MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

Part 31 Permitting Considerations

Ashley Roznowski, PE / Minmin Shu, PE / Lucas Fitzpatrick, PE

Water Resources Division –Transportation Review Unit

Floodplain Regulations

- State: Part 31 of Public Act 451
- Local: Building Codes, Zoning and Floodplain Management Ordinances
- Federal: National Flood Insurance Program (NFIP –FEMA)

EGLE

Floodplain Regulations

- A permit is required under Part 31 for the following activities within the floodplain of a river:
  - Any Occupation
  - Any Filling
  - Any Grade Change

Including in FEMA Unmapped Areas

Part 31 Permit Application Sections

Ashley Roznowski, PE

Water Resources Division - Transportation Review Unit

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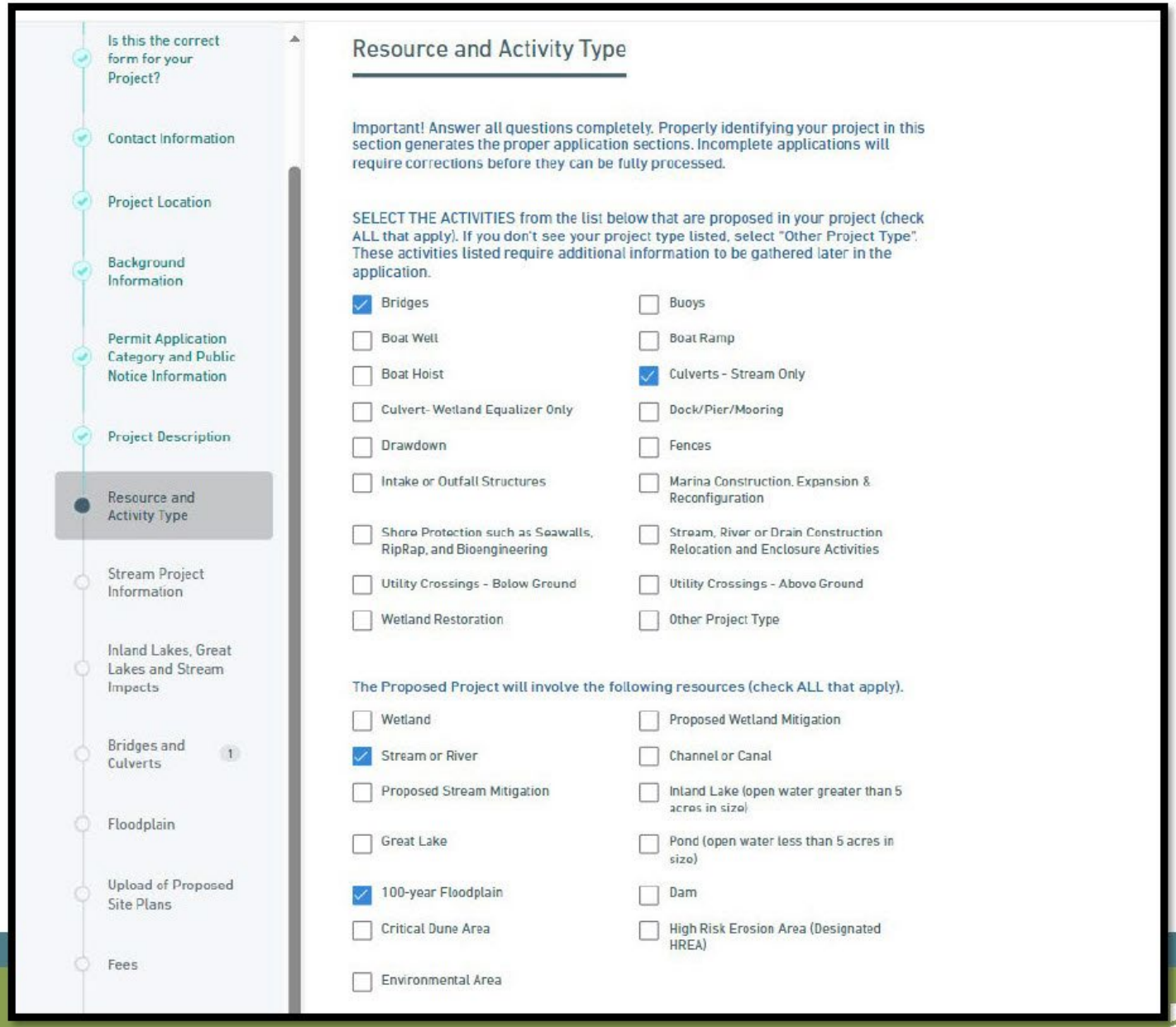
Part 31 Permit Application Sections

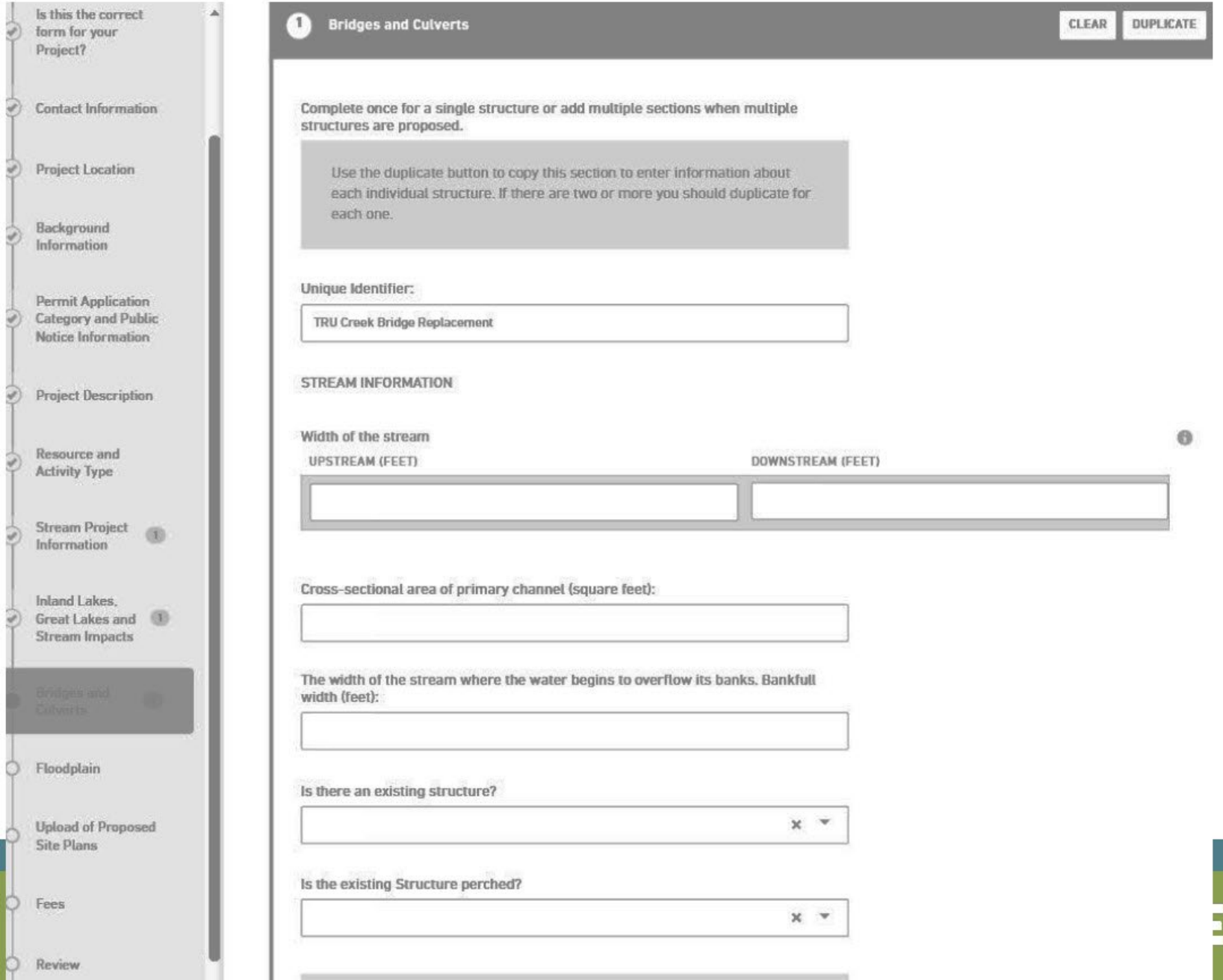
- How to:
  - Generate the Part 31 related JPA sections
  - Fill out the Bridge and Culvert Table
  - Fill out the Floodplain Section
  - Example Floodplain Cut/Fill Drawings

EGLE

Resource and Activity Type



Bridge and Culvert Section



Bridge and Culvert Table – Part 1

Existing and Proposed Bridge and/or Culvert Information

QUESTION	EXISTING	PROPOSED
Number of Culvert Barrels or Bridge Spans		
Structure Length (parallel to stream) (feet)		
Structure Span (Hydraulic Opening Perpendicular to Stream) (feet)		
Culvert Height (feet) (if bridge enter 0)		
Depth Culvert Recessed (feet) (if bridge enter 0)		
Culvert Invert Elevation Upstream (feet) (if bridge enter 0)		
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Bottom of Bridge Beam Elevation Upstream (feet) (if culvert enter 0)		
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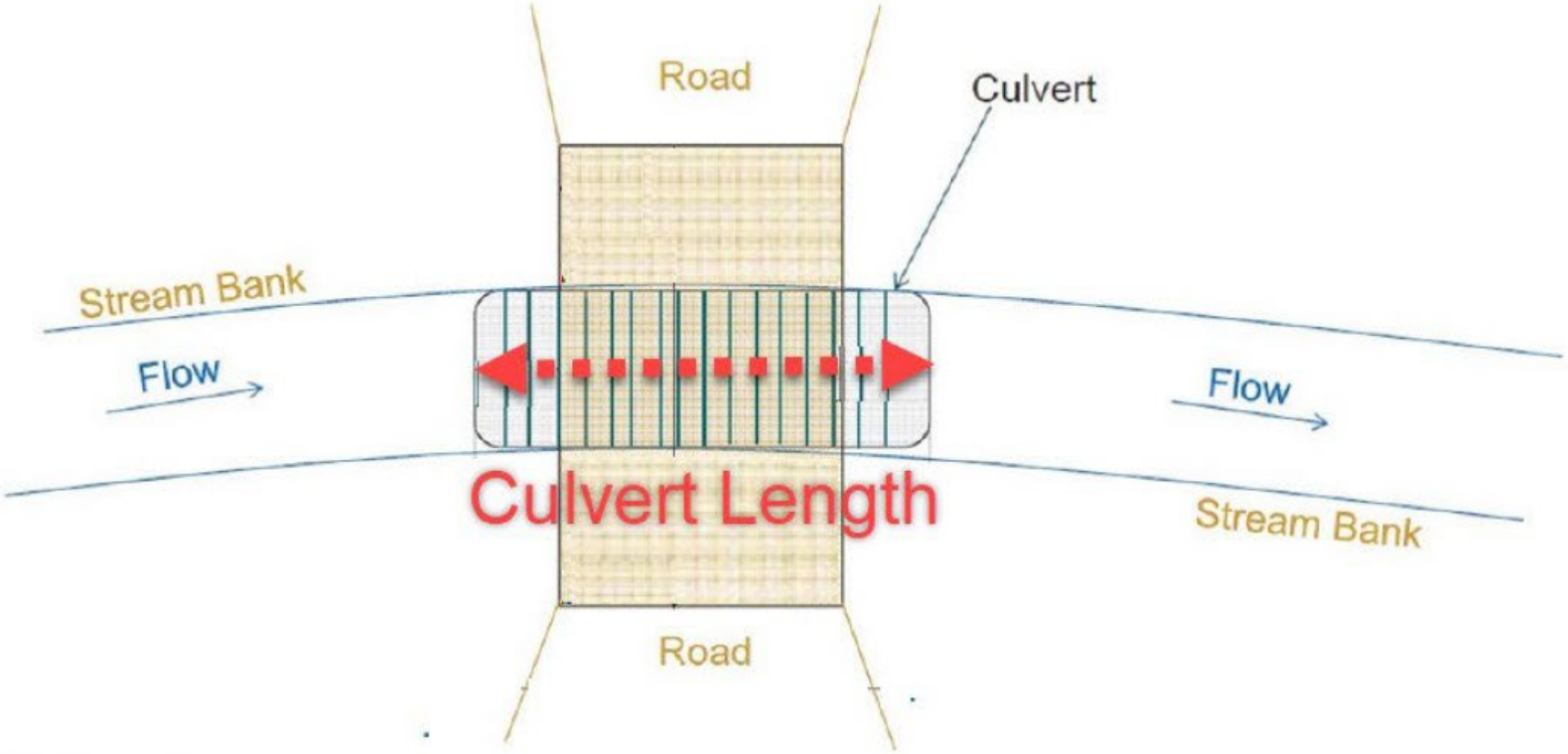
EGLE

