



I-270 over the Mississippi River

Phase I Study - Addendum

Madison County

Technical Report A – Location Drainage Study



Location Drainage Study I-270 over Mississippi River

Route: I-270 (FAI 270)
Bridge Replacement
Mississippi River

PTB: 174-014
Project Location: Madison County / City of St. Louis
Section: 60B-1
Job Numbers: P-98-001-15

Prepared For:



**Illinois Department
of Transportation**

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Submittal Date: October 7, 2020



Illinois Department of Transportation

Location Drainage Study

PROJECT ROUTE: I-270 (FAI 270)
LIMITS: 740+00 to 874+53 (East of Lilac Avenue to West of Waterworks Road)
MUNICIPALITY/COUNTY: Madison, IL and St. Louis, MO; Madison County, IL
JOB NUMBER: P-98-001-15

PREPARED FOR: IDOT Region 5, District 8
Horner & Shifrin, Inc.
Parsons

PREPARED BY: Millennia Professional Services

DATE: October 7, 2020

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LOCATION DRAINAGE STUDY CHECKLIST

Project Route: FAI 270

Limits: 740+00 to 8774+53 (Between Lilac Avenue / Waterworks Road)

Municipality/County: City of Madison, City of St. Louis / Madison County, St. Louis

Job Number: P-98-001-15 (Section 60B-1)

*See ACEC 2014 scope tasks for further information.

0-00 OVERALL PROJECT SCOPE (Provide a brief description of the overall project.)

The project proposes to replace the existing Chain of Rocks Bridge.

The I-270 Bridge over Mississippi River Project consists of removing the existing I-270 Chain of Rocks Bridge over the Mississippi River located near Madison County, Illinois, which was built in 1962 with repairs in 1973, 2011; and replacing it with a new structure, adjacent to the existing structure.

Project limits are from approximately Sta. 740+00 on the west end (in Missouri) to Sta. 905+18 on the east end (in Illinois) of the I-270 main line alignment. Significant improvements and revised alignments are planned at the Riverview Drive intersection as well. The following report and supporting documentation outlines the methods and resulting recommendations regarding the various drainage components of the project during this phase.

1-00 EXISTING DRAINAGE SYSTEM (see Exhibit 1-00a, General Location Drainage Map;
☒ Exhibit 1-00b, Existing Drainage Plan)
(If Exhibit 1-00b is not available, provide a brief description) N/A

1-01 IDENTIFIED DRAINAGE PROBLEMS (see Appendix C)

☒ Yes (continue below) ☐ No (delete below)

1-01.1 Description: As per correspondence with the owner of the closed landfill south of the existing culvert at Station 843+24, the landfill cannot be cut into with new ditches or storm sewers.

Responsibility ☒ IDOT ☐ Others

Action (describe recommendation below)

The landfill south of the existing culvert at Station 843+24 prevents straight aligned extensions from draining directly at landfill, so extending the culvert requires skewed extension. Recommendation is to extend the culvert with skewed extension; reconstruct slide gate on south end.

☒ Incorporate into the Study
(See Section 2-05 and/or Section 2-07)

1-02 IDENTIFIED BASE FLOODPLAINS (see Exhibit 1-02a Flood Boundary and Floodway Map or Flood Insurance Rate Map and Section 3-00)

The Flood Insurance Rate Map for County of Madison & St. Louis was examined for identified base floodplains which were either traversed by or adjacent to (I-270) which were either:

Floodplains ☒ Yes ☐ No

Floodways ☒ Yes ☐ No

1-03 MAJOR DRAINAGE FEATURES (see Exhibit 1-00a)

1-03.1 Bridges

Location: 779+57.61 to 833+40.72 (I-270 Chain of Rocks Bridge)

Structure No.: 060-0035

Hydraulic Report Prepared by Parsons in (December, 2017)

Waterway Information Table Available:

☒ Yes (Exhibit 1-03.1a)
☐ No

Narrative Summary:

The existing structure is a 43-span steel plate girder bridge that conveys the non-navigable portion of the Mississippi River. The bridge has not been susceptible to overtopping. Clearance and freeboard policies are currently met at the 50-year storm by the superstructure. Sensitive flood receptors are present, as noted in the Hydraulic Report. A pattern of degradation was detected in the main channel and the long-term scour depth was determined to equal approximately 6-feet.

1-03.2 Major Culvert Crossings (refer to 1-03.1 and LDS Task Description for information, as applicable)

Location: 745+00 to 750+50 (15' x 12' Box Culvert - Watkins Creek)

Structure No.: N/A

Hydraulic Report Prepared by FEMA

Waterway Information Table Available:

- ☒ Yes (Exhibit 1-03.2a)
☐ No

Narrative Summary:

Culvert was studied as part of Flood Insurance Study, and Waterway Information Table profile is from FIS. Per the FIS, the roadway is not subject to overtopping. Clearance is not provided for the culvert, but the roadway is significantly higher than the design storm flood event, so freeboard is provided per policy.

1-03.3 Pump Stations (N/A)

1-03.4 Reservoirs/Detention Facilities (N/A)

1-03.5 Depressed Road (N/A)

1-03.6 Channels and Zone A Floodplains (N/A)

2-00**PROPOSED DRAINAGE SYSTEM** (☒ Exhibit 2-00a, Proposed Drainage Plan)**2-01 DESIGN CRITERIA** (☒ Exhibit 2-01a - Typical Existing Cross Section.

☒ Exhibit 2-01b - Typical Proposed Cross Sections, if not available, provide a brief description)

Check all that apply:

☒ New Construction ☒ Reconstruction ☐ 3R Projects (Non-Freeways)

☒ 3R Projects (Freeways)

(Provide beginning/ending stations for all new construction, reconstruction, and 3R project scope)

1. Proposed storm sewer conveyance systems will be designed for a (50-year in Illinois, 20-year in Missouri) storm frequency with a velocity between 3 ft/sec and 10 ft/sec. For storm sewers oversized for detention minimum velocity is 2 ft/sec.

☒ Yes ☐ No ☐ N/A

Justification for non-compliance:

2. Proposed ditches will be designed for a 50 year storm frequency and desirable ditch grades will be no less than 0.5%.

☐ Yes ☒ No ☐ N/A

Justification for non-compliance:

Portions of existing ditches have slopes that are less than 0.5%. In the proposed condition, it is not possible to construct a ditch within the ROW without using slopes that are less than 0.5%.

Non-compliance Locations:

I-270 - 774+00 to 782+00:

Ditch along north side of west bound off ramp drains to the east with slopes that are negative or 0.0%. Adjusting the grades is not feasible without modifying grades at the Mississippi River bank.

I-270 - 837+00 to 843+24:

The outlet from the culvert at 843+24 drains to the west with slopes that are negative or 0.0%. Adjusting the culvert higher is not feasible since it would cause further flooding upstream.

Riverview Drive - 326+00 to 335+50:

The outlet from the culvert at 335+50 drains to the south with slopes that are negative or 0.0%. Adjusting the grades is not feasible without modifying grades at the downstream swale, and subsequently the Mississippi River bank.

3. The roadway edge of pavement at the low grade point in a floodplain area for highways with a Design Hourly Volume (DHV) of 100 or more shall be a minimum of three feet above design headwater elevation.

☒ Yes ☐ No (BDE 3100 Required) ☐ N/A

Justification for non-compliance: N/A

4. It is required that a minimum clearance of two (2) feet be established between the design high water and the low beam elevation of bridge structures. The bottom of the bridge super structure shall not be below the all-time high water elevation for the new freeway and expressway construction.

☒ Yes ☐ No (BDE 3100 Required) ☐ N/A

Justification for non-compliance: N/A

5. The waterway openings of bridges and culverts will be designed for a (50) year storm frequency.

☒ Yes ☐ No ☐ N/A

Justification for non-compliance: N/A

6. The vertical alignment for curbed pavements will have a minimum grade of 0.3% and a drainage maximum "K" value of 51 (167 English Unit).

