	1%	Corr Eff	850.00	752.50	757.73	756.75	757.82	0.001191	3.79	522.11	340.29	0.32
Reach-1	66	0.2%	Effective	1200.00	752.46	757.77	756.50	757.86	0.001783	4.88	615.84	346.21	0.40
Reach-1	66	0.2%	Corr Eff	1200.00	752.50	758.06	757.06	758.17	0.001451	4.39	642.09	379.83	0.35
Reach-1	65.5	10%	Proposed	445.00	752.40	756.59	756.59	757.07	0.005669	5.88	115.16	183.20	0.64
Reach-1	65.5	10%	Corr Eff	445.00	752.40	756.59	756.59	757.07	0.005669	5.88	115.16	183.20	0.64
Reach-1	65.5	2%	Proposed	720.00	752.40	757.04	757.03	757.51	0.005543	6.46	209.77	238.17	0.65

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	65.5	2%	Corr Eff	720.00	752.40	757.04	757.03	757.51	0.005543	6.46	209.77	238.17	0.65
Reach-1	65.5	1%	Proposed	850.00	752.40	757.24	757.17	757.67	0.005147	6.49	259.42	265.66	0.63
Reach-1	65.5	1%	Corr Eff	850.00	752.40	757.24	757.17	757.67	0.005147	6.49	259.42	265.66	0.63
Reach-1	65.5	0.2%	Proposed	1200.00	752.40	757.67		758.05	0.004475	6.57	387.38	325.99	0.60
Reach-1	65.5	0.2%	Corr Eff	1200.00	752.40	757.67		758.05	0.004475	6.57	387.38	325.99	0.60
Reach-1	65	10%	Proposed	445.00	752.86	756.40	755.50	756.46	0.003112	3.07	239.86	203.61	0.29
Reach-1	65	10%	Effective	445.00	752.86	756.42	755.50	756.47	0.003016	3.03	242.76	204.90	0.28
Reach-1	65	10%	Corr Eff	445.00	752.86	756.40	755.50	756.46	0.003112	3.07	239.86	203.61	0.29
Reach-1	65	2%	Proposed	720.00	752.86	756.92	755.82	756.99	0.003003	3.31	361.90	269.66	0.29
Reach-1	65	2%	Effective	720.00	752.86	756.94	755.82	757.01	0.002893	3.26	367.54	272.61	0.28
Reach-1	65	2%	Corr Eff	720.00	752.86	756.92	755.82	756.99	0.003003	3.31	361.90	269.66	0.29
Reach-1	65	1%	Proposed	850.00	752.86	757.11	755.94	757.18	0.003014	3.41	414.41	296.02	0.29
Reach-1	65	1%	Effective	850.00	752.86	757.13	755.94	757.20	0.002906	3.36	420.64	298.99	0.29
Reach-1	65	1%	Corr Eff	850.00	752.86	757.11	755.94	757.18	0.003014	3.41	414.41	296.02	0.29
Reach-1	65	0.2%	Proposed	1200.00	752.86	757.53	756.21	757.61	0.002951	3.60	552.02	355.96	0.29
Reach-1	65	0.2%	Effective	1200.00	752.86	757.56	756.21	757.63	0.002828	3.53	561.43	359.70	0.29
Reach-1	65	0.2%	Corr Eff	1200.00	752.86	757.53	756.21	757.61	0.002951	3.60	552.02	355.96	0.29
Reach-1	64	10%	Proposed	445.00	751.06	753.44	753.44	753.81	0.009792	7.28	130.45	143.62	0.85
Reach-1	64	10%	Effective	445.00	751.06	753.44	753.44	753.81	0.009792	7.28	130.45	143.62	0.85
Reach-1	64	10%	Corr Eff	445.00	751.06	753.44	753.44	753.81	0.009792	7.28	130.45	143.62	0.85
Reach-1	64	2%	Proposed	720.00	751.06	753.73	753.73	754.22	0.011935	8.70	173.66	156.30	0.96
Reach-1	64	2%	Effective	720.00	751.06	753.73	753.73	754.22	0.011935	8.70	173.66	156.30	0.96
Reach-1	64	2%	Corr Eff	720.00	751.06	753.73	753.73	754.22	0.011935	8.70	173.66	156.30	0.96
Reach-1	64	1%	Proposed	850.00	751.06	753.86	753.86	754.38	0.012060	9.06	195.57	162.35	0.97
Reach-1	64	1%	Effective	850.00	751.06	753.86	753.86	754.38	0.012060	9.06	195.57	162.35	0.97
Reach-1	64	1%	Corr Eff	850.00	751.06	753.86	753.86	754.38	0.012060	9.06	195.57	162.35	0.97
Reach-1	64	0.2%	Proposed	1200.00	751.06	754.15	754.15	754.77	0.013064	10.09	244.71	175.16	1.03
Reach-1	64	0.2%	Effective	1200.00	751.06	754.15	754.15	754.77	0.013064	10.09	244.71	175.16	1.03
Reach-1	64	0.2%	Corr Eff	1200.00	751.06	754.15	754.15	754.77	0.013064	10.09	244.71	175.16	1.03
Reach-1	63	10%	Proposed	445.00	748.46	751.00		751.01	0.000161	1.01	829.96	521.09	0.11
Reach-1	63	10%	Effective	445.00	748.46	751.01		751.02	0.000159	1.00	834.80	521.62	0.11
Reach-1	63	10%	Corr Eff	445.00	748.46	751.00		751.01	0.000161	1.01	829.96	521.09	0.11
Reach-1	63	2%	Proposed	720.00	748.46	751.54		751.55	0.000171	1.18	1120.05	551.65	0.12
Reach-1	63	2%	Effective	720.00	748.46	751.55		751.56	0.000169	1.17	1125.17	552.17	0.12
Reach-1	63	2%	Corr Eff	720.00	748.46	751.54		751.55	0.000171	1.18	1120.05	551.65	0.12
Reach-1	63	1%	Proposed	850.00	748.46	751.75		751.76	0.000177	1.25	1236.71	563.47	0.12
Reach-1	63	1%	Effective	850.00	748.46	751.76		751.77	0.000175	1.24	1241.97	564.00	0.12
Reach-1	63	1%	Corr Eff	850.00	748.46	751.75		751.76	0.000177	1.25	1236.71	563.47	0.12
Reach-1	63	0.2%	Proposed	1200.00	748.46	752.21		752.22	0.000198	1.44	1500.96	589.37	0.13
Reach-1	63	0.2%	Effective	1200.00	748.46	752.22		752.23	0.000196	1.44	1506.68	589.92	0.13

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	63	0.2%	Corr Eff	1200.00	748.46	752.21		752.22	0.000198	1.44	1500.96	589.37	0.13
Reach-1	62	10%	Proposed	445.00	746.56	750.89		750.91	0.000217	1.54	674.26	448.54	0.13
Reach-1	62	10%	Effective	445.00	746.56	750.90		750.92	0.000214	1.53	678.57	450.51	0.13
Reach-1	62	10%	Corr Eff	445.00	746.56	750.89		750.91	0.000217	1.54	674.26	448.54	0.13
Reach-1	62	2%	Proposed	720.00	746.56	751.42		751.44	0.000260	1.83	939.30	556.65	0.15
Reach-1	62	2%	Effective	720.00	746.56	751.43		751.45	0.000257	1.82	944.34	558.50	0.15
Reach-1	62	2%	Corr Eff	720.00	746.56	751.42		751.44	0.000260	1.83	939.30	556.65	0.15
Reach-1	62	1%	Proposed	850.00	746.56	751.63		751.64	0.000273	1.93	1057.29	598.53	0.15
Reach-1	62	1%	Effective	850.00	746.56	751.64		751.65	0.000270	1.92	1062.75	600.39	0.15
Reach-1	62	1%	Corr Eff	850.00	746.56	751.63		751.64	0.000273	1.93	1057.29	598.53	0.15
Reach-1	62	0.2%	Proposed	1200.00	746.56	752.07		752.09	0.000304	2.15	1343.69	689.68	0.16
Reach-1	62	0.2%	Effective	1200.00	746.56	752.08		752.10	0.000301	2.14	1350.18	691.60	0.16
Reach-1	62	0.2%	Corr Eff	1200.00	746.56	752.07		752.09	0.000304	2.15	1343.69	689.68	0.16
Reach-1	61	10%	Proposed	445.00	745.36	750.66		750.71	0.001140	3.15	338.61	270.02	0.25
Reach-1	61	10%	Effective	445.00	745.36	750.67		750.72	0.001129	3.14	339.90	270.35	0.25
Reach-1	61	10%	Corr Eff	445.00	745.36	750.66		750.71	0.001140	3.15	338.61	270.02	0.25
Reach-1	61	2%	Proposed	720.00	745.36	751.16		751.22	0.001170	3.41	482.91	305.14	0.26
Reach-1	61	2%	Effective	720.00	745.36	751.17		751.22	0.001163	3.40	484.06	305.40	0.26
Reach-1	61	2%	Corr Eff	720.00	745.36	751.16		751.22	0.001170	3.41	482.91	305.14	0.26
Reach-1	61	1%	Proposed	850.00	745.36	751.36		751.41	0.001187	3.52	543.72	318.79	0.26
Reach-1	61	1%	Effective	850.00	745.36	751.36		751.42	0.001181	3.51	544.85	319.03	0.26
Reach-1	61	1%	Corr Eff	850.00	745.36	751.36		751.41	0.001187	3.52	543.72	318.79	0.26
Reach-1	61	0.2%	Proposed	1200.00	745.36	751.77		751.84	0.001291	3.84	681.25	347.68	0.28
Reach-1	61	0.2%	Effective	1200.00	745.36	751.77		751.84	0.001287	3.84	682.15	347.86	0.28
Reach-1	61	0.2%	Corr Eff	1200.00	745.36	751.77		751.84	0.001291	3.84	681.25	347.68	0.28
Reach-1	60	10%	Proposed	445.00	744.96	749.81		749.90	0.003006	4.32	235.91	217.07	0.37
Reach-1	60	10%	Effective	445.00	744.96	749.81		749.90	0.002984	4.30	236.63	217.44	0.36
Reach-1	60	10%	Corr Eff	445.00	744.96	749.81		749.90	0.003006	4.32	235.91	217.07	0.37
Reach-1	60	2%	Proposed	720.00	744.96	750.35		750.44	0.002585	4.33	371.04	277.94	0.35
Reach-1	60	2%	Effective	720.00	744.96	750.35		750.44	0.002578	4.33	371.48	278.12	0.35
Reach-1	60	2%	Corr Eff	720.00	744.96	750.35		750.44	0.002585	4.33	371.04	277.94	0.35
Reach-1	60	1%	Proposed	850.00	744.96	750.55		750.64	0.002498	4.37	429.27	300.39	0.34
Reach-1	60	1%	Effective	850.00	744.96	750.56		750.64	0.002492	4.37	429.61	300.52	0.34
Reach-1	60	1%	Corr Eff	850.00	744.96	750.55		750.64	0.002498	4.37	429.27	300.39	0.34
Reach-1	60	0.2%	Proposed	1200.00	744.96	750.99		751.07	0.002214	4.35	629.84	478.42	0.33
Reach-1	60	0.2%	Effective	1200.00	744.96	750.99		751.07	0.002209	4.34	630.37	478.48	0.33
Reach-1	60	0.2%	Corr Eff	1200.00	744.96	750.99		751.07	0.002214	4.35	629.84	478.42	0.33
Reach-1	59	10%	Proposed	445.00	744.46	749.26		749.33	0.000920	3.08	325.34	259.65	0.25
Reach-1	59	10%	Effective	445.00	744.46	749.26		749.33	0.000920	3.08	325.35	259.66	0.25

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	59	10%	Corr Eff	445.00	744.46	749.26		749.33	0.000920	3.08	325.34	259.65	0.25
Reach-1	59	2%	Proposed	720.00	744.46	749.79		749.87	0.001008	3.47	484.64	334.22	0.27
Reach-1	59	2%	Effective	720.00	744.46	749.79		749.87	0.001007	3.47	485.01	334.37	0.27
Reach-1	59	2%	Corr Eff	720.00	744.46	749.79		749.87	0.001008	3.47	484.64	334.22	0.27
Reach-1	59	1%	Proposed	850.00	744.46	749.99		750.07	0.001045	3.62	552.55	361.36	0.28
Reach-1	59	1%	Effective	850.00	744.46	749.99		750.07	0.001043	3.62	552.97	361.52	0.28
Reach-1	59	1%	Corr Eff	850.00	744.46	749.99		750.07	0.001045	3.62	552.55	361.36	0.28
Reach-1	59	0.2%	Proposed	1200.00	744.46	750.41		750.50	0.001133	3.97	718.70	420.44	0.29
Reach-1	59	0.2%	Effective	1200.00	744.46	750.41		750.50	0.001132	3.97	719.19	420.60	0.29
Reach-1	59	0.2%	Corr Eff	1200.00	744.46	750.41		750.50	0.001133	3.97	718.70	420.44	0.29
Reach-1	58	10%	Proposed	445.00	744.26	748.79		748.90	0.001808	3.96	258.35	222.39	0.34
Reach-1	58	10%	Effective	445.00	744.26	748.79		748.90	0.001807	3.96	258.40	222.42	0.34
Reach-1	58	10%	Corr Eff	445.00	744.26	748.79		748.90	0.001808	3.96	258.35	222.39	0.34
Reach-1	58	2%	Proposed	720.00	744.26	749.28		749.40	0.002022	4.50	383.64	292.47	0.36
Reach-1	58	2%	Effective	720.00	744.26	749.28		749.40	0.002010	4.49	384.60	292.95	0.36
Reach-1	58	2%	Corr Eff	720.00	744.26	749.28		749.40	0.002022	4.50	383.64	292.47	0.36
Reach-1	58	1%	Proposed	850.00	744.26	749.46		749.58	0.002091	4.69	437.91	318.08	0.37
Reach-1	58	1%	Effective	850.00	744.26	749.46		749.58	0.002079	4.68	439.00	318.57	0.37
Reach-1	58	1%	Corr Eff	850.00	744.26	749.46		749.58	0.002091	4.69	437.91	318.08	0.37
Reach-1	58	0.2%	Proposed	1200.00	744.26	749.84		749.97	0.002268	5.13	569.30	372.84	0.39
Reach-1	58	0.2%	Effective	1200.00	744.26	749.84		749.97	0.002255	5.12	570.66	373.37	0.39
Reach-1	58	0.2%	Corr Eff	1200.00	744.26	749.84		749.97	0.002268	5.13	569.30	372.84	0.39
Reach-1	57	10%	Proposed	445.00	743.66	747.74		747.84	0.002273	4.34	273.32	286.94	0.39
Reach-1	57	10%	Effective	445.00	743.66	747.74		747.84	0.002278	4.35	273.06	286.77	0.39
Reach-1	57	10%	Corr Eff	445.00	743.66	747.74		747.84	0.002273	4.34	273.32	286.94	0.39
Reach-1	57	2%	Proposed	720.00	743.66	748.20		748.29	0.002167	4.57	424.11	371.25	0.39
Reach-1	57	2%	Effective	720.00	743.66	748.20		748.29	0.002175	4.58	423.45	370.92	0.39
Reach-1	57	2%	Corr Eff	720.00	743.66	748.20		748.29	0.002167	4.57	424.11	371.25	0.39
Reach-1	57	1%	Proposed	850.00	743.66	748.37		748.46	0.002115	4.64	492.38	403.67	0.39
Reach-1	57	1%	Effective	850.00	743.66	748.38		748.46	0.002102	4.62	493.64	404.24	0.38
Reach-1	57	1%	Corr Eff	850.00	743.66	748.37		748.46	0.002115	4.64	492.38	403.67	0.39
Reach-1	57	0.2%	Proposed	1200.00	743.66	748.77		748.85	0.001924	4.68	665.81	457.19	0.37
Reach-1	57	0.2%	Effective	1200.00	743.66	748.78		748.86	0.001906	4.66	668.07	457.64	0.37
Reach-1	57	0.2%	Corr Eff	1200.00	743.66	748.77		748.85	0.001924	4.68	665.81	457.19	0.37
Reach-1	56	10%	Proposed	445.00	742.86	746.49		746.60	0.002454	4.43	241.02	213.37	0.42
Reach-1	56	10%	Effective	445.00	742.86	746.50		746.61	0.002436	4.41	241.75	213.71	0.42
Reach-1	56	10%	Corr Eff	445.00	742.86	746.49		746.60	0.002454	4.43	241.02	213.37	0.42
Reach-1	56	2%	Proposed	720.00	742.86	747.05		747.15	0.002183	4.61	373.78	266.48	0.40
Reach-1	56	2%	Effective	720.00	742.86	747.05		747.15	0.002161	4.59	375.31	267.03	0.40
Reach-1	56	2%	Corr Eff	720.00	742.86	747.05		747.15	0.002183	4.61	373.78	266.48	0.40

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	56	1%	Proposed	850.00	742.86	747.25		747.35	0.002134	4.71	430.41	286.05	0.40
Reach-1	56	1%	Effective	850.00	742.86	747.26		747.36	0.002112	4.69	432.19	286.65	0.40
Reach-1	56	1%	Corr Eff	850.00	742.86	747.25		747.35	0.002134	4.71	430.41	286.05	0.40
Reach-1	56	0.2%	Proposed	1200.00	742.86	747.70		747.80	0.002114	5.01	566.72	328.42	0.41
Reach-1	56	0.2%	Effective	1200.00	742.86	747.70		747.81	0.002105	5.00	567.68	328.70	0.41
Reach-1	56	0.2%	Corr Eff	1200.00	742.86	747.70		747.80	0.002114	5.01	566.72	328.42	0.41
Reach-1	55	10%	Proposed	445.00	741.16	745.62		745.76	0.002058	4.01	371.44	341.08	0.34
Reach-1	55	10%	Effective	445.00	741.16	745.65		745.78	0.001968	3.94	380.88	346.66	0.33
Reach-1	55	10%	Corr Eff	445.00	741.16	745.62		745.76	0.002058	4.01	371.44	341.08	0.34
Reach-1	55	2%	Proposed	720.00	741.16	746.21		746.35	0.002094	4.41	609.54	461.52	0.35
Reach-1	55	2%	Effective	720.00	741.16	746.24		746.36	0.002018	4.34	620.64	466.38	0.34
Reach-1	55	2%	Corr Eff	720.00	741.16	746.21		746.35	0.002094	4.41	609.54	461.52	0.35
Reach-1	55	1%	Proposed	850.00	741.16	746.42		746.55	0.002126	4.57	710.95	504.16	0.36
Reach-1	55	1%	Effective	850.00	741.16	746.45		746.57	0.002052	4.50	723.04	509.00	0.35
Reach-1	55	1%	Corr Eff	850.00	741.16	746.42		746.55	0.002126	4.57	710.95	504.16	0.36
Reach-1	55	0.2%	Proposed	1200.00	741.16	746.92		747.04	0.001971	4.68	980.15	558.88	0.35
Reach-1	55	0.2%	Effective	1200.00	741.16	746.94		747.05	0.001920	4.63	990.26	560.22	0.34
Reach-1	55	0.2%	Corr Eff	1200.00	741.16	746.92		747.04	0.001971	4.68	980.15	558.88	0.35
Reach-1	54	10%	Proposed	445.00	739.96	745.49		745.50	0.000296	1.70	936.75	497.92	0.13
Reach-1	54	10%	Effective	445.00	739.96	745.49		745.50	0.000295	1.70	938.00	498.09	0.13
Reach-1	54	10%	Corr Eff	445.00	739.96	745.49		745.50	0.000296	1.70	936.75	497.92	0.13
Reach-1	54	2%	Proposed	720.00	739.96	746.02		746.04	0.000389	2.08	1214.51	535.54	0.15
Reach-1	54	2%	Effective	720.00	739.96	746.03		746.04	0.000388	2.08	1215.62	535.69	0.15
Reach-1	54	2%	Corr Eff	720.00	739.96	746.02		746.04	0.000389	2.08	1214.51	535.54	0.15
Reach-1	54	1%	Proposed	850.00	739.96	746.21		746.23	0.000439	2.25	1313.48	548.33	0.16
Reach-1	54	1%	Effective	850.00	739.96	746.21		746.23	0.000438	2.25	1315.42	548.57	0.16
Reach-1	54	1%	Corr Eff	850.00	739.96	746.21		746.23	0.000439	2.25	1313.48	548.33	0.16
Reach-1	54	0.2%	Proposed	1200.00	739.96	746.66		746.68	0.000544	2.63	1566.14	578.59	0.18
Reach-1	54	0.2%	Effective	1200.00	739.96	746.66		746.68	0.000543	2.63	1567.48	578.73	0.18
Reach-1	54	0.2%	Corr Eff	1200.00	739.96	746.66		746.68	0.000544	2.63	1566.14	578.59	0.18
Reach-1	53	10%	Proposed	445.00	738.76	745.40		745.41	0.000147	1.44	1094.86	459.92	0.10
Reach-1	53	10%	Effective	445.00	738.76	745.40		745.41	0.000146	1.44	1095.81	459.93	0.10
Reach-1	53	10%	Corr Eff	445.00	738.76	745.40		745.41	0.000147	1.44	1094.86	459.92	0.10
Reach-1	53	2%	Proposed	720.00	738.76	745.89		745.91	0.000224	1.87	1323.48	461.66	0.12
Reach-1	53	2%	Effective	720.00	738.76	745.89		745.91	0.000224	1.87	1324.44	461.67	0.12
Reach-1	53	2%	Corr Eff	720.00	738.76	745.89		745.91	0.000224	1.87	1323.48	461.66	0.12
Reach-1	53	1%	Proposed	850.00	738.76	746.05		746.07	0.000267	2.07	1397.52	462.22	0.14
Reach-1	53	1%	Effective	850.00	738.76	746.06		746.07	0.000266	2.07	1399.33	462.23	0.14
Reach-1	53	1%	Corr Eff	850.00	738.76	746.05		746.07	0.000267	2.07	1397.52	462.22	0.14
Reach-1	53	0.2%	Proposed	1200.00	738.76	746.45		746.48	0.000370	2.53	1581.03	463.61	0.16

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	53	0.2%	Effective	1200.00	738.76	746.45		746.48	0.000370	2.52	1582.16	463.62	0.16
Reach-1	53	0.2%	Corr Eff	1200.00	738.76	746.45		746.48	0.000370	2.53	1581.03	463.61	0.16
Reach-1	52	10%	Proposed	445.00	736.66	745.35	741.06	745.36	0.000102	1.49	1233.86	464.00	0.09
Reach-1	52	10%	Effective	445.00	736.66	745.36	741.06	745.37	0.000102	1.49	1234.88	464.00	0.09
Reach-1	52	10%	Corr Eff	445.00	736.66	745.35	741.06	745.36	0.000102	1.49	1233.86	464.00	0.09
Reach-1	52	2%	Proposed	720.00	736.66	745.82	743.30	745.84	0.000168	1.99	1452.38	464.00	0.12
Reach-1	52	2%	Effective	720.00	736.66	745.83	743.30	745.84	0.000168	1.99	1453.32	464.00	0.12
Reach-1	52	2%	Corr Eff	720.00	736.66	745.82	743.30	745.84	0.000168	1.99	1452.38	464.00	0.12
Reach-1	52	1%	Proposed	850.00	736.66	745.97	743.55	745.99	0.000205	2.22	1520.21	464.00	0.13
Reach-1	52	1%	Effective	850.00	736.66	745.98	743.55	746.00	0.000204	2.22	1522.08	464.00	0.13
Reach-1	52	1%	Corr Eff	850.00	736.66	745.97	743.55	745.99	0.000205	2.22	1520.21	464.00	0.13
Reach-1	52	0.2%	Proposed	1200.00	736.66	746.33	743.76	746.36	0.000300	2.76	1687.61	464.00	0.16
Reach-1	52	0.2%	Effective	1200.00	736.66	746.33	743.76	746.36	0.000300	2.76	1688.66	464.00	0.16
Reach-1	52	0.2%	Corr Eff	1200.00	736.66	746.33	743.76	746.36	0.000300	2.76	1687.61	464.00	0.16
Reach-1	51.5			Bridge									
Reach-1	51	10%	Proposed	445.00	736.66	745.34	741.05	745.35	0.000103	1.50	1229.25	464.00	0.09
Reach-1	51	10%	Effective	445.00	736.66	745.35	741.05	745.36	0.000103	1.50	1230.27	464.00	0.09
Reach-1	51	10%	Corr Eff	445.00	736.66	745.34	741.05	745.35	0.000103	1.50	1229.25	464.00	0.09
Reach-1	51	2%	Proposed	720.00	736.66	745.81	742.49	745.83	0.000170	2.00	1445.39	464.00	0.12
Reach-1	51	2%	Effective	720.00	736.66	745.81	742.49	745.83	0.000170	2.00	1446.27	464.00	0.12
Reach-1	51	2%	Corr Eff	720.00	736.66	745.81	742.49	745.83	0.000170	2.00	1445.39	464.00	0.12
Reach-1	51	1%	Proposed	850.00	736.66	745.95	743.21	745.97	0.000208	2.23	1511.77	464.00	0.13
Reach-1	51	1%	Effective	850.00	736.66	745.96	743.21	745.98	0.000208	2.23	1513.75	464.00	0.13
Reach-1	51	1%	Corr Eff	850.00	736.66	745.95	743.21	745.97	0.000208	2.23	1511.77	464.00	0.13
Reach-1	51	0.2%	Proposed	1200.00	736.66	746.31	743.66	746.34	0.000307	2.78	1675.72	464.00	0.16
Reach-1	51	0.2%	Effective	1200.00	736.66	746.31	743.66	746.34	0.000306	2.78	1676.79	464.00	0.16
Reach-1	51	0.2%	Corr Eff	1200.00	736.66	746.31	743.66	746.34	0.000307	2.78	1675.72	464.00	0.16
Reach-1	50	10%	Proposed	490.00	737.76	745.32		745.34	0.000203	1.82	848.75	319.52	0.12
Reach-1	50	10%	Effective	490.00	737.76	745.32		745.34	0.000203	1.82	849.49	319.82	0.12
Reach-1	50	10%	Corr Eff	490.00	737.76	745.32		745.34	0.000203	1.82	848.75	319.52	0.12
Reach-1	50	2%	Proposed	800.00	737.76	745.76		745.80	0.000382	2.60	1001.74	377.26	0.16
Reach-1	50	2%	Effective	800.00	737.76	745.76		745.80	0.000382	2.59	1002.48	377.52	0.16
Reach-1	50	2%	Corr Eff	800.00	737.76	745.76		745.80	0.000382	2.60	1001.74	377.26	0.16
Reach-1	50	1%	Proposed	940.00	737.76	745.89		745.93	0.000476	2.93	1051.59	394.26	0.18
Reach-1	50	1%	Effective	940.00	737.76	745.89		745.94	0.000475	2.92	1053.39	394.86	0.18
Reach-1	50	1%	Corr Eff	940.00	737.76	745.89		745.93	0.000476	2.93	1051.59	394.26	0.18
Reach-1	50	0.2%	Proposed	1350.00	737.76	746.19		746.27	0.000771	3.82	1179.70	434.89	0.23
Reach-1	50	0.2%	Effective	1350.00	737.76	746.20		746.28	0.000769	3.82	1180.81	435.23	0.23
Reach-1	50	0.2%	Corr Eff	1350.00	737.76	746.19		746.27	0.000771	3.82	1179.70	434.89	0.23