Culvert Length



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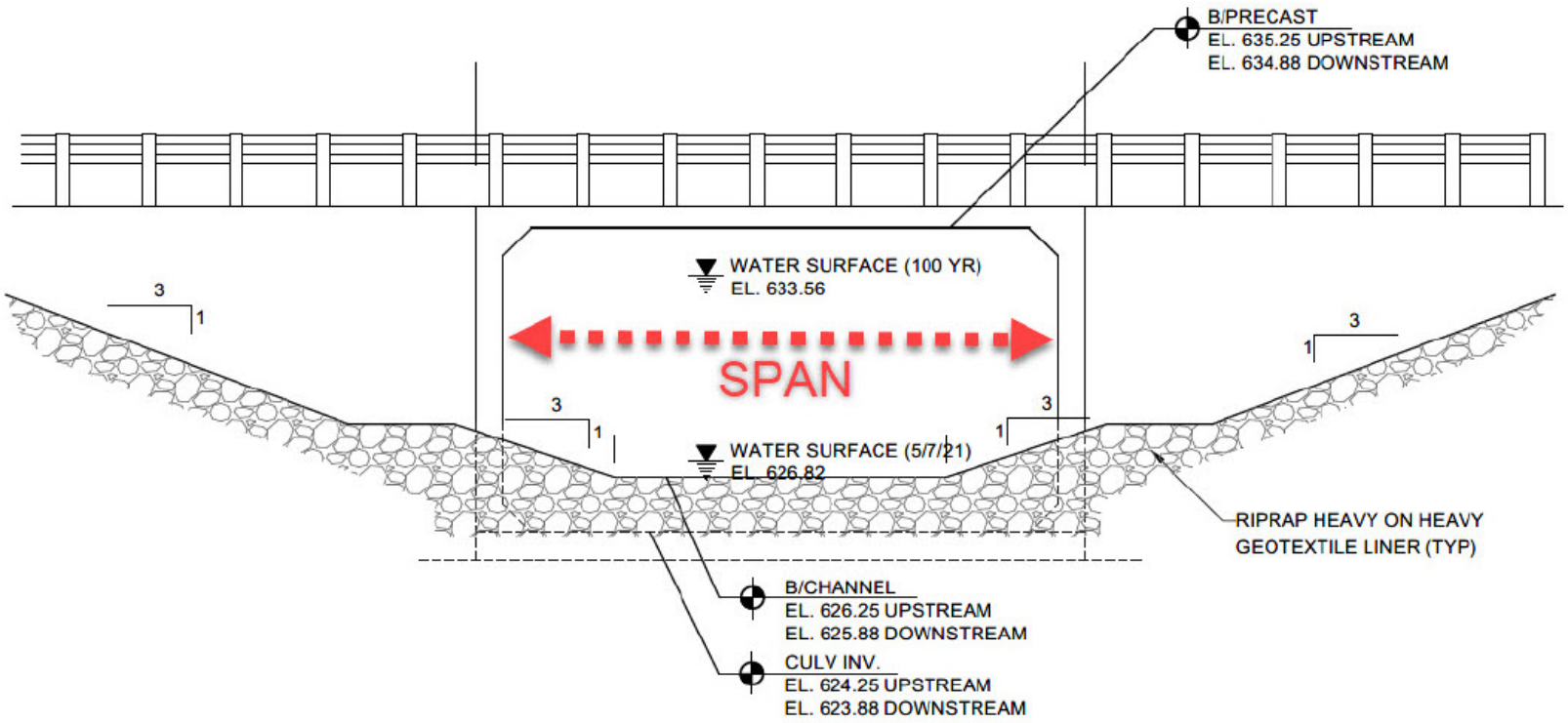
EGLE

Structure Span



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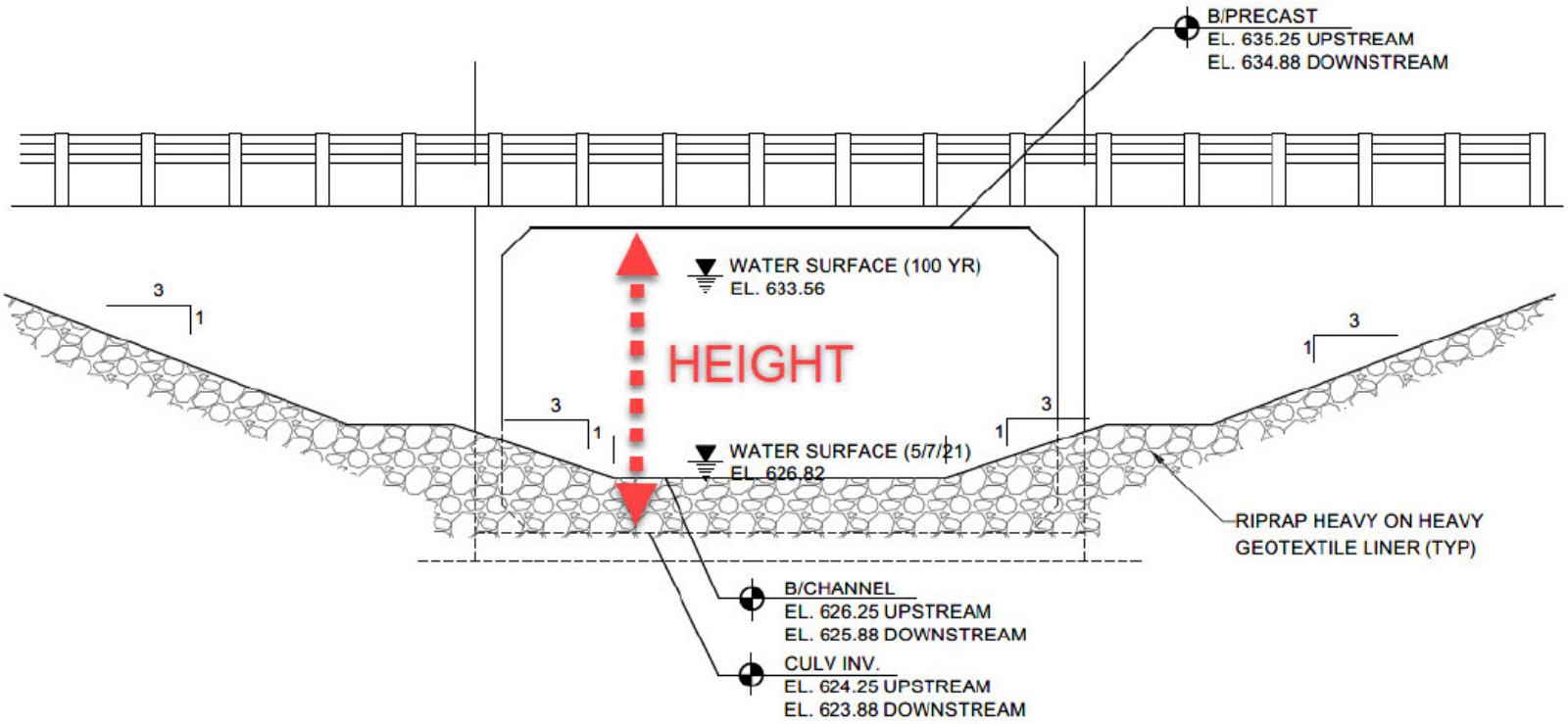
EGLE

Culvert Height (no recess)



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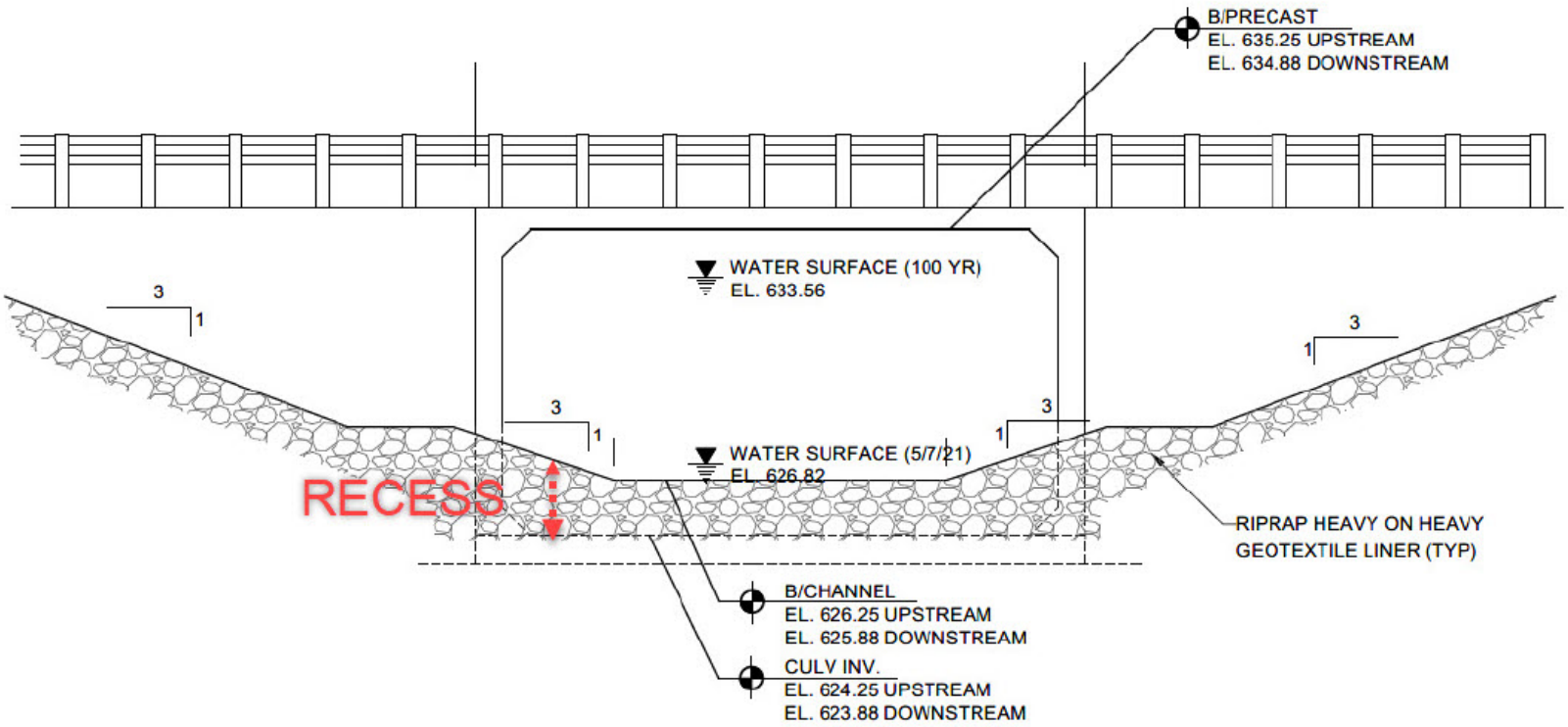
EGLE