☒ Yes ☐ No ☐ N/A

Justification for non-compliance: N/A

7. Minimum Pavement cross slopes will be 1.5% to 2% per BDE Manual Section 34.2.01 (b).

☒ Yes ☐ No ☐ N/A

Justification for non-compliance: N/A

List every design exception separately, cite the presentation at the FHWA meeting and cite a copy of the meeting minutes included in Appendix C.

If the scope of work is changed during the P.S.& E. stage, the appropriate drainage design exemption approval, if any, will be processed through the Hydraulics Section by the District's Bureau of Design.

2-02 OUTLET EVALUATION

Unless otherwise noted below, the various outlets within the limits of the subject improvement were determined to be suitable for continued use under proposed conditions without modifications or the provision of storm water detention.

Unsuitable outlets: ☒ Yes (continue below) ☐ No (delete below)

Location: 837+00 to 866+00 (Landfill)

Source: Box Culvert and Open Ditches

Evaluation: Roadway slope extensions require adjustment of drainage along landfill.

Recommendation Skew culvert extension, and place excavated ditches outside landfill.

Sensitive (receptor to rate, volume, and/or water quality) outlets:

☒ Yes (continue below) ☐ No (delete below)

Location: 774+00 to 782+00 (Wetlands)

Source: Open Ditches

Evaluation: Roadway on/off ramp slope extensions require regrading swales.

Recommendation Minimize disturbance; mitigate required disturbance.

Location: 841+00 to 865+00 (Wetlands)

Source: Open Ditches

Evaluation: Roadway on south slope extensions require regrading swales.

Recommendation Minimize disturbance; mitigate required disturbance.

2-03 STORM WATER DETENTION ANALYSIS

This project has been reviewed in accordance with Drainage Manual, Section 1-304.03 "Storm Water Storage".

2-03.1 Evaluation

☐ No storm water detention required

Comments (provide a brief explanation and delete below):

☒ Storm water detention required (continue below)

Diversion

Location:

Comments:

Unsuitable outlets (see Section 2-02)

Location:

Sensitive outlets (see Section 2-02)

Location:

2-.03.2 Recommendation

Detention Ponds ☒ Yes (continue below) ☐ No (delete below)

Outlet 1-7

Calcs Cu. Yds. (10) year storm Frequency

Pond location: Finalize in Phase II

Outlet 8

Calcs Cu. Yds. (10) year storm Frequency

Pond location: Finalize in Phase II

Outlet 9-11

Calcs Cu. Yds. (10) year storm Frequency

Pond location: Finalize in Phase II

Storage Pipes ☐ Yes (continue below) ☒ No (delete below)

Oversizing storm sewers/ditches ☐ Yes (continue below) ☒ No (delete below)

Control structure schematics – To be designed in Phase II

☐ Yes ☒ No

2-04 RIGHT OF WAY ANALYSIS

☒ Yes ☐ No

Additional right of way is required to accommodate the proposed drainage system. (If no, delete below).

Location: 774+00 to 783+00 – Offset 400' RT

Description: Parcel 9121-00-2600-0 (City of St. Louis Map), new drainage ditch for new I-270 east bound on ramp

Location: 833+40 to 842+50 – Offset Varies 210' to 350' RT

Description: Parcels 18-1-13-36-00-000-001 and 18-1-13-36-00-000-001.001 (Madison County Map), new drainage ditch for extended I-270 slope

Location: 833+40 to 848+00 – Offset Varies 850' to 1,000' LT

Description: Parcels 18-1-13-25-00-000-006; 18-1-13-25-00-000-007; and 18-1-13-36-00-000-004 (Madison County Map), new compensatory storage basin.

The right of way requirements have been coordinated and accepted by the Project and Environmental Studies Section.

☒ Yes ☐ No

A drainage easement(s) is required to accommodate the proposed drainage system (If no, delete below).

Location: 836+50 to 837+50 – Offset 450' RT

Description Parcel 18-1-13-36-00-000-005 (Madison County Map), connect new drainage ditch to existing ditch

The drainage easement(s) have been coordinated and accepted by the Project and Environmental Studies Section.

2-05 DRAINAGE ALTERNATIVES (Briefly describe each alternative and justify the selection)

- Open drainage (ditches / swales) were selected at the outside lanes as the primary drainage feature for cost and simplicity of construction.
- Existing Riverview Drive right-of-way slopes at the Gas Station northwest of the I-270 interchange and the existing residential property southwest of the I-270 interchange were prohibitive to open drainage. Curbs and storm sewers were utilized to accommodate the existing properties.
- The use of an interstate highway median barrier with storm sewers or median open ditches was discussed, and the median barrier was selected for use to be consistent with recent highway projects within the District.
- Multiple iterations of the bridge alignment were evaluated by the roadway design team. The preferred alignment factored in preliminary drainage concepts provided prior to selection of the preferred alignment.

2-06 LOCAL AND OTHER AGENCY COORDINATION (see Appendix C)

☒ Yes	☐ No	Local ordinances considered
☒ Yes	☐ No	Joint participation
☐ Yes	☒ No	Sewer separation
☐ Yes	☒ No	Jurisdictional transfer
☐ Yes	☒ No	Letter of intent required/processed/approved
☒ Yes	☐ No	Coordination completed and comments provided.

Comments:

Within the City of St. Louis, the Metropolitan St. Louis Sewer District requires storm sewers to be designed to the 20-year, 20-minute storm, "Rules and Regulations and Engineering Design Requirements for Sanitary Sewer and Stormwater Drainage Facilities."

The project's joint participation is between IDOT and MoDOT.

A meeting was held between IDOT and the Metropolitan St. Louis Sewer District. MSD will require review of the Phase II Design Plans. It is anticipated that all project improvements with Missouri will be completed within the MoDOT right-of-way.

Additional updates to the LDS report will be necessary upon review coordination to be provided by MoDOT at a future date.

2-07 PROPOSED DRAINAGE PLAN

2-07.1 Roadway Drainage

Ditches and Swales

☒ Yes ☐ No

Regrade/reestablish existing ditches/swales

Limits:

I-270

741+00 to 745+60 - Median

Comments: Regrade ditch existing inlet to median barrier wall.

741+00 to 742+50 - LT

Comments: Regrade grass ditch between concrete swales.

837+50 to 863+40 - RT

Comments: Reestablish grass ditch.

883+00 to 905+00

Comments: Reestablish ditch to meet policy ditch requirements and not disturb existing Waterworks Rd.

Riverview

312+00 to 316+00 - RT

Comments: Reestablish ditch for new onramp.

☒ Yes ☐ No

Construct new ditches/swales

Limits:

I-270

752+00 to 780+00 – LT & RT

Comments: Construct ditches for new onramps / offramps

833+40 to 837+50 – RT

Comments: Construct ditch for extended I-270 slope.

Riverview

312+00 to 316+00 – LT

Comments: Construct ditches for new offramp

Storm Sewers

☒ Yes ☐ No

Utilize existing storm sewers with minor extensions and/or adjustment of existing drainage structures

Limits: 741+00

Comments: Connect new median storm sewer to existing.
Limits: 748+00

Comments: Connect new median storm sewer to existing.
Limits: 757+50

Comments: Connect new median storm sewer to existing.
Limits: 845+10

Comments: Connect new median storm sewer to existing.
Limits: 860+50

Comments: Connect new median storm sewer to existing.
Limits: 863+00

Comments: Connect new median storm sewer to existing.
873+25

Comments: Connect new median storm sewer to existing.
883+20

Comments: Connect new median storm sewer to existing.
891+50

Comments: Connect new median storm sewer to existing.

☐ Yes ☒ No

Replace/relocate/upsized existing storm sewers

Limits:

Comments:

☒ Yes ☐ No

Abandon existing storm sewers

Limits:

I-270
764+00 to 771+37 - LT

Comments: Existing storm sewers currently drain westbound onramp, and will be replaced with open drainage ditch.

☒ Yes ☐ No

Construct new storm sewers (e.g. converting from an open drainage system to closed drainage system)

Limits:

I-270

745+60 to 771+37 - Median

773+69 to 779+57 - Median

833+40 to 891+00 - Median

Comments: Grass median ditch converted to paved median with barrier wall and storm sewers.