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	49	10%	Proposed	490.00	734.56	745.31	740.92	745.32	0.000169	1.31	935.56	336.57	0.08
Reach-1	49	10%	Effective	490.00	734.56	745.32	740.92	745.32	0.000169	1.31	936.32	336.79	0.08
Reach-1	49	10%	Corr Eff	490.00	734.56	745.31	740.92	745.32	0.000169	1.31	935.56	336.57	0.08
Reach-1	49	2%	Proposed	800.00	734.56	745.75	742.36	745.76	0.000324	1.88	1101.70	408.70	0.11
Reach-1	49	2%	Effective	800.00	734.56	745.75	742.36	745.76	0.000324	1.88	1102.49	408.94	0.11
Reach-1	49	2%	Corr Eff	800.00	734.56	745.75	742.36	745.76	0.000324	1.88	1101.70	408.70	0.11
Reach-1	49	1%	Proposed	940.00	734.56	745.88	742.94	745.89	0.000400	2.11	1155.21	424.34	0.13
Reach-1	49	1%	Effective	940.00	734.56	745.88	742.94	745.90	0.000398	2.11	1157.15	424.90	0.13
Reach-1	49	1%	Corr Eff	940.00	734.56	745.88	742.94	745.89	0.000400	2.11	1155.21	424.34	0.13
Reach-1	49	0.2%	Proposed	1350.00	734.56	746.19	744.52	746.21	0.000630	2.71	1291.34	461.75	0.16
Reach-1	49	0.2%	Effective	1350.00	734.56	746.19	744.52	746.22	0.000629	2.71	1292.52	462.07	0.16
Reach-1	49	0.2%	Corr Eff	1350.00	734.56	746.19	744.52	746.21	0.000630	2.71	1291.34	461.75	0.16
Reach-1	48.5			Bridge									
Reach-1	48	10%	Proposed	490.00	734.56	744.01	740.92	744.04	0.000414	1.83	592.65	213.79	0.12
Reach-1	48	10%	Effective	490.00	734.56	744.03	740.92	744.05	0.000409	1.82	596.23	214.64	0.12
Reach-1	48	10%	Corr Eff	490.00	734.56	744.01	740.92	744.04	0.000414	1.83	592.65	213.79	0.12
Reach-1	48	2%	Proposed	800.00	734.56	744.82	742.34	744.86	0.000626	2.42	784.64	275.12	0.15
Reach-1	48	2%	Effective	800.00	734.56	744.85	742.34	744.88	0.000618	2.41	791.29	278.21	0.15
Reach-1	48	2%	Corr Eff	800.00	734.56	744.82	742.34	744.86	0.000626	2.42	784.64	275.12	0.15
Reach-1	48	1%	Proposed	940.00	734.56	745.06	742.47	745.10	0.000750	2.70	852.62	305.17	0.17
Reach-1	48	1%	Effective	940.00	734.56	745.08	742.47	745.12	0.000738	2.69	860.09	308.29	0.17
Reach-1	48	1%	Corr Eff	940.00	734.56	745.06	742.47	745.10	0.000750	2.70	852.62	305.17	0.17
Reach-1	48	0.2%	Proposed	1350.00	734.56	745.62	742.47	745.68	0.001034	3.32	1050.00	392.99	0.20
Reach-1	48	0.2%	Effective	1350.00	734.56	745.64	742.47	745.70	0.001015	3.30	1058.11	395.50	0.20
Reach-1	48	0.2%	Corr Eff	1350.00	734.56	745.62	742.47	745.68	0.001034	3.32	1050.00	392.99	0.20
Reach-1	47	10%	Proposed	490.00	737.46	744.00		744.02	0.000241	1.60	827.82	367.59	0.11
Reach-1	47	10%	Effective	490.00	737.46	744.02		744.03	0.000237	1.59	834.05	369.67	0.11
Reach-1	47	10%	Corr Eff	490.00	737.46	744.00		744.02	0.000241	1.60	827.82	367.59	0.11
Reach-1	47	2%	Proposed	800.00	737.46	744.81		744.83	0.000286	1.88	1164.16	460.30	0.12
Reach-1	47	2%	Effective	800.00	737.46	744.84		744.85	0.000279	1.87	1175.37	462.65	0.12
Reach-1	47	2%	Corr Eff	800.00	737.46	744.81		744.83	0.000286	1.88	1164.16	460.30	0.12
Reach-1	47	1%	Proposed	940.00	737.46	745.05		745.06	0.000319	2.03	1274.37	482.85	0.13
Reach-1	47	1%	Effective	940.00	737.46	745.07		745.09	0.000311	2.01	1286.30	484.93	0.13
Reach-1	47	1%	Corr Eff	940.00	737.46	745.05		745.06	0.000319	2.03	1274.37	482.85	0.13
Reach-1	47	0.2%	Proposed	1350.00	737.46	745.61		745.63	0.000381	2.33	1558.39	520.91	0.15
Reach-1	47	0.2%	Effective	1350.00	737.46	745.63		745.65	0.000373	2.32	1569.24	522.29	0.14
Reach-1	47	0.2%	Corr Eff	1350.00	737.46	745.61		745.63	0.000381	2.33	1558.39	520.91	0.15
Reach-1	46	10%	Proposed	490.00	737.26	743.74		743.90	0.002490	4.84	286.36	231.29	0.34

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	46	10%	Effective	490.00	737.26	743.77		743.92	0.002391	4.76	292.70	235.02	0.33
Reach-1	46	10%	Corr Eff	490.00	737.26	743.74		743.90	0.002490	4.84	286.36	231.29	0.34
Reach-1	46	2%	Proposed	800.00	737.26	744.63		744.72	0.001739	4.42	545.66	346.79	0.29
Reach-1	46	2%	Effective	800.00	737.26	744.67		744.75	0.001648	4.32	557.16	348.51	0.28
Reach-1	46	2%	Corr Eff	800.00	737.26	744.63		744.72	0.001739	4.42	545.66	346.79	0.29
Reach-1	46	1%	Proposed	940.00	737.26	744.87		744.96	0.001645	4.40	630.58	359.30	0.29
Reach-1	46	1%	Effective	940.00	737.26	744.91		744.98	0.001568	4.31	642.14	360.97	0.28
Reach-1	46	1%	Corr Eff	940.00	737.26	744.87		744.96	0.001645	4.40	630.58	359.30	0.29
Reach-1	46	0.2%	Proposed	1350.00	737.26	745.44		745.52	0.001546	4.48	843.69	388.92	0.28
Reach-1	46	0.2%	Effective	1350.00	737.26	745.47		745.54	0.001497	4.42	853.70	390.26	0.28
Reach-1	46	0.2%	Corr Eff	1350.00	737.26	745.44		745.52	0.001546	4.48	843.69	388.92	0.28
Reach-1	45	10%	Proposed	490.00	736.76	742.62		742.95	0.004539	6.51	175.70	94.58	0.48
Reach-1	45	10%	Effective	490.00	736.76	742.62		742.95	0.004536	6.51	175.84	94.76	0.48
Reach-1	45	10%	Corr Eff	490.00	736.76	742.62		742.95	0.004539	6.51	175.70	94.58	0.48
Reach-1	45	2%	Proposed	800.00	736.76	743.60		743.94	0.004665	7.33	328.42	217.08	0.50
Reach-1	45	2%	Effective	800.00	736.76	743.61		743.95	0.004633	7.31	329.63	217.78	0.50
Reach-1	45	2%	Corr Eff	800.00	736.76	743.60		743.94	0.004665	7.33	328.42	217.08	0.50
Reach-1	45	1%	Proposed	940.00	736.76	743.92		744.22	0.004346	7.30	402.97	256.44	0.49
Reach-1	45	1%	Effective	940.00	736.76	743.93		744.23	0.004273	7.25	406.40	258.10	0.48
Reach-1	45	1%	Corr Eff	940.00	736.76	743.92		744.22	0.004346	7.30	402.97	256.44	0.49
Reach-1	45	0.2%	Proposed	1350.00	736.76	744.65		744.88	0.003486	6.99	624.72	338.81	0.44
Reach-1	45	0.2%	Effective	1350.00	736.76	744.68		744.89	0.003351	6.87	633.83	339.34	0.43
Reach-1	45	0.2%	Corr Eff	1350.00	736.76	744.65		744.88	0.003486	6.99	624.72	338.81	0.44
Reach-1	44	10%	Proposed	490.00	736.06	740.89		741.28	0.004629	6.18	148.38	78.36	0.50
Reach-1	44	10%	Effective	490.00	736.06	740.91		741.29	0.004526	6.13	149.99	79.05	0.49
Reach-1	44	10%	Corr Eff	490.00	736.06	740.89		741.28	0.004629	6.18	148.38	78.36	0.50
Reach-1	44	2%	Proposed	800.00	736.06	741.79		742.22	0.004763	7.03	231.92	108.72	0.52
Reach-1	44	2%	Effective	800.00	736.06	741.81		742.23	0.004660	6.97	234.29	109.46	0.52
Reach-1	44	2%	Corr Eff	800.00	736.06	741.79		742.22	0.004763	7.03	231.92	108.72	0.52
Reach-1	44	1%	Proposed	940.00	736.06	742.11		742.55	0.004765	7.30	268.99	119.76	0.53
Reach-1	44	1%	Effective	940.00	736.06	742.13		742.57	0.004664	7.24	271.62	120.50	0.52
Reach-1	44	1%	Corr Eff	940.00	736.06	742.11		742.55	0.004765	7.30	268.99	119.76	0.53
Reach-1	44	0.2%	Proposed	1350.00	736.06	742.93		743.39	0.004682	7.88	378.03	145.01	0.53
Reach-1	44	0.2%	Effective	1350.00	736.06	742.96		743.41	0.004588	7.82	381.53	145.66	0.53
Reach-1	44	0.2%	Corr Eff	1350.00	736.06	742.93		743.39	0.004682	7.88	378.03	145.01	0.53
Reach-1	43	10%	Proposed	490.00	734.26	739.31		739.52	0.003188	5.04	186.45	92.88	0.40
Reach-1	43	10%	Effective	490.00	734.26	739.31		739.52	0.003189	5.04	186.43	92.87	0.40
Reach-1	43	10%	Corr Eff	490.00	734.26	739.31		739.52	0.003188	5.04	186.45	92.88	0.40
Reach-1	43	2%	Proposed	800.00	734.26	740.11		740.36	0.003472	5.82	266.57	107.66	0.43
Reach-1	43	2%	Effective	800.00	734.26	740.11		740.36	0.003468	5.81	266.70	107.68	0.43

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	43	2%	Corr Eff	800.00	734.26	740.11		740.36	0.003472	5.82	266.57	107.66	0.43
Reach-1	43	1%	Proposed	940.00	734.26	740.42		740.69	0.003516	6.06	301.12	113.44	0.43
Reach-1	43	1%	Effective	940.00	734.26	740.42		740.69	0.003512	6.06	301.27	113.46	0.43
Reach-1	43	1%	Corr Eff	940.00	734.26	740.42		740.69	0.003516	6.06	301.12	113.44	0.43
Reach-1	43	0.2%	Proposed	1350.00	734.26	741.25		741.54	0.003513	6.60	402.76	132.56	0.44
Reach-1	43	0.2%	Effective	1350.00	734.26	741.25		741.54	0.003527	6.61	402.11	132.44	0.45
Reach-1	43	0.2%	Corr Eff	1350.00	734.26	741.25		741.54	0.003513	6.60	402.76	132.56	0.44
Reach-1	42	10%	Proposed	490.00	733.36	737.16		737.38	0.004538	5.42	173.57	94.11	0.49
Reach-1	42	10%	Effective	490.00	733.36	737.16		737.38	0.004536	5.42	173.60	94.11	0.49
Reach-1	42	10%	Corr Eff	490.00	733.36	737.16		737.38	0.004538	5.42	173.57	94.11	0.49
Reach-1	42	2%	Proposed	800.00	733.36	738.09		738.32	0.003716	5.68	269.56	111.39	0.46
Reach-1	42	2%	Effective	800.00	733.36	738.11		738.33	0.003666	5.65	270.96	111.62	0.46
Reach-1	42	2%	Corr Eff	800.00	733.36	738.09		738.32	0.003716	5.68	269.56	111.39	0.46
Reach-1	42	1%	Proposed	940.00	733.36	738.46		738.69	0.003508	5.79	311.04	118.08	0.45
Reach-1	42	1%	Effective	940.00	733.36	738.47		738.70	0.003470	5.77	312.33	118.28	0.45
Reach-1	42	1%	Corr Eff	940.00	733.36	738.46		738.69	0.003508	5.79	311.04	118.08	0.45
Reach-1	42	0.2%	Proposed	1350.00	733.36	739.55		739.78	0.002749	5.84	467.11	170.46	0.41
Reach-1	42	0.2%	Effective	1350.00	733.36	739.39		739.64	0.003150	6.14	439.94	162.13	0.44
Reach-1	42	0.2%	Corr Eff	1350.00	733.36	739.55		739.78	0.002749	5.84	467.11	170.46	0.41
Reach-1	41	10%	Proposed	490.00	730.96	735.40		735.62	0.002802	4.72	171.42	71.45	0.40
Reach-1	41	10%	Effective	490.00	730.96	735.40		735.63	0.002792	4.72	171.67	71.51	0.39
Reach-1	41	10%	Corr Eff	490.00	730.96	735.40		735.62	0.002802	4.72	171.42	71.45	0.40
Reach-1	41	2%	Proposed	800.00	730.96	736.26		736.57	0.003314	5.78	238.85	85.22	0.44
Reach-1	41	2%	Effective	800.00	730.96	736.22		736.54	0.003430	5.85	235.51	84.59	0.45
Reach-1	41	2%	Corr Eff	800.00	730.96	736.26		736.57	0.003314	5.78	238.85	85.22	0.44
Reach-1	41	1%	Proposed	940.00	730.96	736.66		736.99	0.003298	6.05	273.92	92.12	0.45
Reach-1	41	1%	Effective	940.00	730.96	736.63		736.97	0.003360	6.09	271.71	91.60	0.45
Reach-1	41	1%	Corr Eff	940.00	730.96	736.66		736.99	0.003298	6.05	273.92	92.12	0.45
Reach-1	41	0.2%	Proposed	1350.00	730.96	738.30		738.57	0.002153	5.79	454.47	127.66	0.38
Reach-1	41	0.2%	Effective	1350.00	730.96	737.35		737.81	0.004100	7.28	342.41	107.00	0.51
Reach-1	41	0.2%	Corr Eff	1350.00	730.96	738.30		738.57	0.002153	5.79	454.47	127.66	0.38
Reach-1	40	10%	Proposed	490.00	729.26	733.01		733.46	0.008800	7.10	133.44	74.36	0.65
Reach-1	40	10%	Effective	490.00	729.26	733.11		733.52	0.007776	6.80	141.39	78.42	0.62
Reach-1	40	10%	Corr Eff	490.00	729.26	733.01		733.46	0.008800	7.10	133.44	74.36	0.65
Reach-1	40	2%	Proposed	800.00	729.26	734.15		734.53	0.006092	7.08	243.78	118.90	0.57
Reach-1	40	2%	Effective	800.00	729.26	734.34		734.65	0.004936	6.54	266.85	126.24	0.52
Reach-1	40	2%	Corr Eff	800.00	729.26	734.15		734.53	0.006092	7.08	243.78	118.90	0.57
Reach-1	40	1%	Proposed	940.00	729.26	734.18		734.69	0.008138	8.21	247.28	120.04	0.66
Reach-1	40	1%	Effective	940.00	729.26	734.30		734.75	0.007085	7.80	262.43	124.86	0.62
Reach-1	40	1%	Corr Eff	940.00	729.26	734.18		734.69	0.008138	8.21	247.28	120.04	0.66

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	40	0.2%	Proposed	1350.00	729.26	737.90		737.97	0.000744	3.63	936.96	297.04	0.22
Reach-1	40	0.2%	Effective	1350.00	729.26	735.30		735.66	0.005040	7.43	402.76	153.12	0.54
Reach-1	40	0.2%	Corr Eff	1350.00	729.26	737.90		737.97	0.000744	3.63	936.96	297.04	0.22
Reach-1	39	10%	Proposed	490.00	727.76	732.65		732.70	0.000906	2.54	365.30	153.97	0.21
Reach-1	39	10%	Effective	490.00	727.76	732.70		732.74	0.000858	2.49	372.23	154.44	0.20
Reach-1	39	10%	Corr Eff	490.00	727.76	732.65		732.70	0.000906	2.54	365.30	153.97	0.21
Reach-1	39	2%	Proposed	800.00	727.76	733.92		733.96	0.000665	2.55	568.39	167.25	0.18
Reach-1	39	2%	Effective	800.00	727.76	734.07		734.11	0.000583	2.43	594.55	168.88	0.17
Reach-1	39	2%	Corr Eff	800.00	727.76	733.92		733.96	0.000665	2.55	568.39	167.25	0.18
Reach-1	39	1%	Proposed	940.00	727.76	733.80		733.87	0.001018	3.11	548.74	166.01	0.23
Reach-1	39	1%	Effective	940.00	727.76	733.85		733.92	0.000971	3.06	557.75	166.58	0.22
Reach-1	39	1%	Corr Eff	940.00	727.76	733.80		733.87	0.001018	3.11	548.74	166.01	0.23
Reach-1	39	0.2%	Proposed	1350.00	727.76	737.81		737.83	0.000245	2.16	1368.40	318.11	0.12
Reach-1	39	0.2%	Effective	1350.00	727.76	734.90		734.97	0.000887	3.25	737.24	177.70	0.22
Reach-1	39	0.2%	Corr Eff	1350.00	727.76	737.81		737.83	0.000245	2.16	1368.40	318.11	0.12
Reach-1	38	10%	Proposed	490.00	725.86	731.88	731.08	732.10	0.004017	6.00	243.63	123.37	0.44
Reach-1	38	10%	Effective	490.00	725.86	731.94	731.08	732.15	0.003724	5.82	251.43	124.44	0.42
Reach-1	38	10%	Corr Eff	490.00	725.86	731.88	731.08	732.10	0.004017	6.00	243.63	123.37	0.44
Reach-1	38	2%	Proposed	800.00	725.86	733.40	731.65	733.55	0.002531	5.56	466.45	185.36	0.36
Reach-1	38	2%	Effective	800.00	725.86	733.61	731.65	733.74	0.002119	5.19	507.80	198.30	0.33
Reach-1	38	2%	Corr Eff	800.00	725.86	733.40	731.65	733.55	0.002531	5.56	466.45	185.36	0.36
Reach-1	38	1%	Proposed	940.00	725.86	732.83	731.86	733.15	0.005576	7.82	370.59	151.18	0.53
Reach-1	38	1%	Effective	940.00	725.86	732.87	731.86	733.18	0.005382	7.72	377.27	153.81	0.52
Reach-1	38	1%	Corr Eff	940.00	725.86	732.83	731.86	733.15	0.005576	7.82	370.59	151.18	0.53
Reach-1	38	0.2%	Proposed	1350.00	725.86	737.72	732.35	737.74	0.000293	2.58	1526.86	255.00	0.13
Reach-1	38	0.2%	Effective	1350.00	725.86	734.11	732.35	734.35	0.004010	7.45	614.24	228.24	0.46
Reach-1	38	0.2%	Corr Eff	1350.00	725.86	737.72	732.35	737.74	0.000293	2.58	1526.86	255.00	0.13
Reach-1	37	10%	Proposed	490.00	724.26	728.39	728.39	729.49	0.016267	9.81	94.43	50.46	0.86
Reach-1	37	10%	Effective	490.00	724.26	728.39	728.39	729.49	0.016267	9.81	94.43	50.46	0.86
Reach-1	37	10%	Corr Eff	490.00	724.26	728.39	728.39	729.49	0.016267	9.81	94.43	50.46	0.86
Reach-1	37	2%	Proposed	800.00	724.26	728.55	728.55	731.08	0.036197	15.02	102.83	52.90	1.30
Reach-1	37	2%	Effective	800.00	724.26	728.55	728.55	731.08	0.036197	15.02	102.83	52.90	1.30
Reach-1	37	2%	Corr Eff	800.00	724.26	728.55	728.55	731.08	0.036197	15.02	102.83	52.90	1.30
Reach-1	37	1%	Proposed	940.00	724.26	729.75	729.75	730.48	0.010569	9.61	299.79	190.55	0.73
Reach-1	37	1%	Effective	940.00	724.26	729.75	729.75	730.48	0.010569	9.61	299.79	190.55	0.73
Reach-1	37	1%	Corr Eff	940.00	724.26	729.75	729.75	730.48	0.010569	9.61	299.79	190.55	0.73
Reach-1	37	0.2%	Proposed	1350.00	724.26	728.42	728.42	736.55	0.119595	26.72	95.86	50.88	2.35
Reach-1	37	0.2%	Effective	1350.00	724.26	729.77	728.42	731.25	0.021276	13.66	303.20	191.31	1.04
Reach-1	37	0.2%	Corr Eff	1350.00	724.26	728.42	728.42	736.55	0.119595	26.72	95.86	50.88	2.35

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	36	10%	Proposed	490.00	721.16	726.20	724.28	726.32	0.001759	4.07	364.57	205.77	0.32
Reach-1	36	10%	Effective	490.00	721.16	726.28	724.28	726.39	0.001595	3.92	381.26	210.66	0.31
Reach-1	36	10%	Corr Eff	490.00	721.16	726.20	724.28	726.32	0.001759	4.07	364.57	205.77	0.32
Reach-1	36	2%	Proposed	800.00	721.16	727.70	724.43	727.77	0.001032	3.71	808.24	412.91	0.26
Reach-1	36	2%	Effective	800.00	721.16	727.95	724.43	728.01	0.000795	3.34	916.24	453.42	0.23
Reach-1	36	2%	Corr Eff	800.00	721.16	727.70	724.43	727.77	0.001032	3.71	808.24	412.91	0.26
Reach-1	36	1%	Proposed	940.00	721.16	727.05		727.26	0.002769	5.67	575.14	307.79	0.41
Reach-1	36	1%	Effective	940.00	721.16	727.07		727.28	0.002706	5.62	582.42	311.61	0.41
Reach-1	36	1%	Corr Eff	940.00	721.16	727.05		727.26	0.002769	5.67	575.14	307.79	0.41
Reach-1	36	0.2%	Proposed	1350.00	721.16	727.64		727.87	0.003133	6.42	783.19	402.93	0.44
Reach-1	36	0.2%	Effective	1350.00	721.16	727.65		727.88	0.003075	6.37	790.37	405.81	0.44
Reach-1	36	0.2%	Corr Eff	1350.00	721.16	727.64		727.87	0.003133	6.42	783.19	402.93	0.44
Reach-1	35	10%	Proposed	490.00	718.46	722.34	722.34	723.68	0.022143	12.00	83.46	34.34	1.08
Reach-1	35	10%	Effective	490.00	718.46	722.34	722.34	723.68	0.022143	12.00	83.46	34.34	1.08
Reach-1	35	10%	Corr Eff	490.00	718.46	722.34	722.34	723.68	0.022143	12.00	83.46	34.34	1.08
Reach-1	35	2%	Proposed	800.00	718.46	722.54	722.54	725.63	0.048268	18.33	90.51	35.85	1.61
Reach-1	35	2%	Effective	800.00	718.46	722.54	722.54	725.63	0.048268	18.33	90.51	35.85	1.61
Reach-1	35	2%	Corr Eff	800.00	718.46	722.54	722.54	725.63	0.048268	18.33	90.51	35.85	1.61
Reach-1	35	1%	Proposed	940.00	718.46	724.19	724.19	724.67	0.007949	9.36	489.98	452.38	0.69
Reach-1	35	1%	Effective	940.00	718.46	724.19	724.19	724.67	0.007949	9.36	489.98	452.38	0.69
Reach-1	35	1%	Corr Eff	940.00	718.46	724.19	724.19	724.67	0.007949	9.36	489.98	452.38	0.69
Reach-1	35	0.2%	Proposed	1350.00	718.46	724.56	724.56	725.02	0.008554	10.12	672.18	545.50	0.73
Reach-1	35	0.2%	Effective	1350.00	718.46	724.56	724.56	725.02	0.008554	10.12	672.18	545.50	0.73
Reach-1	35	0.2%	Corr Eff	1350.00	718.46	724.56	724.56	725.02	0.008554	10.12	672.18	545.50	0.73
Reach-1	34	10%	Proposed	490.00	717.76	721.43		721.43	0.000023	0.49	2099.80	1041.58	0.04
Reach-1	34	10%	Effective	490.00	717.76	721.55		721.55	0.000019	0.45	2226.77	1046.99	0.04
Reach-1	34	10%	Corr Eff	490.00	717.76	721.43		721.43	0.000023	0.49	2099.80	1041.58	0.04
Reach-1	34	2%	Proposed	800.00	717.76	722.43		722.43	0.000017	0.49	3162.97	1086.05	0.04
Reach-1	34	2%	Effective	800.00	717.76	722.59		722.59	0.000014	0.46	3341.08	1093.46	0.04
Reach-1	34	2%	Corr Eff	800.00	717.76	722.43		722.43	0.000017	0.49	3162.97	1086.05	0.04
Reach-1	34	1%	Proposed	940.00	717.76	722.75		722.75	0.000017	0.51	3520.19	1101.45	0.04
Reach-1	34	1%	Effective	940.00	717.76	722.90		722.91	0.000015	0.48	3687.89	1108.89	0.04
Reach-1	34	1%	Corr Eff	940.00	717.76	722.75		722.75	0.000017	0.51	3520.19	1101.45	0.04
Reach-1	34	0.2%	Proposed	1350.00	717.76	723.48		723.48	0.000018	0.58	4334.86	1137.12	0.04
Reach-1	34	0.2%	Effective	1350.00	717.76	723.59		723.59	0.000017	0.56	4460.08	1142.50	0.04
Reach-1	34	0.2%	Corr Eff	1350.00	717.76	723.48		723.48	0.000018	0.58	4334.86	1137.12	0.04
Reach-1	33	10%	Proposed	490.00	716.66	721.40		721.40	0.000082	1.07	1165.03	748.53	0.09
Reach-1	33	10%	Effective	490.00	716.66	721.52		721.53	0.000067	0.98	1260.81	769.10	0.08
Reach-1	33	10%	Corr Eff	490.00	716.66	721.40		721.40	0.000082	1.07	1165.03	748.53	0.09
Reach-1	33	2%	Proposed	800.00	716.66	722.41		722.41	0.000053	0.98	2002.74	912.90	0.07

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	33	2%	Effective	800.00	716.66	722.57		722.58	0.000045	0.92	2157.31	988.49	0.07
Reach-1	33	2%	Corr Eff	800.00	716.66	722.41		722.41	0.000053	0.98	2002.74	912.90	0.07
Reach-1	33	1%	Proposed	940.00	716.66	722.73		722.74	0.000050	0.99	2317.00	995.02	0.07
Reach-1	33	1%	Effective	940.00	716.66	722.89		722.89	0.000041	0.91	2471.07	1001.27	0.06
Reach-1	33	1%	Corr Eff	940.00	716.66	722.73		722.74	0.000050	0.99	2317.00	995.02	0.07
Reach-1	33	0.2%	Proposed	1350.00	716.66	723.46		723.46	0.000046	1.02	3052.00	1024.50	0.07
Reach-1	33	0.2%	Effective	1350.00	716.66	723.57		723.58	0.000041	0.97	3166.25	1029.00	0.07
Reach-1	33	0.2%	Corr Eff	1350.00	716.66	723.46		723.46	0.000046	1.02	3052.00	1024.50	0.07
Reach-1	32	10%	Proposed	490.00	715.76	721.33		721.34	0.000209	1.83	721.65	404.55	0.14
Reach-1	32	10%	Effective	490.00	715.76	721.46		721.47	0.000169	1.67	778.19	412.78	0.12
Reach-1	32	10%	Corr Eff	490.00	715.76	721.33		721.34	0.000209	1.83	721.65	404.55	0.14
Reach-1	32	2%	Proposed	800.00	715.76	722.36		722.37	0.000142	1.69	1170.73	465.94	0.12
Reach-1	32	2%	Effective	800.00	715.76	722.53		722.54	0.000117	1.56	1252.16	476.22	0.11
Reach-1	32	2%	Corr Eff	800.00	715.76	722.36		722.37	0.000142	1.69	1170.73	465.94	0.12
Reach-1	32	1%	Proposed	940.00	715.76	722.69		722.70	0.000138	1.72	1327.14	487.25	0.12
Reach-1	32	1%	Effective	940.00	715.76	722.85		722.86	0.000118	1.62	1406.24	499.04	0.11
Reach-1	32	1%	Corr Eff	940.00	715.76	722.69		722.70	0.000138	1.72	1327.14	487.25	0.12
Reach-1	32	0.2%	Proposed	1350.00	715.76	723.41		723.43	0.000145	1.89	1701.19	540.74	0.12
Reach-1	32	0.2%	Effective	1350.00	715.76	723.53		723.54	0.000132	1.82	1763.38	549.13	0.12
Reach-1	32	0.2%	Corr Eff	1350.00	715.76	723.41		723.43	0.000145	1.89	1701.19	540.74	0.12
Reach-1	31	10%	Proposed	490.00	713.66	720.73		721.08	0.002722	6.46	136.10	50.20	0.44
Reach-1	31	10%	Effective	490.00	713.66	720.83		721.18	0.002689	6.48	141.63	57.16	0.44
Reach-1	31	10%	Corr Eff	490.00	713.66	720.73		721.08	0.002722	6.46	136.10	50.20	0.44
Reach-1	31	2%	Proposed	800.00	713.66	721.41	719.78	722.11	0.005197	9.52	186.11	96.29	0.62
Reach-1	31	2%	Effective	800.00	713.66	721.63		722.21	0.004319	8.85	209.07	111.23	0.56
Reach-1	31	2%	Corr Eff	800.00	713.66	721.41	719.78	722.11	0.005197	9.52	186.11	96.29	0.62
Reach-1	31	1%	Proposed	940.00	713.66	721.61	720.22	722.43	0.006050	10.46	207.24	110.11	0.67
Reach-1	31	1%	Effective	940.00	713.66	721.88		722.51	0.004715	9.45	239.52	128.38	0.59
Reach-1	31	1%	Corr Eff	940.00	713.66	721.61	720.22	722.43	0.006050	10.46	207.24	110.11	0.67
Reach-1	31	0.2%	Proposed	1350.00	713.66	722.16	720.39	723.13	0.007428	12.13	277.18	146.85	0.75
Reach-1	31	0.2%	Effective	1350.00	713.66	722.52		723.17	0.005152	10.40	334.11	171.03	0.63
Reach-1	31	0.2%	Corr Eff	1350.00	713.66	722.16	720.39	723.13	0.007428	12.13	277.18	146.85	0.75
Reach-1	30	10%	Proposed	490.00	713.06	720.57		720.65	0.000628	3.54	412.93	300.73	0.23
Reach-1	30	10%	Effective	490.00	713.06	720.66		720.72	0.000547	3.33	439.36	308.28	0.22
Reach-1	30	10%	Corr Eff	490.00	713.06	720.57		720.65	0.000628	3.54	412.93	300.73	0.23
Reach-1	30	2%	Proposed	800.00	713.06	721.58		721.62	0.000397	3.07	759.91	388.35	0.19
Reach-1	30	2%	Effective	800.00	713.06	721.63		721.67	0.000369	2.97	782.45	393.37	0.18
Reach-1	30	2%	Corr Eff	800.00	713.06	721.58		721.62	0.000397	3.07	759.91	388.35	0.19
Reach-1	30	1%	Proposed	940.00	713.06	721.85		721.89	0.000390	3.10	871.09	412.50	0.19
Reach-1	30	1%	Effective	940.00	713.06	721.91		721.95	0.000366	3.02	893.70	417.25	0.18