Depth Recessed



EGLE

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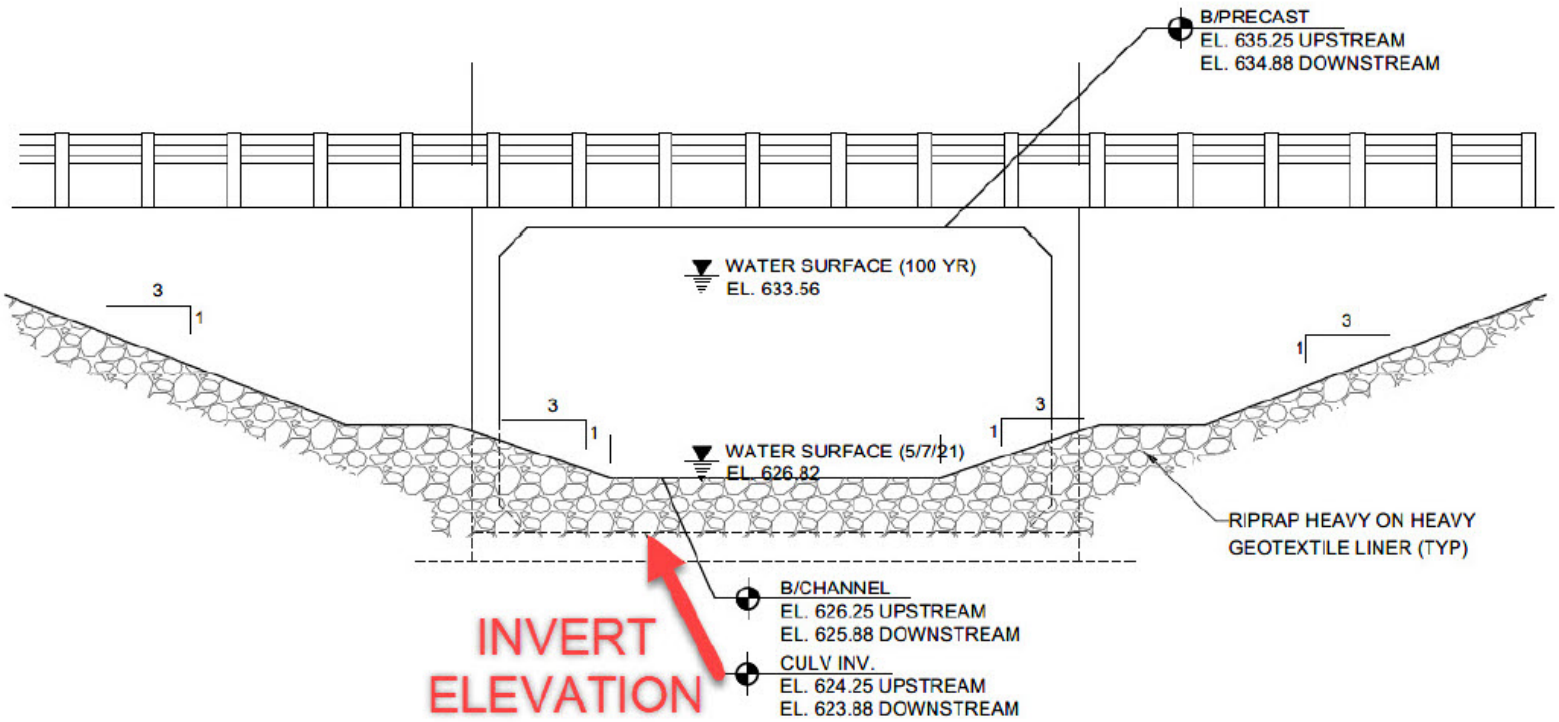
EGLE

Culvert Invert Elevations



EGLE

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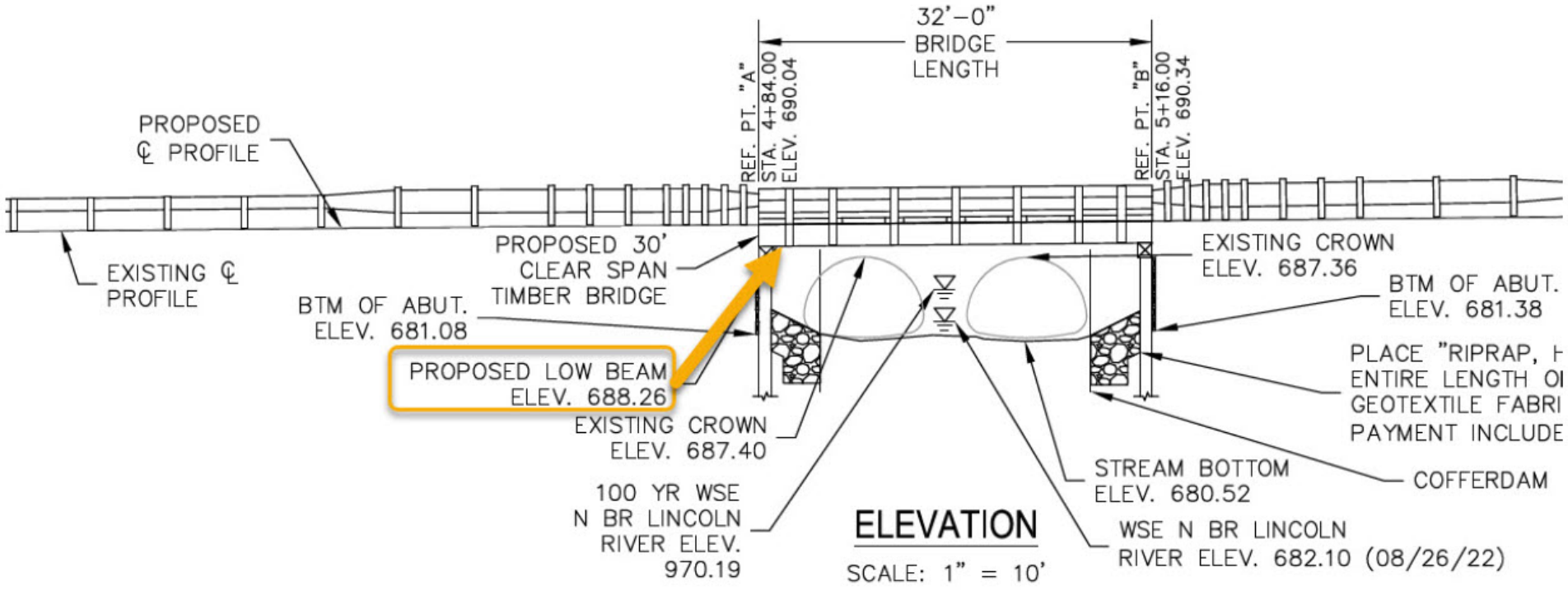
EGLE

Bridge Beam (Low Beam) Elevations

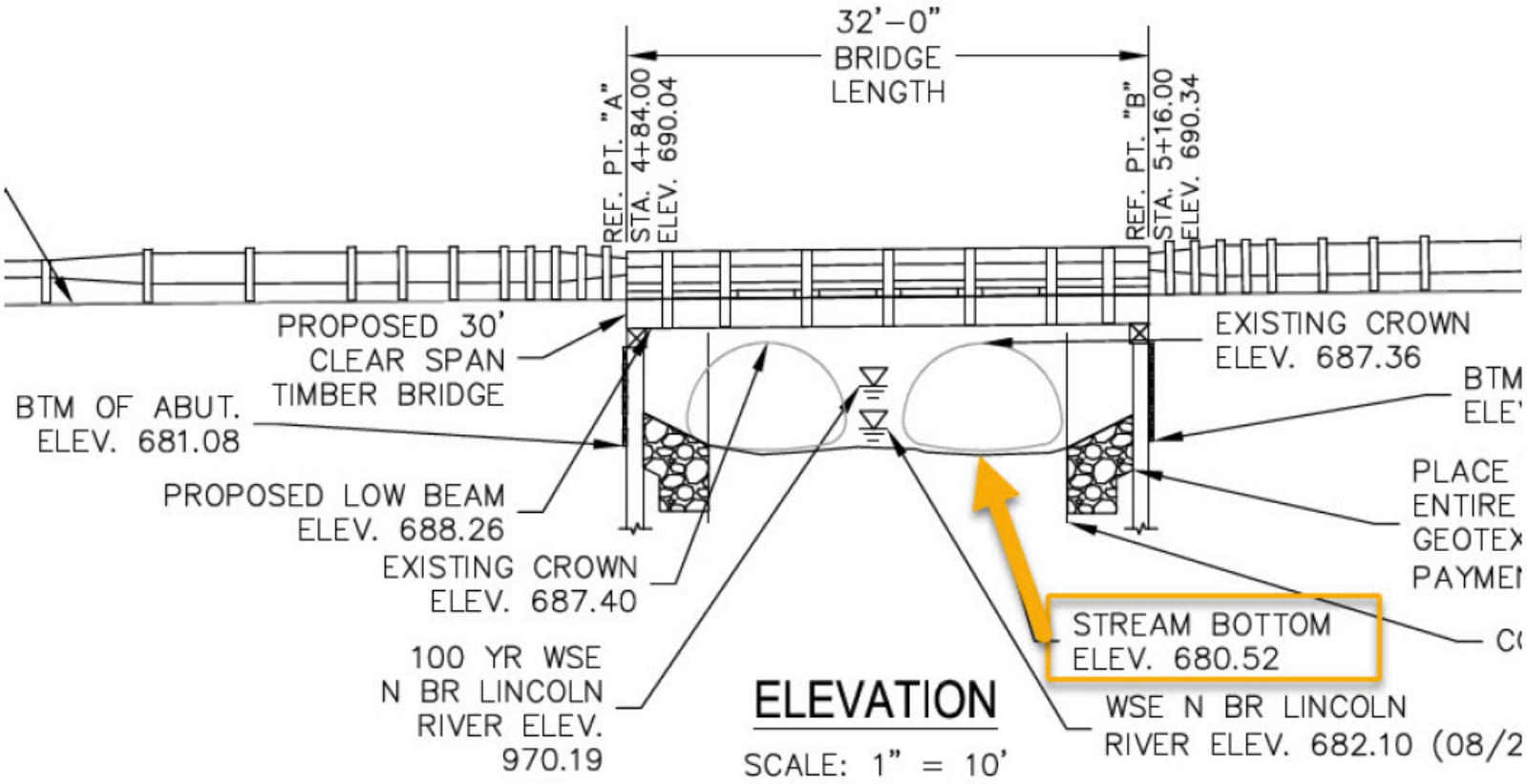


Bridge and Culvert Table – Part 2

Stream Invert Elevation at Bridge Upstream (feet) (if culvert enter 0)		
Stream Invert Elevation at Bridge Downstream (feet) (if culvert enter 0)		
Bridge Rise from Streambed to Bottom of Beam Upstream (feet)		
Total Waterway Opening above Streambed (square feet)		
Total Waterway Opening below the 100-year Flood Elevation (square feet)		
Elevation of Road Grade at Structure (feet)		
Elevation of Low Point in Road (feet)		
Distance from Structure to Low Point in Road (feet)		
Length of Approach Fill from Structure to Existing Grade (feet)		

EGLE

Stream Invert Elevations



EGLE

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EGLE

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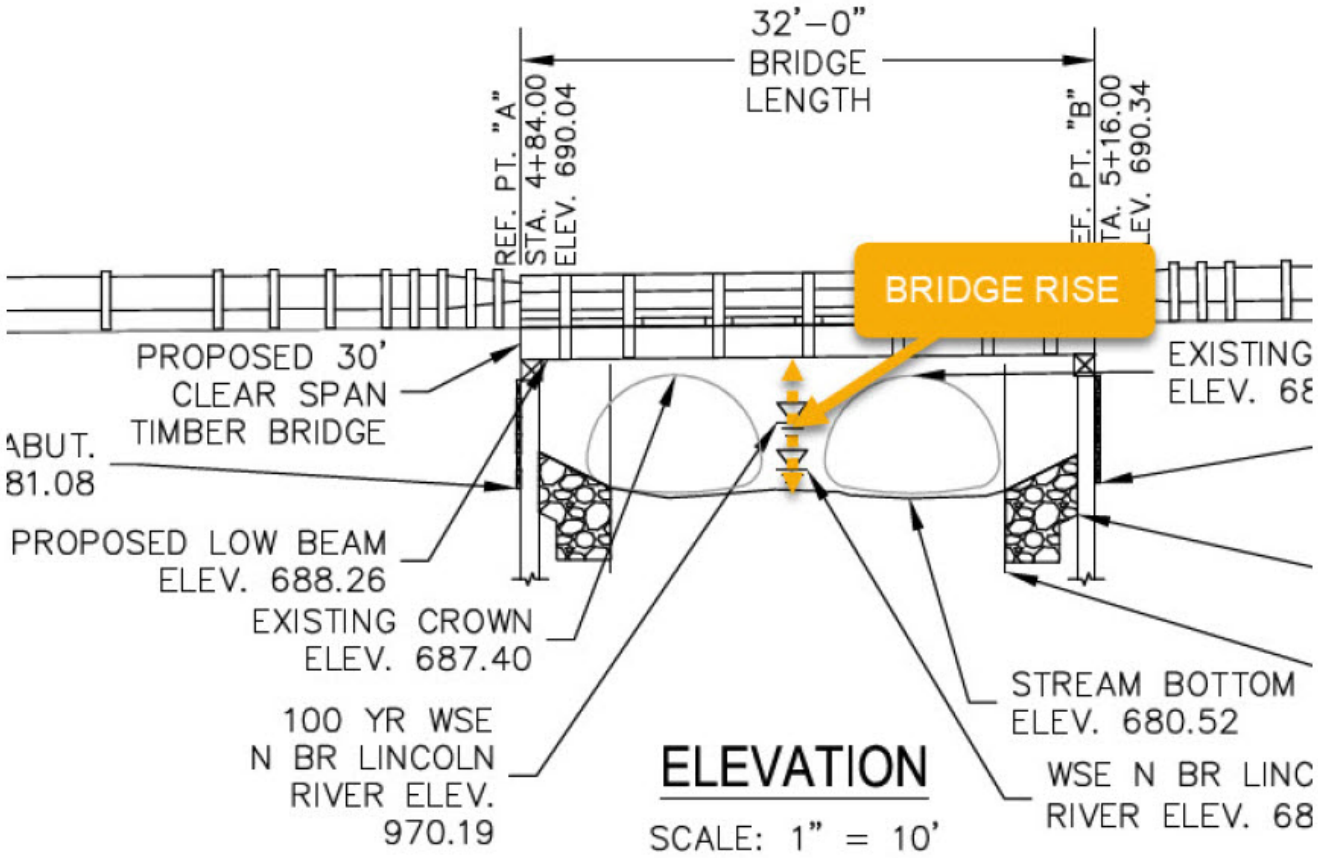