Combined Sewers

☐ Yes ☒ No

Utilize existing combined sewers with minor extensions and/or adjustment of existing drainage structures

☐ Yes ☒ No

Replace/relocate existing combined sewers

Outlets

☒ Yes ☐ No

Regrade/reestablish/maintain existing outlets

Locations: Missouri – Outlets 1-7

Comments:

Locations: Illinois – Outlets 8-11

Comments:

☐ Yes ☒ No

Construct new outlets

Locations and types:

Comments:

Cross Road Culverts

☒ Yes ☐ No

Maintain/replace/extend existing cross road culverts

Locations: 843+24, 859+00, 883+40 and 894+00

Comments:

☐ Yes ☒ No

Construct new cross road culverts

Locations:

Comments:

Other Items

☒ Yes ☐ No

Construct/modify special drainage structures/sewers

Locations/Limits and types: 843+24 and 859+00 Box Culvert End Sections

Comments: Slide gates constructed on existing structures. Construct new slide gates on extended structures.

2-07.2 Proposed Action for all Major Drainage Features

2-07.2.1 Bridges

Location: 779+57.61 to 833+40.72 (I-270 Chain of Rocks Bridge)

Structure No. 060-0035

Hydraulic Report Prepared by: Parsons

Waterway Information Table Available:

☒ Yes (Exhibit 1-03.1a)
☐ No

Narrative Summary:

The existing I-270 structure will be replaced with dual structures, each carrying only one direction of traffic. The proposed structure will be a 24-span, 5,389-foot long steel plate girder bridge. The waterway opening is proposed as 197,994 square feet, and no overtopping is proposed at the maximum calculation flood event (500-year). A clearance value of 9-feet and freeboard value over 4-feet are proposed for the bridge.

2-07.2.2 Major Culvert Crossings

Location: 745+00 to 750+50 (15' x 12' Box Culvert - Watkins Creek)

Structure No. N/A

Hydraulic Report Prepared by: FEMA

Waterway Information Table Available:

☒ Yes (Exhibit 1-03.2a)
☐ No

Narrative Summary:

No changes are proposed to the existing structure.

2-07.2.3 Pump Stations (N/A)

2-07.2.4 Reservoirs/Detention Facilities

Location: Station 856+50 – Design Detention in Phase II

2-07.2.5 Depressed Road

Location: Station 770+50 – Median Storm Sewer Inlets (50-year Design)

Location: Station 866+85 – Median Storm Sewer Inlets (50-year Design)

2-07.2.6 Channel and Zone A Floodplain (N/A)

2-08 WATER QUALITY BEST MANAGEMENT PRACTICES (BMP) PERMANENT MEASURES

☐ Yes ☒ N/A Identification of USACE and other Federal/State BMP Requirements
Comments: Permits identified in I-270 Bridge Hydraulic Report.

☐ Yes ☒ N/A Coordination with Project & Environmental Studies
Comments:

☒ Yes ☐ No Did you coordinate with other agencies? If yes, list them here
Comments: MSD indicated MoDOT operates as own MS4.

3-00 FLOODPLAIN ENCROACHMENT EVALUATION

The proposed project has been reviewed in accordance with Executive Order 11988 "Floodplain Management"; Section 26-7.05(d) "Assessment and Documentation of Floodplain Encroachments" as contained in the Illinois Department of Transportation, Bureau of Design and Environment Manual; Drainage Manual; and 17 Illinois Administration Code 3700 "Construction in Floodways of Rivers, Lakes and Streams."

☐ No Potential Floodplain Encroachment (delete below)

☒ Potential Floodplain Encroachment (continue below)

3-00.1 Location of base floodplain: Station: 771+00 to 905+18 Stream: Mississippi River
(see Exhibit 1-02a & 1-02b, Flood Insurance Rate Maps 2903850018C / 1704360135B)

Type of potential encroachment

☒ Transverse ☒ Longitudinal

Overtopping elevation

☒ greater than 100 year frequency flood elevation

☐ less than 100 year frequency flood elevation

Fill or Excavation in the floodplain, fringe, or floodplain if no floodway:

☒ Yes (continue below) ☐ No (delete below)

Location: 833+50 to 905+18 will fill in floodplain by extending roadway slopes

Fill in the floodway:

☐ Yes (continue below) ☒ No (delete below)

Compensatory storage for fill in the floodway

☐ Yes (continue below) ☒ No (delete below)

Category: (assess floodplain encroachments to identify an appropriate category)

Fill occurs in Mississippi River fringe floodplain only (Zone AE).

Evaluation: (assess and characterize floodplain encroachments in accordance with BDE Manual Section 26-7.05 (c))

Project I-270 plan is the Only Practicable Alternative Finding:

- The project action must be located in the floodplain. The I-270 Project is considered an essential part of the metro transportation corridor, and no alternate routes are available that do not cross the floodplain.
- The only viable alternative is a no-build option. This was not considered a practicable option.
- The project action conforms to applicable State and Local floodplain protection standards.
- Project I-270 roadway will provide more than 3-feet of freeboard from 100-year flood, and will be elevated above the 500-year flood.

3-00.2 Location of base floodplain: Station: 742+00 to 752+00 Stream: Watkins Creek
(see Exhibit 1-02c, Flood Insurance Rate Map – Panel 29189C0089K)

Type of potential encroachment

☒ Transverse ☐ Longitudinal

Overtopping elevation

☒ greater than 100 year frequency flood elevation

☐ less than 100 year frequency flood elevation

Fill or Excavation in the floodplain, fringe, or floodplain if no floodway:

☐ Yes (continue below) ☒ No (delete below)

Location: 833+50 to 874+53 will fill in floodplain by extending roadway slopes

Fill in the floodway:

☐ Yes (continue below) ☒ No (delete below)

Compensatory storage for fill in the floodway

☐ Yes (continue below) ☒ No (delete below)

Category: (assess floodplain encroachments to identify an appropriate category)

Existing project is located within Zone AE.

Evaluation: (assess and characterize floodplain encroachments in accordance with BDE Manual Section 26-7.05 (c))

Project I-270 plan is the Only Practicable Alternative Finding:

- The project action must be located in the floodplain. The I-270 Project is considered an essential part of the metro transportation corridor, and no alternate routes are available that do not cross the floodplain.
- As no changes to the project are proposed at this location, the viable alternative of no-build is considered a practicable option.
- The project action conforms to applicable State and Local floodplain protection standards.
- Project I-270 roadway will provide more than 3-feet of freeboard from 100-year flood, and will be elevated above the 500-year flood.

4-00 ILLINOIS DEPARTMENT OF NATURAL RESOURCES

OFFICE OF WATER RESOURCES (IDNR-OWR) PERMIT

☒ Required (continue below) ☐ Not Required (delete below)

☒ Individual Permit

Location: I-270 Bridge over Mississippi River.

☐ Statewide Permit #

Location:

☐ Floodway Permit

☐ Regulated Floodway Construction Permit

Location:

☐ Regional Permit #1

Location:

☐ Regional Permit #2

Location:

☐ Regional Permit #3

Location:

☐ Permit Summary form completed and included in Appendix C

☐ IDNR-OWR coordination documented and included in Appendix C

5-00 Appendix A: Source Data Reviewed

USGS Maps*

- Columbia Bottom - Quadrangle Map

As Built Plans***

- Metropolitan St. Louis Sewer District GIS Map 10D - July 6, 2017
- MotoMart Convenience Center & Restaurant As-Built - June 2, 2009

Highway Plans**

- Proposed Highway Plans, FAI Route 270, I-270 over Chain of Rocks Canal - June 17, 2011
- Plans for Federal Aid Highway, FAI Route 270 Section 60-1 - July 19, 1961

Flood Insurance Study*

- St. Louis County, Missouri (and Incorporated Areas) - February 4, 2015
- City of St. Louis, Missouri, Independent City - May 24, 2011
- Madison County, Illinois (and Unincorporated Areas) - October 15, 1981

Proposed Geometrics**

- Prepared by HornerShifrin & Parsons for the project limits and transmitted to IDOT under separate submittal.