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	30	1%	Corr Eff	940.00	713.06	721.85		721.89	0.000390	3.10	871.09	412.50	0.19
Reach-1	30	0.2%	Proposed	1350.00	713.06	722.49		722.53	0.000396	3.28	1151.80	467.98	0.19
Reach-1	30	0.2%	Effective	1350.00	713.06	722.54		722.58	0.000376	3.21	1175.25	472.32	0.19
Reach-1	30	0.2%	Corr Eff	1350.00	713.06	722.49		722.53	0.000396	3.28	1151.80	467.98	0.19
Reach-1	29	10%	Proposed	490.00	712.66	719.70		720.14	0.002562	7.24	166.99	103.29	0.49
Reach-1	29	10%	Effective	490.00	712.66	719.85		720.22	0.002186	6.79	183.40	113.30	0.45
Reach-1	29	10%	Corr Eff	490.00	712.66	719.70		720.14	0.002562	7.24	166.99	103.29	0.49
Reach-1	29	2%	Proposed	800.00	712.66	721.09		721.31	0.001468	6.20	375.37	197.81	0.38
Reach-1	29	2%	Effective	800.00	712.66	721.15		721.35	0.001379	6.03	386.65	201.82	0.37
Reach-1	29	2%	Corr Eff	800.00	712.66	721.09		721.31	0.001468	6.20	375.37	197.81	0.38
Reach-1	29	1%	Proposed	940.00	712.66	721.37		721.59	0.001486	6.38	434.07	217.86	0.38
Reach-1	29	1%	Effective	940.00	712.66	721.42		721.63	0.001410	6.23	444.74	221.31	0.37
Reach-1	29	1%	Corr Eff	940.00	712.66	721.37		721.59	0.001486	6.38	434.07	217.86	0.38
Reach-1	29	0.2%	Proposed	1350.00	712.66	722.00		722.22	0.001575	6.88	585.04	262.49	0.40
Reach-1	29	0.2%	Effective	1350.00	712.66	722.04		722.25	0.001517	6.77	594.70	265.09	0.39
Reach-1	29	0.2%	Corr Eff	1350.00	712.66	722.00		722.22	0.001575	6.88	585.04	262.49	0.40
Reach-1	28	10%	Proposed	490.00	712.36	718.67		719.15	0.002754	7.47	124.43	43.37	0.53
Reach-1	28	10%	Effective	490.00	712.36	718.78		719.28	0.002773	7.59	129.56	53.10	0.53
Reach-1	28	10%	Corr Eff	490.00	712.36	718.67		719.15	0.002754	7.47	124.43	43.37	0.53
Reach-1	28	2%	Proposed	800.00	712.36	719.70	717.85	720.43	0.003858	9.79	217.34	137.42	0.64
Reach-1	28	2%	Effective	800.00	712.36	719.82	717.85	720.46	0.003425	9.33	234.09	148.15	0.60
Reach-1	28	2%	Corr Eff	800.00	712.36	719.70	717.85	720.43	0.003858	9.79	217.34	137.42	0.64
Reach-1	28	1%	Proposed	940.00	712.36	720.08	718.31	720.73	0.003587	9.76	275.72	171.95	0.62
Reach-1	28	1%	Effective	940.00	712.36	720.17	718.31	720.75	0.003241	9.36	292.03	180.42	0.59
Reach-1	28	1%	Corr Eff	940.00	712.36	720.08	718.31	720.73	0.003587	9.76	275.72	171.95	0.62
Reach-1	28	0.2%	Proposed	1350.00	712.36	721.01		721.44	0.002730	9.19	474.24	255.88	0.55
Reach-1	28	0.2%	Effective	1350.00	712.36	721.06		721.47	0.002576	8.97	487.52	260.49	0.54
Reach-1	28	0.2%	Corr Eff	1350.00	712.36	721.01		721.44	0.002730	9.19	474.24	255.88	0.55
Reach-1	27	10%	Proposed	490.00	712.16	718.27		718.43	0.001254	4.38	182.29	70.64	0.31
Reach-1	27	10%	Effective	490.00	712.16	718.35		718.50	0.001170	4.27	187.97	72.38	0.30
Reach-1	27	10%	Corr Eff	490.00	712.16	718.27		718.43	0.001254	4.38	182.29	70.64	0.31
Reach-1	27	2%	Proposed	800.00	712.16	719.18		719.40	0.001749	5.68	259.86	105.62	0.38
Reach-1	27	2%	Effective	800.00	712.16	719.20		719.42	0.001711	5.63	262.75	106.89	0.37
Reach-1	27	2%	Corr Eff	800.00	712.16	719.18		719.40	0.001749	5.68	259.86	105.62	0.38
Reach-1	27	1%	Proposed	940.00	712.16	719.47		719.72	0.001886	6.06	293.22	119.41	0.40
Reach-1	27	1%	Effective	940.00	712.16	719.50		719.74	0.001838	6.00	296.77	120.78	0.39
Reach-1	27	1%	Corr Eff	940.00	712.16	719.47		719.72	0.001886	6.06	293.22	119.41	0.40
Reach-1	27	0.2%	Proposed	1350.00	712.16	720.39		720.62	0.001746	6.31	421.77	161.91	0.39
Reach-1	27	0.2%	Effective	1350.00	712.16	720.42		720.65	0.001698	6.24	427.00	163.40	0.38
Reach-1	27	0.2%	Corr Eff	1350.00	712.16	720.39		720.62	0.001746	6.31	421.77	161.91	0.39

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	26	10%	Proposed	490.00	711.46	717.99		718.06	0.000545	2.94	275.67	102.62	0.20
Reach-1	26	10%	Effective	490.00	711.46	718.07		718.13	0.000505	2.86	284.28	104.28	0.20
Reach-1	26	10%	Corr Eff	490.00	711.46	717.99		718.06	0.000545	2.94	275.67	102.62	0.20
Reach-1	26	2%	Proposed	800.00	711.46	718.73		718.84	0.000889	4.04	367.42	183.81	0.27
Reach-1	26	2%	Effective	800.00	711.46	718.74		718.85	0.000875	4.01	369.89	184.12	0.26
Reach-1	26	2%	Corr Eff	800.00	711.46	718.73		718.84	0.000889	4.04	367.42	183.81	0.27
Reach-1	26	1%	Proposed	940.00	711.46	719.02		719.13	0.000887	4.14	422.62	190.59	0.27
Reach-1	26	1%	Effective	940.00	711.46	719.03		719.14	0.000877	4.12	424.60	190.83	0.27
Reach-1	26	1%	Corr Eff	940.00	711.46	719.02		719.13	0.000887	4.14	422.62	190.59	0.27
Reach-1	26	0.2%	Proposed	1350.00	711.46	720.04		720.14	0.000672	3.92	629.32	214.09	0.24
Reach-1	26	0.2%	Effective	1350.00	711.46	720.05		720.14	0.000667	3.91	630.82	214.25	0.24
Reach-1	26	0.2%	Corr Eff	1350.00	711.46	720.04		720.14	0.000672	3.92	629.32	214.09	0.24
Reach-1	25	10%	Proposed	490.00	711.16	717.45		717.60	0.001519	4.79	215.62	144.18	0.34
Reach-1	25	10%	Effective	490.00	711.16	717.62		717.74	0.001152	4.25	240.88	146.96	0.30
Reach-1	25	10%	Corr Eff	490.00	711.16	717.45		717.60	0.001519	4.79	215.62	144.18	0.34
Reach-1	25	2%	Proposed	800.00	711.16	718.05		718.22	0.001645	5.31	305.63	153.85	0.36
Reach-1	25	2%	Effective	800.00	711.16	718.06		718.23	0.001613	5.26	307.85	154.08	0.36
Reach-1	25	2%	Corr Eff	800.00	711.16	718.05		718.22	0.001645	5.31	305.63	153.85	0.36
Reach-1	25	1%	Proposed	940.00	711.16	718.39		718.55	0.001460	5.16	359.39	159.34	0.34
Reach-1	25	1%	Effective	940.00	711.16	718.40		718.55	0.001443	5.14	360.91	159.49	0.34
Reach-1	25	1%	Corr Eff	940.00	711.16	718.39		718.55	0.001460	5.16	359.39	159.34	0.34
Reach-1	25	0.2%	Proposed	1350.00	711.16	719.64		719.74	0.000872	4.44	669.77	365.34	0.27
Reach-1	25	0.2%	Effective	1350.00	711.16	719.65		719.75	0.000862	4.42	673.51	367.27	0.27
Reach-1	25	0.2%	Corr Eff	1350.00	711.16	719.64		719.74	0.000872	4.44	669.77	365.34	0.27
Reach-1	24	10%	Proposed	490.00	710.56	717.12		717.19	0.000575	3.00	274.27	113.09	0.21
Reach-1	24	10%	Effective	490.00	710.56	717.34		717.40	0.000479	2.80	300.14	123.27	0.19
Reach-1	24	10%	Corr Eff	490.00	710.56	717.12		717.19	0.000575	3.00	274.27	113.09	0.21
Reach-1	24	2%	Proposed	800.00	710.56	717.48		717.62	0.001137	4.37	317.51	129.65	0.29
Reach-1	24	2%	Effective	800.00	710.56	717.50		717.64	0.001119	4.34	320.02	130.55	0.29
Reach-1	24	2%	Corr Eff	800.00	710.56	717.48		717.62	0.001137	4.37	317.51	129.65	0.29
Reach-1	24	1%	Proposed	940.00	710.56	717.84		717.99	0.001152	4.55	367.06	146.35	0.30
Reach-1	24	1%	Effective	940.00	710.56	717.85		718.00	0.001136	4.53	369.44	147.10	0.30
Reach-1	24	1%	Corr Eff	940.00	710.56	717.84		717.99	0.001152	4.55	367.06	146.35	0.30
Reach-1	24	0.2%	Proposed	1350.00	710.56	719.29		719.39	0.000742	4.13	636.56	237.15	0.25
Reach-1	24	0.2%	Effective	1350.00	710.56	719.30		719.40	0.000734	4.11	639.67	238.18	0.25
Reach-1	24	0.2%	Corr Eff	1350.00	710.56	719.29		719.39	0.000742	4.13	636.56	237.15	0.25
Reach-1	23	10%	Proposed	490.00	708.96	714.72	714.35	716.32	0.023045	12.64	62.05	38.25	0.97
Reach-1	23	10%	Effective	490.00	708.96	714.72	714.35	716.32	0.023048	12.64	62.04	38.22	0.97
Reach-1	23	10%	Corr Eff	490.00	708.96	714.72	714.35	716.32	0.023045	12.64	62.05	38.25	0.97

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	23	2%	Proposed	800.00	708.96	716.45	716.07	716.73	0.004922	7.06	264.34	186.77	0.47
Reach-1	23	2%	Effective	800.00	708.96	716.45	716.07	716.73	0.004926	7.06	264.26	186.77	0.47
Reach-1	23	2%	Corr Eff	800.00	708.96	716.45	716.07	716.73	0.004922	7.06	264.34	186.77	0.47
Reach-1	23	1%	Proposed	940.00	708.96	717.22		717.33	0.002080	4.92	413.59	206.04	0.31
Reach-1	23	1%	Effective	940.00	708.96	717.24		717.35	0.002011	4.84	418.65	206.72	0.31
Reach-1	23	1%	Corr Eff	940.00	708.96	717.22		717.33	0.002080	4.92	413.59	206.04	0.31
Reach-1	23	0.2%	Proposed	1350.00	708.96	719.04		719.09	0.000600	3.04	841.23	280.29	0.17
Reach-1	23	0.2%	Effective	1350.00	708.96	719.04		719.09	0.000598	3.04	842.10	280.53	0.17
Reach-1	23	0.2%	Corr Eff	1350.00	708.96	719.04		719.09	0.000600	3.04	841.23	280.29	0.17
Reach-1	22	10%	Proposed	490.00	709.46	715.16	712.58	715.46	0.001665	4.41	111.18	269.95	0.35
Reach-1	22	10%	Effective	490.00	709.46	715.16	712.58	715.46	0.001666	4.41	111.18	269.88	0.35
Reach-1	22	10%	Corr Eff	490.00	709.46	715.16	712.58	715.46	0.001665	4.41	111.18	269.95	0.35
Reach-1	22	2%	Proposed	800.00	709.46	715.80	713.56	716.43	0.002990	6.39	125.18	455.16	0.47
Reach-1	22	2%	Effective	800.00	709.46	715.79	713.56	716.43	0.002991	6.39	125.17	454.99	0.47
Reach-1	22	2%	Corr Eff	800.00	709.46	715.80	713.56	716.43	0.002990	6.39	125.18	455.16	0.47
Reach-1	22	1%	Proposed	940.00	709.46	716.27	713.96	717.02	0.003159	6.93	135.64	588.74	0.49
Reach-1	22	1%	Effective	940.00	709.46	716.30	713.96	717.04	0.003102	6.89	136.37	598.14	0.49
Reach-1	22	1%	Corr Eff	940.00	709.46	716.27	713.96	717.02	0.003159	6.93	135.64	588.74	0.49
Reach-1	22	0.2%	Proposed	1350.00	709.46	719.06	715.00	719.06	0.000050	1.12	2557.04	764.93	0.07
Reach-1	22	0.2%	Effective	1350.00	709.46	719.06	715.00	719.07	0.000050	1.12	2559.20	765.06	0.07
Reach-1	22	0.2%	Corr Eff	1350.00	709.46	719.06	715.00	719.06	0.000050	1.12	2557.04	764.93	0.07
Reach-1	21.5			Bridge									
Reach-1	21	10%	Proposed	490.00	709.46	715.16	712.58	715.46	0.001669	4.41	111.12	269.08	0.35
Reach-1	21	10%	Effective	490.00	709.46	715.16	712.58	715.46	0.001669	4.41	111.11	269.01	0.35
Reach-1	21	10%	Corr Eff	490.00	709.46	715.16	712.58	715.46	0.001669	4.41	111.12	269.08	0.35
Reach-1	21	2%	Proposed	800.00	709.46	715.79	713.55	716.42	0.003006	6.40	124.97	452.47	0.47
Reach-1	21	2%	Effective	800.00	709.46	715.79	713.55	716.42	0.003008	6.40	124.96	452.30	0.47
Reach-1	21	2%	Corr Eff	800.00	709.46	715.79	713.55	716.42	0.003006	6.40	124.97	452.47	0.47
Reach-1	21	1%	Proposed	940.00	709.46	716.26	713.95	717.01	0.003179	6.94	135.38	585.39	0.49
Reach-1	21	1%	Effective	940.00	709.46	716.29	713.95	717.03	0.003122	6.91	136.12	594.88	0.49
Reach-1	21	1%	Corr Eff	940.00	709.46	716.26	713.95	717.01	0.003179	6.94	135.38	585.39	0.49
Reach-1	21	0.2%	Proposed	1350.00	709.46	717.86	715.00	717.87	0.000151	1.76	1801.14	718.26	0.11
Reach-1	21	0.2%	Effective	1350.00	709.46	717.86	715.00	717.87	0.000151	1.76	1801.01	718.25	0.11
Reach-1	21	0.2%	Corr Eff	1350.00	709.46	717.86	715.00	717.87	0.000151	1.76	1801.14	718.26	0.11
Reach-1	20	10%	Proposed	490.00	708.56	715.10	712.99	715.32	0.002275	5.58	254.14	324.94	0.39
Reach-1	20	10%	Effective	490.00	708.56	715.10	712.99	715.32	0.002277	5.58	254.02	324.85	0.39
Reach-1	20	10%	Corr Eff	490.00	708.56	715.10	712.99	715.32	0.002275	5.58	254.14	324.94	0.39
Reach-1	20	2%	Proposed	800.00	708.56	715.99		716.06	0.001020	4.08	634.69	532.98	0.27
Reach-1	20	2%	Effective	800.00	708.56	715.99		716.06	0.001021	4.08	634.36	532.83	0.27

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	20	2%	Corr Eff	800.00	708.56	715.99		716.06	0.001020	4.08	634.69	532.98	0.27
Reach-1	20	1%	Proposed	940.00	708.56	716.57		716.60	0.000508	3.03	982.12	667.27	0.19
Reach-1	20	1%	Effective	940.00	708.56	716.60		716.63	0.000478	2.94	1004.34	668.62	0.19
Reach-1	20	1%	Corr Eff	940.00	708.56	716.57		716.60	0.000508	3.03	982.12	667.27	0.19
Reach-1	20	0.2%	Proposed	1350.00	708.56	717.85		717.86	0.000156	1.86	1872.90	719.31	0.11
Reach-1	20	0.2%	Effective	1350.00	708.56	717.85		717.86	0.000156	1.86	1872.77	719.30	0.11
Reach-1	20	0.2%	Corr Eff	1350.00	708.56	717.85		717.86	0.000156	1.86	1872.90	719.31	0.11
Reach-1	19	10%	Proposed	490.00	706.66	713.76		713.81	0.001357	3.10	331.88	248.31	0.22
Reach-1	19	10%	Effective	490.00	706.66	713.76		713.81	0.001351	3.09	332.50	248.64	0.21
Reach-1	19	10%	Corr Eff	490.00	706.66	713.76		713.81	0.001357	3.10	331.88	248.31	0.22
Reach-1	19	2%	Proposed	800.00	706.66	715.66		715.67	0.000245	1.56	1043.48	506.32	0.10
Reach-1	19	2%	Effective	800.00	706.66	715.65		715.67	0.000245	1.56	1042.92	506.17	0.10
Reach-1	19	2%	Corr Eff	800.00	706.66	715.66		715.67	0.000245	1.56	1043.48	506.32	0.10
Reach-1	19	1%	Proposed	940.00	706.66	716.38		716.38	0.000147	1.28	1443.97	606.38	0.07
Reach-1	19	1%	Effective	940.00	706.66	716.42		716.43	0.000140	1.25	1469.96	612.31	0.07
Reach-1	19	1%	Corr Eff	940.00	706.66	716.38		716.38	0.000147	1.28	1443.97	606.38	0.07
Reach-1	19	0.2%	Proposed	1350.00	706.66	717.77		717.78	0.000067	0.95	2325.88	632.00	0.05
Reach-1	19	0.2%	Effective	1350.00	706.66	717.77		717.78	0.000067	0.95	2325.73	632.00	0.05
Reach-1	19	0.2%	Corr Eff	1350.00	706.66	717.77		717.78	0.000067	0.95	2325.88	632.00	0.05
Reach-1	18	10%	Proposed	490.00	707.16	713.26	711.05	713.61	0.002126	4.73	103.54	170.30	0.38
Reach-1	18	10%	Effective	490.00	707.16	713.27	711.05	713.61	0.002121	4.73	103.61	170.73	0.38
Reach-1	18	10%	Corr Eff	490.00	707.16	713.26	711.05	713.61	0.002126	4.73	103.54	170.30	0.38
Reach-1	18	2%	Proposed	800.00	707.16	714.99	712.01	715.49	0.002002	5.65	141.47	385.10	0.39
Reach-1	18	2%	Effective	800.00	707.16	714.99	712.01	715.48	0.002003	5.66	141.44	384.94	0.39
Reach-1	18	2%	Corr Eff	800.00	707.16	714.99	712.01	715.49	0.002002	5.65	141.47	385.10	0.39
Reach-1	18	1%	Proposed	940.00	707.16	715.62	712.41	716.19	0.002020	6.05	155.42	454.54	0.40
Reach-1	18	1%	Effective	940.00	707.16	715.68	712.41	716.24	0.001969	6.00	156.62	460.52	0.40
Reach-1	18	1%	Corr Eff	940.00	707.16	715.62	712.41	716.19	0.002020	6.05	155.42	454.54	0.40
Reach-1	18	0.2%	Proposed	1350.00	707.16	717.72	713.45	717.76	0.000214	2.34	1141.59	594.42	0.14
Reach-1	18	0.2%	Effective	1350.00	707.16	717.72	713.45	717.76	0.000214	2.34	1141.51	594.41	0.14
Reach-1	18	0.2%	Corr Eff	1350.00	707.16	717.72	713.45	717.76	0.000214	2.34	1141.59	594.42	0.14
Reach-1	17.5			Bridge									
Reach-1	17	10%	Proposed	490.00	707.16	713.26	711.05	713.61	0.002132	4.74	103.45	169.80	0.39
Reach-1	17	10%	Effective	490.00	707.16	713.26	711.05	713.61	0.002127	4.73	103.53	170.23	0.38
Reach-1	17	10%	Corr Eff	490.00	707.16	713.26	711.05	713.61	0.002132	4.74	103.45	169.80	0.39
Reach-1	17	2%	Proposed	800.00	707.16	713.87	712.01	714.60	0.003792	6.85	116.80	248.37	0.52
Reach-1	17	2%	Effective	800.00	707.16	713.90	712.01	714.62	0.003716	6.81	117.51	252.59	0.52
Reach-1	17	2%	Corr Eff	800.00	707.16	713.87	712.01	714.60	0.003792	6.85	116.80	248.37	0.52
Reach-1	17	1%	Proposed	940.00	707.16	714.40	712.41	714.52	0.001024	3.79	518.10	316.86	0.28

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	17	1%	Effective	940.00	707.16	714.44	712.41	714.56	0.000969	3.71	532.76	322.79	0.27
Reach-1	17	1%	Corr Eff	940.00	707.16	714.40	712.41	714.52	0.001024	3.79	518.10	316.86	0.28
Reach-1	17	0.2%	Proposed	1350.00	707.16	715.14	713.45	715.24	0.000872	3.79	785.76	401.49	0.26
Reach-1	17	0.2%	Effective	1350.00	707.16	715.22	713.45	715.32	0.000793	3.65	819.89	410.70	0.25
Reach-1	17	0.2%	Corr Eff	1350.00	707.16	715.14	713.45	715.24	0.000872	3.79	785.76	401.49	0.26
Reach-1	16	10%	Proposed	490.00	706.66	713.27		713.41	0.001759	4.25	242.31	171.18	0.30
Reach-1	16	10%	Effective	490.00	706.66	713.27		713.41	0.001751	4.24	242.97	171.67	0.30
Reach-1	16	10%	Corr Eff	490.00	706.66	713.27		713.41	0.001759	4.25	242.31	171.18	0.30
Reach-1	16	2%	Proposed	800.00	706.66	714.05		714.17	0.001660	4.46	415.55	272.02	0.30
Reach-1	16	2%	Effective	800.00	706.66	714.08		714.20	0.001581	4.37	425.34	276.63	0.29
Reach-1	16	2%	Corr Eff	800.00	706.66	714.05		714.17	0.001660	4.46	415.55	272.02	0.30
Reach-1	16	1%	Proposed	940.00	706.66	714.34		714.45	0.001545	4.42	500.43	309.67	0.29
Reach-1	16	1%	Effective	940.00	706.66	714.39		714.49	0.001446	4.30	516.02	316.10	0.28
Reach-1	16	1%	Corr Eff	940.00	706.66	714.34		714.45	0.001545	4.42	500.43	309.67	0.29
Reach-1	16	0.2%	Proposed	1350.00	706.66	715.10		715.18	0.001188	4.14	770.10	399.14	0.26
Reach-1	16	0.2%	Effective	1350.00	706.66	715.19		715.26	0.001066	3.95	805.82	409.17	0.24
Reach-1	16	0.2%	Corr Eff	1350.00	706.66	715.10		715.18	0.001188	4.14	770.10	399.14	0.26
Reach-1	15	10%	Proposed	490.00	706.26	712.50		712.65	0.003410	4.93	206.42	153.76	0.36
Reach-1	15	10%	Effective	490.00	706.26	712.53		712.68	0.003201	4.79	212.15	156.26	0.35
Reach-1	15	10%	Corr Eff	490.00	706.26	712.50		712.65	0.003410	4.93	206.42	153.76	0.36
Reach-1	15	2%	Proposed	800.00	706.26	713.50		713.59	0.001891	4.08	390.75	213.86	0.28
Reach-1	15	2%	Effective	800.00	706.26	713.58		713.66	0.001692	3.89	408.10	218.63	0.26
Reach-1	15	2%	Corr Eff	800.00	706.26	713.50		713.59	0.001891	4.08	390.75	213.86	0.28
Reach-1	15	1%	Proposed	940.00	706.26	713.85		713.93	0.001636	3.93	468.65	234.53	0.26
Reach-1	15	1%	Effective	940.00	706.26	713.94		714.02	0.001446	3.73	491.53	240.27	0.25
Reach-1	15	1%	Corr Eff	940.00	706.26	713.85		713.93	0.001636	3.93	468.65	234.53	0.26
Reach-1	15	0.2%	Proposed	1350.00	706.26	714.72		714.79	0.001227	3.67	695.73	290.11	0.23
Reach-1	15	0.2%	Effective	1350.00	706.26	714.85		714.91	0.001077	3.48	734.69	301.12	0.22
Reach-1	15	0.2%	Corr Eff	1350.00	706.26	714.72		714.79	0.001227	3.67	695.73	290.11	0.23
Reach-1	14	10%	Proposed	490.00	705.06	710.49		711.07	0.004912	6.30	89.25	31.36	0.49
Reach-1	14	10%	Effective	490.00	705.06	710.51		711.08	0.004827	6.26	89.95	31.56	0.48
Reach-1	14	10%	Corr Eff	490.00	705.06	710.49		711.07	0.004912	6.30	89.25	31.36	0.49
Reach-1	14	2%	Proposed	800.00	705.06	711.48		712.33	0.006143	7.92	131.13	53.73	0.56
Reach-1	14	2%	Effective	800.00	705.06	711.54		712.36	0.005904	7.80	133.90	54.93	0.55
Reach-1	14	2%	Corr Eff	800.00	705.06	711.48		712.33	0.006143	7.92	131.13	53.73	0.56
Reach-1	14	1%	Proposed	940.00	705.06	711.83	710.91	712.76	0.006493	8.44	150.95	61.79	0.58
Reach-1	14	1%	Effective	940.00	705.06	711.89	710.91	712.78	0.006191	8.29	154.77	63.23	0.57
Reach-1	14	1%	Corr Eff	940.00	705.06	711.83	710.91	712.76	0.006493	8.44	150.95	61.79	0.58
Reach-1	14	0.2%	Proposed	1350.00	705.06	712.72	712.24	713.78	0.006858	9.45	216.16	89.61	0.61
Reach-1	14	0.2%	Effective	1350.00	705.06	712.81	712.24	713.81	0.006489	9.26	223.84	95.06	0.60