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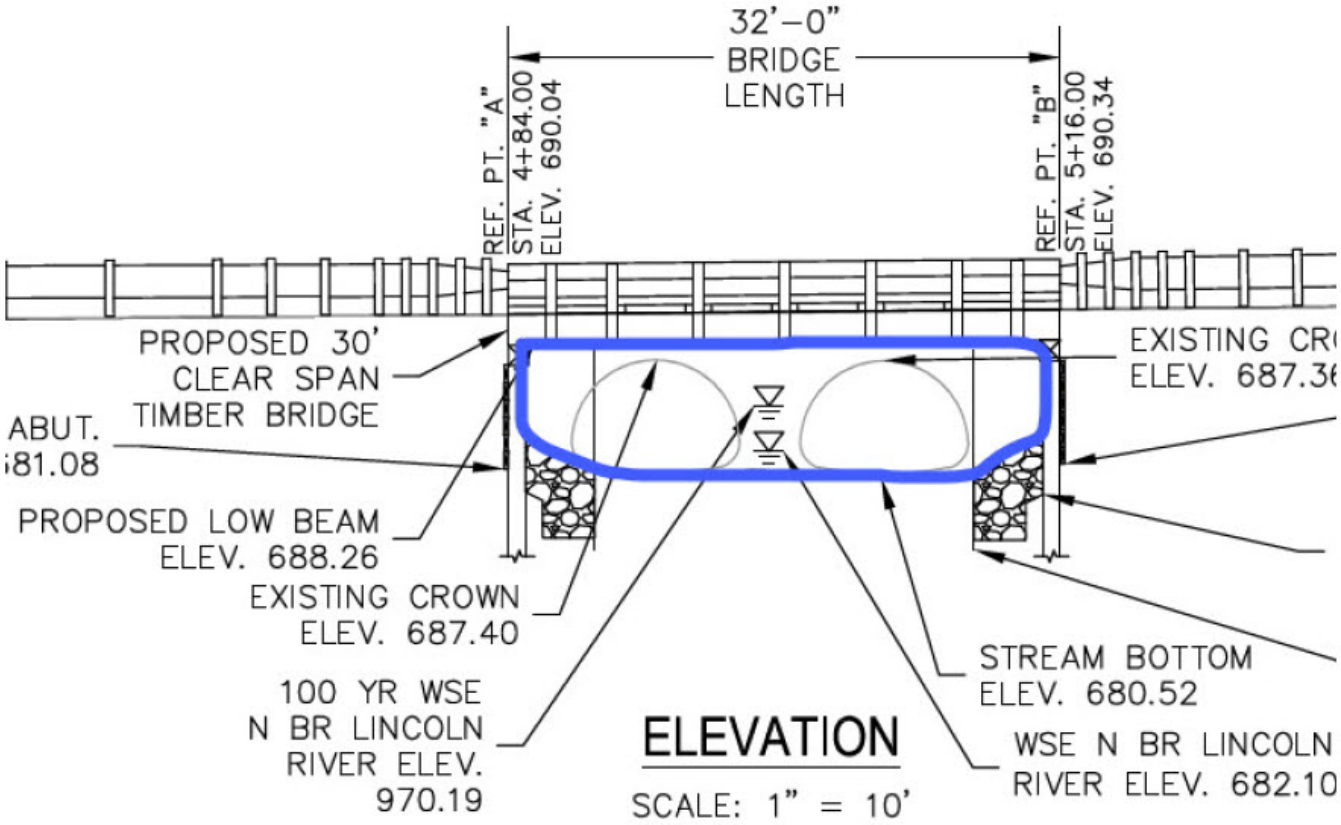
EGLE

Waterway Opening Above Streambed



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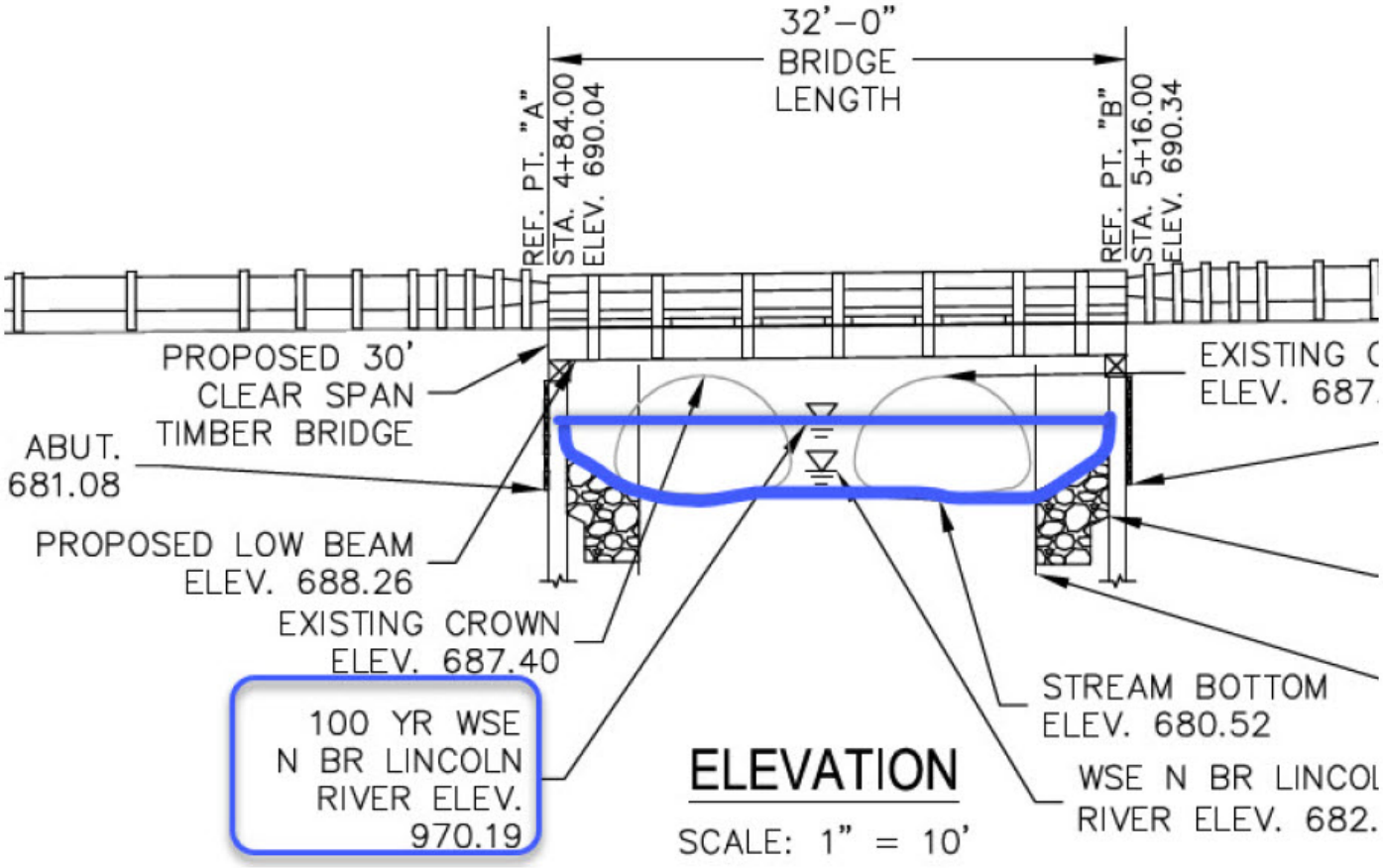
EGLE

Waterway Opening Below 100-year



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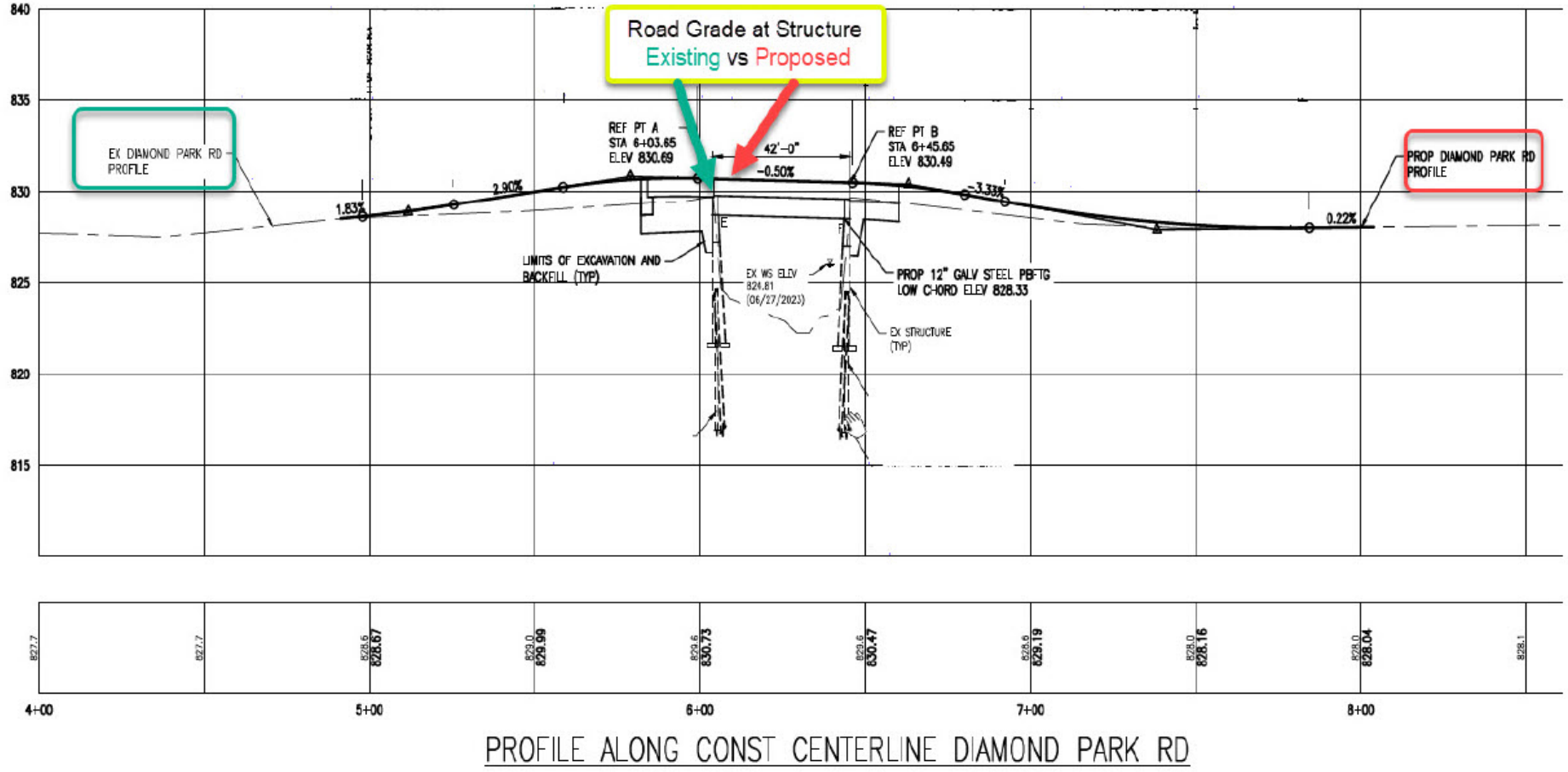
EGLE