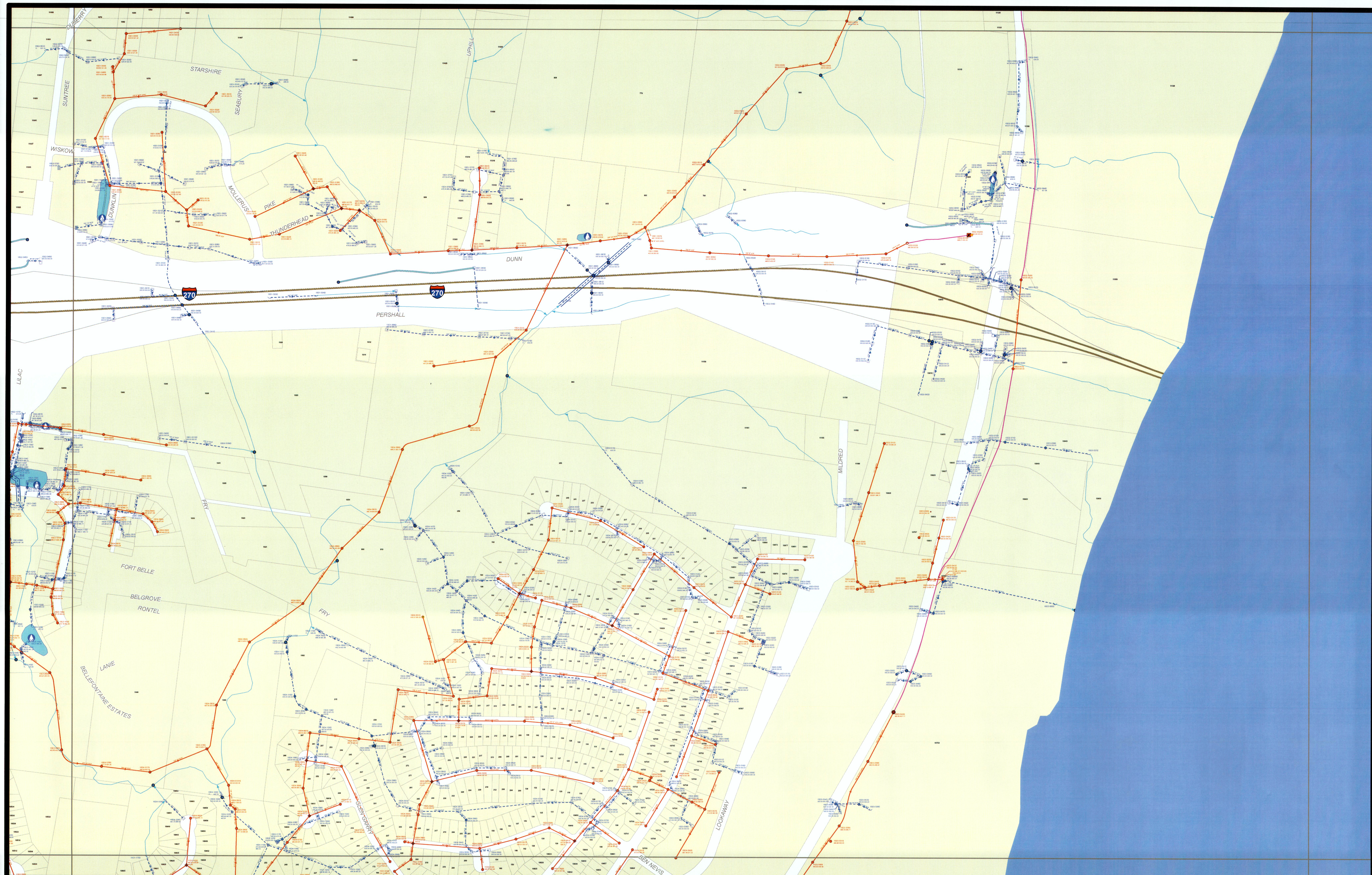
Other Studies**

- I-270 North Environmental Assessment, I-70 to the Chain of Rocks Bridge, St. Louis County, Missouri

* On file in the Hydraulics Section

** On file in the Project and Environmental Studies Section

*** Transmitted to the Bureau of Design



STRUCTURES			
○ MANHOLE	□ CONSTRUCTED SSO SIGN	● FITTING	□ SSP - COMBINATION
⊕ DROP MANHOLE	□ SINGLE INLET	○ CLEANOUT	□ SSP - PUMP
⊕ BREAKOVER MANHOLE	□ DOUBLE INLET	⊕ EMERGENCY TRUCK CONNECTION	□ SSP - CHECK VALVE
⊕ DETENTION ACCESS	□ MULTIPLE INLET	⊕ FLUSHING STRUCTURE	⊕ PUMP - FORCE
⊕ FORCEMAIN DISCHARGE	⊕ GRATED INLET	⊕ PIGGING STATION	⊕ PUMP - LOW PRESSURE
⊕ FLEX VALVE MANHOLE	⊕ DOUBLE GRATED INLET	⊕ AIR RELEASE	⊕ PUMP STATION - FORCE
⊕ CONSTRUCTED SSO	⊕ INTAKE/OUTFALL	⊕ SIMPLE CHECK VALVE	⊕ PUMP STATION - LOW PRESSURE
		⊕ ACCESS SHAFT	⊕ DIVERSION CHAMBER
		⊕ DROP SHAFT	
		⊕ AIR VENT	
		⊕ GATE WELL	
		⊕ PLUG	
		⊕ SLUICE GATE	
		⊕ RELIEF WELL	
		⊕ INTERCEPTOR	
		⊕ HYDRODYNAMIC SEPARATOR	
		⊕ VALVE JUNCTION BOX	
		⊕ STORM NETWORK JUNCTION	
		⊕ ISOLATION	
		⊕ UNDERGROUND ENCLOSURE	
		⊕ TREATMENT PLANT	
		⊕ SINK HOLE	

HAZARDOUS

- DO NOT ENTER
- ⚠ CAUTION
- ☢ RADIOACTIVE
- ⚠ DO NOT ENTER
- ⚠ CAUTION
- ☢ RADIOACTIVE

PIPES

- COMBINED
- SANITARY
- STORM
- FORCE MAIN
- IMPROVED CHANNEL
- UNIMPROVED CHANNEL

WARNING

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NOTE:

STRUCTURE SYMBOLIZATION AND COLOR ARE DETERMINED BY BOTH SEWER NETWORK THAT IT PARTICIPATES IN AND THE COLOR OF THE PRINT AND MAY VARY FROM SYMBOLIZATION USED IN OTHER MAPS PRODUCES BY MSD. ANY UNKNOWN STRUCTURE TYPES ARE REPRESENTED BY A QUESTION MARK (?).

CONFIDENTIAL INFORMATION RELATING TO HOMELAND SECURITY ISSUES. DO NOT DUPLICATE NOR DISTRIBUTE WITHOUT PERMISSION. TREAT AS CLASSIFIED INFORMATION.