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	14	0.2%	Corr Eff	1350.00	705.06	712.72	712.24	713.78	0.006858	9.45	216.16	89.61	0.61
Reach-1	13	10%	Proposed	490.00	703.96	708.72	707.63	709.05	0.003143	5.31	137.24	68.68	0.43
Reach-1	13	10%	Effective	490.00	703.96	708.76	707.63	709.08	0.002999	5.22	140.13	69.37	0.43
Reach-1	13	10%	Corr Eff	490.00	703.96	708.72	707.63	709.05	0.003143	5.31	137.24	68.68	0.43
Reach-1	13	2%	Proposed	800.00	703.96	709.59	708.58	709.99	0.003379	6.18	203.20	83.03	0.46
Reach-1	13	2%	Effective	800.00	703.96	709.64	708.58	710.02	0.003215	6.06	207.50	83.88	0.45
Reach-1	13	2%	Corr Eff	800.00	703.96	709.59	708.58	709.99	0.003379	6.18	203.20	83.03	0.46
Reach-1	13	1%	Proposed	940.00	703.96	709.94	708.87	710.35	0.003371	6.42	232.87	88.73	0.47
Reach-1	13	1%	Effective	940.00	703.96	710.00	708.87	710.39	0.003192	6.30	238.21	89.72	0.46
Reach-1	13	1%	Corr Eff	940.00	703.96	709.94	708.87	710.35	0.003371	6.42	232.87	88.73	0.47
Reach-1	13	0.2%	Proposed	1350.00	703.96	710.75	709.53	711.23	0.003586	7.23	310.74	107.38	0.49
Reach-1	13	0.2%	Effective	1350.00	703.96	710.82	709.53	711.28	0.003414	7.10	318.87	110.70	0.48
Reach-1	13	0.2%	Corr Eff	1350.00	703.96	710.75	709.53	711.23	0.003586	7.23	310.74	107.38	0.49
Reach-1	12	10%	Proposed	490.00	702.46	705.49	705.49	706.35	0.012565	8.34	80.56	51.53	0.85
Reach-1	12	10%	Effective	490.00	702.46	705.49	705.49	706.35	0.012565	8.34	80.56	51.53	0.85
Reach-1	12	10%	Corr Eff	490.00	702.46	705.49	705.49	706.35	0.012565	8.34	80.56	51.53	0.85
Reach-1	12	2%	Proposed	800.00	702.46	706.27	706.27	707.24	0.011538	9.34	126.80	67.12	0.85
Reach-1	12	2%	Effective	800.00	702.46	706.27	706.27	707.24	0.011538	9.34	126.80	67.12	0.85
Reach-1	12	2%	Corr Eff	800.00	702.46	706.27	706.27	707.24	0.011538	9.34	126.80	67.12	0.85
Reach-1	12	1%	Proposed	940.00	702.46	706.50	706.50	707.56	0.012000	9.91	142.86	71.75	0.88
Reach-1	12	1%	Effective	940.00	702.46	706.50	706.50	707.56	0.012000	9.91	142.86	71.75	0.88
Reach-1	12	1%	Corr Eff	940.00	702.46	706.50	706.50	707.56	0.012000	9.91	142.86	71.75	0.88
Reach-1	12	0.2%	Proposed	1350.00	702.46	707.23	707.23	708.39	0.011337	10.79	204.54	96.58	0.88
Reach-1	12	0.2%	Effective	1350.00	702.46	707.23	707.23	708.39	0.011337	10.79	204.54	96.58	0.88
Reach-1	12	0.2%	Corr Eff	1350.00	702.46	707.23	707.23	708.39	0.011337	10.79	204.54	96.58	0.88
Reach-1	11	10%	Proposed	490.00	701.36	703.79		703.86	0.002328	3.14	263.83	207.74	0.36
Reach-1	11	10%	Effective	490.00	701.36	703.79		703.86	0.002311	3.13	264.50	207.85	0.36
Reach-1	11	10%	Corr Eff	490.00	701.36	703.79		703.86	0.002328	3.14	263.83	207.74	0.36
Reach-1	11	2%	Proposed	800.00	701.36	704.32		704.41	0.002171	3.47	379.46	225.88	0.36
Reach-1	11	2%	Effective	800.00	701.36	704.33		704.41	0.002153	3.46	380.56	226.04	0.36
Reach-1	11	2%	Corr Eff	800.00	701.36	704.32		704.41	0.002171	3.47	379.46	225.88	0.36
Reach-1	11	1%	Proposed	940.00	701.36	704.54		704.63	0.002091	3.58	429.87	233.34	0.36
Reach-1	11	1%	Effective	940.00	701.36	704.55		704.64	0.002069	3.56	431.45	233.57	0.35
Reach-1	11	1%	Corr Eff	940.00	701.36	704.54		704.63	0.002091	3.58	429.87	233.34	0.36
Reach-1	11	0.2%	Proposed	1350.00	701.36	705.11		705.21	0.001905	3.81	566.46	247.44	0.35
Reach-1	11	0.2%	Effective	1350.00	701.36	705.12		705.22	0.001878	3.79	569.25	247.72	0.35
Reach-1	11	0.2%	Corr Eff	1350.00	701.36	705.11		705.21	0.001905	3.81	566.46	247.44	0.35
Reach-1	10	10%	Proposed	490.00	699.46	702.54		702.66	0.002681	4.07	219.83	152.77	0.41
Reach-1	10	10%	Effective	490.00	699.46	702.55		702.67	0.002628	4.04	221.61	153.43	0.41

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	10	10%	Corr Eff	490.00	699.46	702.54		702.66	0.002681	4.07	219.83	152.77	0.41
Reach-1	10	2%	Proposed	800.00	699.46	703.24		703.36	0.002194	4.22	330.67	164.14	0.38
Reach-1	10	2%	Effective	800.00	699.46	703.25		703.37	0.002135	4.18	333.74	164.42	0.38
Reach-1	10	2%	Corr Eff	800.00	699.46	703.24		703.36	0.002194	4.22	330.67	164.14	0.38
Reach-1	10	1%	Proposed	940.00	699.46	703.49		703.62	0.002140	4.35	372.18	167.89	0.38
Reach-1	10	1%	Effective	940.00	699.46	703.51		703.63	0.002083	4.31	375.60	168.20	0.38
Reach-1	10	1%	Corr Eff	940.00	699.46	703.49		703.62	0.002140	4.35	372.18	167.89	0.38
Reach-1	10	0.2%	Proposed	1350.00	699.46	704.09		704.24	0.002138	4.77	476.21	176.94	0.39
Reach-1	10	0.2%	Effective	1350.00	699.46	704.11		704.26	0.002090	4.73	479.88	177.25	0.39
Reach-1	10	0.2%	Corr Eff	1350.00	699.46	704.09		704.24	0.002138	4.77	476.21	176.94	0.39
Reach-1	9	10%	Proposed	490.00	697.16	701.12		701.35	0.003199	4.94	164.22	97.95	0.44
Reach-1	9	10%	Effective	490.00	697.16	701.13		701.36	0.003161	4.92	165.22	98.60	0.44
Reach-1	9	10%	Corr Eff	490.00	697.16	701.12		701.35	0.003199	4.94	164.22	97.95	0.44
Reach-1	9	2%	Proposed	800.00	697.16	701.81		702.10	0.003738	5.95	246.17	141.71	0.49
Reach-1	9	2%	Effective	800.00	697.16	701.82		702.11	0.003684	5.92	247.88	142.48	0.49
Reach-1	9	2%	Corr Eff	800.00	697.16	701.81		702.10	0.003738	5.95	246.17	141.71	0.49
Reach-1	9	1%	Proposed	940.00	697.16	702.04		702.36	0.003867	6.26	281.82	156.99	0.50
Reach-1	9	1%	Effective	940.00	697.16	702.06		702.37	0.003806	6.23	283.89	157.83	0.50
Reach-1	9	1%	Corr Eff	940.00	697.16	702.04		702.36	0.003867	6.26	281.82	156.99	0.50
Reach-1	9	0.2%	Proposed	1350.00	697.16	702.61		702.96	0.004081	6.93	380.46	191.30	0.53
Reach-1	9	0.2%	Effective	1350.00	697.16	702.62		702.96	0.004014	6.88	382.91	191.64	0.52
Reach-1	9	0.2%	Corr Eff	1350.00	697.16	702.61		702.96	0.004081	6.93	380.46	191.30	0.53
Reach-1	8	10%	Proposed	490.00	695.96	700.10		700.27	0.002986	4.67	198.33	144.63	0.41
Reach-1	8	10%	Effective	490.00	695.96	700.10		700.27	0.002986	4.68	198.31	144.62	0.41
Reach-1	8	10%	Corr Eff	490.00	695.96	700.10		700.27	0.002986	4.67	198.33	144.63	0.41
Reach-1	8	2%	Proposed	800.00	695.96	700.66		700.86	0.003331	5.39	288.92	176.57	0.44
Reach-1	8	2%	Effective	800.00	695.96	700.66		700.86	0.003344	5.40	288.45	176.47	0.45
Reach-1	8	2%	Corr Eff	800.00	695.96	700.66		700.86	0.003331	5.39	288.92	176.57	0.44
Reach-1	8	1%	Proposed	940.00	695.96	700.87		701.07	0.003431	5.63	326.09	183.99	0.45
Reach-1	8	1%	Effective	940.00	695.96	700.86		701.07	0.003435	5.64	325.97	183.97	0.46
Reach-1	8	1%	Corr Eff	940.00	695.96	700.87		701.07	0.003431	5.63	326.09	183.99	0.45
Reach-1	8	0.2%	Proposed	1350.00	695.96	701.36		701.60	0.003654	6.21	421.41	201.78	0.48
Reach-1	8	0.2%	Effective	1350.00	695.96	701.36		701.60	0.003651	6.21	421.53	201.80	0.48
Reach-1	8	0.2%	Corr Eff	1350.00	695.96	701.36		701.60	0.003654	6.21	421.41	201.78	0.48
Reach-1	7	10%	Proposed	490.00	694.96	698.66		698.82	0.006481	5.39	180.01	162.65	0.52
Reach-1	7	10%	Effective	490.00	694.96	698.66		698.82	0.006450	5.38	180.30	162.70	0.52
Reach-1	7	10%	Corr Eff	490.00	694.96	698.66		698.82	0.006481	5.39	180.01	162.65	0.52
Reach-1	7	2%	Proposed	800.00	694.96	699.01		699.23	0.007587	6.23	238.50	171.75	0.57
Reach-1	7	2%	Effective	800.00	694.96	699.02		699.23	0.007441	6.18	240.08	171.99	0.56
Reach-1	7	2%	Corr Eff	800.00	694.96	699.01		699.23	0.007587	6.23	238.50	171.75	0.57

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	7	1%	Proposed	940.00	694.96	699.15		699.39	0.007907	6.52	262.48	175.34	0.59
Reach-1	7	1%	Effective	940.00	694.96	699.16		699.40	0.007752	6.47	264.26	175.60	0.58
Reach-1	7	1%	Corr Eff	940.00	694.96	699.15		699.39	0.007907	6.52	262.48	175.34	0.59
Reach-1	7	0.2%	Proposed	1350.00	694.96	699.53		699.82	0.008289	7.10	330.58	185.16	0.61
Reach-1	7	0.2%	Effective	1350.00	694.96	699.55		699.83	0.008051	7.02	333.89	185.63	0.60
Reach-1	7	0.2%	Corr Eff	1350.00	694.96	699.53		699.82	0.008289	7.10	330.58	185.16	0.61
Reach-1	6	10%	Proposed	490.00	693.76	697.11		697.21	0.005267	4.33	216.58	213.36	0.44
Reach-1	6	10%	Effective	490.00	693.76	697.12		697.21	0.005193	4.31	217.57	213.44	0.44
Reach-1	6	10%	Corr Eff	490.00	693.76	697.11		697.21	0.005267	4.33	216.58	213.36	0.44
Reach-1	6	2%	Proposed	800.00	693.76	697.56		697.68	0.004375	4.34	315.16	221.08	0.41
Reach-1	6	2%	Effective	800.00	693.76	697.57		697.68	0.004366	4.34	315.38	221.09	0.41
Reach-1	6	2%	Corr Eff	800.00	693.76	697.56		697.68	0.004375	4.34	315.16	221.08	0.41
Reach-1	6	1%	Proposed	940.00	693.76	697.75		697.87	0.004125	4.36	356.19	224.21	0.40
Reach-1	6	1%	Effective	940.00	693.76	697.75		697.87	0.004122	4.36	356.26	224.22	0.40
Reach-1	6	1%	Corr Eff	940.00	693.76	697.75		697.87	0.004125	4.36	356.19	224.21	0.40
Reach-1	6	0.2%	Proposed	1350.00	693.76	698.23		698.37	0.003660	4.47	467.14	232.47	0.39
Reach-1	6	0.2%	Effective	1350.00	693.76	698.24		698.37	0.003652	4.47	467.44	232.49	0.39
Reach-1	6	0.2%	Corr Eff	1350.00	693.76	698.23		698.37	0.003660	4.47	467.14	232.47	0.39
Reach-1	5	10%	Proposed	490.00	692.26	695.88		695.96	0.002393	3.56	240.35	162.84	0.34
Reach-1	5	10%	Effective	490.00	692.26	695.86		695.95	0.002466	3.60	237.87	162.39	0.34
Reach-1	5	10%	Corr Eff	490.00	692.26	695.88		695.96	0.002393	3.56	240.35	162.84	0.34
Reach-1	5	2%	Proposed	800.00	692.26	696.44		696.55	0.002400	3.95	337.49	179.58	0.35
Reach-1	5	2%	Effective	800.00	692.26	696.44		696.54	0.002426	3.96	336.25	179.38	0.35
Reach-1	5	2%	Corr Eff	800.00	692.26	696.44		696.55	0.002401	3.95	337.46	179.58	0.35
Reach-1	5	1%	Proposed	940.00	692.26	696.67		696.78	0.002374	4.07	378.19	184.07	0.35
Reach-1	5	1%	Effective	940.00	692.26	696.66		696.77	0.002407	4.09	376.41	183.98	0.35
Reach-1	5	1%	Corr Eff	940.00	692.26	696.67		696.78	0.002374	4.07	378.19	184.07	0.35
Reach-1	5	0.2%	Proposed	1350.00	692.26	697.22		697.36	0.002348	4.40	482.32	189.65	0.36
Reach-1	5	0.2%	Effective	1350.00	692.26	697.22		697.36	0.002348	4.40	482.34	189.65	0.36
Reach-1	5	0.2%	Corr Eff	1350.00	692.26	697.22		697.36	0.002348	4.40	482.32	189.65	0.36
Reach-1	4	10%	Proposed	490.00	689.76	692.63		692.98	0.010030	7.12	114.70	72.28	0.75
Reach-1	4	10%	Effective	490.00	689.76	692.76		693.06	0.008300	6.67	124.01	76.23	0.69
Reach-1	4	10%	Corr Eff	490.00	689.76	692.63		692.98	0.010030	7.12	114.70	72.28	0.75
Reach-1	4	2%	Proposed	800.00	689.76	693.44		693.81	0.008399	7.73	183.44	97.75	0.72
Reach-1	4	2%	Effective	800.00	689.76	693.57		693.89	0.007101	7.27	196.14	101.76	0.67
Reach-1	4	2%	Corr Eff	800.00	689.76	693.44		693.81	0.008396	7.73	183.46	97.76	0.72
Reach-1	4	1%	Proposed	940.00	689.76	693.72		694.10	0.008107	7.98	211.53	106.42	0.72
Reach-1	4	1%	Effective	940.00	689.76	693.85		694.18	0.006892	7.52	225.60	110.50	0.66
Reach-1	4	1%	Corr Eff	940.00	689.76	693.72		694.10	0.008107	7.98	211.53	106.42	0.72
Reach-1	4	0.2%	Proposed	1350.00	689.76	694.36		694.78	0.007772	8.65	286.22	126.61	0.72

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	4	0.2%	Effective	1350.00	689.76	694.49		694.87	0.006677	8.18	303.80	130.91	0.67
Reach-1	4	0.2%	Corr Eff	1350.00	689.76	694.36		694.78	0.007772	8.65	286.22	126.61	0.72
Reach-1	3	10%	Proposed	490.00	688.06	692.65		692.66	0.000135	1.14	745.60	298.68	0.09
Reach-1	3	10%	Effective	490.00	688.06	692.70		692.71	0.000127	1.11	760.30	299.05	0.09
Reach-1	3	10%	Corr Eff	490.00	688.06	692.65		692.66	0.000135	1.14	745.60	298.68	0.09
Reach-1	3	2%	Proposed	800.00	688.06	693.46		693.47	0.000146	1.33	989.34	304.74	0.10
Reach-1	3	2%	Effective	800.00	688.06	693.51		693.52	0.000139	1.30	1004.25	305.10	0.10
Reach-1	3	2%	Corr Eff	800.00	688.06	693.46		693.47	0.000146	1.33	989.39	304.74	0.10
Reach-1	3	1%	Proposed	940.00	688.06	693.73		693.74	0.000156	1.42	1072.20	306.77	0.11
Reach-1	3	1%	Effective	940.00	688.06	693.78		693.79	0.000150	1.39	1087.11	307.13	0.10
Reach-1	3	1%	Corr Eff	940.00	688.06	693.73		693.74	0.000156	1.42	1072.22	306.77	0.11
Reach-1	3	0.2%	Proposed	1350.00	688.06	694.35		694.37	0.000190	1.68	1265.37	311.46	0.12
Reach-1	3	0.2%	Effective	1350.00	688.06	694.40		694.42	0.000184	1.66	1280.00	311.81	0.12
Reach-1	3	0.2%	Corr Eff	1350.00	688.06	694.35		694.37	0.000190	1.68	1265.37	311.46	0.12
Reach-1	2	10%	Proposed	490.00	687.06	692.38		692.51	0.001280	3.79	232.58	123.68	0.29
Reach-1	2	10%	Effective	490.00	687.06	692.42		692.55	0.001235	3.74	237.16	126.61	0.29
Reach-1	2	10%	Corr Eff	490.00	687.06	692.38		692.51	0.001280	3.79	232.58	123.68	0.29
Reach-1	2	2%	Proposed	800.00	687.06	693.14		693.31	0.001537	4.54	349.83	184.55	0.33
Reach-1	2	2%	Effective	800.00	687.06	693.17		693.33	0.001488	4.49	355.48	186.98	0.32
Reach-1	2	2%	Corr Eff	800.00	687.06	693.14		693.31	0.001537	4.54	349.89	184.57	0.33
Reach-1	2	1%	Proposed	940.00	687.06	693.40		693.57	0.001618	4.79	399.18	204.82	0.34
Reach-1	2	1%	Effective	940.00	687.06	693.42		693.60	0.001570	4.74	404.94	207.06	0.33
Reach-1	2	1%	Corr Eff	940.00	687.06	693.40		693.57	0.001618	4.79	399.19	204.83	0.34
Reach-1	2	0.2%	Proposed	1350.00	687.06	693.97		694.17	0.001812	5.38	530.94	250.13	0.36
Reach-1	2	0.2%	Effective	1350.00	687.06	694.00		694.19	0.001760	5.32	536.88	250.36	0.36
Reach-1	2	0.2%	Corr Eff	1350.00	687.06	693.97		694.17	0.001812	5.38	530.94	250.13	0.36
Reach-1	1	10%	Proposed	490.00	685.56	690.93	689.89	691.35	0.006538	6.95	132.58	97.29	0.55
Reach-1	1	10%	Effective	490.00	685.56	690.93	689.89	691.35	0.006538	6.95	132.58	97.29	0.55
Reach-1	1	10%	Corr Eff	490.00	685.56	690.93	689.89	691.35	0.006538	6.95	132.58	97.29	0.55
Reach-1	1	2%	Proposed	800.00	685.56	691.61	691.27	692.03	0.006528	7.56	214.98	142.34	0.56
Reach-1	1	2%	Effective	800.00	685.56	691.61	691.27	692.03	0.006540	7.57	214.80	142.25	0.56
Reach-1	1	2%	Corr Eff	800.00	685.56	691.61	691.27	692.03	0.006540	7.57	214.80	142.25	0.56
Reach-1	1	1%	Proposed	940.00	685.56	691.84	691.47	692.26	0.006528	7.77	249.25	157.32	0.56
Reach-1	1	1%	Effective	940.00	685.56	691.84	691.50	692.26	0.006529	7.77	249.24	157.31	0.56
Reach-1	1	1%	Corr Eff	940.00	685.56	691.84	691.50	692.26	0.006529	7.77	249.24	157.31	0.56
Reach-1	1	0.2%	Proposed	1350.00	685.56	692.35	692.00	692.76	0.006531	8.20	335.02	180.67	0.57
Reach-1	1	0.2%	Effective	1350.00	685.56	692.35	692.00	692.76	0.006531	8.20	335.02	180.67	0.57
Reach-1	1	0.2%	Corr Eff	1350.00	685.56	692.35	692.00	692.76	0.006531	8.20	335.02	180.67	0.57

ATTACHMENT F

Wetland Delineation Report

WETLAND DELINEATION REPORT
FRANKLIN MOBILE ESTATES BRIDGE

Delineation # 20.2018
October 30, 2018

Addendum:
Delineation # 9.2019
July 3, 2019

Alice Thompson
Maureen Bogdanski
Thompson and Associates Wetland Services, LLC
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Wetland Delineation Report
Franklin Mobile Estates Bridge
October 30, 2018
July 3, 2019

1. Introduction
2. Site Description
3. Resource Review
4. Results and Conclusion

Appendices

1. INTRODUCTION

The study area was delineated by Thompson and Associates Wetland Services at the request of David Steinberger, owner. Alice Thompson was the lead delineator, Maureen Bogdanski was the field assistant. The original project area consisted of approximately 0.1 acre project area located at a failed bridge on West Westmoor Avenue (see Figure 1). More specifically, the study area is located within the NE ¼ of Section 1, Township 5 North, Range 22 East in the City of Franklin, Milwaukee County, WI. This October 30, 2018 report was submitted as an assured 2018 wetland delineation.

We returned in July 3, 2019 to expand the project corridor to the north and south ends of the property in the vicinity of the stream at the request of the City of Franklin. This is an ~ 0.22 acre project area (See Figure 7). The report has been expanded to reflect the new project corridor. This report is being submitted as an assured wetland delineation in 2019 as well.

As shown in Figure 2, for the **2019 field visit** the precipitation maps documenting the 90 day departure from normal precipitation as shown on the Advance Hydrologic Prediction Service Website of the National Weather Service (National Oceanic and Atmospheric Administration) indicated that precipitation during the 90 days prior to the field visit was approximately **4-6 inches above normal**. Precipitation maps documenting the 90 day percent of mean departure from normal indicate that the mean departure from precipitation was from **125-150%** or **wet** (75%-125% considered normal; <75% indicates drier conditions; >125% indicates wetter conditions). The Current Drought Condition as shown on the National Integrated Drought Information System- US Drought Portal is **None**. The USDM uses a five-category system, labeled Abnormally Dry or D0, (a precursor to drought, not actually drought), and Moderate (D1), Severe (D2), Extreme (D3) and Exceptional (D4) Drought. Drought categories show experts' assessments of conditions related to dryness and drought including observations of how much water is available in streams, lakes, and soils compared to usual for the same time of year. U.S. Drought Monitor data go back to 2000.

Considering that the precipitation was wet in the past 90 days prior to field work the evidence of hydrology could include obvious primary indicators such as standing water, a high water table or saturation in the root zone. We also use more subtle primary and secondary indicators relying on indicators that persist even with local climatic variation could include a positive FAC neutral test that documents long term vegetation patterns due in part to moisture gradients; a concave basin at a geomorphic low point which indicates probable wet conditions; evidence of saturation or ponding on aerial photographs in multiple years; blackened leaves or water marks on trees indicating ponding etc.

2. SITE DESCRIPTION

The study area consists of a stream or waterway that flows south within a trailer park. There is a row of trailers on each side of an access road, with a bridge crossing, which connects the East and West sections of Franklin Mobile Estates. The original bridge has collapsed and a temporary timber-mat bridge has been overlaid.

3. RESOURCE REVIEW

The site is located on a **Topographic Map** in Figure 3.

According to the **NRCS Soil Survey** (Figure 4), the study area contains Ashkum silty clay loam, a hydric soil, and Blount silt loam is mapped to the east, an upland soil with hydric inclusions.

The **Wisconsin Wetland Inventory** (Figure 5) identifies a T3K wetland is located to the north, extending just over the property line and a T3/S3K wetland is located to the south of the property line. T3K wetlands are classified as broad-leaved deciduous forest wetlands with wet soils that contain surface water for only short periods of time. The T3/S3K wetland to the South would include the above as well as a shrub/scrub broad-leaved deciduous shrub layer.

Historical maps (Figure 6) show the site changed over time in the following ways: the 1937 aerial shows a waterway between active agricultural fields. In the 1951 aerial, a bridge crossing and mobile estates to the East of the waterway have been installed. In the 1963 aerial, mobile estates have been added to the West side of the waterway.

4. RESULTS AND CONCLUSION

- **One Wetland** was delineated within the study area (Figure 7). The study area contains "Significantly Disturbed" and "Problem" areas as outlined on Table 1 and shown on data sheets.
- **On our July 3, 2019 visit we extended the wetland line to the north and south property lines on both sides of the stream. We added data sheets 7-11 to document the north and south ends of the project area.**

- **Wetland A was ~0.05 acres** located on the east and west banks of the unnamed stream.
- **The wetland community** type is fresh wet meadow.
- **Vegetation** included reed canary grass, calico aster, and curly dock.
- **Soils** could not be sampled as the stream and sideslopes was heavily armored with rip rap and cobble, except at the north end (data point #7) where soils met Depleted Matrix.
- **Hydrology** included a positive FAC-neutral test & geomorphic position as well as 4 inches of flowing water within the stream.
- **The wetland line** was placed at a shift from hydric vegetation including reed canary grass and Virginia waterleaf that was replaced by upland vegetation including creeping Charlie, common fescue grass, burdock and dandelion. This was concurrent with a rise in topography.

- **Other Water Features:**

The wetland was on the banks of a stream that flows south. The stream (WBIC 5037048) is an un-named tributary to the Franklin Tributary in the Root River Watershed. The stream is 5-6 feet wide with ~ 3'tall banks, and the substrate is cobble and rock.

- **Uplands**

- **Uplands** were characterized by trailer pads on fill, with limited vegetation in small mowed patches. The fill dates back to the 1950-60's per the historical aerial photos (Figure 6). There were mature trees rooted within the fill. There was concrete block, rip rap as well as gravels and silty clay loam in the uplands.

The wetland line staked in the field by Thompson and Associates Wetland Services is an estimate of the wetland boundary and the opinions presented in this report are best estimates of the conditions at the time the wetlands were delineated.

Alice Thompson, lead delineator, is an Assured Delineator as explained at the Wisconsin Department of Natural Resources' (the "WDNR") web site, at http://www.dnr.state.wi.us/org/water/fhp/wetlands/boundaries.html . The WDNR considers Thompson's wetland delineation work to be "Assured" for purposes of Wisconsin waterway and wetland permits, such that Thompson's clients do not need to wait for concurrence letters from the WDNR before relying on such delineations and may expect that wetland delineation issues should not be the cause of delays in state waterway and wetland permit decisions.

This report will be submitted to the WDNR Assured Delineation Report Portal electronically. Thompson's work is reviewed annually by the WDNR Wetland ID program and one site a year is field verified as part of Thompson's continued assurance status. A client will be notified if their site is going to be spot-checked, and no additional fees will be required. The Assurance Program has a code of ethics that includes high moral and ethical standards and clear and scientifically accurate reporting to the WDNR. All of Thompson's reports are filed with the WDNR Wetland ID program, unless the client does not want to utilize the report and findings. Any work not filed with the WDNR is not valid.

The wetlands identified in this report may be subject to federal regulation under the jurisdiction of the U.S. Army Corps of Engineers (USACE), state regulation under the jurisdiction of the Wisconsin Department of

Natural Resources (WDNR), and local jurisdiction under your local county, town, city or village. Municipalities, townships and counties may have local zoning authority over certain areas or types of wetland and waterways. The determination that a wetland or waterway is subject to federal, state or local regulatory jurisdiction is made independently by the agencies. As a result, there may be adjustments to boundaries or jurisdiction based upon review of a regulatory agency.