Road Grade Elevation



PROFILE ALONG CONST CENTERLINE DIAMOND PARK RD

EGLE

Bridge and Culvert Table – Part 2

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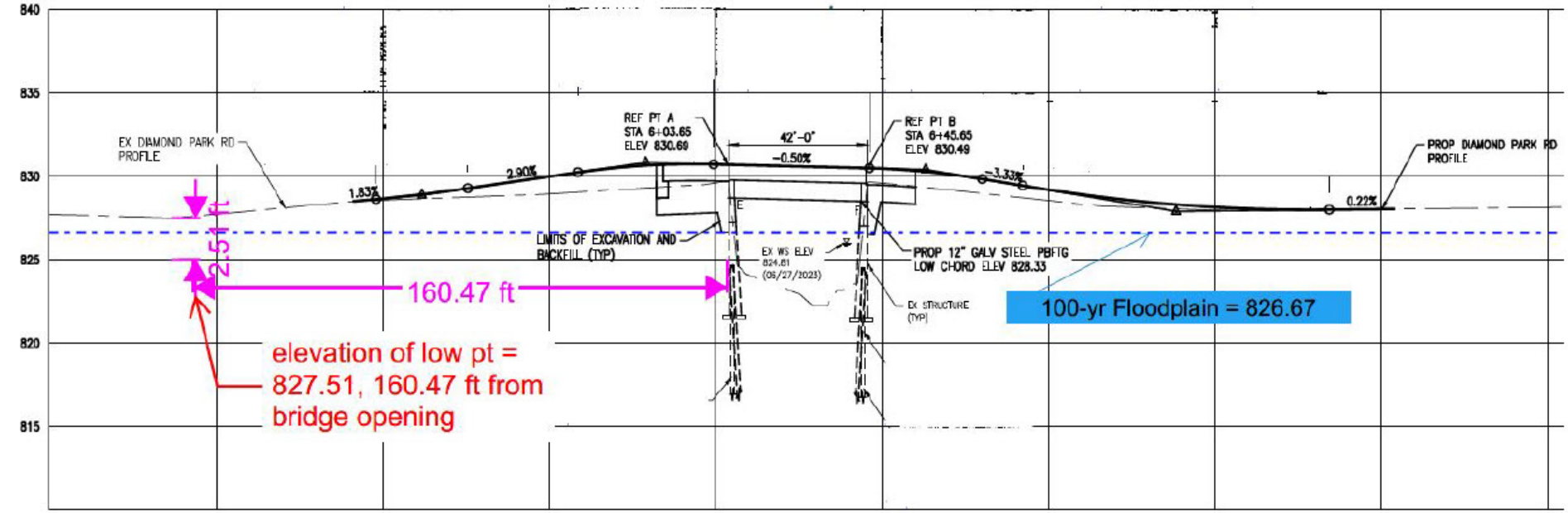
EGLE

Low Point Elevation



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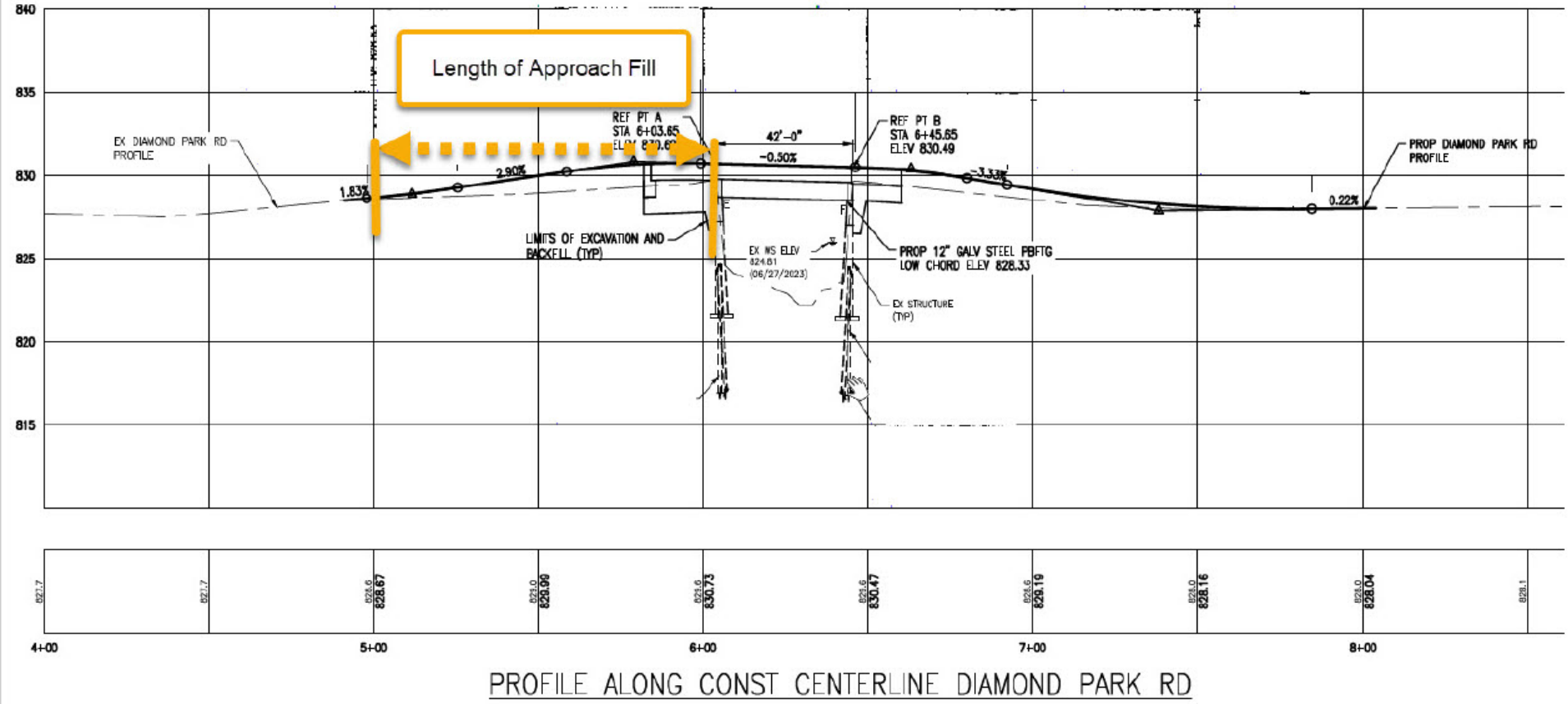
EGLE

Approach Fill



PROFILE ALONG CONST CENTERLINE DIAMOND PARK RD

Bridge and Culvert Table - Part 3

Structure Type:

EXISTING	PROPOSED
Steel beam	Timber

Structure Entrance Design Type:

EXISTING	PROPOSED
Projecting	Wingwalls

Certification Upload

A Licensed Professional Engineer may certify that your project will not cause a harmful interference for a range of flood discharges up to and including the 100-year flood discharge. The "Required Certification Language" is found under "forms" on the "maps, forms and documents" link from the www.mi.gov/jointpermit page or a copy may be requested by phone, email, or mail. A hydraulic report supporting this certification may also be required.

Please be aware that files exceeding 500 MB in size are not allowed

Drop files here to upload

OR

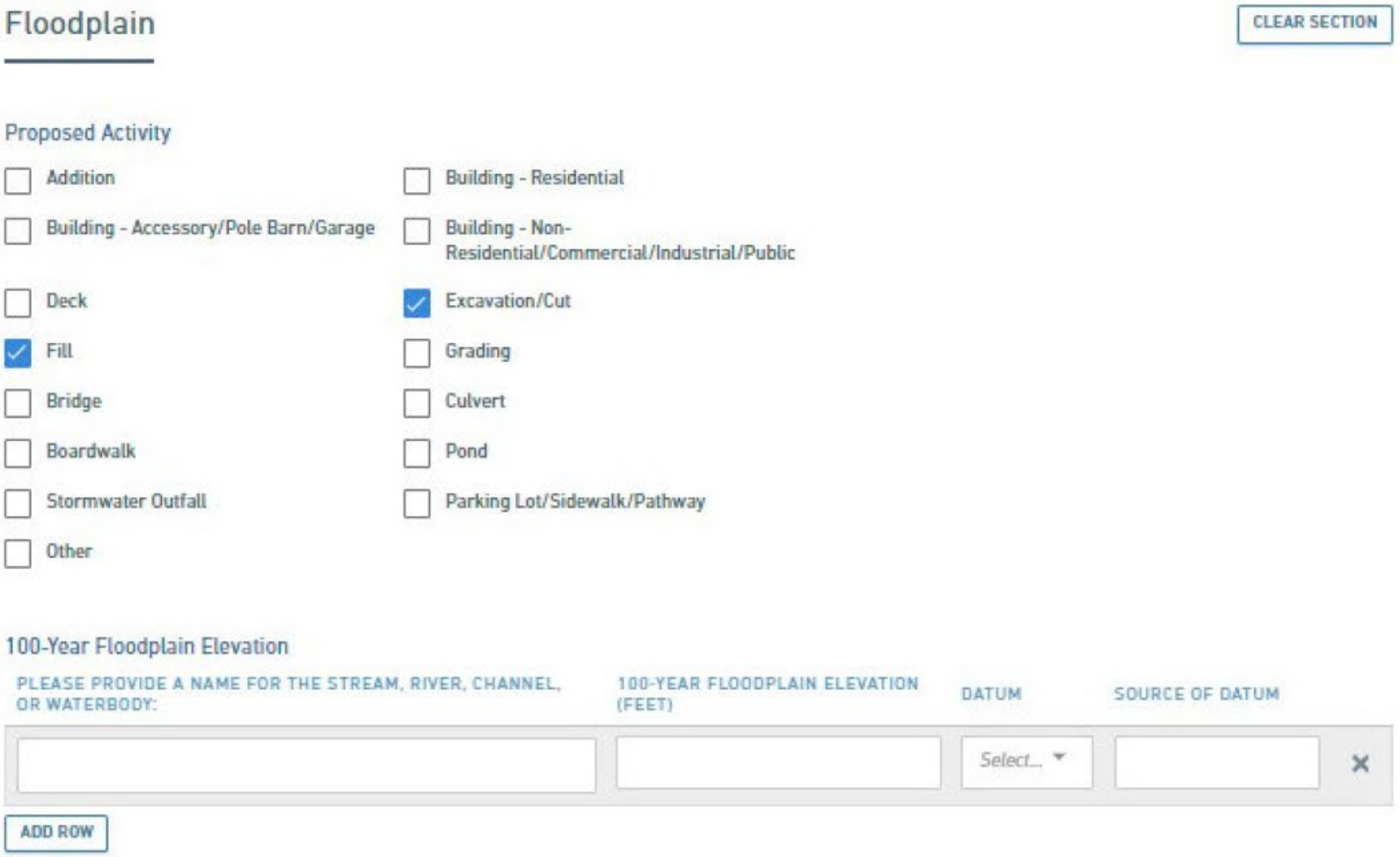
CHOOSE FILE

Comment

DUPLICATE *BRIDGES AND CULVERTS*

EGLE

Floodplain Section - Part 1



EGLE

Floodplain Section - Part 2

Excavation/Cut volume below the 100-year floodplain elevation (cubic yards)

*

Fill volume below the 100-year floodplain elevation (cubic yards)

*

Source of Fill Material:

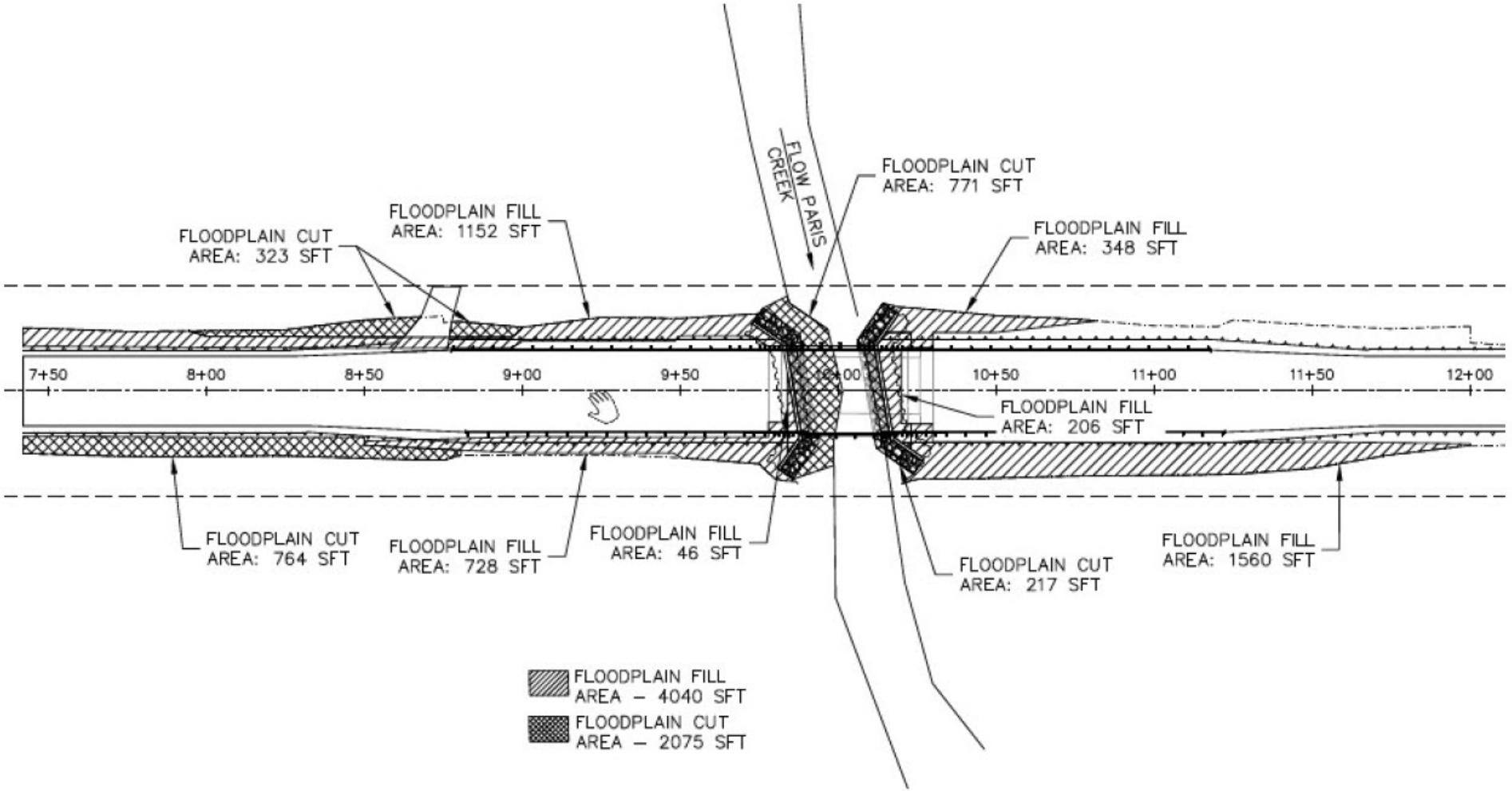
*

Type of Fill

- [ ] Sand
- [ ] Clay
- [ ] Peastone
- [ ] Gravel
- [ ] Other

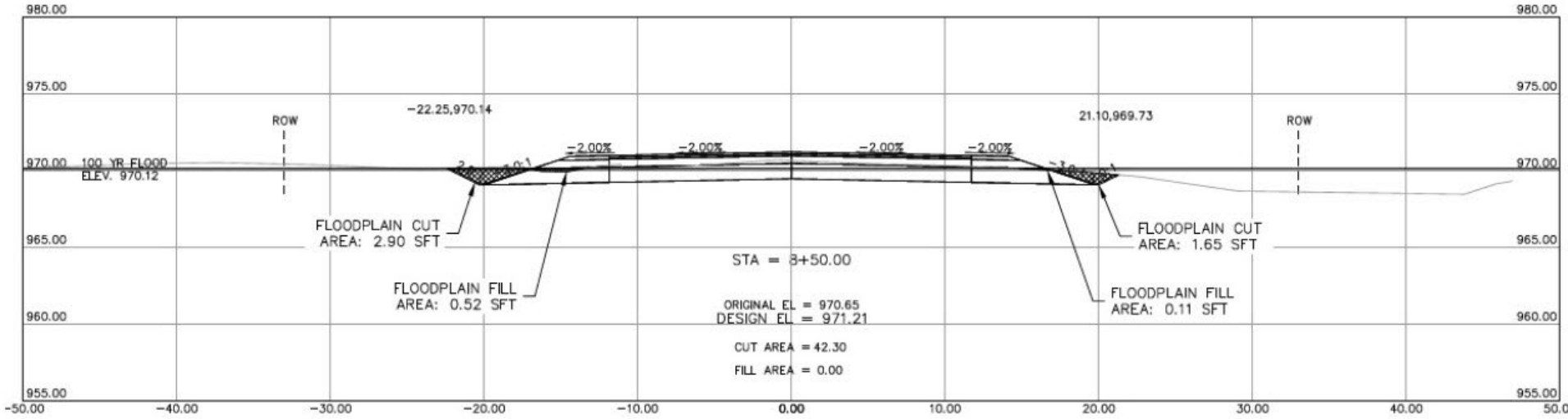
EGLE

Floodplain Cut / Fill Drawings



EGLE

Floodplain Cut / Fill Cross Sections



MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

Hydraulic Modeling for Part 31 Permit

Minmin Shu, P. E.
Transportation Review Unit

shum@michigan.gov
517-582-1585

Hydraulic Modeling for Part 31 Permit

- Not every Part 31 permit review requires hydraulic model.
- Knowing if a hydraulic model is required for the permit application, impacts project design and permit review.

A hydraulic model is not required for Part 31 permit review if the proposed activity is one of the following conditions:

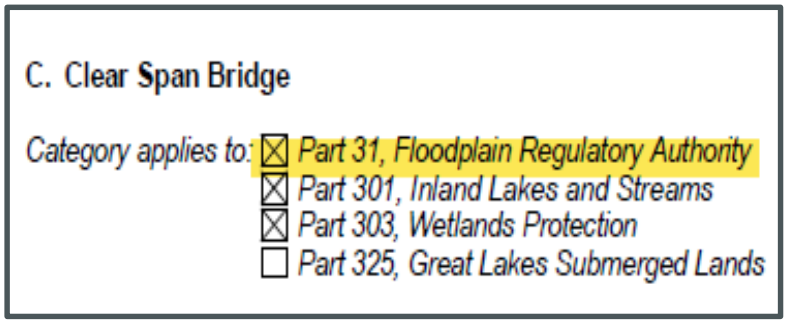
1) Proposed work is exempted under Part 31.

If a proposed activity is one of conditions in Part 31 R 323.1312 Applicability of rules, Rule 312, from (a) to (m), proposed work is exempted under Part 31.

https://www.michigan.gov/egle/about/organization/water-resources/transportation/laws-and-rules

EGLE

2) General Permit Categories


C. Clear Span Bridge

Category applies to: ☒ Part 31, Floodplain Regulatory Authority
☒ Part 301, Inland Lakes and Streams
☒ Part 303, Wetlands Protection
☐ Part 325, Great Lakes Submerged Lands

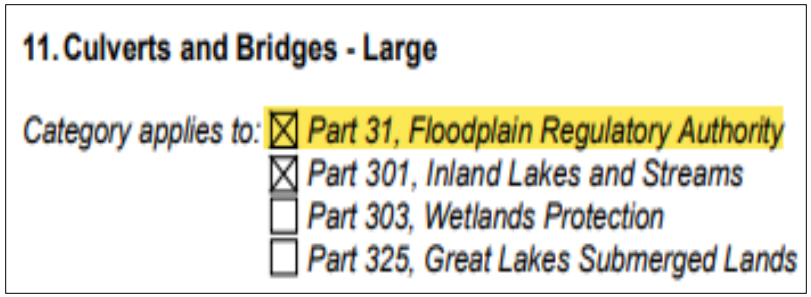
If a proposed activity meets one or more of conditions listed in GENERAL PERMIT CATEGORIES IN THE STATE OF MICHIGAN, which the box of Part 31 has been checked, the hydraulic model is not required to submit.

https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Programs/WRD/Wetlands/General-Permit-Categories.pdf?rev=0282e978148e4ef0ad4b0239819ca3a0&hash=2766452CEAFD566F1096B59A06F72C05

Continue Activities that do not require a hydraulic model:

3) Minor Permit Categories

If a proposed activity meets one or more conditions in MINOR PROJECT CATEGORIES IN THE STATE OF MICHIGAN where the box of Part 31 has been checked, the hydraulic model is not required to submit.

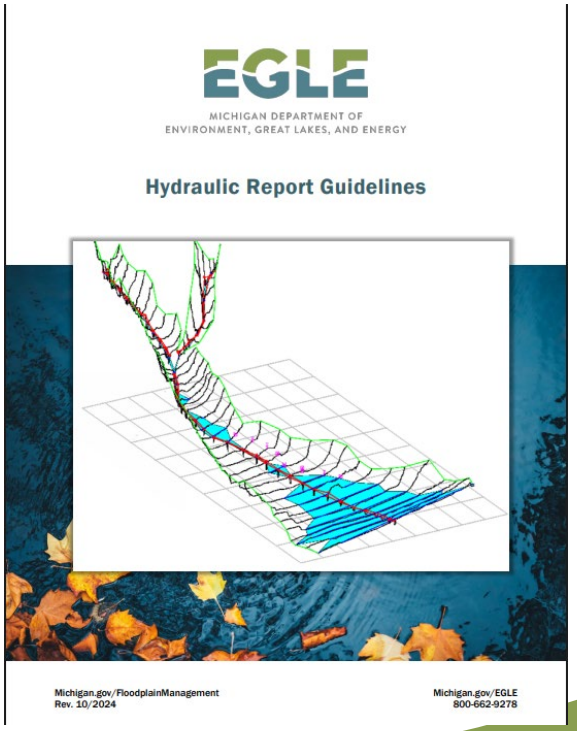


https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Programs/WRD/Wetlands/Minor-Project-Categories.pdf?rev=164090e75bae475db00bc6dd5c175f5c&hash=2D1644552C6B2C11825EE17BAC1D77EA

When is a Hydraulic Analysis Needed?

A hydraulic analysis is needed for review under the State's Floodplain Regulatory Authority found in Part 31 of the NREPA as below: (The list is from Hydraulic Report Guidelines, Rev.10/2024)

1. Any filling or construction within the FEMA mapped floodway that does not meet minor project criteria under Part 31.
2. Filling or construction in the floodways not mapped by FEMA, that exceeds one percent of the cross-sectional area of the 100-year floodway unless the construction is directly in-line, adjacent to and on the downstream side of an existing obstruction.



Continue ***When is a Hydraulic Analysis Needed?***

3. Stream relocation.
4. Changing the FEMA floodway boundary line.
5. Culvert or bridge replacement projects that have the following characteristics (with all other items remaining equal):

   - An increase in road grade unless the existing road grade is above the 100-year floodplain elevation
   - A reduction in end-area.
   - An increase in the Manning's roughness coefficient (i.e., going from a concrete to metal culvert).

*Continue **When is a Hydraulic Analysis Needed?***

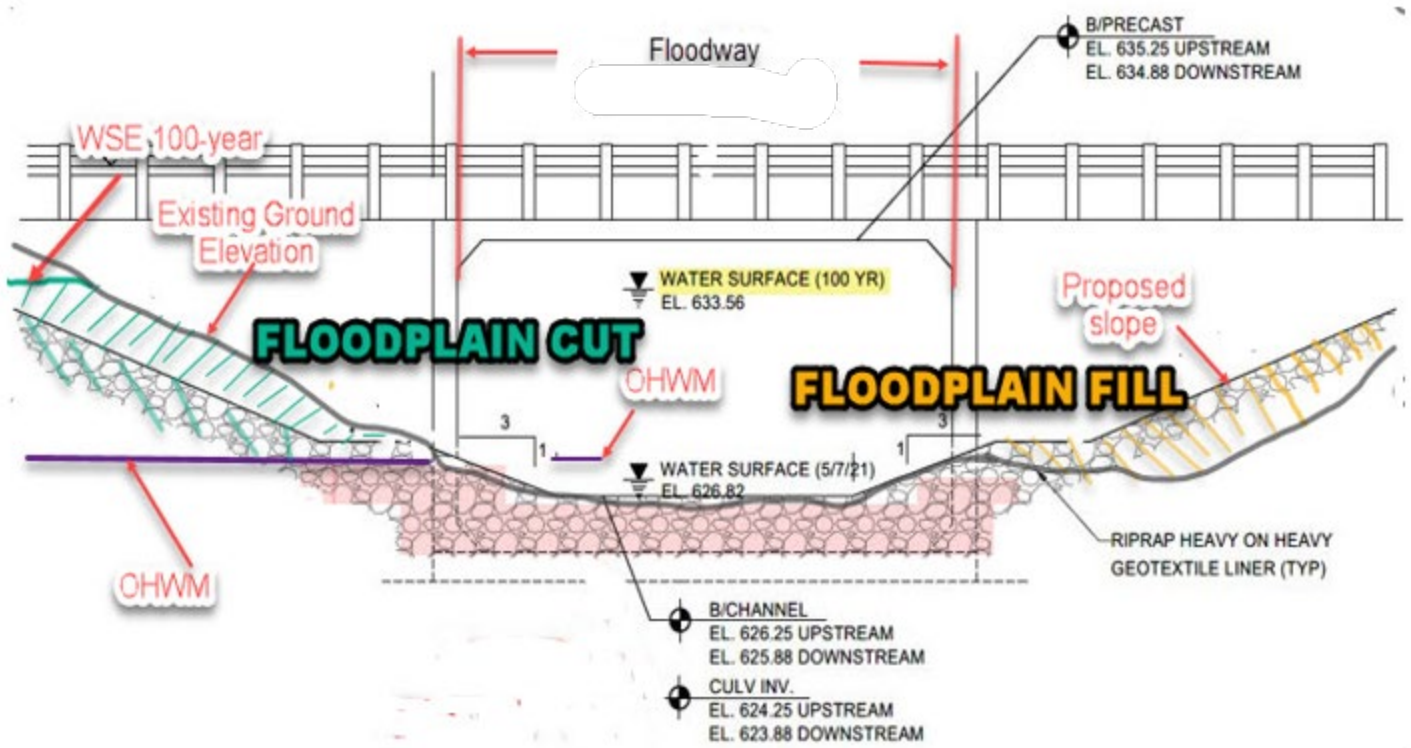
- A reduction in the efficiency of the entrance condition (i.e., going from a headwall condition to a projecting or mitered end section.
- An extension onto an existing structure that exceeds 24 feet.
- A new culvert/bridge that is longer/wider than the existing structure.
- A change in slope.