FACILITIES MAPS	MAP NO.
METROPOLITAN ST. LOUIS SEWER DISTRICT	10D
GIS MAPPING	7/6/2017

-FINAL MEASUREMENT DRAWING-

PART OF LOT 7 OF BENJAMIN F. WATKINS SUBDIVISION, RECORDED IN PLAT BOOK 9 ON PATE 37 OF THE CITY OF ST. LOUIS RECORDS, AND LOCATED IN SURVEY 114, T 47 N, R 7 E OF THE 5TH P.M., ST. LOUIS COUNTY, MISSOURI

MSD Project: RIVERVIEW & DUNN (MOTOMART)
MSD Ref# P-0027615-00
MSD Base Map: 10-D-2

LEGEND

- CURB OR AREA INLET
- MANHOLE
- AB AS BUILT
- FM FORCE MAIN
- SS SANITARY SEWER
- SS STORM SEWER
- SS STORM SEWER

DESCRIPTION KEY

PR. TOP: XXX.XX: INDICATES PROPOSED TOP
PR. INV: XXX.XX: INDICATES PROPOSED INVERT
EX. TOP: XXX.XX: INDICATES AS-BUILT TOP
EX. INV: XXX.XX: INDICATES AS-BUILT INVERT



S 8°39'31" W 423.85'

S 81°20'29" E 250.00

S 81°20'29" E 250.00

N 41°30'53" E 91.70

N 10°18'52" E 338.00

SCALE
HORIZ. 1"=20'
VERT. 1"=5'

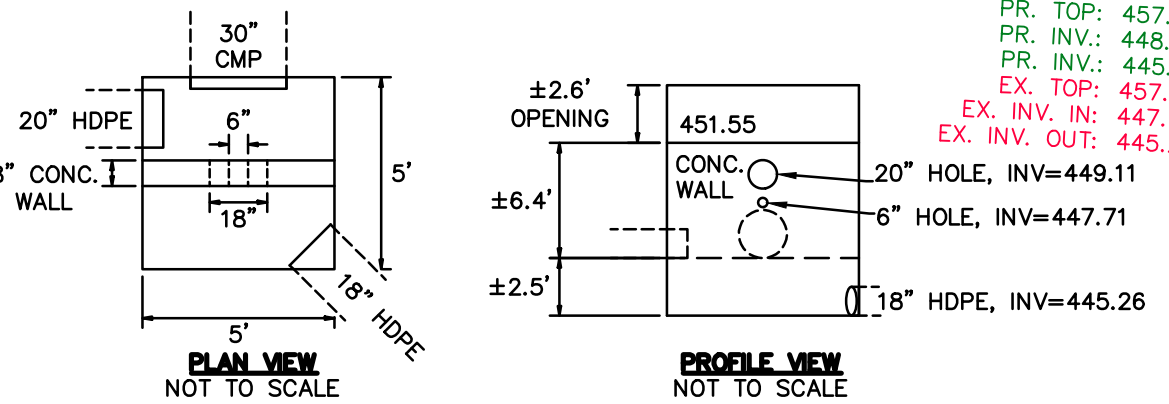
The existing sewer lengths, sizes, flowlines, depths of structures and sewers and locations with respect to existing or proposed easement have been measured. The results of those measurements are shown on this set of Final Measurement plans. Since the wye locations have been plotted from information provided by the sewer contractor or other sources, I disclaim any responsibility for that specific information.

All public sewers are located within designated existing or proposed easements.

ERIC R. OLSON, P.E.
MISSOURI CERT. NO. 028164

Date: _____

OUTFLOW STRUCTURE DETAIL



REV. FEB. 2009-MSD REVIEW LETTER DATED 01/12/2009

REV. FEB. 2009-MSD REVIEW LETTER DATED 01/12/2009

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NEW MOTOMART CONVENIENCE CENTER AND RESTAURANT
FOR MOTO, INC - RIVERVIEW STORE

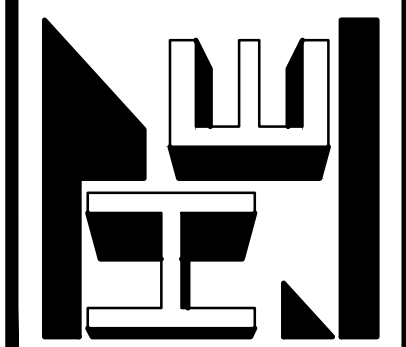
OWNER - F&G OIL
721 WEST MAIN STREET
BELLEVILLE, ILLINOIS 62220

JOB NO 05-0224A

SHEET NO 1

OF 1

DATE	02-16-2009
DRAWN	JDD
CHECKED	DLW
APPROVED	ERO



Hoelscher Engineering, P.C.
11 Executive Drive Suite 12
Fairview Heights, Illinois 62208
(618)24-8610 FAX: (618)24-8611

ISSUANCE NO	DATE	DESCRIPTION	APPROVED
1	16/2/2009	MSD ASBUILT SURVEY	

5-00 Appendix B: Exhibits

General Location Drainage Map, Exhibit 1-00a

Existing Drainage Plan, Exhibit 1-00b

Flood Insurance Rate Maps, Exhibits 1-02a, 1-02b, 1-02c

- FIRM Panel 2903850018C - City of St. Louis, Missouri
- FIRM Panel 1704360135B - Monroe County, Illinois
- FIRM Panel 29189C0089K - St. Louis County, Missouri

Waterway Information Table, Exhibits 1-03.1a, 1-03.1b

- I-270 Mississippi River Bridge Crossing
- Watkins Creek FIS Profile

Proposed Drainage Plan, Exhibit 2-00a

Typical Existing Cross Sections, Exhibit 2-01a

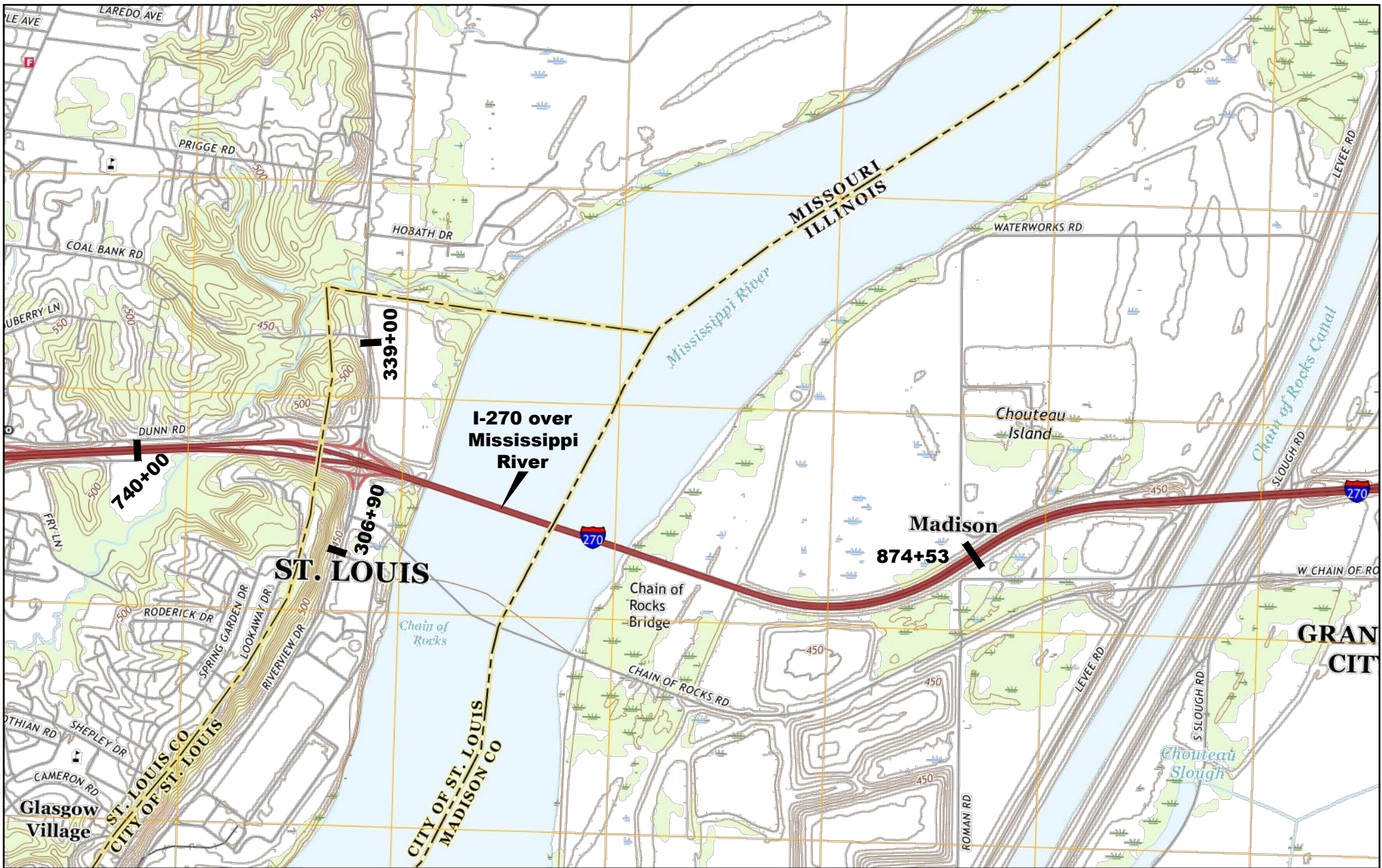
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Typical Proposed Cross Sections, Exhibit 2-01b

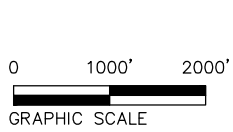
- Prepared by HornerShifrin & Parsons and also transmitted to IDOT under separate submittal.