Any activity in the delineated wetland may require U.S. Army Corps of Engineers permit, State of Wisconsin Department of Natural Resources Water Quality Certification, and local government permits. If the Client proceeds to change, modify or utilize the property in question without obtaining authorization from the appropriate regulatory agency, it will be done at the Client's own risk and Thompson and Associates Wetland Services shall not be responsible or liable for any resulting damages.

This field work and report is not intended to meet the requirements of an SEWRPC Environmental Corridor, WDNR Endangered Species Review, a navigability determination, or the location of either the Ordinary High Water Mark or floodplain.

APPENDICES:

1. Field Photographs
2. Figures
    - Figure 1. Location Map
    - Figure 2. NWS Departure from Mean Precipitation Maps
    - Figure 3. 2-ft Contour Map
    - Figure 4. Soil Map & Hydric Soil List with Minor Soils
    - Figure 5. Wisconsin Wetland Inventory
    - Figure 6. Historical Aerial Photographs
    - Figure 7. Wetland and Data Point Locations
3. Field Data and Results
    - Table 1. Significantly Disturbed and Problem Areas
    - Data Sheets

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ROUTINE METHODOLOGY FOR DELINEATING WETLANDS

This delineation was performed according to guidelines set by the U.S. Army Corps of Engineers 1987 Manual and either the 2012 Regional Supplement to the Corp of Engineers Wetland Delineation Manual: Northcentral and Northeastern Region, or the 2010 Regional Supplement to the Corp of Engineers Wetland Delineation Manual: Midwest Region, depending on which region the site occurs within per US Army Corps of Engineers guidance. Additional DNR requirements and guidance that were presented at wetland delineation training courses offered by UW-Extension have also been incorporated. The most recent of these workshops we attended that provided current guidance was the Critical Methods in Wetland Delineation Workshop in March of 2018.

Maps used during the delineation included site location map, NRCS County soil maps, U.S.G.S. topographic map, Wisconsin Wetland Inventory Map, and aerial photography. NRCS Wetland Inventory Maps are provided when available and pertinent. Soil taxonomy is obtained from the NRCS Official Soil Series Descriptions (OSD). The indicator plant status was taken from the State of Wisconsin 2016 Wetland Plant List authored by Lichvar, R.W., D.L. Banks, W.N.Kirchner, and N.C. Melvin. The National Wetland Plant List: 2016 wetland ratings. U.S. Army Corps of Engineers. When an indicator was not given then the indicator listed in the Plants of the Chicago Region by Floyd Swink and Gerould Wilhelm (1994) was used. *Typha* plants area not identified to species level as recent research by Dr. Pamela Geddes documents the inability to accurately identify to species using current field characteristics. Similarly, Dr. Gary Fewless reports *Craetegus sp.* cannot be identified to species due to hybridization. The reference for landform descriptors is: Schoeneberger, P.J., Wysocki and Benham. 2012. Field Book for describing and sampling soils, Version 3.0, NRCS, Lincoln, NE. The NOAA Advanced Hydrologic Prediction Service Departure from Normal Map is used to calculate the 90-day departure from normal on the day of the delineation, and the 90 day percent of mean departure from normal. This NOAA data set uses radar, satellite data, and observed data from the 12 CONUS River Forecast Center. The NOAA "normal" precipitation is derived from PRISM climate data created at Oregon State University. As of 2015 the 30- year PRISM Normals have been updated utilizing the 1981-2010 dataset. The location of the project is geo-referenced on the map. The Current Drought Conditions Map is found on the National Integrated Drought Information System- US Drought Portal sponsored by the USDA, National Drought Mitigation Center and seven federal agencies including the U. S. Army Corps of Engineer and NOAA. It is updated weekly on www.drought.gov.

Data points were set in areas that exhibited obvious wetland and obvious upland characteristics. The location of each data point is in the midpoint of the number on the aerial map "Data Point Locations". At each data point, vegetation was identified, soils described, and hydrology noted. Vegetation was recorded as species and absolute percent cover. Herbaceous vegetation, shrub, and tree cover were estimated in circular plots of approximately 5, 15, and 30 feet in radius, respectively, with the center point being the soil pit. If the entire circular plot was not located within a single plant community, then the plot shape was adjusted accordingly with the total plot area remaining equivalent to the circular plot area. The absolute cover was estimated as precisely as possible with low cover estimated as 1%, 3%, or 5%. Vegetation greater than 5% absolute cover was estimated in additional increments of 5%. The appropriate test (Rapid Assessment, Dominance, Prevalence or Morphological Adaptations test) was used to determine dominant vegetation. All plots with a 50% dominance of hydrophytes were evaluated with the Prevalence Index. The wetland boundary was staked and located between the wetland and upland data points, at a consistent break in vegetation, topography, and soils.

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BIOGRAPHIES OF FIELD INVESTIGATORS

Alice L. Thompson, Owner, Assured Wetland Delineator
Alice L. Thompson is an independent wetland consultant for the past twenty years and is certified by the Society of Wetland Scientists as a Professional Wetland Scientist (PWS). Thompson is a WDNR "assured" wetland delineator since 2006. She obtained a Master's degree in biological sciences at the University of Wisconsin-Milwaukee in 1995. Her professional interests include wetland restoration, mitigation, and the control of invasive plant species, especially reed canary grass. Ms. Thompson has satisfactorily completed the Wetland Delineation course offered by the Wisconsin Department of Administration, Coastal Management Program in 1998; the Advanced Wetland Delineation Training Workshop offered by the University of Wisconsin-La Crosse in 2002, 2008 and again in 2014; Advanced Hydric Soils offered by the Wetland Training Institute in 2004; the Primary Environmental Corridor Delineation Workshop offered by the Southeastern Wisconsin Regional Planning Commission in 2004; Wetland Plant Identification offered by Dr. Mohlenbrock, Biotic Consultants, 2003 and 2004; Ecological Geology Workshop, UWM Field Station, 2006; the Midwest Supplement Training offered by the US Army Corp of Engineers in 2009, Native Mussel Identification Workshop, UWM Field Station, 2012; and the Critical Methods in Wetland Delineation offered annually by the Wisconsin Department of Natural Resources in 2018 and eight previous years since 2006.

Maureen K. Bogdanski, Assistant Wetland Ecologist
Maureen K. Bogdanski earned a Bachelor of Science degree in Environmental Science and a Bachelor of Arts in Economics with a concentration in Environmental Economics from the University of Toledo in 2015. Her undergraduate thesis involved the development and implementation of a Northern Bobwhite Quail call survey and protocol, which lead to a non market valuation survey to determine the willingness to pay for the reintroduction of a population to a designated location. She came to Southeast Wisconsin for a Field Ecologist position at an ecological landscaping company. She previously worked as an Oak Openings Restoration Assistant at The Nature Conservancy's Kitty Todd Nature Preserve (Swanton, Ohio) where she did invasive species control and prescribed fire in various plant communities including prairies, savannas, woodlands, and wetlands. Ms. Bogdanski has conducted various flora and fauna surveys as an employee and volunteer for various organizations throughout Northwest Ohio, Southeast Michigan, and Southeast Wisconsin. Those surveys include vernal pool monitoring, macro invertebrate surveys, frog and toad call listening surveys, Ohio rare plant surveys, and vegetation inventories. She successfully completed the Vegetation of Wisconsin Workshop course offered by the University of Wisconsin-Milwaukee in 2016

Wetland Delineation Photos taken on 10/30/2018 and July 3, 2019

Upper right- Upland West side of waterway, facing South

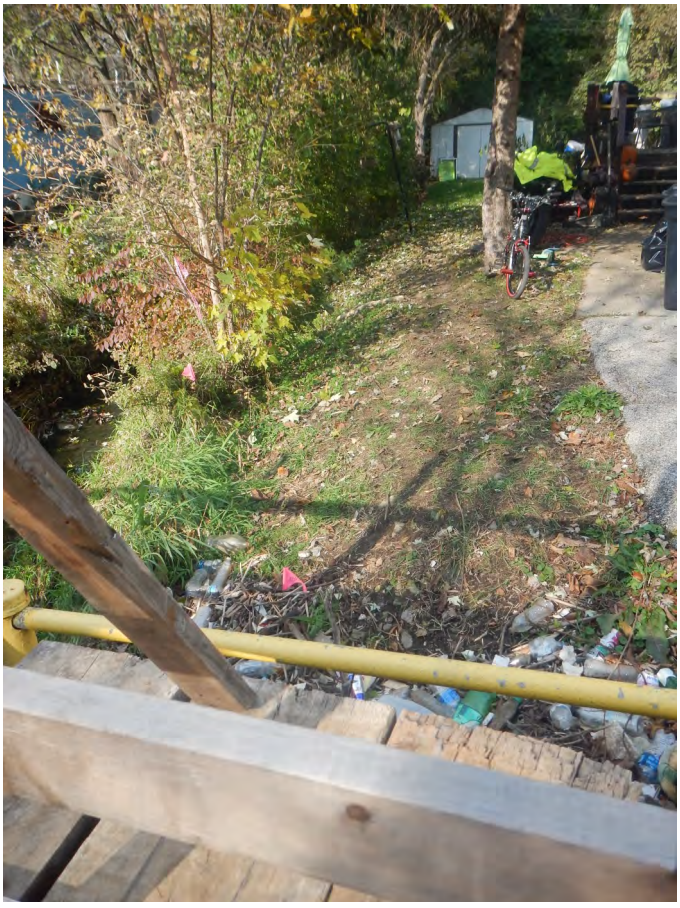
Center left– Wetland A and stream South of bridge

Lower right– Stream south of bridge– not significant riprap and armor.

Wetland Delineation Photos taken on 10/30/2018 and July 3, 2019

Upper left– Wetland A on south side of failed bridge with temporary timber mat providing access to residents.

Center right– In right of photo– upland on East side of bridge, facing North; Wetland A in left side of photo



Lower left– Wetland A on right of photo; Upland on West side of bridge facing North in left of photo

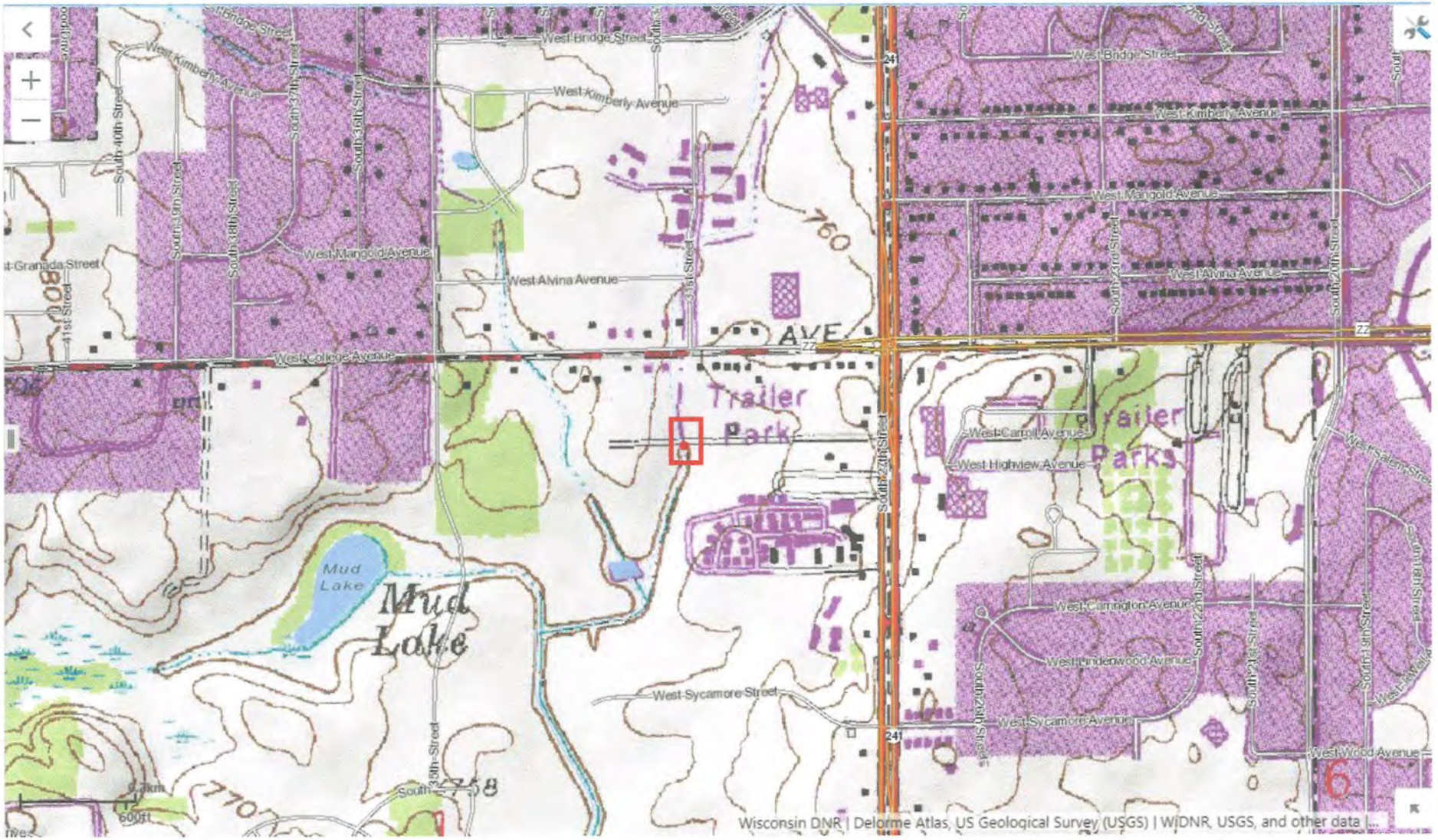
Wetland Delineation Photos taken on 10/30/2018 and July 3, 2019

July 3, 2019– Upper left– Stream and wetland facing north

Upper right– Stream and wetland on north edge of property facing east

Lower left– north end of property– vicinity of data point 7– stream bends to west

Lower right– uplands on south end of property in vicinity of data point 11 facing west



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N

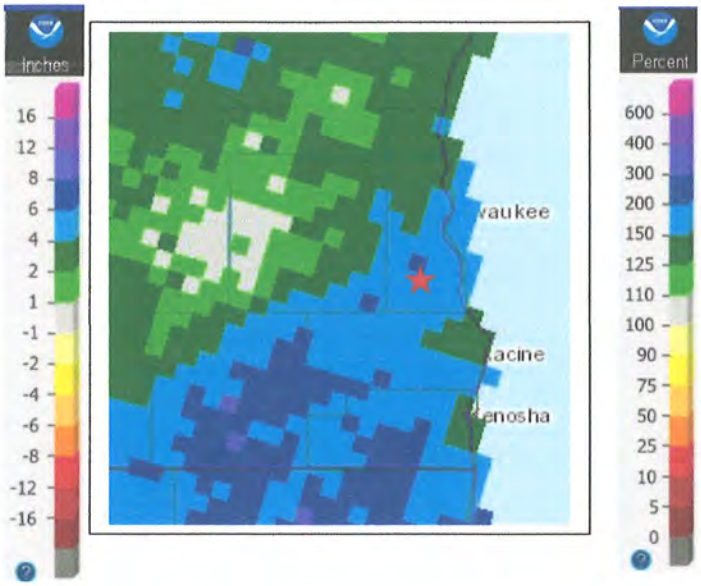
Project Area
in red

Franklin Mobile Estates Bridge- Addendum

Location and USGS Topographic Map

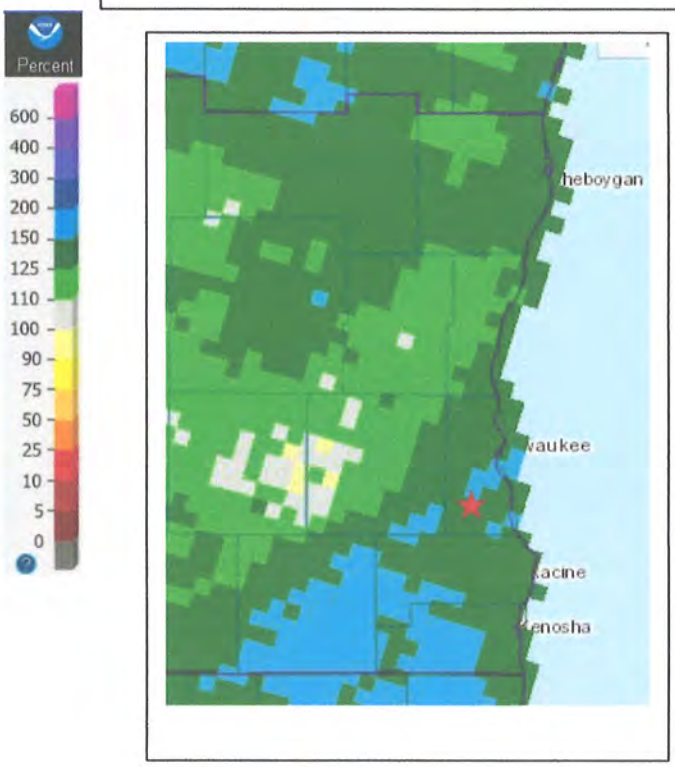
Figure 1

90 Day Departure From Normal Precipitation- inches



90 Day Departure Percent of Normal Precipitation- per cent

0-75=Drier than Normal; 75-125=Normal; 125-600+ =Wetter than Normal



Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

U.S. Drought Monitor- Wisconsin
Current Conditions as of 7/2/2019

N

Sources: Advanced Hydrologic Precipitation Service Website, National Weather Service

National Integrated Drought Information System, U.S. Drought Monitor-Wisconsin (www.droughtmonitor.unl.edu)

Project Area Starred in Red

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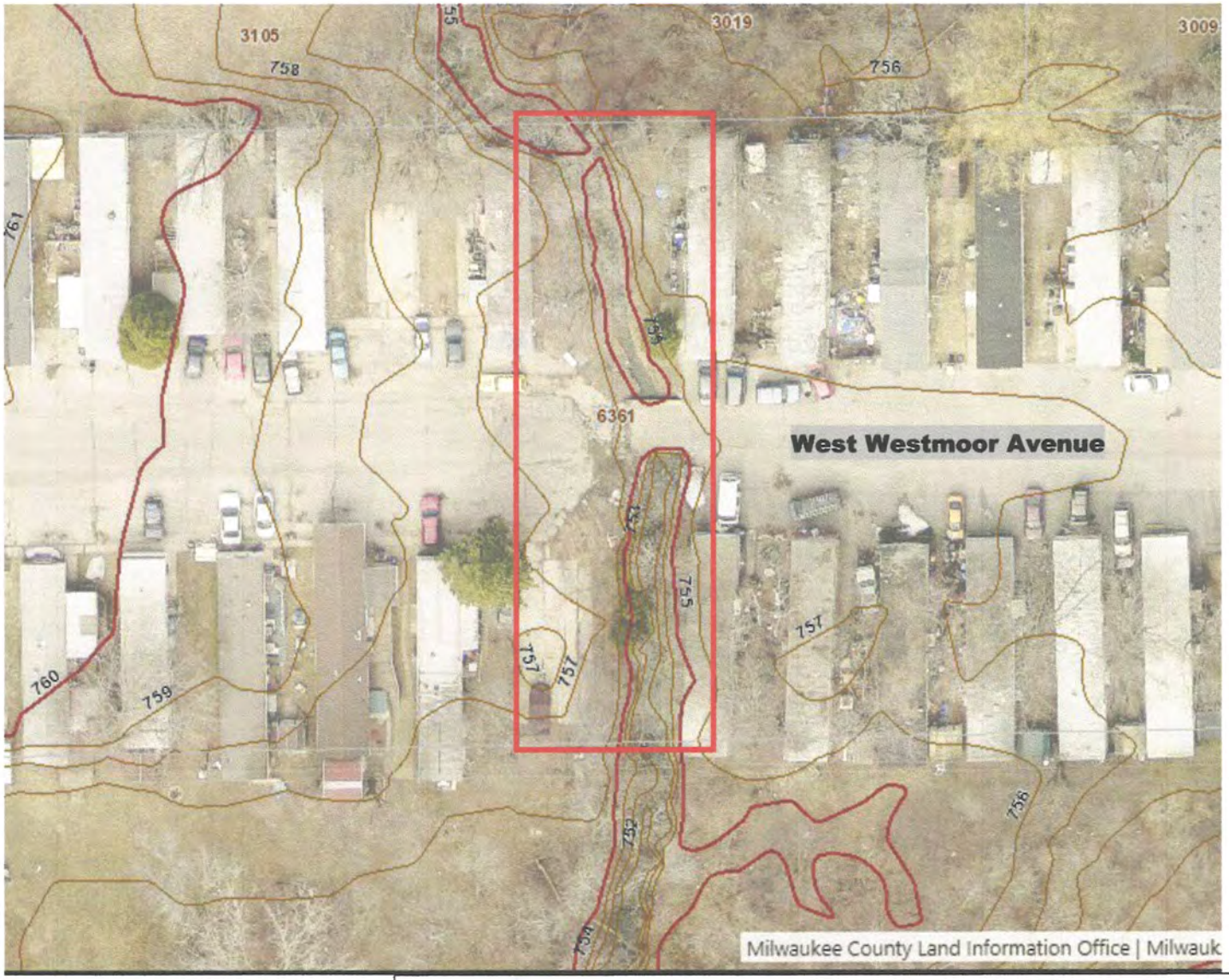
Addendum- Franklin Mobile Estates Bridge

90- Day Departure from Normal and Percent of Normal Precipitation & Current Drought Intensity

Figure 2



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N

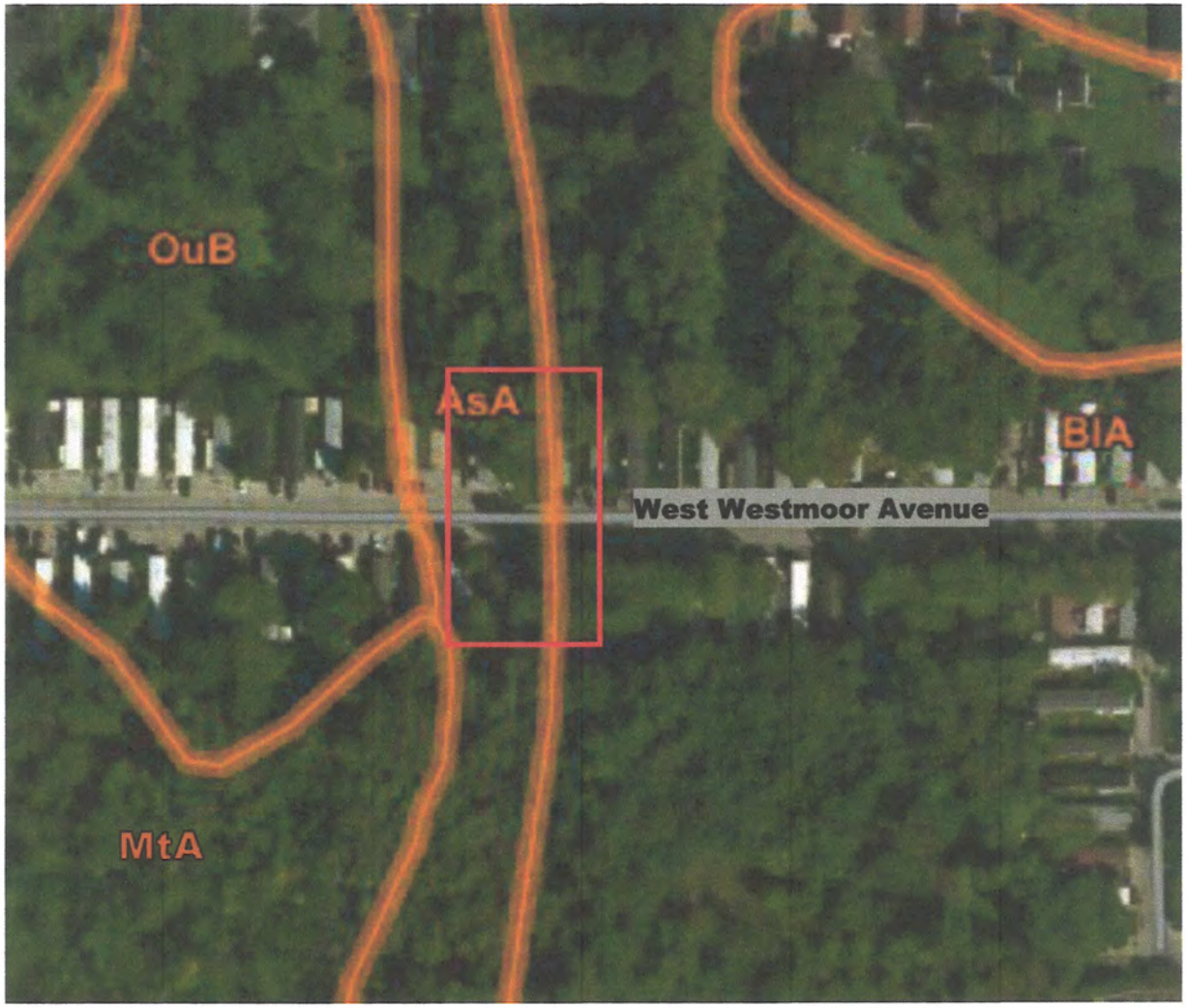
Project Area
outlined in red

Source: Milwaukee County
GIS Website

Franklin Mobile Estates Bridge Addendum 2019

Contour Topography

Figure 3



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Project Area
outlined in red

Source: NRCS Web Soil Survey, soils descriptions follow

N

Franklin Mobile Estates Bridge- Addendum 2019

NRCS Soil Survey

Figure 4

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Project Area outlined in red

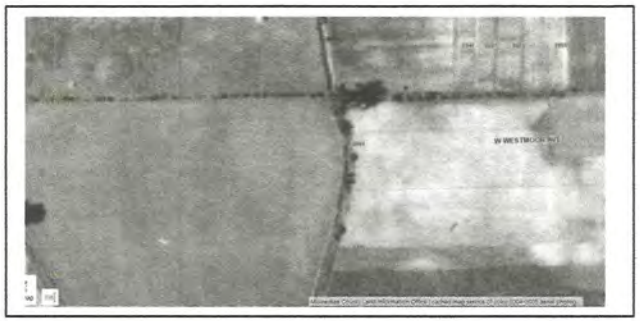
Source: WDNR Surface Water Data Viewer

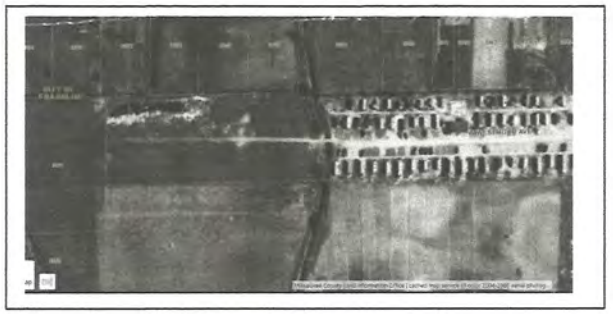
N

Franklin Mobile Estates Bridge- Addendum 2019

Wisconsin Wetland Inventory

Figure 5



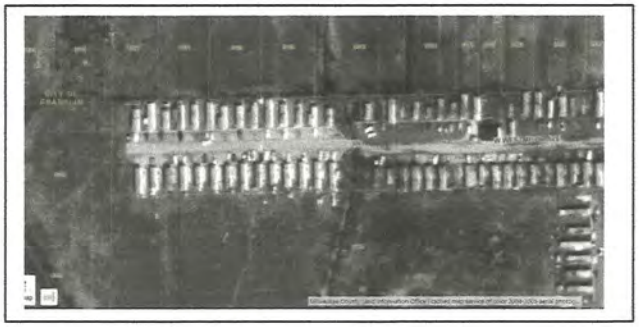


upper left
1937

upper right
1951

lower left
1963

lower right
2010



Thompson & Associates
Wetland Services

Source: Milwaukee County
GIS Website

N

Franklin Mobile Estates Bridge- Addendum 2019

Historic Aerials

Figure 6

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Project Area outlined in red