6. Developing a floodway boundary in an area without a mapped floodway.

Additional:

For a project not located in a FEMA zone AE area, or where the 100-year floodplain elevation is not available, but the project has over 300 cubic yards net fill, hydraulic analysis/computation maybe needed to estimate the 100-year floodplain elevation for calculating the floodplain excavation and fill quantities.

Floodplain cut and fill



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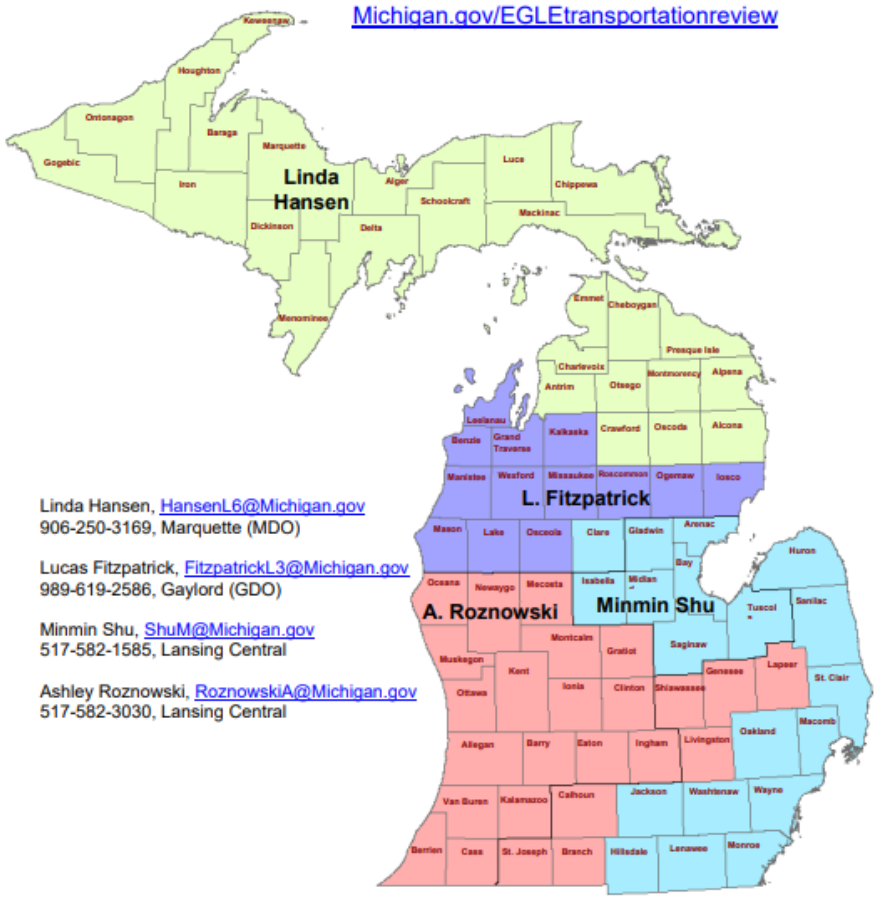
Besides Modeling, the Other Resources for the 100-year Floodplain Elevation

- FEMA zone AE
- USGS gages
- Dam safety report and plan
- From previous permitting file
- File floodplain service application to WRD for the floodplain elevation
- And more……

Transportation Project Hydraulic Review Staff



- Each project has its special point on hydraulic issues. You are welcome to discuss hydraulic modeling issues with the TRU engineer who covers the counties your project is located in.

MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

Hydraulic Review Submittal Requirements

Luke Fitzpatrick, PE, CFM
Gaylord/Cadillac District Floodplain Engineer

FitzpatrickL3@michigan.gov
989-619-2586

Submittal Components

HydraulicModel.zip

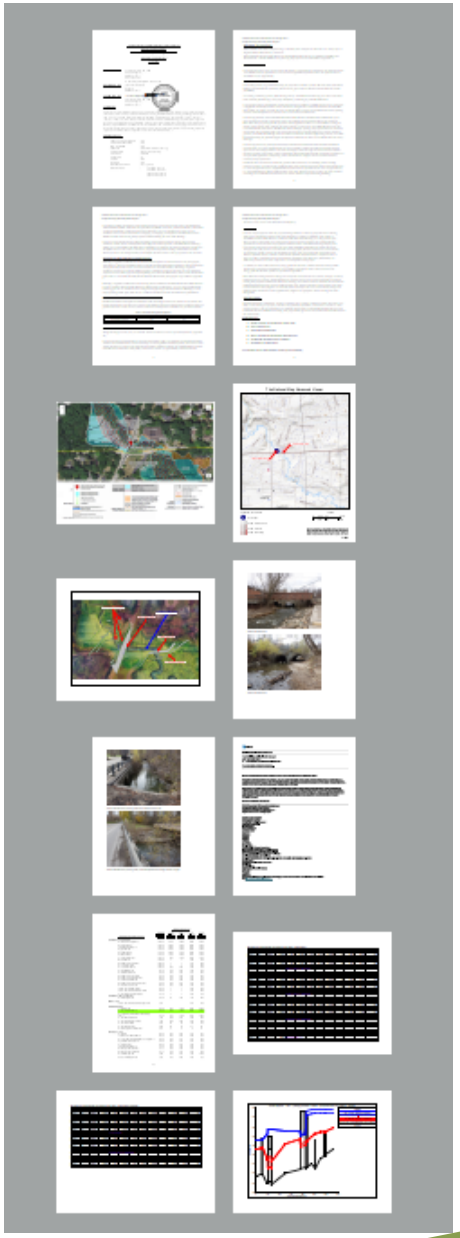
HydraulicReport.pdf

Supporting Documents

- Plans
- Cross Sections
  - EX vs PR alterations only
  - DO NOT PRINT ALL THE MODEL CROSS SECTIONS
  - May be included in plan set
- EGLE Flood Discharge Estimate
- Photographs
- Summary Ex vs Pr Results Table*
- Summary Ex vs Pr HGL/EGL Profile*

If Increase in EGL>0.005 feet

- Damage Assessment Certification
- Affected Property Owner Statements



Hydraulic Model

PLEASE GEOREFERENCE RAS MODELS

- HY-8
  - For **simple** bridge or culvert projects. No piers.
  - **No** other structures in immediate vicinity
  - **Not** when a flood stage increase is proposed
- HEC-RAS
  - For **simple or complex** projects
  - When other structures are in vicinity, piers, etc.
  - **Required** when a flood stage increase is proposed
- Upload into MiEnviro as .zip or .7z

EGLE

Hydraulic Model Format Guidelines

Acceptable*

- HEC-RAS 1D Steady Flow[1,2]
- HY-8[1]

Not Acceptable**

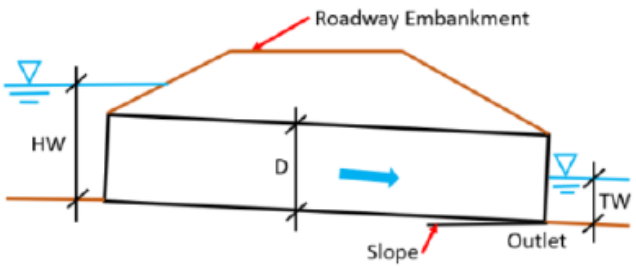
- 2D
- Unsteady Flow
- SWMM
- SMS
- Other

*1: culverts, 2: bridges (per MDOT Drainage Manual Ch 5, 6)

**Rare case by case, discuss with your district floodplain engineer BEFORE submitting an alternate model format.

EGLE

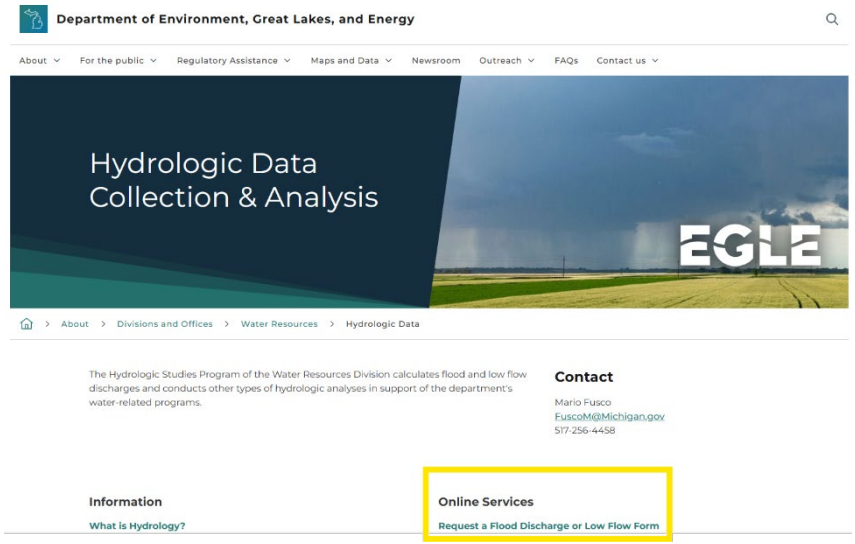
Hydraulic Model (continued)



- Existing + Proposed Conditions Model Runs
- Label Plan Names Clearly
- Delete Trial Runs
- Temporary Conditions Model Run if Appropriate
- Only use flows recently obtained from **EGLE Flood Flow Request**

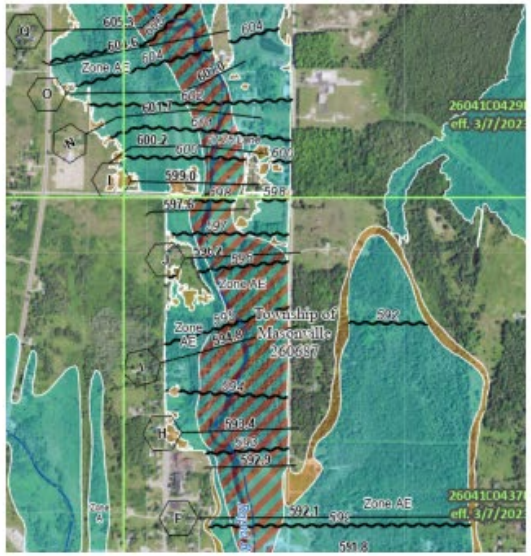
EGLE

Request Flood Discharge



- EGLE discharge estimates are valid for 1 year only
- Use downstream most location or make separate requests for multiple structures or long reaches
- Hydraulic Reports must include a range of discharges up to and including the 100-year flood discharge (R323.1313 3(c))

Hydraulic Model for FEMA Detailed Flood Study Areas



- **Detailed Flood Study Areas** have:
  - Mapped Floodways
  - Published Elevations
- FEMA's HEC-RAS model must be used for your model runs

***IF DIGITAL MODEL AVAILABLE**

- Obtain from the "FEMA Engineering Library" online
- Required as part of CFR regulations that govern NFIP.
- Keeps NFIP Communities in compliance with NFIP.