Unsuitable and Sensitive Outlets Map, Exhibit 2-01c

- Prepared by HornerShifrin & Parsons and also transmitted to IDOT under separate submittal.



44 45 46 47 48 49 000E



USGS US TOPO 7.5-MINUTE MAP
COLUMBIA BOTTOM

GENERAL LOCATION DRAINAGE MAP
EXHIBIT 1-00a.1

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FA1270	60B-1	MADISON	15	1
FED. ROAD DIST. NO. 8	ILLINOIS	CONTRACT NO.	----	

P-98-001-15



LOCATION OF SECTION INDICATED THUS: - ■ -





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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
EXISTING
DRAINAGE PLAN
EXHIBIT 1-00b
I-270 BRIDGE
OVER MISSISSIPPI



T 4 N

R 10 W

LOCATION MAP

SYMBOL LEGEND

EXISTING

PROPOSED

REFERENCE LINE / CENTERLINE
AND STATIONING

RIGHT OF WAY LINE

INTERPRETED DRAINAGE AREA
TO OUTLET / SUB-DIVIDE

WETLAND AREA

DRAINAGE SUMMIT

FLOW DIRECTION

SWALE

SHALLOW CONC./GUTTER FLOW

DITCH

OUTLET

SHEET FLOW

OVERFLOW

STORM SEWER

CULVERT PIPE

CULVERT END SECTION

STORM CATCH BASIN

HEADWALL/ENDWALL

INLET

MANHOLE/VALVE VAULT

DRAINAGE BASIN ID
(TRIBUTARY TO OUTLET A,
SUB AREA 2)

WATER MAIN

ELECTRIC LINE

TELEPHONE LINE

GAS LINE

CABLE TV LINE

TREE

FIRE HYDRANT

LIGHT POLE

TELEPHONE POLE

UTILITY POLE

REGULATORY SIGN

CENTERLINE

FLOODPLAIN (ZONE A)

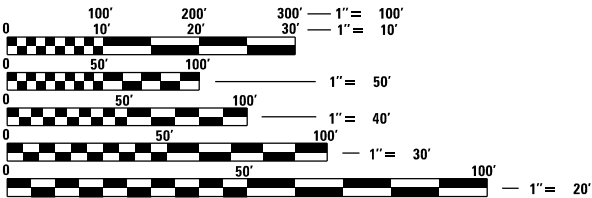
FLOODPLAIN (ZONE X)

EASEMENT

A.2 = xx AC.

A.2 = xx AC.

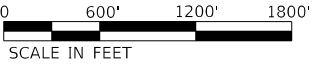
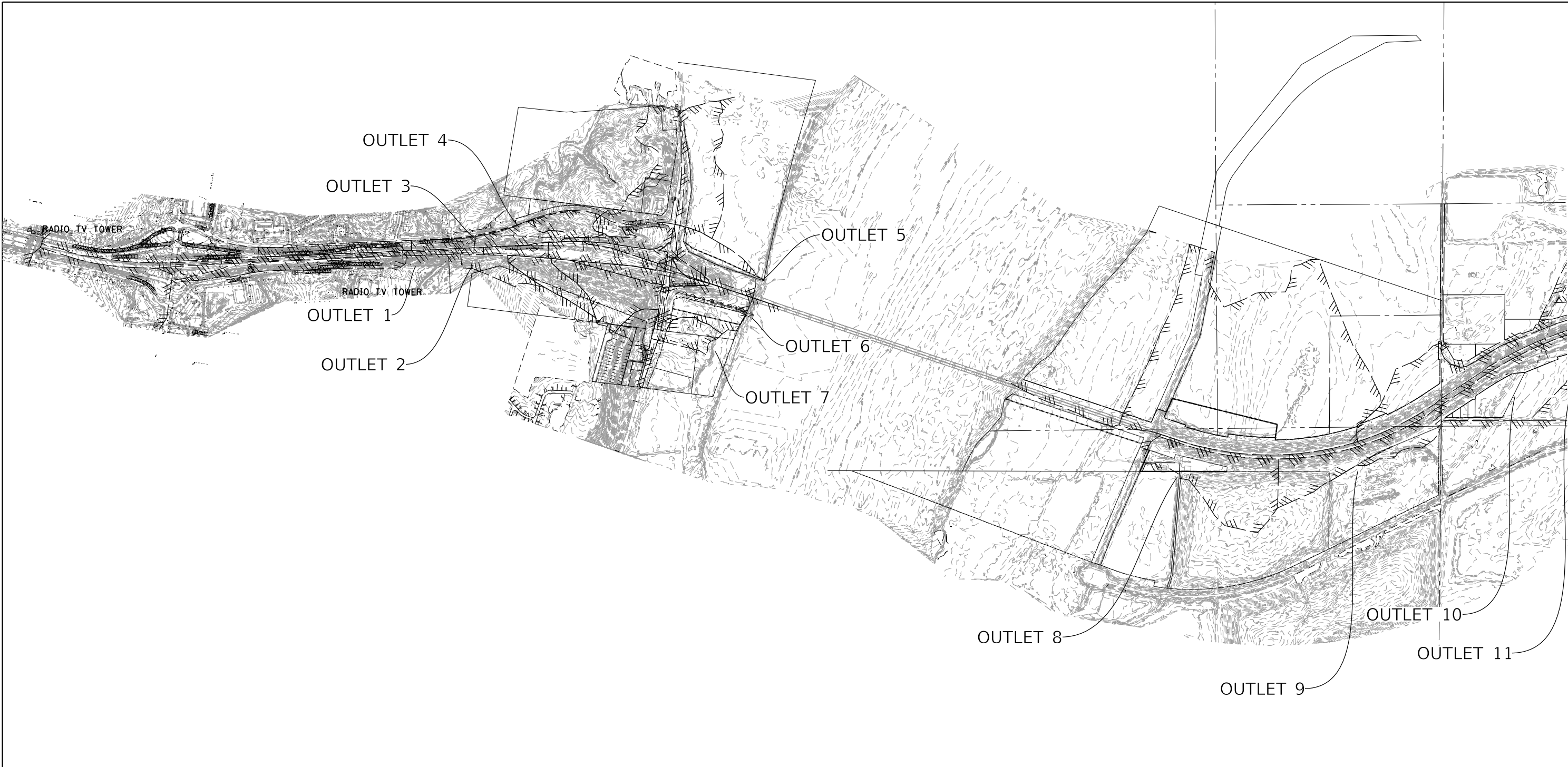
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FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD
ENGINEERING SCALES. REDUCED SIZED PLANS WILL NOT
CONFORM TO STANDARD SCALES. IN MAKING MEASUREMENTS
ON REDUCED PLANS, THE ABOVE SCALES MAY BE USED.

J.U.L.I.E.
JOINT UTILITY LOCATION INFORMATION FOR EXCAVATION
1-800-892-0123 OR 811

CONTRACT NO.