Source: Milwaukee County
GIS 2018 aerial

Franklin Mobile Estates Bridge- Addendum 2019

Data Point Locations and Site Overview

Figure 7

Table 1. ***Summary of "Significantly Disturbed" and "Problem" Areas***

Site: Franklin Mobile Estates Bridge Addendum

Significantly Disturbed Areas	**Corresponding Data Points**	**Description**	**Justification for wetland with less than 3 parameters**
☐ Farmed Field			
☑ Managed plant community	*2,3,4,6, 8, 9, 11*	*occasional mow*	
☐ Soil Removal			
☑ Fill	*all plots*	*the Trailer Park is constructed between the 1951-1963 aerials- presumably on fill at that time- mature trees rooted in substrate*	*Due to heavy fill and extensive rip/rap and cobble in stream, soil investigaton was limited. Also a utility corridor overhead limited digging. Used vegetation, hydrology and landscape position to determine wetlands.*
☐ Subsurface Plow 2,3,4,6			
☐ Surface Layer Removed			
☐ Man-Made Structure			
☐ Dam/Levee			
☐ Channelization			
☐ Drainage			
☐ Human-induced wetland			
☐ Change in River			

Problem Areas	**Corresponding Data Points**	**Description**	**Justification for wetland with less than 3 parameters**
☐ Highly seasonal wetland			
☐ Vegetated flats			
☐ FACU dominated wetland			
☐ Beaver impoundment			
☐ Problem soils- red parent material, sandy etc.			
☐ Fluvial Soils			
☐ Vernal pools			
☐ Multi-year wet/dry cycle			
☐ White pine swamp			
☐ Other			

Significantly disturbed and problem areas are found when one or more of three parameters (vegetation, soils, hydrology) are missing, obscured or misleading. Disturbed areas include human-caused disturbance or disturbance due to a significant, catastrophic natural event. Problem areas are due to natural, normal, seasonal, or annual variability or permanently due to the nature of soils or vegetation on site.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Franklin Mobile Estates Bridge City/County: Franklin/Milwaukee Sampling Date: 10/30 /2018

Applicant/Owner: David Steinberger, owner State: WI Sampling Point: 1

Investigator(s): TAWS - Alice Thompson, Maureen Bogdanski Section 1 Township 5 N, Range 22 East West

Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other _____ Local relief: concave, convex, linear, other: _____

Soil Map Unit Name: Ashkum silty clay loam WWI classification: B

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ____ No X Reason: Previous 90 day Precipitation WET NORMAL DRY

Are Vegetation ____, Soil X, or Hydrology ____ significantly disturbed? rip rap Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area within a Wetland?	Yes X No ____
Hydric Soil Present?	Yes ____	No N/P	Wetland Type: Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland	
Wetland Hydrology Present?	Yes X	No ____		

Wetland A

Remarks: Bridge washed out within Trailer Park - emergency bridge (timber mat) in place. - Growing Season 2018 - Milwaukee County still has ~20-30% leaf on trees

sugar maple, dogwood retain leaves, Sunny ~50°F day

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: equiv to 5' radius) linear plot			
1. Phalaris arundinacea	10	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	10 = Total Cover		10/4
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ Rapid test for hydrophytic vegetation

X Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
	rock / rip rap							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ___ No ___ N/A

Remarks: Rock & rip rap on streambed - unable to dig

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- √ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 2-4"

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Is Wetland Hydrology Present? Yes √ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: water flows south - brisk - clear water

stream has rip rap on banks - fist size cobble & gravel in stream

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Franklin Mobile Estates Bridge City/County: Franklin/Milwaukee Sampling Date: 10/30/2018
Applicant/Owner: David Steinberger - owner State: WI Sampling Point: 2
Investigator(s): TAWS - Alice Thompson, [illegible] Section 1 Township 5 N, Range 22 East West
Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other Local relief: concave, convex, linear, other:
Soil Map Unit Name: Aztalan silty clay loam WWI classification: E
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ___ No X Reason: Previous 90 day Precipitation WET NORMAL DRY
Are Vegetation X, Soil X, or Hydrology ___ significantly disturbed? mow/fill Are "Normal Circumstances" present? Yes ___ No X
Are Vegetation ___, Soil ___, or Hydrology ___ problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	Is the Sampled Area within a Wetland?	Yes ___ No X
Hydric Soil Present?	Yes ___	No ___ NA	Wetland Type: Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland	
Wetland Hydrology Present?	Yes ___	No X		

Remarks: unable to dig 77" due to historic fill

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius) linear plot	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja occidentalis	40	Y	FACW
2. Fraxinus pennsylvanica	40	Y	FACW
3.			
4.			
5.			
	80	= Total Cover	40/16
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1. Rhamnus cathartica	10	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	10	= Total Cover	5/2
Herb Stratum (Plot size: equiv to 5' radius)			
1. Daucus carota	40	Y	UPL
2. Viola sororia	10	Y	FAC
3. Solidago canadensis	10		FACU
4. Tridium pratense	10		FACU
5. Glecoma hederacea	40	Y	FACU
6. Eutrochium maculatum	10		FACW
7. Solidago flexicaulis	10		FACU
8. Taraxacum officinale	5		FACU
9. Plantago lanceolata	5		FACU
10.			
	200	= Total Cover	100/40
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
		= Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___	(A) ___ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
___ Rapid test for hydrophytic vegetation
X Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks)
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes X No ___

Remarks: Vegetation dominated by disturbance species - common buckthorn
Cirsium [illegible] etc

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7"	10YR 3/2	100					Sandy loam	
7"	Compacted fill							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ___ No X

Remarks:

historic fill on corner [illegible]

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Franklin Mobile Estates Bridge City/County: Franklin/Milwaukee Sampling Date: 10/30/2018

Applicant/Owner: David Sheridenmayer - owner State: WI Sampling Point: 3

Investigator(s): TAWS - Alice Thompson, N. Bogdanski Section 1 Township 5 N, Range 22 East West

Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other _____ Local relief: concave, convex, linear, other: _____

Soil Map Unit Name: Ashkum silty clay loam WWI classification: _____

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ___ No X Reason: Previous 90 day Precipitation WET NORMAL DRY

Are Vegetation X, Soil X, or Hydrology ___ significantly disturbed? mod fill Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation ___, Soil ___, or Hydrology ___ problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present?	Yes ___	No N/A	Wetland Type: Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland
Wetland Hydrology Present?	Yes ___	No X	

Remarks:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharinum	30	Y	FACW
2.			
3.			
4.			
5.			
	30 = Total Cover		15/6
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1. Salix nigra	5	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	5 = Total Cover		2.5/1
Herb Stratum (Plot size: equiv to 5' radius)			
1. Phalaris arundinacea	20	Y	FACW
2. Daucus carota	20	Y	UPL
3. Taraxacum officinale	20	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	60 = Total Cover		30/12
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___	(A) ___ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ Rapid test for hydrophytic vegetation

__ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
2 –	histosol fill							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ___ No ___

Remarks:

Ø asphalt and riprap on north shoreline

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Franklin Mobile Estates Bridge City/County: Franklin / Milwaukee Sampling Date: 10/30/2018
Applicant/Owner: David Steinberger - owner State: WI Sampling Point: 4
Investigator(s): TAWS - Alice Thompson, M. Bogdanski Section 1 Township 5 N, Range 22 East West
Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other _____ Local relief: concave, convex, linear, other: _____
Soil Map Unit Name: Ashkum silty clay loam WWI classification: _____
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ___ No X Reason: Previous 90 day Precipitation WET NORMAL DRY
Are Vegetation X, Soil X, or Hydrology ___ significantly disturbed? mow / fill Are "Normal Circumstances" present? Yes ___ No X
Are Vegetation ___, Soil ___, or Hydrology ___ problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	Is the Sampled Area within a Wetland? Yes ___ No X
Hydric Soil Present?	Yes ___	No NP	Wetland Type: Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland
Wetland Hydrology Present?	Yes ___	No X	

Remarks:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	50	Y	FACW
2. Betula alleghaniensis	20	Y	FAC
3. Picea glauca	20	Y	FACU
4.			
5.			
	90	= Total Cover	35/14
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1. Acer saccharum	10	Y	FACU
2. Rhamnus cathartica	10	Y	FAC
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	10/4
Herb Stratum (Plot size: equiv to 5' radius)			
1. Glechoma hederacea	50	Y	FACU
2. Schedonorus arundinaceus	30	Y	FACU
3. Taraxacum officinale	50	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90	= Total Cover	45/18
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
		= Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 8 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 37% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:		(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
__ Rapid test for hydrophytic vegetation
__ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	100					sandy loam	
2"	compacted fill							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

N/A

Is Hydric Soil Present? Yes ___ No ___

Remarks:

historic fill

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Franklin Mobile Estates Bridge City/County: Franklin/Milwaukee Sampling Date: 10/30/2018
Applicant/Owner: David Steinberger - owner State: WI Sampling Point: 5
Investigator(s): TAWS - Alice Thompson, M. Bogdanski Section 1 Township 5 N, Range 22 East West
Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other Local relief: concave, convex, linear, other:
Soil Map Unit Name: Ashkum silty clay loam WWI classification:
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ___ No X Reason: Previous 90 day Precipitation WET NORMAL DRY
Are Vegetation ___, Soil X, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X
Are Vegetation ___, Soil ___, or Hydrology ___ problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	Is the Sampled Area within a Wetland? Yes X No ___ Wetland A
Hydric Soil Present?	Yes ___	No NA	Wetland Type: Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland
Wetland Hydrology Present?	Yes X	No ___	

Remarks:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: equiv to 5' radius)			
1. Phalaris arundinacea (linear plot)	50	Y	FACW
2. Symphyotrichum lateriflorum	20	Y	FACW
3. Rumex crispus	10		FAC
4. Elymus dulcamara	20	Y	FAC
5. Schoenoplectus tabernaemontani	10		OBL
6.			
7.			
8.			
9.			
10.			
	110 = Total Cover		55/22

Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
	= Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:		(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
___ Rapid test for hydrophytic vegetation
X Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-	rock + riprap							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

N/A

Is Hydric Soil Present? Yes ___ No ___

Remarks:

cobble, gravel + riprap in stream + banks

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 4"

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Is Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

flowing water in stream

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Franklin Mobile Estates Bridge City/County: Franklin / Milwaukee Sampling Date: 10/30/2018
Applicant/Owner: David Steinberger - owner State: WI Sampling Point: 6
Investigator(s): TAWS - Alice Thompson, M. Bogdanski Section 1 Township 5 N, Range 22 East West
Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other _____ Local relief: concave, convex, linear, other: _____
Soil Map Unit Name: Ashkum silty clay loam WWI classification: _____
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ___ No X Reason: Previous 90 day Precipitation WET NORMAL DRY
Are Vegetation X, Soil X, or Hydrology ___ significantly disturbed? mowed/fill Are "Normal Circumstances" present? Yes ___ No X
Are Vegetation ___, Soil ___, or Hydrology ___ problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present?	Yes ___	No N/A	**Wetland Type:** Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland
Wetland Hydrology Present?	Yes ___	No X	

Remarks:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius) linear plot	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharinum	40	Y	FACW
2.			
3.			
4.			
5.			
	40 = Total Cover		20/8
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1. Rhamnus cathartica	5	Y	FAC
2. Morus alba	5	Y	FAC
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		5/2
Herb Stratum (Plot size: equiv to 5' radius)			
1. Trifolium pratense	40	Y	FACU
2. Viola sora	20		FAC
3. Plantago lanceolata	10		FACU
4. Rumex crispus	10		FAC
5. Scheloneris gymnadenes	30	Y	FACU
6. Dactylis glomerata	30	Y	FACU
7. Taraxacum officinale	10		FACU
8. Glecoma hederacea	20		FACU
9. Daucus carota	10		UPL
10.			
	180 = Total Cover		90/36
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
	= Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	40	x 2 =	80
FAC species	40	x 3 =	120
FACU species	140	x 4 =	560
UPL species	10	x 5 =	50
Column Totals:	230 (A)		810 (B)

Prevalence Index = B/A = 3.5

Hydrophytic Vegetation Indicators:
___ Rapid test for hydrophytic vegetation
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks)
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR3/2	100					Sandy loam	
4"	compacted fill							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Is Hydric Soil Present? Yes ___ No ___ N/A

Remarks:

historic fill

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Franklin Mobile Estate Addition City/County: Franklin/Milwaukee Sampling Date: 7/3 /2019

Applicant/Owner: David Steinberger - owner State: WI Sampling Point: 7

Investigator(s): TAWS - Alice Thompson, Maureen Bagdanska Section 1 Township 5 N, Range 22 (East) West

Landform: Summit Shoulder Backslope Footslope (Toeslope) Urban Modified Other: Local relief: (concave), convex, linear, other:

Soil Map Unit Name: Ashkum silty clay loam WWI classification: T3K

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ___ No X Reason: Previous 90 day Precipitation (WET) NORMAL DRY

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** Yes X No ___
Hydric Soil Present?	Yes X	No ___	**Wetland Type:** Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland Stream
Wetland Hydrology Present?	Yes X	No ___	

Remarks:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer negundo	100	Y	FAC
2. Quercus macrocarpa	5		FAC
3. Tilia americana	70	Y	FACU
4.			
5.			
	175	= Total Cover	88/35
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1. Cornus racemosa	40	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	40	= Total Cover	20/8
Herb Stratum (Plot size: equiv to 5' radius)			
1. Alliaria petiolata	5	N	FAC
2. Impatiens capensis	2		FACW
3. Hydrophyllum virginianum	10	Y	FAC
4. Rhamnus cathartica	10	Y	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	27	= Total Cover	14/5
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:		(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Rapid test for hydrophytic vegetation

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/1	100					Silty loam	
3-24	10YR 4/1	90	10YR 5/8	10	C	M	Sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Is Hydric Soil Present? Yes X No ___

Remarks: edge of stream - heavy rip rap

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 5 in

Water Table Present? Yes X No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0

Is Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Shallow roots

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Franklin Mobile Home Addendum City/County: Franklin / Milwaukee Sampling Date: 7/3 /2019

Applicant/Owner: David Steinberger, owner State: WI Sampling Point: 8

Investigator(s): TAWS - Alice Thompson, M Bogdanski Section 1 Township 5 N, Range 22 (East) West

Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other: Local relief: concave, convex, linear, other:

Soil Map Unit Name: Ashkum silty clay loam WWI classification: just south of T3K

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ___ No X Reason: Previous 90 day Precipitation (WET) NORMAL DRY

Are Vegetation ___, Soil X, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation ___, Soil ___, or Hydrology ___ problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present?	Yes ___	No X	**Wetland Type:** Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland
Wetland Hydrology Present?	Yes ___	No X	

Remarks: lawn edge of trailer lot - mowed | historic fill

Dominated by facultative plants

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharinum	30	Y	FACW
2.			
3.			
4.			
5.			
	30 = Total Cover		5/6
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1. Corus racemosa	50	Y	FAC
2. Fraxinus pennsylvanica	10		FACW
3. Rhamnus cathartica	20	Y	FAC
4.			
5.			
6.			
7.			
	80 = Total Cover		4/6
Herb Stratum (Plot size: equiv to 5' radius)			
1. Viola sororia	30	Y	FAC
2. Glechoma hederacea	50	Y	FACU
3. Plantago lanceolata	10		FACU
4. Taraxacum officinale	20		FACU
5. Carex blanda	20		FAC
6. Poa pratense	50	Y	FAC
7. Solidago canadensis	0		FACU
8. Trifolium hybridum	20		FACU
9.			
10.			
	210 = Total Cover		105/42
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___	(A) ___ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance Test is >50%
- ___ Prevalence Index ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/2	100					Sandy clay loam	
9-24"	10YR 4/3	40					sandy clay loam +	
	10YR 3/2	60					gravel	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ___ No X

Remarks:

Likely historic fill for former lot - [illegible] on fill

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Franklin Mobile Estate Addition City/County: Franklin / Milwaukee Sampling Date: 7/3 /2019

Applicant/Owner: David Steinberger, owner State: WI Sampling Point: 9

Investigator(s): TAWS - Alice Thompson, M Bogdanski Section 1 Township 5 N, Range 22 East West

Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other: Local relief: concave, convex, linear, other:

Soil Map Unit Name: Ashkum silty clay loam | Blount WWI classification: South of T3K

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ___ No X Reason: Previous 90 day Precipitation WET NORMAL DRY

Are Vegetation X, Soil X, or Hydrology ___ significantly disturbed? mow / fill Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation ___, Soil ___, or Hydrology ___ problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ___

Hydric Soil Present? Yes ___ No ___

Wetland Hydrology Present? Yes ___ No X

Is the Sampled Area within a Wetland? Yes ___ No X

Wetland Type: Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland

Remarks: too close to electric pole to dig
Assume historic fill for most of

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Tilia americana	20	Y	FACU
2. Ulmus rubra	40	Y	FAC
3.			
4.			
5.			
	60	= Total Cover	30/12
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1. Rhamnus cathartica	50	Y	FAC
2. Acer negundo	10		FACW
3.			
4.			
5.			
6.			
7.			
	60	= Total Cover	30/17
Herb Stratum (Plot size: equiv to 5' radius)			
1. Poa pratensis	50	Y	FAC
2. Hydrophyllum virginiana	10		FAC
3. Parthenocissus quinquefolia	5		FACU
4. Pastinaca sativa	10		FACU
5. Alliaria petiolata	10		FAC
6. Taraxacum officinale	10		FACU
7. Glecoma hederacea	30	Y	FACU
8. Trifolium pratense	10		FACU
9.			
10.			
	165	= Total Cover	83/33
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1. Vitis riparia	20	Y	FACW
2.			
3.			
	20	= Total Cover	10/4

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___	(A) ___ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Rapid test for hydrophytic vegetation

Y Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes Y No ___

Remarks: Dominated by Facultative Plants

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ___ No ___

Remarks:

Electric utility too close to dig in soil

Assume historic fill for trailer lot - very mature trees rooted in soil

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Upslope of stream

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Franklin Mobile Estates Addendum City/County: Franklin / Milwaukee Sampling Date: 7/3 /2019

Applicant/Owner: David Steinberger owner State: WI Sampling Point: 10

Investigator(s): TAWS - Alice Thompson, N Bogdanski Section 1 Township 5 N, Range 22 (East) West

Landform: Summit Shoulder Backslope Footslope Toeslope (Urban Modified) Other: Local relief: concave, convex, linear, other:

Soil Map Unit Name: Ashkum silty clay loam WWI classification: B

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ___ No X Reason: Previous 90 day Precipitation (WET) NORMAL DRY

Are Vegetation ___, Soil X, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation ___, Soil ___, or Hydrology ___ problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present?	Yes ___	No ___	**Wetland Type:** Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland
Wetland Hydrology Present?	Yes ___	No X	

Remarks: SE lot - wetland / stream bank too steep to sample - similar to data point #1 (Utilities - cant dig)

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius) linear plot	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1. Acer negundo	10	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		5/2
Herb Stratum (Plot size: equiv to 5' radius)			
1. Arctium minus	40	Y	FACU
2. Taraxacum officinale	30	Y	FACU
3. Glechoma hederacea	30	Y	FACU
4. Plantago major	10		FAC
5. Alliaria petiolata	20		FAC
6. Hydrophyllum virginiana	10		FAC
7. Geum canadense	5		FAC
8. Cirsium vulgare	20		FAC
9.			
10.			
	165 = Total Cover		83/33
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:		(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ Rapid test for hydrophytic vegetation

__ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

SOIL

Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
	0							
	utilities							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ____ No ____

Remarks:

Utility corridor - mowed daily

Visible fill, concrete slabs, gravel on surface

Historic fill (mature trees, wood)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2) *(~July 15 or later)*
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No ____ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): ____

Is Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

above drift lines - stream adjacent

retaining wall in portion of stream near trailer

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Franklin Mobile Estates Addendum City/County: Franklin / Milwaukee Sampling Date: 7/3 /2019

Applicant/Owner: David Steinberger, owner State: WI Sampling Point: 11

Investigator(s): TAWS - Alice Thompson M. Bogdanski Section Township N, Range East West

Landform: Summit Shoulder Backslope Footslope Toeslope (Urban Modified) Other: Local relief: concave, convex, linear, other:

Soil Map Unit Name: Ashkum silty clay loam / Blount WWI classification: Ø

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ___ No X Reason: Previous 90 day Precipitation WET NORMAL DRY

Are Vegetation X, Soil X, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation ___, Soil ___, or Hydrology ___ problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ___ No X

Hydric Soil Present? Yes ___ No ___

Wetland Hydrology Present? Yes ___ No X

Is the Sampled Area within a Wetland? Yes ___ No X

Wetland Type: Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland

HISTORY Remarks: Stream bank, too steep to sample, mowed / historic fill

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharinum	40	M	FACW
2. Juglans nigra	20	M	FACU
3. Prunus serotina	40	M	FACU
4.			
5.			
	100	= Total Cover	50 / 20
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1. Rhamnus cathartica	40	M	FAC
2. Rubus hallianus	10		FACU
3. Morus rubra	10		FACU
4.			
5.			
6.			
7.			
	60	= Total Cover	30 / 12
Herb Stratum (Plot size: equiv to 5' radius)			
1. Poa pratensis	80	M	FAC
2. Erigeron annus	10		FACU
3. Solidago canadensis	10		FACU
4. Glecoma hederacea	50	M	FACU
5. Trifolium dubia	40	M	FACU
6. Taraxacum officinale	10		FACU
7. Plantago major	20		FAC
8. Plantago lanceolata	30		FACU
9. Hemerocallis fulva	10		UPL
10. Trifolium hybridum	10		FACU
	270	= Total Cover	135 / 54
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 43 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___	(A) ___ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ Rapid test for hydrophytic vegetation

__ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

SOIL

Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
	Ø	utilities						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ___ No ___

Remarks:

under electric utility – ranout dug
historic fill for trailer lot + concrete slab
(trees planted – mature)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

no drift etc – above mark

City of Franklin
Department of City Development

Date:	October 31, 2019
To:	David Steinberger, Franklin Mobile LLC / Franklin Mobile Home Park
From:	Department of City Development
RE:	Franklin Mobile Estates Special Use and Land Use Permit – Staff Comments

Please be advised that City Staff has reviewed the above application for property located at 6361 S. 27th St. Department comments are as follows for the Special Use and Land Use Permit date-stamped by the City of Franklin on September 20, 2019.

Unified Development Ordinance (UDO) Requirements

Special Use

Bridges and approaches in the § 15-3.0319: FW Floodway District, are a Special Use under § 15-3.0604.B.1. (See also § 15-13.0100: Floodplain Zoning Ordinance and § 15-9.0103 Applications for Special Use Permit.)

1. Please note that § 15-3.0319.E prohibits mobile homes in FW zoning.
   Response: *Noted. No mobile homes are being proposed as part of this project. The existing mobile homes adjacent to the proposed project have been in place since before the ratification of the City's Floodplain Zoning regulations in 1968.*

2. Pursuant to § 15-3.0604.B.1, please verify that the proposed culvert and bridge will not cause ponding.
   Response: *A hydraulic analysis for the East Branch of the Root River was completed by SSE to show that the proposed culvert does not cause ponding and does not result in an increase in the flood stage from the existing bridge at this location. The results of this analysis were provided in the permit application submitted to the City of Franklin dated August 30, 2019 and discussed in detail in Section 3 of the permit application report. The model was reviewed for compliance with NR116 by Michelle Hase at the WDNR who subsequently approved it in a letter sent via e-mail to Joel Dietl on September 27, 2019.*

3. Pursuant to § 15-13.0100.6.1(2) which provides that existing legal nonconforming structures such as mobile homes may continue on condition that they are not modified beyond ordinary maintenance or stand unused for more than twelve (12) months, and cannot be replaced if more than 50% of the structure is destroyed, please contact the Inspection Services Department to arrange a process to provide them such data on an annual basis.
   Response: *Property owner's legal counsel to address.*

Special Use Standards and Regulations Questionnaire Comments, per 15-3.0701.C:

4. § 15-3.0701.A.6 Please clarify that the proposed use will also impact wetland, floodway, shoreland, and stream. List the features being impacted by work.
   Response: *As defined in the City of Franklin UDO, the proposed bridge replacement at Franklin Estates will impact Streams, Floodplains/Floodways, Shore Buffer, Wetlands, and Wetland Buffer. The proposed bridge replacement at Franklin Estates will not impact steep slopes, woodlands, forests, lakes, or ponds.*

5. § 15-3.0701.C.3 Please clarify that mitigation for the impacts associated with construction of the proposed culvert is not being proposed.
   Response: *0.011 acres of stream bank and 0.004 acres of wetland will be permanently impacted by the proposed bridge replacement. No mitigation is being proposed, however, all areas disturbed as part of the bridge replacement are proposed to be restored with deep-rooted native vegetation that will enhance the existing streambank conditions.*

Site Plan

Site Plans are reviewed pursuant to Division 15-7.0100.

6. § 15-7.0102.E and F require safe facilities for pedestrian traffic. Staff recommends the addition of railings, and suggests paved and striped shoulders.
   Response: *Two-foot gravel shoulders will improve pedestrian access across the bridge from the existing conditions. The bridge serves approximately 25 residential homes where pedestrian and vehicular traffic across the bridge will be minimal and paved or striped shoulders is not required. There is a 4-foot wide vegetated buffer between the gravel shoulder and the culvert apron that will provide for pedestrian safety without requiring the installation of a railing.*

7. Pursuant to § 15-7.0102.G, and § 15-7.0103.Q, Site plans must meet the requirements of § 15-4.0100: Natural Resource Protection Standards, and § 15-7.0201: Natural Resource Protection Plan (NRPP) Requirements.
   a. Clearly illustrate and enumerate all natural resource features per § 15-4.0102: Natural Resource Features Determination
      i. Pursuant to § 15-4.0102.D and § 15-7.0201.I, please provide complete written narrative, and illustrated information about the stream according to the standards laid out in § 15-4.0102.D.1 through D.3.
      Response: *Section 15-4.0102 D. 1-3 defines three methods used to define the "channel" and "stream". The first method, topographic survey, is the preferred method. The surveyed topography of the stream is shown on both the proposed plans and on the Natural Resources Protection Plan provided with our original application. The survey is illustrated at a one-foot contour interval exceeding the minimum two-foot interval requirement. This survey is used to define the location of the stream for the purposes of this project.*

Section 15-7-0201 lists Natural Resource Protection Plan Requirements. We have provided a NRPP with our original permit submittal and a revised plan with our current submittal. If the Zoning Administrator finds any issues with the NRPP as provided, please indicate what we should revise and resubmit.

ii. Pursuant to § 15-4.0102.F and § 15-7.0201.I, please provide written narrative, and illustrated information about the floodplain and floodway boundary.
Response: *Section 15-4.0102 F. defines floodplains and floodways. While we do not have a copy of the City of Franklin's "Official Zoning Map", per the FEMA FIRM of this location it is clear that the entirety of the proposed project is within the regulatory floodway. The FEMA FIRM at this location is provided as an attachment to the report included with the original permit application.*

Section 15-7-0201 lists Natural Resource Protection Plan Requirements. We have provided a NRPP with our original permit submittal and a revised plan with our current submittal. If the Zoning Administrator finds any issues with the NRPP as provided, please indicate what we should revise and resubmit.

iii. Pursuant to § 15-7.0201.I, illustrate and enumerate the wetland, wetland setback, and areas of disturbance,
Response: *Section 15-7-0201 lists Natural Resource Protection Plan Requirements. We have provided a NRPP with our original permit submittal that illustrated and enumerated the wetland, wetland setback, and areas of disturbance. A revised NRPP is provided with this response that includes the total impact to each natural resource in a table format at the request of the City Zoning Department.*

iv. Pursuant to § 15-4.0102.K and § 15-7.0201.J, provide written narrative, and illustrated information about natural resources to be disturbed. If a category of natural resource is not present, please note that.

Response: *Section 15-4.0102 lists the following natural resource features:*
- *Steep Slopes*
- *Woodlands & Forests: Mature, Young*
- *Lakes & Ponds*
- *Streams*
- *Shore Buffers*
- *Floodplains/Food-ways*
- *Wetlands & Shoreland Wetlands*
- *Wetland Buffers*

The total area disturbed as part of the proposed construction is 0.09 acres. The proposed bridge replacement at Franklin Estates Mobile Home Park impacts the following resources:

- *Streams: The bridge replacement will impact 0.01 acres of stream which will be restored with a natural stream bottom per the proposed project plans.*
- *Floodplains/Floodways: 0.09 acres of regulatory floodway will be disturbed as shown on the Natural Resources Protection Plan for this project*
- *Shore Buffers: 0.09 acres will be disturbed as shown on the Natural Resources Protection Plan for this project*
- *Wetlands: 0.02 acres will be disturbed as shown on the Natural Resources Protection Plan for this project*
- *Wetland Buffer: 0.06 acres will be disturbed as shown on the Natural Resources Protection Plan for this project*
- *Wetland Setback: 0.01 acres will be disturbed as shown on the Natural Resources Protection Plan for this project*

The following natural resources do not exist within the project area:
- *Steep slopes,*
- *woodlands & Forests,*
- *Lakes & Ponds*

Section 15-7-0201 lists Natural Resource Protection Plan Requirements. We have provided a NRPP with our original permit submittal and a revised plan with our current submittal that includes the area of impact to each natural resource feature in a table format as requested.