EGLE

Hydraulic Model for FEMA Detailed Flood Study Areas (continued)

REQUIRED MODEL RUNS

***IF DIGITAL MODEL AVAILABLE**

1. Duplicate Effective:
   - *Currently Effective FEMA model with NO changes*
2. Corrected Effective:
   - *Corrects errors in Duplicate Effective*
   - *Add cross-sections where needed*
   - *Add more detailed topography*
3. Existing Conditions:
   - *Add changes to floodplain since date of Effective model*
   - *If no changes – is the same as Corrected Effective*
4. Proposed Conditions:
   - *Add proposed project changes to geometry*
5. Temporary Conditions (if needed):
   - *For temporary fill and structures such as causeways and temporary piers*

EGLE

Hydraulic Model for FEMA Detailed Flood Study Areas (continued)

Considerations:

- All model run changes should be supported by documentation (survey data, plans, etc.)
- Changes to the models shall be limited to project area stream reach
- ~~Projects altering the mapped floodway or causing increases to the Base Flood Elevation requires applicant to obtain a CLOMR from FEMA prior to EGLE permit issuance.~~

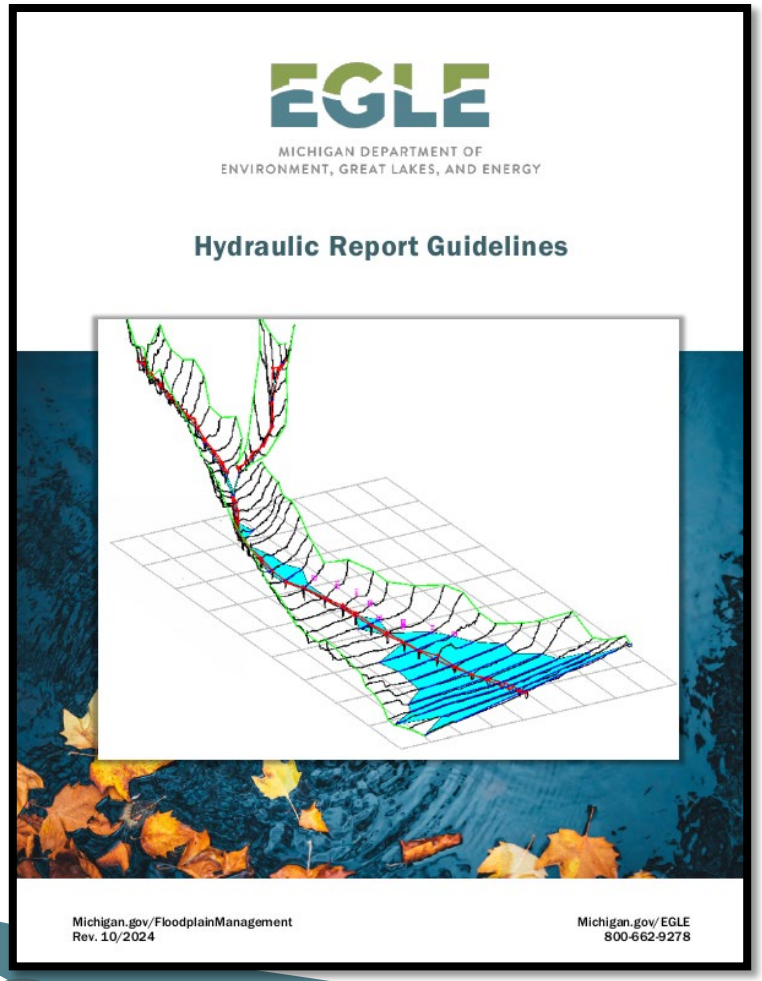
EGLE

Common Issues

- Do not separate RAS project files. Use one project file with multiple plan files for ex, pr, temp conditions
- Cross sections should span the whole floodplain and use USGS LIDAR to extend cross sections beyond survey extent if needed
- Remember to use ineffective flow areas
- Remember to use pressure/weir method when applicable
- Remember to use internal bridge cross section editor when needed
- Remember to account for skew when applicable

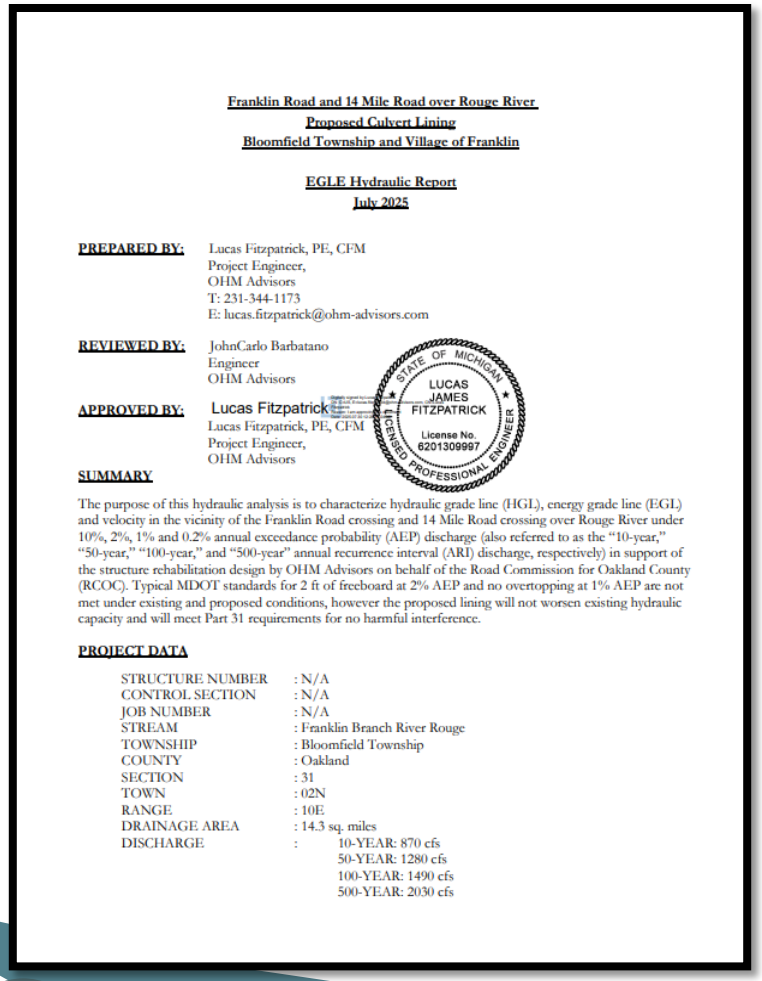
EGLE

Hydraulic Report



- Must be submitted for every Hydraulic Review
- Sealed by a PE licensed in Michigan
- Required contents listed in EGLE's Hydraulic Report Guidelines (rev10/2024)

Hydraulic Report



Franklin Road and 14 Mile Road over Rouge River
Proposed Culvert Lining
Bloomfield Township and Village of Franklin

EGLE Hydraulic Report
July 2025

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STATE OF MICHIGAN
LUCAS JAMES FITZPATRICK
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LICENSED PROFESSIONAL ENGINEER

SUMMARY

The purpose of this hydraulic analysis is to characterize hydraulic grade line (HGL), energy grade line (EGL) and velocity in the vicinity of the Franklin Road crossing and 14 Mile Road crossing over Rouge River under 10%, 2%, 1% and 0.2% annual exceedance probability (AEP) discharge (also referred to as the "10-year," "50-year," "100-year," and "500-year" annual recurrence interval (ARI) discharge, respectively) in support of the structure rehabilitation design by OHM Advisors on behalf of the Road Commission for Oakland County (RCOC). Typical MDOT standards for 2 ft of freeboard at 2% AEP and no overtopping at 1% AEP are not met under existing and proposed conditions, however the proposed lining will not worsen existing hydraulic capacity and will meet Part 31 requirements for no harmful interference.

PROJECT DATA

STRUCTURE NUMBER	: N/A
CONTROL SECTION	: N/A
JOB NUMBER	: N/A
STREAM	: Franklin Branch River Rouge
TOWNSHIP	: Bloomfield Township
COUNTY	: Oakland
SECTION	: 31
TOWN	: 02N
RANGE	: 10E
DRAINAGE AREA	: 14.3 sq. miles
DISCHARGE	: 10-YEAR: 870 cfs 50-YEAR: 1280 cfs 100-YEAR: 1490 cfs 500-YEAR: 2030 cfs

- Introduction – 5Ws
- Method of Analysis (RAS or HY8)
- Upstream and Downstream Modeling Limits and Boundary Conditions
- Variables, Coefficients, and Modeling Strategies
- Discussion of Findings, Warnings
- Conclusion and Harmful Interference Statement
- Supporting Docs

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Plans

Included as JPA Requirement -

- Do not duplicate the plan set for hydraulic review submittal if already uploaded to MiEnviro

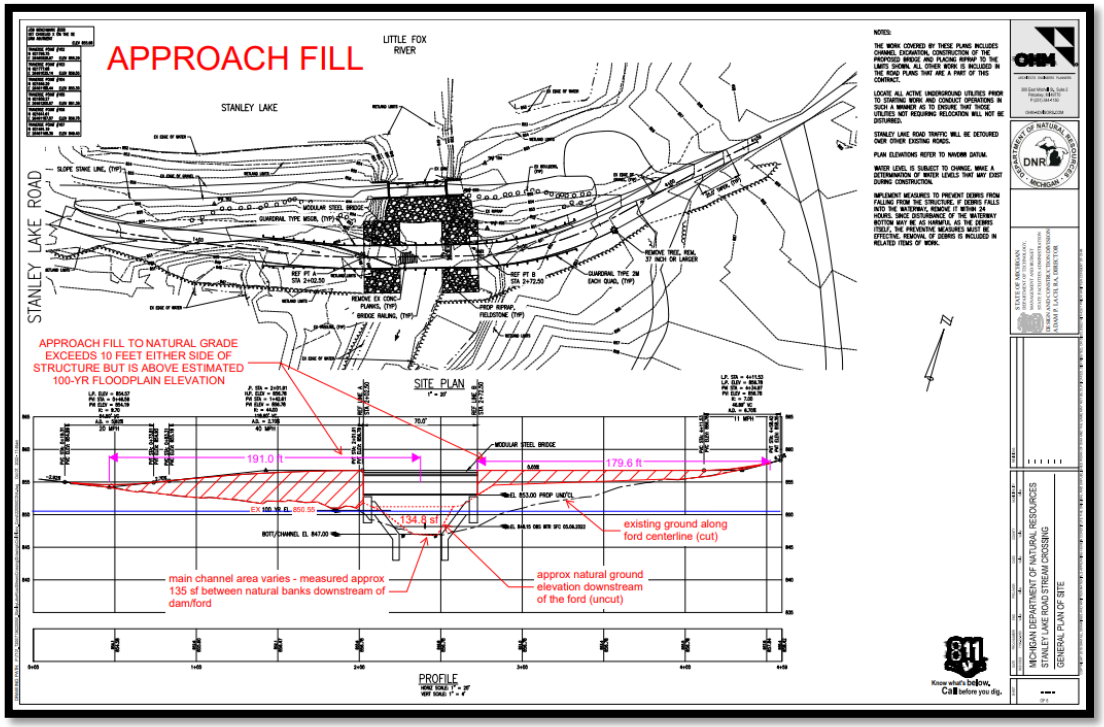
Must Include Existing and Proposed Conditions

- Include contours

Plan Dimensions should match JPA quantities and hydraulic model

Specific impact callouts are helpful to match to the JPA and to the model

*****IF YOU DO NOT GOREFERENCE THE HYDRAULIC MODEL, YOU MUST INDLUDE THE MODEL CROSS SECTION LOCATIONS IN THE PLANS*****



CERTIFICATIONS

HYDRAULIC CAPACITY

- Option for meeting MP criteria for new or replacement culverts and bridges
- Must provide supporting documentation
- R 323.1312 Applicability of Rules (e) and (f)

DAMAGE ASSESSMENT

- Required if proposed project causes an increase in EGL>0.005 feet
- Michigan PE must certify that the increase is non-harmful
- If increase outside of applicant's properties, Affected Property Owner Statements required

EGLE

Temporary Conditions

- Common temporary construction impacts are covered under MP51 Temporary Construction, Access, and Dewatering
  - In stream barriers limited to 14 days
  - “the crest of the barrier shall be placed at an elevation that will not cause upstream flooding”
- Hydraulic analysis may be needed to demonstrate compliance with MP51 for barriers that block or isolate flow
- Temporary culverts and bridges are not included in this category

Temporary Bridges and Culverts

From a hydraulics perspective **a temporary proposed condition is still a proposed condition**, and you must show that it will not cause harmful interference up to the 100-year flood discharge.

Temporary structures are evaluated the same as permanent structures for hydraulic modeling requirements; however, applicants may choose to design temporary conditions such that obstructions may be feasibly removed or modified in response to high water conditions according to an approved emergency action plan in lieu of using a temporary structure sized to pass the 100-year discharge.