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CHECKED	-	MJR
DATE	-	6/19/2020

REVISED	-
REVISED	-
REVISED	-
REVISED	-

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

EXISTING DRAINAGE PLAN - OVERALL
I-270 OVER MISSISSIPPI

SCALE: 1"=600' SHEET NO. 2 OF 15 SHEETS STA. TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
270	60B-1	MADISON	15	2
P-98-001-15 CONTRACT NO.				
FED. ROAD DIST. NO. 8 ILLINOIS FED. AID PROJECT				



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USER NAME = tlopez
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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

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FED. ROAD DIST. NO. 8 ILLINOIS FED. AID PROJECT				

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USER NAME = glopez



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DATE	-	6/19/2020

REVISED	-
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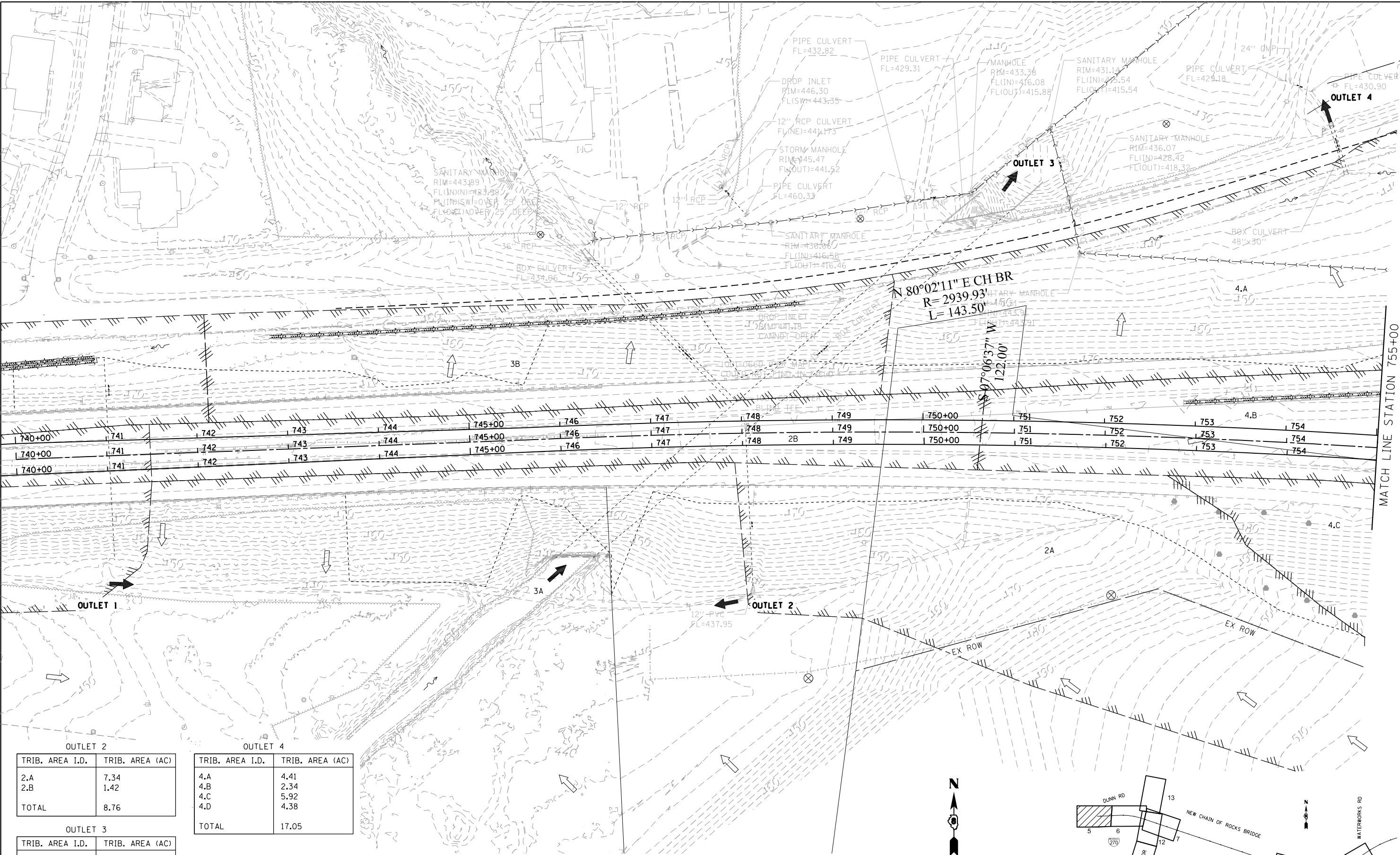
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

EXISTING DRAINAGE PLAN - OVERALL ILLINOIS
I-270 OVER MISSISSIPPI

SCALE: 1"=300'	SHEET NO. 4 OF 15 SHEETS	STA.	TO STA.
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F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
270	60B-1	MADISON	15	4
P-98-001-15		CONTRACT NO.		
FED. ROAD DIST. NO. 8 ILLINOIS FED. AID PROJECT				

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SHEET NAME = 50502



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2.A	7.34
2.B	1.42
TOTAL	8.76

TRIB. AREA I.D.	TRIB. AREA (AC)
4.A	4.41
4.B	2.34
4.C	5.92
4.D	4.38
TOTAL	17.05

TRIB. AREA I.D.	TRIB. AREA (AC)
3.A	5.67
3.B	2.04
TOTAL	7.71



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DATE - 3/20/2020	REVISED -

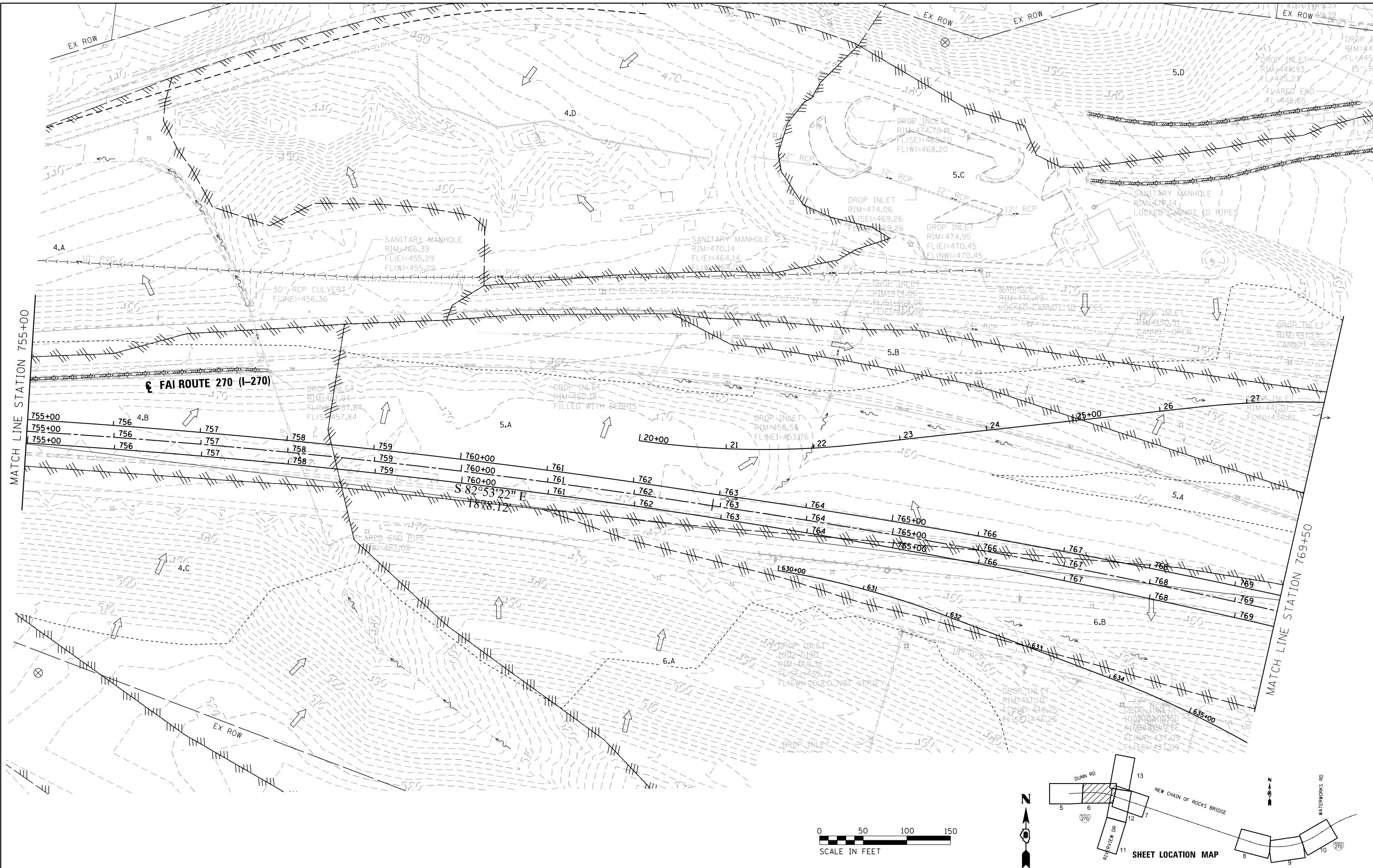
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