Pursuant to § 15-4.0102. K and § 15-7.0201.J, provide written narrative, and illustrated information about natural resources to be permanently removed. If a category of natural resource is not present, please note that.
Response: *0.01 acres of stream bank will be permanently removed as part of this project due to the replacement of the bridge with a culvert. 0.004 acres of wetland equal to 187 square feet will be permanently disturbed due to the proposed culvert extending beyond the limits of the existing bridge in order to accommodate wingwalls which are recommended for improved hydraulic conditions and the sloping buffer between the edge of the pedestrian path and the beginning of the headwall.*

The following natural resources within the project area are not being permanently removed:
- *0.09 acres Floodplain/Floodway*
- *0.09 acres Shore Buffer*
- *0.06 acres Wetland Buffer*
- *0.01 acres Wetland Setback*
- *0.015 acres Wetland*
- *0.02 acres Stream*

The following natural resources are not present within the project area:
- *Steep slopes,*
- *woodlands & Forests,*

- *Lakes & Ponds*

v. Pursuant to § 15-4.0102. K and § 15-7.0201.J, provide written narrative, and illustrated information about natural resources to be preserved. If a category of natural resource is not present, please note that.

The following natural resources within the project area will be restored:
- *0.09 acres Floodplain/Floodway*
- *0.09 acres Shore Buffer*
- *0.06 acres Wetland Buffer*
- *0.01 acres Wetland Setback*
- *0.015 acres Wetland*
- *0.02 acres Stream*

The following natural resources are not present within the project area:
- *Steep slopes,*
- *woodlands & Forests,*
- *Lakes & Ponds*

8. Show the location of any pedestrian sidewalks and walkways, as required by § 15-7.0103.T.
Response: *The location of pavement is shown on the project plans which encompasses any pedestrian walkways. The location of the pedestrian walkways associated with the proposed bridge reconstruction are shown on the plans.*

Land Use Permit

9. Pursuant to Sections 15-13.0100.2.3 and 3.2(c) of the Floodplain Ordinance, and at the request of the Wisconsin Department of Natural Resources, the Department of City Development has contacted the Federal Emergency Management Agency (FEMA) to determine if any other permits or approvals (i.e. a Letter of Map Revision) are required for the subject project.
Response: *Noted.*

10. Pursuant to Sections 15-13.01003.4 and 7.1(2)(b) of the Floodplain Ordinance, please verify if any private wells or private septic systems are located within the floodway. If present, they must be removed, or the requirements of Wisconsin Administrative Code NR 811 and NR 812 must be fully addressed.
Response: *Property owner's legal counsel to address.*

11. Pursuant to Section 15-13-01007.1(2)(b) of the Floodplain Ordinance, please provide the location of the floodplain and floodway limits on the site plan.
Response: *The floodplain and floodway limits are shown on the Natural Resources Protection Plan provided with this document.*

Additional Planning Department Comments

Special Use

12. Staff recommends restoration of all natural plantings in and around the disturbed area with appropriate native plants to prevent erosion and invasive species.
    Response: *The updated construction plans indicate that all areas disturbed as part of the bridge replacement will be seeded with a floodplain seed mix from Agracol Native Plant and Seed Nursery. The Agracol Floodplain mix provides for natural flood and erosion control while supporting fish and wildlife habitat.*

13. Staff recommends creation of registry of nonconforming buildings in the floodway as required by § 15-13.0100.6.1(2)(c) that includes evaluation of their current individual assessed value and tracks the cost of modifications until the 50% threshold is reached, at which time they must relocate.
    Response: *Property owner's legal counsel to address.*

Site Plan

14. Staff suggests creation of a conservation easement to protect the stream and related natural resources in perpetuity, pursuant to § 15-7.0103.X.
    Response: *Property owner's legal counsel to address.*

15. Pursuant to Sections 15-7.0102E., and F., staff recommends that a sidewalk (or striped crosswalk) with a railing be placed along the bridge to provide a safe and convenient crossing for pedestrians. Staff further recommends that the railing be an open railing so as not to impede floodwaters.
    Response: *Two-foot gravel shoulders will improve pedestrian access across the bridge from the existing conditions. The bridge serves approximately 25 residential homes where pedestrian and vehicular traffic across the bridge will be minimal and paved or striped shoulders is not required. There is a 4-foot wide vegetated buffer between the gravel shoulder and the culvert apron that will provide for pedestrian safety without requiring the installation of a railing.*

Natural Resource Protection Plan

16. Staff recommends that the NRPP Map should extend to the north and south property lines.
    Response: *The proposed project is for a bridge reconstruction and proposes to impact 0.9 acres. The complete parcel is approximately 7 acres. A map equal zoomed out to the extents of the entire parcel would not be capable of showing the nuance in areas of impact that is required to be illustrated on the NRPP Map as required by the City of Franklin.*

17. Staff recommends the NRPP Map include a table of natural resource features and their area.
Response: *A table of natural resources features and the area impacted by the proposed bridge reconstruction is included on the updated Natural Resources Protection Plan provided with this document.*

18. Pursuant to § 15-4.0103.B.4, § 15-4.0103.B.5, and § 15-4.0103.B.6, staff suggests mitigation of disturbed and destroyed natural features. Please describe the proposed mitigation, including a maintenance plan.
Response: *The proposed bridge reconstruction project is not proposing mitigation for the 0.004 acres of wetlands that will be permanently impacted due to the increased width of the bridge crossing. The project will enhance the existing stream bank by seeding all disturbed areas with a deep-rooted native seed mix.*

19. Please correct the collation error in Attachment A.
Response: *Titles have been added to the pages in Attachment A to clarify which pages belong with which permit.*

20. Please note that 12 mobile homes are currently located within the mapped floodway associated with the East Branch of the Root River. Although mobile homes have been present in this area since the 1950's, the City's Floodplain Zoning regulations which were first established by Ordinance No. 221 and adopted by the City of Franklin on February 6, 1968, do not allow such structures within the floodplain/floodway. Furthermore, since February 6, 1968, 12 mobile homes have/have not received any Building Permit approvals to be allowed within the floodway. In addition, should structures be allowed within a floodway, certain Building Code provisions and Floodplain Zoning regulations would apply.
    a. Therefore, pursuant to Sections 15-3.0701D., staff recommends that all 12 mobile homes which were placed within the floodway after February 6, 1968 without all proper permits and approvals be removed as soon as possible, but no later than from one year of the date of the subject Special Use approval. Staff suggests for resident safety purposes, that all mobile homes located within the floodway be removed within one year.

Response: *Property owner's legal counsel to address.*

Engineering Department Comments

Engineering investigated the structural stability of the proposed culvert and determined that it was sound.

Engineering requests that the applicant provide a brief opinion on why the structure does not impede drainage, ponding etc.

Response: *A hydraulic analysis for the East Branch of the Root River was completed by SSE to show that the proposed culvert does not cause ponding and does not result in an increase in the*

flood stage from the existing bridge at this location. The results of this analysis were provided in the permit application submitted to the City of Franklin dated August 30, 2019 and discussed in detail in Section 3 of the permit application report. The model was reviewed for compliance with NR116 by Michelle Hase at the WDNR who subsequently approved it in a letter sent via e-mail to Joel Dietl on September 27, 2019.

Inspection Services Department Comments

Since we have little knowledge of how the actual foundations and anchoring systems were constructed for the Franklin Mobile Home Park mobile homes, it is difficult to comment on actual conditions. However, due to the age of the buildings and knowing that codes and standards change all the time, I would have concerns for the buildings located in the floodway. Current code would require that the structural system of these dwellings are designed, connected and anchored to resist flotation, collapse or permanent lateral movement due to structural loads and stresses at the base flood elevation. There are other provisions in the code designed to protect the electrical and mechanical systems serving the dwellings. Without a thorough engineering analysis of each dwellings in the floodway, it would be difficult to make any assumptions at this point.

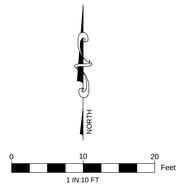
Fire Department Comments

The fire department recommends expeditious approval. Regardless of the permitting and property history, the bridge is now vital to the more than 25 mobile homes to the west of the bridge. Relocating those structures does not appear to be a viable option, and the bridge is provides critical fire and EMS access to those residents.

Health Department Comments

I spoke with some of our more veteran staff and none of them could remember any flooding scenarios in the Franklin Mobile Estates area in the last 10+ years. However from a Health concern, any flooding in that area could pose a potential problem to any private wells with a number of different contaminants that could pose a health risk. Water from flooded wells cannot be considered safe for drinking or food preparation until the well and plumbing system have been flushed and disinfected. Flood water itself can cause a health threat as well because it can contain anything from downed power lines to human waste, to animals, or other hazardous chemical or waste. Homes in or near a floodway are in danger of both of these situations if a flood were to occur.

From an injury prevention standpoint, the current state of the bridge in question looks very questionable and we would recommend as little travel as possible over it until it can be deemed structurally sound.



PROJECT CONTACTS:

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6361 SOUTH 27TH STREET
FRANKLIN, WI 53132-9429
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PROJECT MANAGER: MAHMOUD (MAC) N. MALAS, P.E.
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WDNR: JOSHUA WIED
WATER REG. & ZONING SPEC. - SENIOR
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WAUKESHA, WI 53188-3789
(262) 574-2132
Joshua.Wied@wisconsin.gov

FRANKLIN MOBILE ESTATES BRIDGE REPLACEMENT-NATURAL RESOURCES PRESERVATION PLAN

THE PROJECT IS LOCATED WITHIN FRANKLIN ESTATES MOBILE HOME PARK IN THE CITY OF FRANKLIN, WISCONSIN (NW ¼, SECTION 29, T5N, R21E). THE PROJECT PROPOSES TO REPLACE THE EXISTING FAILED BRIDGE THAT CARRIES WEST WESTMOOR AVENUE OVER THE EAST BRANCH OF THE ROOT RIVER WITH A PROPOSED ELLIPTICAL CULVERT AS SHOWN ON THE PROJECT PLANS.

FLOODPLAIN/FLOODWAY, STREAM, WETLANDS, WETLAND BUFFERS, AND SHORE BUFFERS WILL BE DISTURBED AS PART OF THIS PROJECT. THESE DISTURBED AREAS ARE QUANTIFIED IN THE TABLE PROVIDED ON THIS PLAN. THE TOTAL AREA DISTURBED AS PART OF THIS PROJECT IS PROPOSED TO BE 0.09 ACRES.

DISTURBED AREAS WILL BE RESTORED WITH A DEEP ROOTED NATIVE SEED MIX AS INDICATED ON THE CONSTRUCTION PLAN VIEW.

PERTINENT INFORMATION RELATED TO THE NATURAL RESOURCE PRESERVATION PLAN INCLUDE:

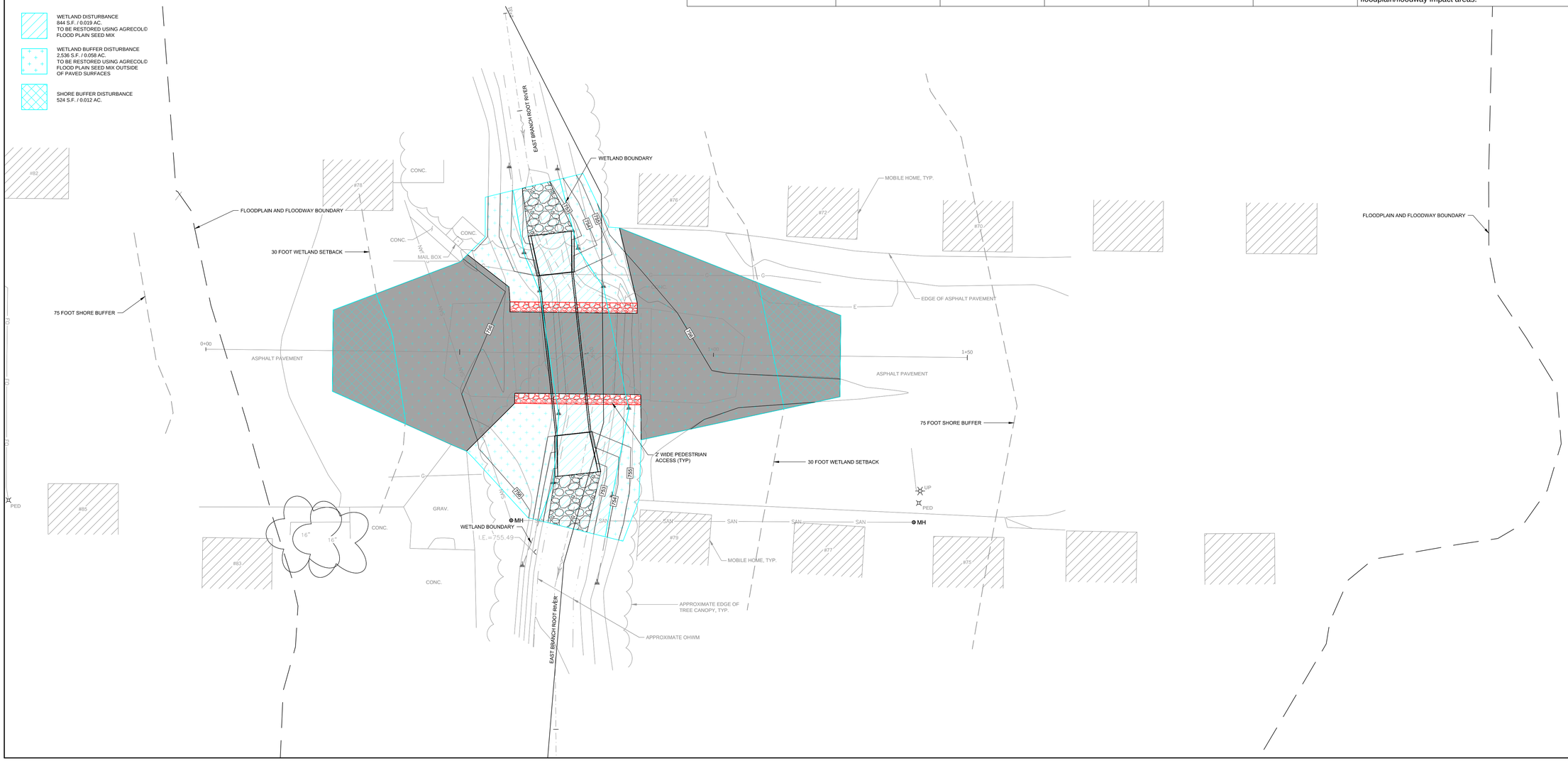
1. DISTURBED AREAS ARE SHOWN ON THE PLANS. THE PRESERVED AREAS INCLUDE ALL AREAS NOT DISTURBED BY PROPOSED ACTION.
2. ACCESS TO THE PROJECT AREAS WILL FOLLOW WEST WESTMOOR AVENUE. THERE WILL BE MINIMAL, TO NO DISTURBANCE ACCESSING THE SITE.
3. ALL WORK IS REQUIRED TO TAKE PLACE WITHIN WETLAND SETBACK, WETLAND BUFFERS, AND SHORE BUFFERS AS SHOWN ON THE PLAN.
4. UPON COMPLETION OF THE PROJECT, THE NATURAL RESOURCES WILL CONTINUE TO BE PRESERVED/PROTECTED WITHIN THE WETLAND BOUNDARY ALONG THE EAST BRANCH OF THE ROOT RIVER. NO PERMANENT EASEMENT WILL BE CREATED AS PART OF THIS PROJECT.
5. WETLAND DISTURBANCE/MITIGATION IS SUBJECT TO WDNR APPROVAL.

GENERAL NOTES:

1. WETLAND DELINEATION WAS PERFORMED BY THOMPSON AND ASSOCIATES WETLAND SERVICES, LLC ON OCTOBER 30, 2018, BY ALICE THOMPSON WITH AN ADDENDUM ON JULY 3, 2019.
2. WETLAND BUFFER IS 30' LANDWARD OF THE DELINEATED WETLAND BOUNDARY.
3. SHORE BUFFER IS 75' LANDWARD OF THE ORDINARY HIGH WATER MARK.
4. ELEVATIONS SHOWN ON THIS PLAN ARE REFERENCED TO NAVD88.
5. HORIZONTAL DATUM IS REFERENCED TO NAD83.
6. FLOODPLAIN/FLOODWAY LIMITS SHOWN WERE OBTAINED VIA SHAPEFILES DOWNLOADED FROM FEMA FLOOD MAP SERVICE CENTER

Natural Resource Impacts

	Exists on Site (Y/N)	Area Disturbed (square feet)	Area Disturbed (acres)	Area Permanently Removed (square feet)	Area Permanently Removed (acres)	Notes
Steep Slopes:						
10-19%	N	0	0.00	0	0.00	
20-30%	N	0	0.00	0	0.00	
30%	N	0	0.00	0	0.00	
Woodlands & Forests:						
Mature	N	0	0.00	0	0.00	
Young	N	0	0.00	0	0.00	
Lakes & Ponds	N	0	0.00	0	0.00	
Streams	Y	1,312	0.03	488	0.01	The limits of the stream are considered the top of banks per the topographic information collected for the purposes of this project. Permenent impact includes stream bank area removed due to replacing the existing bridge with a culvert which is more narrow than the banks of the stream. The channel through the culvert will maintain a natural stream bottom, and the existing stream centerline will remain unchanged.
Shore Buffers	Y	3,904	0.09	0	0.00	The existing shore buffer includes asphalt pavement which will remain in the proposed conditions and is not considered permenent shore buffer impact due to this project.
Flood- plains/ Flood- ways	Y	3,904	0.09	0	0.00	
Wetlands & Shoreland Wetlands	Y	844	0.02	187	0.00	Includes the areas immediately upstream and downstream of the existing bridge. Permenant impact is due to the culvert extending beyond the existing bridge limits.
Wetland Buffers	Y	2,536	0.06	0	0.00	The existing wetland buffer includes asphalt pavement which will remain in the proposed conditions and is not considered permenent wetland buffer impact.
Wetland Setback	Y	524	0.01	0	0.00	The area of impact includes the 20 feet that the wetland setback extends beyond the limits of the wetland buffer. This area overlaps with the shore buffer and floodplain/floodway impact areas.



REVISION

DATE

FRANKLIN MOBILE ESTATES
6361 S. 27TH STREET
FANKLIN, WI

NATURAL RESOURCE PROTECTION PLAN

DATE: 10/15/2018
JOB NO.: 18056.029
DESIGNED BY: MAB
CHECKED BY: DMB

SHEET NUMBER
NRPP

GENERAL NOTES:

1. THE UNDERGROUND UTILITY INFORMATION AS SHOWN HEREON IS BASED, IN PART, UPON INFORMATION FURNISHED BY UTILITY COMPANIES AND THE LOCAL MUNICIPALITY. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, IT'S ACCURACY AND COMPLETENESS CANNOT BE GUARANTEED OR CERTIFIED TO.
2. PRIOR TO EXCAVATION CALL TOLL FREE, DIGGERS HOTLINE, 1-800-242-8511. COST OF REPLACEMENT OR REPAIR OF EXISTING UTILITIES DAMAGED AS A RESULT OF THE CONTRACTOR'S OPERATION SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
3. ELEVATIONS SHOWN ON THIS PLAN ARE REFERENCED TO NAVD88.
4. HORIZONTAL DATUM IS REFERENCED TO NAD83.
5. CONTRACTOR SHALL PROTECT EXISTING SITE IMPROVEMENTS TO REMAIN FROM DAMAGE DURING CONSTRUCTION. COST TO RESTORE DAMAGED IMPROVEMENTS TO THEIR ORIGINAL CONDITION, AS ACCEPTABLE BY THE OWNER, WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
6. CONTRACTOR SHALL MINIMIZE INTERFERENCE WITH ADJOINING ROADS, STREETS, WALKS, AND OTHER ADJACENT OCCUPIED OR USED FACILITIES DURING CONSTRUCTION OPERATIONS. DO NOT CLOSE OR OBSTRUCT STREETS, WALKS, DRIVEWAYS, OR OTHER ADJACENT OCCUPIED OR USED FACILITIES WITHOUT PERMISSION FROM OWNER AND AUTHORITIES HAVING JURISDICTION. PROVIDE ALTERNATE ROUTES AROUND CLOSED OR OBSTRUCTED TRAFFIC WAYS IF REQUIRED BY OWNER OR AUTHORITIES HAVING JURISDICTION.
7. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL PROPERTIES AT ALL TIMES.
8. CONTRACTOR MAY CLOSE VEHICULAR ACCESS TO THE WEST SIDE OF EAST BRANCH ROOT RIVER FOR A MAXIMUM OF 2 DAYS. PEDESTRIAN ACCESS SHALL BE MAINTAINED ACROSS THE RIVER UTILIZING A CATWALK OR PLATFORM, A MINIMUM OF 4-FEET WIDE WITH 42" HIGH RAILING MEETING ADA ACCESSIBILITY REQUIREMENTS.
9. SLOPE INTERCEPT LINE DEFINES SLOPE & REMOVAL AND GRADING LIMITS.
10. IF EXCAVATION BELOW SUBGRADE (EBS) IS REQUIRED, IT WILL BE MEASURED AND PAID FOR AS COMMON EXCAVATION. THE LIMITS OF EBS WILL BE DETERMINED BY THE ENGINEER IN THE FIELD. THE FACTOR USED FOR EXPANDING THE FILLS TO COMPUTE THE VOLUME OF MATERIAL REQUIRED IS 1.3.
11. CONTRACTOR TO MAINTAIN POSITIVE SITE DRAINAGE WITHIN THE PROJECT LIMITS AT ALL TIMES.
12. MATERIAL CERTIFICATION FOR ALL MATERIALS USED ON SITE SHALL CONFORM TO THE PROJECT SPECIFICATIONS AND SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND RECORD.
13. TOTAL DISTURBED AREA AS DEFINED BY THE SLOPE INTERCEPT = 3,900 S.F.
14. TOTAL WETLAND AREA DISTURBED AS DEFINED BY THE SLOPE INTERCEPT = 1,590 S.F. (THE VEGETATED AREA BETWEEN THE ORDINARY HIGH WATERMARK (OHWM) AND THE PAVEMENT EDGE ON BOTH SIDES OF THE CREEK ARE ASSUMED TO BE WETLANDS.)
15. THE STRUCTURE AND CONSTRUCTION SHALL MEET ALL APPLICABLE STATUTES AND ADMINISTRATIVE CODES.
16. THE STANDARD SPECIFICATIONS FOR THIS PROJECT SHALL BE THE FOLLOWING:
    - 16.1. THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION,
    - 16.2. THE WISCONSIN STATE PLUMBING CODE,
    - 16.3. THE CITY OF FRANKLIN PLUMBING CODE,
    - 16.4. WISDOT 2018 STANDARD SPECIFICATIONS,
    - 16.5. WISDOT BRIDGE MANUAL CHAPTER 36, AND
    - 16.6. WISDOT LIST OF APPROVED PRODUCTS.
17. ANY PRODUCTS NOT ON THE WISDOT APPROVED LIST SHALL BE SUBMITTED IN ADVANCE TO THE ENGINEER FOR APPROVAL.
18. CONTRACTOR SHALL SUBMIT STAMPED CALCULATIONS AND SHOP DRAWINGS FOR THE CONCRETE PIPE AND ENDWALLS TO THE ENGINEER FOR REVIEW PRIOR TO PIPE PLACEMENT.
19. CONTRACTOR SHALL PROVIDE TEMPORARY BYPASS MEANS FOR INCOMING FLOWS AROUND THE WORK AREA. BYPASS METHOD SHALL BE SUBMITTED IN ADVANCE TO THE ENGINEER FOR APPROVAL PRIOR TO ANY CONSTRUCTION ACTIVITIES TAKING PLACE.
20. DO NOT COMMENCE SITE DISTURBANCE OPERATIONS UNTIL THE TEMPORARY BYPASS MEASURES ARE IN PLACE.
21. THE CONTRACTOR SHALL BE REQUIRED TO REMOVE ANY MUD, DIRT, OR DEBRIS RESULTING FROM CONSTRUCTION TRAFFIC ENTERING OR EXITING THE SITE PRIOR TO THE END OF EACH WORKING DAY.
22. DESIGN DATA: VEHICLE LOAD - HS 20. REINFORCED CULVERT PIPE SHALL BE DESIGNED TO WITHSTAND HS 20 VEHICULAR LOADING.
23. WETLAND DELINEATION WAS PERFORMED BY THOMPSON AND ASSOCIATES WETLAND SERVICES, LLC ON OCTOBER 30, 2018, BY ALICE THOMPSON.
24. SEEDING FOR TURF RESTORATION SHALL BE AGRECOL'S FLOOD PLAIN SEED MIX

PROJECT CONTACTS:

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Integrated Innovative Solutions and Excellence in Engineering

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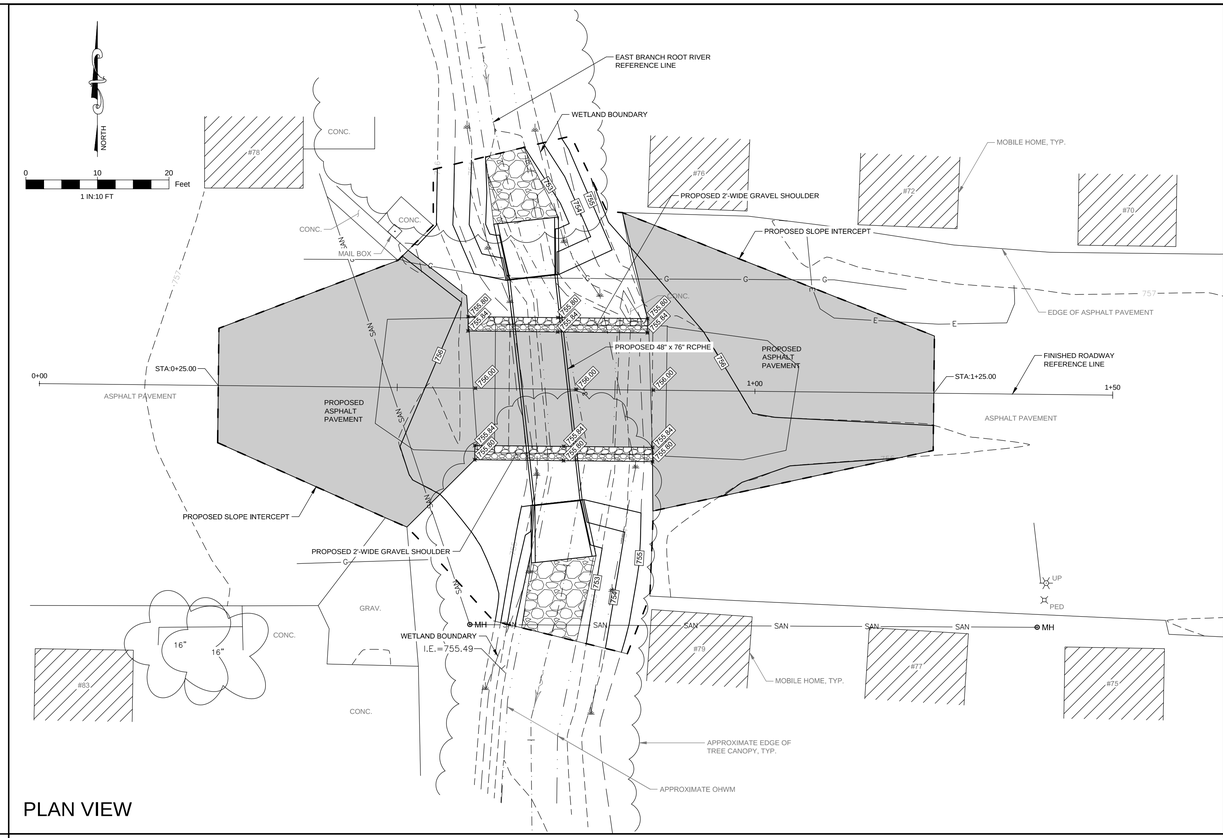
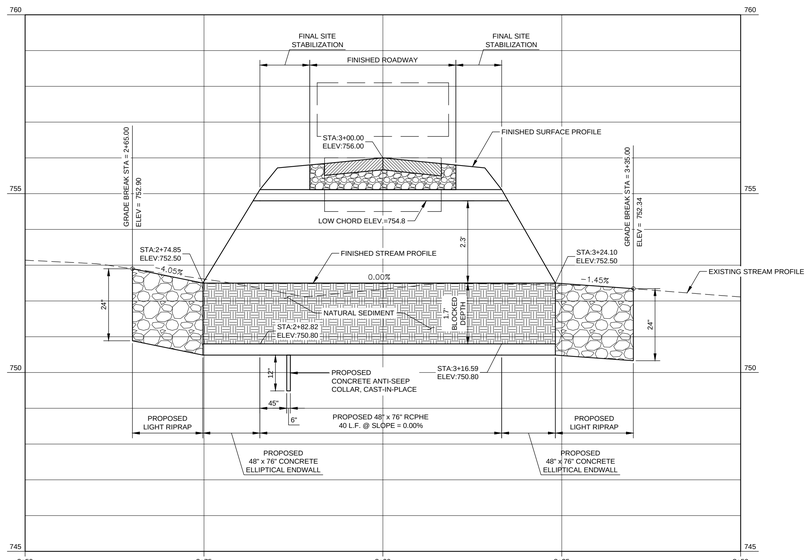
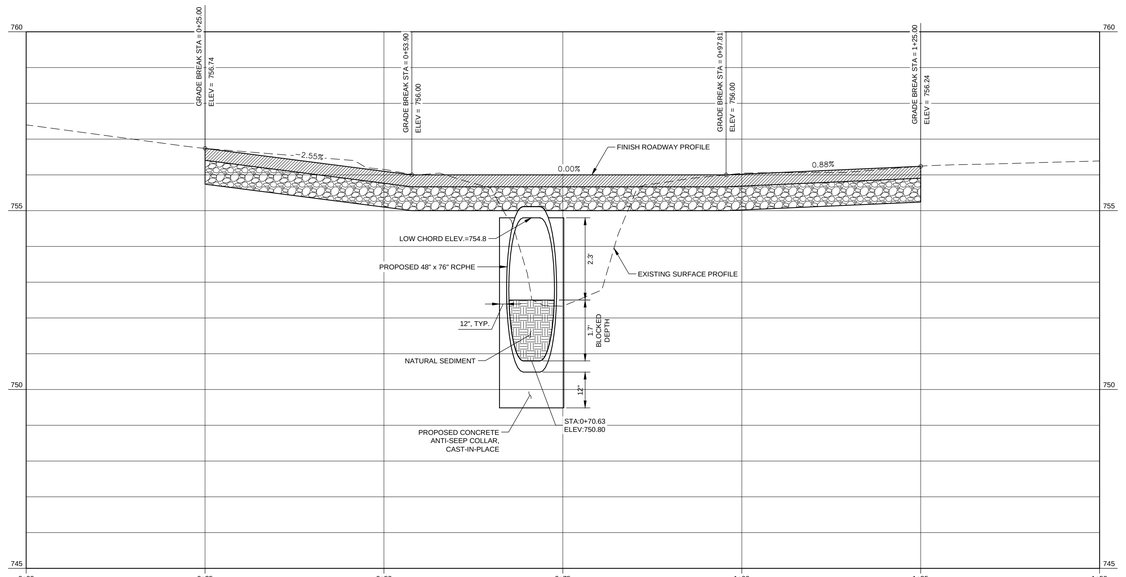


PLAN VIEW



PROFILE VIEW: THROUGH CULVERT

HORIZONTAL SCALE: 1"=10'
VERTICAL SCALE: 1"=1'



PROFILE VIEW: THROUGH ROADWAY

HORIZONTAL SCALE: 1"=10'
VERTICAL SCALE: 1"=1'

Himalayan Consultants, LLC
Engineers and Hydrogeologists

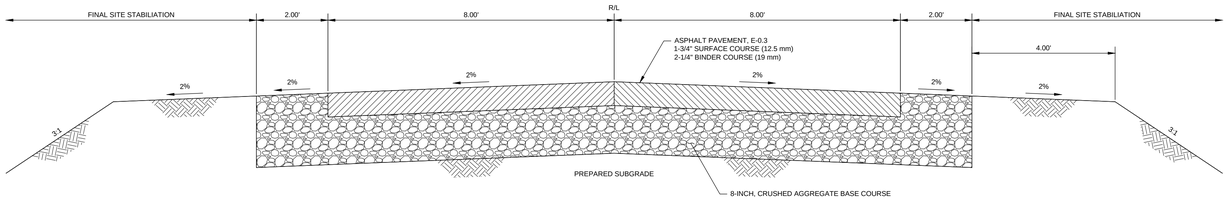
REVISION | DATE

FRANKLIN MOBILE ESTATES
6361 S. 27TH STREET
FANKLIN, WI

CULVERT PLAN & PROFILE

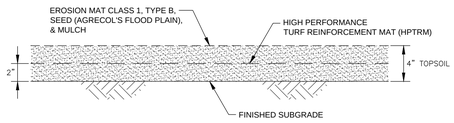
DATE:	10/15/2018
JOB NO.:	18056.029
DESIGNED BY:	MAB
CHECKED BY:	DMB

SHEET NUMBER
C1.0



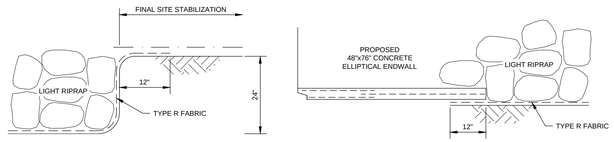
TYPICAL ROADWAY SECTION OVER CREEK

N.T.S.



TYPICAL SECTION, FINAL SITE STABILIZATION

N.T.S.



ENDWALL OUTLET PROTECTION

N.T.S.

Category	Item	Quantity	Unit
Miscellaneous	Mobilization / Demobilization	1	LS
	Clearing & Grubbing	1	LS
	Structure Removal	1	LS
Earthworks	Rough Grading	1	LS
	Finish Grading	1	LS
Roadway	Asphalt Pavement, E-0.3		
	Surface Course (12.5 mm)	14	CY
	Binder Course (19 mm)	18	CY
	Crushed Aggregate Base Course	62	CY
	Gravel Shoulder	4	CY
Storm Sewer	48" x 76" RCPHE	40	LF
	48" x 76" Concrete Elliptical Endwall w/ Bulkhead	2	EA
	Concrete Anti-Seep Collar	1	EA
Erosion Control	Cofferdam & Bypass Pumps	1	LS
	Best Management Practices (i.e. Silt Fence, Tracking Pad, etc.)	1	LS
	Light Riprap	12	CY
	Type R Fabric	44	SY
	Final Site Stabilization	134	SY

THE MISCELLANEOUS QUANTITIES SHOWN IN THE TABLE ABOVE ARE FOR REFERENCE ONLY AND NOT FOR BIDDING. CONTRACTOR SHALL VERIFY ALL QUANTITIES.

MISCELLANEOUS QUANTITIES

EXISTING CONDITIONS

River Station (RS)	Storm Event	Flow (cfs)	Water Surface Elevation (ft)	Channel Velocity (ft/s)
65	10-year (PF 1)	445	756.43	3.01
	50-year (PF 2)	720	756.93	3.29
	100-year (PF 3)	850	757.13	3.35
	500-year (PF 4)	1200	757.57	3.51
66	10-year (PF 1)	445	756.63	3.75
	50-year (PF 2)	720	757.14	4.28
	100-year (PF 3)	850	757.34	4.45
	500-year (PF 4)	1200	757.78	4.86
66.5	Bridge			
67	10-year (PF 1)	445	756.89	3.13
	50-year (PF 2)	720	757.20	4.12
	100-year (PF 3)	850	757.39	4.32
	500-year (PF 4)	1200	757.82	4.75
68	10-year (PF 1)	445	757.78	8.78
	50-year (PF 2)	720	758.26	9.70
	100-year (PF 3)	850	758.48	9.68
	500-year (PF 4)	1200	758.96	9.35

PROPOSED CONDITIONS

River Station (RS)	Storm Event	Flow (cfs)	Water Surface Elevation (ft)	Change in Water Surface Elevation (ft)	Channel Velocity (ft/s)
65	10-year (PF 1)	445	756.43	0.00	3.01
	50-year (PF 2)	720	756.93	0.00	3.29
	100-year (PF 3)	850	757.13	0.00	3.35
	500-year (PF 4)	1200	757.57	0.00	3.51
66	10-year (PF 1)	445	756.62	-0.01	3.28
	50-year (PF 2)	720	757.14	0.00	3.75
	100-year (PF 3)	850	757.34	0.00	3.90
	500-year (PF 4)	1200	757.78	0.00	4.25
66.5	Culvert				
67	10-year (PF 1)	445	756.82	-0.07	2.87
	50-year (PF 2)	720	757.20	0.00	3.60
	100-year (PF 3)	850	757.34	-0.05	3.89
	500-year (PF 4)	1200	757.78	-0.04	4.23
				0.00	
68	10-year (PF 1)	445	757.78	0.00	8.77
	50-year (PF 2)	720	758.20	-0.06	10.14
	100-year (PF 3)	850	758.46	-0.02	9.87
	500-year (PF 4)	1200	758.93	-0.03	9.51

HYDRAULIC SUMMARY

Malas Engineering LLC
Integrated Innovative Solutions and Excellence in Engineering

Himalayan Consultants, LLC
Engineers and Hydrogeologists

REVISION

DATE

FRANKLIN MOBILE ESTATES
6361 S. 27TH STREET
FANKLIN, WI

CULVERT PLAN DETAILS

DATE: 10/15/2018

JOB NO.: 18056.029

DESIGNED BY: MAB

CHECKED BY: DMB

SHEET NUMBER
C1.1

Flood Plain

Flood plains provide natural flood and erosion control on our waterways while supporting fish and wildlife habitat. This seed mix is perfect for establishing native vegetation in low-lying areas that are adjacent to rivers and streams. These sites are prone to seasonal flooding but are typically dry throughout most of the year. This mix does best in sites with full sun to partial shade.

#FLPL	Wet Mesic to Mesic	Full Sun to Part Sun	8.00 PLS LBS/Acre	82.00 Seeds/ Sq. Ft

Wildflowers		Oz/Acre
Alisma subcordatum	Mud Plantain	1.00
Asclepias incarnata	Marsh (Red) Milkweed	3.00
Aster novae-angliae	New England Aster	1.00
Aster puniceus	Swamp Aster	1.00
Eupatorium maculatum	Spotted Joe Pye Weed	1.00
Eupatorium perfoliatum	Boneset	0.50
Helenium autumnale	Sneezeweed	0.30
Helianthus grosseserratus	Sawtooth Sunflower	0.50
Liatris spicata	Marsh Blazing Star	3.00
Lobelia cardinalis	Cardinal Flower	0.30
Lobelia siphilitica	Great Blue Lobelia	0.35
Pycnanthemum virginianum	Mountain Mint	0.50
Rudbeckia laciniata	Wild Golden Glow	3.00
Silphium perfoliatum	Cup Plant	4.00
Solidago riddellii	Riddell's Goldenrod	4.00
Verbena hastata	Blue Vervain	2.00
Vernonia fasciculata	Ironweed	4.00
Zizia aurea	Golden Alexanders	4.00
Grasses, Sedges, & Rushes		**Oz/Acre**
Bromus ciliatus	Fringed Brome	24.00
Carex vulpinoidea	Brown Fox Sedge	4.00
Elymus riparius	River Bank Wild Rye	30.00
Elymus virginicus	Virginia Wild Rye	24.00
Glyceria grandis	Reed Manna Grass	2.00
Leersia oryzoides	Rice Cut Grass	2.00
Scirpus atrovirens	Dark-Green Bulrush	1.00
Scirpus cyperinus	Wool Grass	0.25
Scirpus fluviatilis	River Bulrush	3.00
Scirpus validus	Great Bulrush	0.30
Spartina pectinata	Prairie Cordgrass	4.00

Gail Olsen

From: Gail Olsen
Sent: Wednesday, November 13, 2019 4:55 PM
To: Gail Olsen
Subject: FW: Franklin Mobile Estates - Partial Comments

Marion Ecks
Assistant Planner
Department of City Development
City of Franklin
414-425-4024
mecks@franklinwi.gov

From: Sarah Pasquesi [mailto:sarah@stormwater-solutions-engineering.com]
Sent: Tuesday, October 22, 2019 6:08 PM
To: Joel Dietl; Marion Ecks; Franklin Mobile llc
Cc: Gail Olsen; mmalas@malasengineering.com; Carrie Bristoll-Groll; Steve Olson; Kristen Wilhelm; Carrie Bristoll-Groll
Subject: RE: Franklin Mobile Estates - Partial Comments

Good Evening, Joel

I have updated the table that I provided to Marion this morning to include the additional information that you are requesting. You are correct that the culvert extends slightly wider than the existing bridge. I have included in the permanent wetland impact that area upstream and downstream of the existing bridge that will now slope down to the top of the culvert. I have also included some permanent stream impacts for the channel banks that will be replaced when the culvert goes in. The channel bottom will remain naturalized with the exception of the rip rap on the upstream and downstream ends which you point out is an exception, so no permanent impacts will extend to the channel bottom.

Table 1: Franklin Estates Bridge Replacement				
Natural Resource Impacts				
	Exists on Site (Y/N)	**Area Disturbed**	**Area Permanently Removed**	**Notes**
Steep Slopes:				
10-19%	N	0	0	
20-30%	N	0	0	
30%	N	0	0	
Woodlands & Forests:				
Mature	N	0	0	
Young	N	0	0	

Lakes & Ponds	N	0	0	
Streams	Y	1,312 square feet	488 linear feet	Includes stream bank area removed due to replacing the existing bridge with a culvert which is more narrow than the banks of the stream. The channel through the culvert will maintain a natural stream bottom
Shore Buffers	Y	524 square feet	0 square feet	The shore buffer includes the existing asphalt pavement which will remain in the proposed conditions and is not considered additional shore buffer impact.
Flood- plains/ Flood-ways	Y	3,904 square feet	0 square feet	
Wetlands & Shoreland Wetlands	Y	844 square feet	187 square feet	Includes the areas immediately upstream and downstream of the existing bridge. Impacts are due to the culvert extending beyond the existing bridge limits.
Wetland Buffers	Y	2,536 square feet	0 square feet	The existing wetland buffer includes the existing asphalt pavement which will remain in the proposed conditions and is not considered additional wetland buffer impact.
Wetland Setback	Y	524 square feet	0 square feet	The area of impact includes the 20 feet that the wetland setback extends beyond the limits of the wetland buffer and overlaps with the shore buffer.

Please let me know if there is anything else.

Thank you,

_____

Sarah Pasquesi, PE, CFM
Senior Project Engineer

Stormwater Solutions Engineering, LLC
247 Freshwater Way, Suite 410
Milwaukee, WI 53204

Office: 414-810-1245
Cell: 224-636-1379

Improving the built and natural environments within communities through sustainable engineering and design.

From: Joel Dietl <JDietl@franklinwi.gov>
Sent: Tuesday, October 22, 2019 4:12 PM
To: Sarah Pasquesi <sarah@stormwater-solutions-engineering.com>; Marion Ecks <MEcks@franklinwi.gov>; Franklin Mobile llc <franklinmobilellc@gmail.com>
Cc: Gail Olsen <GOlsen@franklinwi.gov>; mmalas@malasengineering.com; Carrie Bristoll-Groll <cbg@stormwater-solutions-engineering.com>; Steve Olson <Solson@franklinwi.gov>; Kristen Wilhelm <KWilhelm@franklinwi.gov>; Carrie Bristoll-Groll <cbg@stormwater-solutions-engineering.com>
Subject: RE: Franklin Mobile Estates - Partial Comments

Ms. Pasquesi,

Pursuant to the following sections of the UDO, the original Natural Resource Protection Plan should have had included the amount of each natural resource feature disturbed **quantified in square feet or acres**.

- Section 15-11.0103 (buffer, shore)
- Section 15-3.0503 and Table 15-3.0503 (each natural resource feature)
- Section 15-4.0102D. (Streams)
- Section 15-4.0102E. (Shore buffers)
- Section 15-4.0102G. (Wetlands)
- Section 15-4.0102I. (wetland setbacks)
- Section 15-4.0102K. (each natural resource feature)
- Section 15-7.0201J. (each existing resource)

Based upon your emails yesterday and today, most of that information has now been provided. However, you still need to provide the stream impact in square feet or acres, not linear feet. And please provide the amount of wetland setback disturbed. **As noted in yesterday's email, all of this information is required for the public hearing notice.**

In addition, please identify the amount of each natural resource feature to be permanently removed. It is my understanding that the proposed new culvert will be longer than the existing bridge and that the proposed new road (with shoulders) will be wider than the existing road. As such, certain lawn areas (possibly stream bed, etc.) immediately north and south of the existing bridge/road will be permanently removed. **FYI, the City Attorney has previously required the amount of each natural resource feature permanently removed to be included in similar public hearing notices.**

FYI, rip-rap when employed to prevent erosion is allowed within natural resource features per Section 15-8.0607 of the UDO and per the Floodplain Zoning Ordinance. Such areas do not have to be counted toward the area permanently removed.

Joel Dietl, AICP
Planning Manager

Department of City Development
City of Franklin
9229 W. Loomis Road
Franklin, Wisconsin 53132
Phone: 414-425-4024
Email: jdietl@franklinwi.gov

From: Sarah Pasquesi [mailto:sarah@stormwater-solutions-engineering.com]
Sent: Tuesday, October 22, 2019 11:14 AM
To: Marion Ecks; Franklin Mobile llc
Cc: Joel Dietl; Gail Olsen; mmalas@malasengineering.com; Carrie Bristoll-Groll; Steve Olson; Kristen Wilhelm; Carrie Bristoll-Groll
Subject: RE: Franklin Mobile Estates - Partial Comments

Good Morning, Marion

Per our phone conversation I am including with this e-mail a list of the natural resources that we are impacting in table format which you indicated would be more useful than the bulleted list that I provided last night. I will paste the table below and I will also include it as an excel document in case that is easier for you to paste into your public notice.

I have been looking through the ordinance sections 15-4 and 15-7 as well as the NRPP summary that I've attached to this e-mail and there are many references to a plan, but I'm not seeing references to a written report. I believe that we have addressed and provided this detail in the permit report that we originally provided with our application, but I am happy to summarize/reorganize into whatever format you find is required by the ordinance for the use in your public notice.

Table 1: Franklin Estates Bridge Replacement
Natural Resource Impacts

	Exists on Site (Y/N)	Area Disturbed	Area Permanently Removed
Steep Slopes:			
10-19%	N	0	0
20-30%	N	0	0
30%	N	0	0
Woodlands & Forests:			
Mature	N	0	0
Young	N	0	0
Lakes & Ponds	N	0	0

Streams	Y	70 linear feet	0 linear feet
Shore Buffers	Y	524 square feet	0 square feet
Flood- plains/ Flood-ways	Y	3,904 square feet	0 square feet
Wetlands & Shoreland Wetlands	Y	844 square feet	0 square feet
Wetland Buffers	Y	2,536 square feet	0 square feet

I know you are preparing a more detailed response I look forward to seeing your comments soon.

Thanks,

_____
Sarah Pasquesi, PE, CFM
Senior Project Engineer

Stormwater Solutions Engineering, LLC
247 Freshwater Way, Suite 410
Milwaukee, WI 53204

Office: 414-810-1245
Cell: 224-636-1379

Improving the built and natural environments within communities through sustainable engineering and design.

From: Sarah Pasquesi
Sent: Monday, October 21, 2019 6:52 PM
To: Marion Ecks <MEcks@franklinwi.gov>; Franklin Mobile llc <franklinmobilellc@gmail.com>
Cc: Joel Dietl <JDietl@franklinwi.gov>; Gail Olsen <GOlsen@franklinwi.gov>; mmalas@malasengineering.com; Carrie Bristoll-Groll <cbg@stormwater-solutions-engineering.com>
Subject: RE: Franklin Mobile Estates - Partial Comments

Marion,

Please see below for responses to each of your comments. If you need additional clarification, please let me know.

a. Clearly illustrate and **enumerate all natural resource features per § 15-4.0102**: Natural Resource Features Determination

i. Note that natural resource features are defined and described by ordinance. See: § 15-4.0100 and § 15-11.0100.

ii. Pursuant to § 15-4.0102.D and § 15-7.0201.I, **please provide complete written narrative**, and illustrated information **about the stream** according to the standards laid out in § 15-4.0102.D.1 through D.3.

Section 15-4.0102 D. 1-3 defines three methods used to define the "channel" and "stream". The first method, topographic survey, is the preferred method. The surveyed topography of the stream is shown on both the proposed plans and on the Natural Resources Protection Plan provided with our original application. The survey is illustrated at a one-foot contour interval exceeding the minimum two-foot interval requirement. This survey is used to define the location of the stream for the purposes of this project.

Section 15-7-0201 lists Natural Resource Protection Plan Requirements. We have provided a NRPP with our original permit submittal that follows the City of Franklin's requirements. If the Zoning Administrator finds any issues with the NRPP as provided, please indicate what we should revise and resubmit.

iii. Pursuant to § 15-4.0102.F and § 15-7.0201.I, **please provide written narrative,** and illustrated information **about the floodplain, floodway, and floodway boundary.**

Section 15-4.0102 F. defines floodplains and floodways. While we do not have a copy of the City of Franklin's "Official Zoning Map", per the FEMA FIRM of this location, it is clear that the entirety of the proposed project is within the regulatory floodway. The FEMA FIRM at this location is provided as an attachment to the report included with the original permit application.

Section 15-7-0201 lists Natural Resource Protection Plan Requirements. We have provided a NRPP with our original permit submittal that follows the City of Franklin's requirements. If the Zoning Administrator finds any issues with the NRPP as provided, please indicate what we should revise and resubmit.

iv. Pursuant to § 15-7.0201.I, illustrate and **enumerate the wetland, wetland setback, and areas of disturbance**,

Section 15-7-0201 lists Natural Resource Protection Plan Requirements. We have provided a NRPP with our original permit submittal that follows the City of Franklin's requirements. The total wetland, and wetland setback, and total area of disturbance for the proposed project is written out on the NRPP as well as shown on the plan as a hatched area. In addition, the areas of disturbance are included in response to the following comment number v.

v. Pursuant to § 15-4.0102.K and § 15-7.0201.J, **provide written narrative,** and illustrated information **about natural resources to be disturbed. If a category of natural resource is not present, include that information**.

Section 15-4.0102 lists the following natural resource features:

- *Steep Slopes*
- *Woodlands & Forests: Mature, Young*
- *Lakes & Ponds*
- *Streams*
- *Shore Buffers*
- *Floodplains/Food-ways*
- *Wetlands & Shoreland Wetlands*
- *Wetland Buffers*

The total area disturbed as part of the proposed construction is 2,536 square feet. The proposed bridge replacement at Franklin Estates Mobile Home Park impacts the following resources:

- *Streams: The bridge replacement will impact 70 linear feet of streambed which will be restored to a natural stream bottom per the proposed project plans.*
- *Floodplains/Floodways: 2,536 square feet of regulatory floodway will be disturbed as shown on the Natural Resources Protection Plan for this project*
- *Shore Buffers: 524 square feet will be disturbed as shown on the Natural Resources Protection Plan for this project*
- *Wetlands: 844 square feet will be disturbed as shown on the Natural Resources Protection Plan for this project*
- *Wetland Buffer: 2,536 square feet will be disturbed as shown on the Natural Resources Protection Plan for this project*

The following natural resources do not exist within the project area:
- *Steep slopes,*
- *woodlands & Forests,*
- *Lakes & Ponds*

Section 15-7-0201 lists Natural Resource Protection Plan Requirements. We have provided a NRPP with our original permit submittal that follows the City of Franklin's requirements. The total wetland, and wetland setback, and total area of disturbance for the proposed project is written out on the NRPP as well as shown on the plan as a hatched area.

vi. Pursuant to § 15-4.0102. K and § 15-7.0201.J, **provide written narrative,** and illustrated information **about natural resources to be permanently removed. If a category of natural resource is not present, include that information.**

No natural resources will be permanently removed as part of this project. All streams, floodways, shore buffers, wetlands, and wetland buffers that are disturbed as part of this project will be restored to existing condition after the bridge is replaced.

The following natural resources are not present within the project area:
- *Steep slopes,*
- *woodlands & Forests,*
- *Lakes & Ponds*

Section 15-7-0201 lists Natural Resource Protection Plan Requirements. We have provided a NRPP with our original permit submittal that follows the City of Franklin's requirements.

vii. Pursuant to § 15-4.0102. K and § 15-7.0201.J, **provide written narrative,** and illustrated information **about natural resources to be preserved. If a category of natural resource is not present, include that information.**

All natural resources not called out as disturbed on the Natural Resources Protection Plan will be preserved. Construction traffic will utilize the existing roadway to the site and will only disturb the floodway, wetland buffer, wetland, and stream as shown on the NRPP to complete construction.

Section 15-7-0201 lists Natural Resource Protection Plan Requirements. We have provided a NRPP with our original permit submittal that follows the City of Franklin's requirements.

Let me know as you have additional comments or questions and I will respond as quickly as possible to maintain the permit schedule.

Regards,

_____

Sarah Pasquesi, PE, CFM

Senior Project Engineer

Stormwater Solutions Engineering, LLC
247 Freshwater Way, Suite 410
Milwaukee, WI 53204

Office: 414-810-1245
Cell: 224-636-1379

Improving the built and natural environments within communities through sustainable engineering and design.

From: Marion Ecks <MEcks@franklinwi.gov>
Sent: Monday, October 21, 2019 5:01 PM
To: Franklin Mobile llc <franklinmobilellc@gmail.com>; Sarah Pasquesi <sarah@stormwater-solutions-engineering.com>
Cc: Joel Dietl <JDietl@franklinwi.gov>; Gail Olsen <GOlsen@franklinwi.gov>; mmalas@malasengineering.com
Subject: Franklin Mobile Estates - Partial Comments

Mr. Steinberger et. al,

We are working to complete our comments on your applications. Additional comments which will also need to be addressed will be forthcoming, but due to the urgency of this matter we would like to try to expedite the drafting of public hearing notices. We are therefore requesting key information that will affect those notices now. **Please respond to the following items in bold** as soon as possible, ideally prior to Monday, October 28.

Site Plan

1. Site plans must meet the requirements of § 15-4.0100: Natural Resource Protection Standards, and § 15-7.0201: Natural Resource Protection Plan (NRPP) Requirements.
    a. Clearly illustrate and **enumerate all natural resource features per § 15-4.0102**: Natural Resource Features Determination
        i. Note that natural resource features are defined and described by ordinance. See: § 15-4.0100 and § 15-11.0100.
        ii. Pursuant to § 15-4.0102.D and § 15-7.0201.I, **please provide complete written narrative**, and illustrated information **about the stream** according to the standards laid out in § 15-4.0102.D.1 through D.3.
        iii. Pursuant to § 15-4.0102.F and § 15-7.0201.I, **please provide written narrative,** and illustrated information **about the floodplain, floodway, and floodway boundary.**
        iv. Pursuant to § 15-7.0201.I, illustrate and **enumerate the wetland, wetland setback, and areas of disturbance**,
        v. Pursuant to § 15-4.0102.K and § 15-7.0201.J, **provide written narrative,** and illustrated information **about natural resources to be disturbed. If a category of natural resource is not present, include that information**.

vi. Pursuant to § 15-4.0102. K and § 15-7.0201.J, **provide written narrative,** and illustrated information **about natural resources to be permanently removed. If a category of natural resource is not present, include that information.**

vii. Pursuant to § 15-4.0102. K and § 15-7.0201.J, **provide written narrative,** and illustrated information **about natural resources to be preserved. If a category of natural resource is not present, include that information.**

Please let me know if you have questions about the requested information or how to format it.

Thank you,

Marion Ecks
Assistant Planner
Department of City Development
City of Franklin
414-425-4024
mecks@franklinwi.gov

9229 W. Loomis Road
Franklin, Wisconsin 53132