EXISTING DRAINAGE PLAN
I-270 OVER MISSISSIPPI

SCALE: 1"=50' SHEET NO. 5 OF 13 SHEETS STA. 740+00 TO STA. 752+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
270	60B-1	MADISON	13	5
P-98-001-15 CONTRACT NO.				
FED. ROAD DIST. NO. 8 ILLINOIS FED. AID PROJECT				

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DRAWN	- RAW	REVISED	-
CHECKED	- MJR	REVISED	-
DATE	- 3/20/2020	REVISED	-

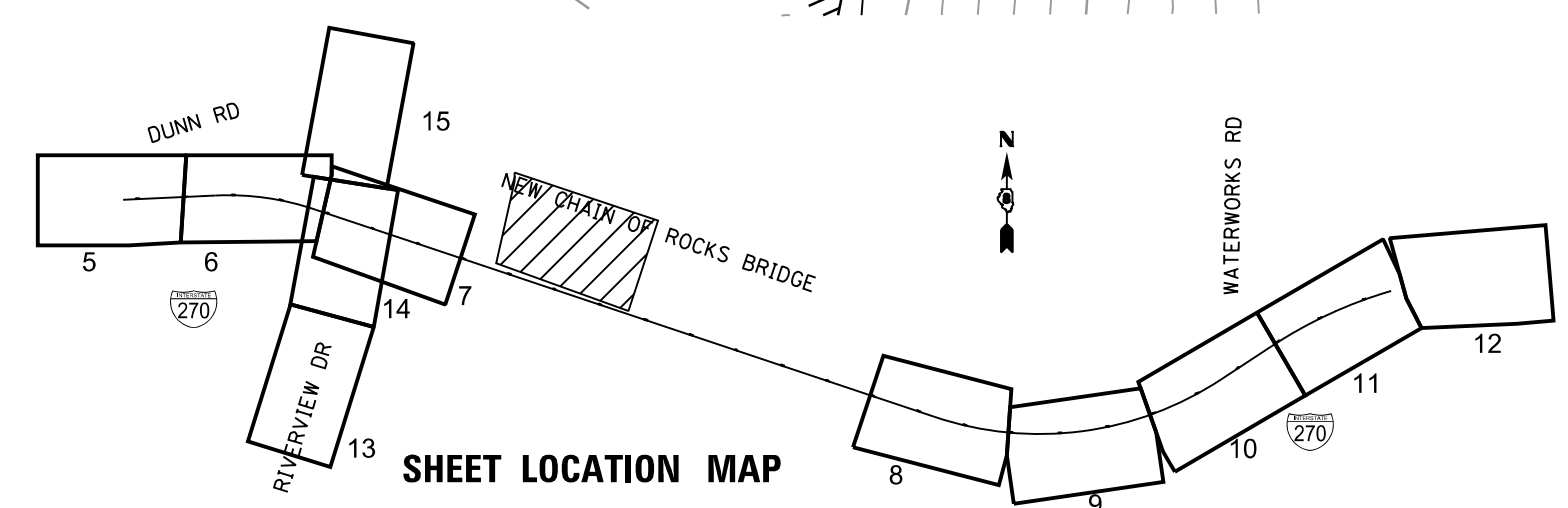
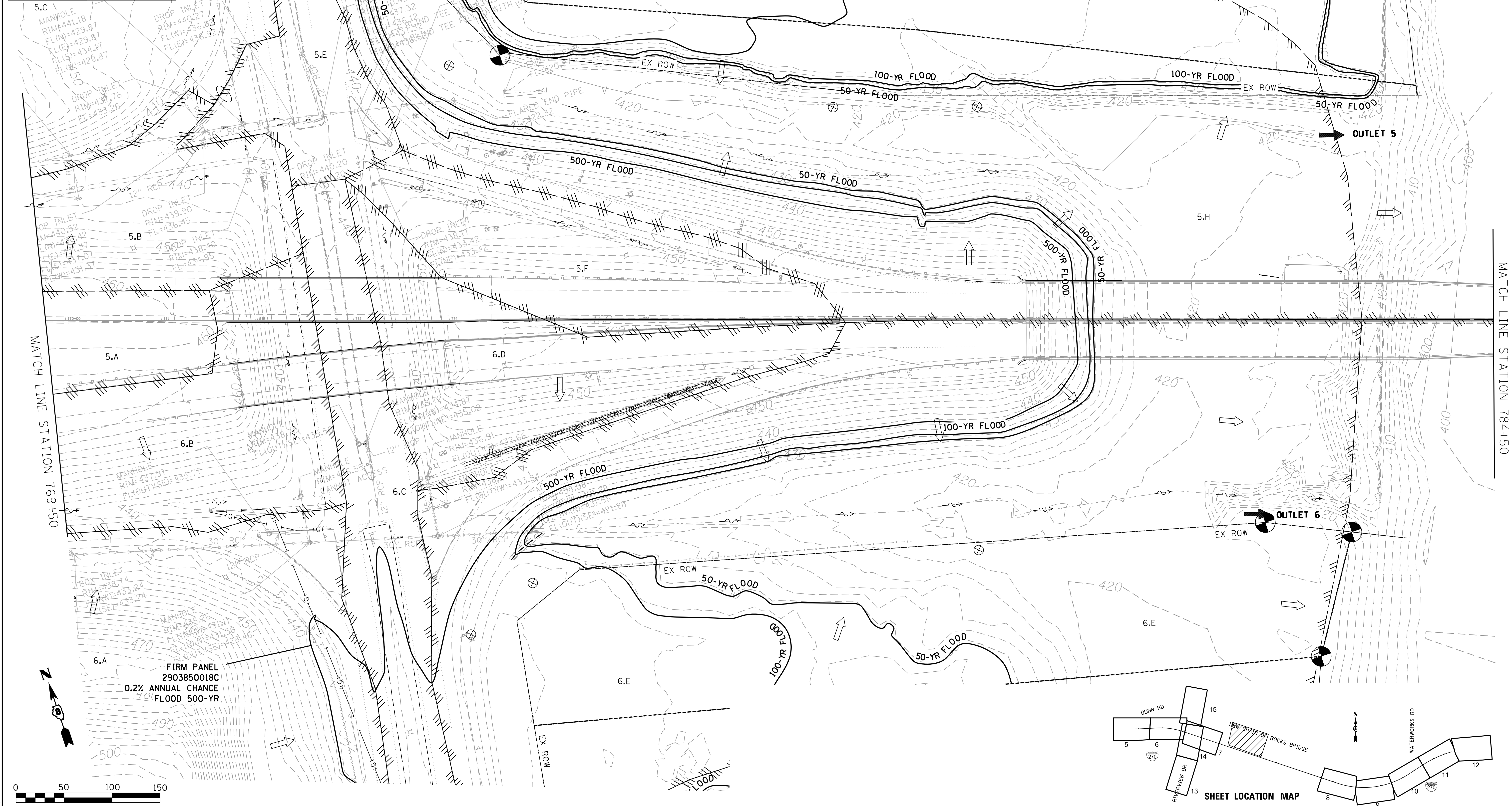
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-270 OVER MISSISSIPPI
SCALE: 1"=50'
SHEET NO. 6 OF 13 SHEETS
STA. 752+00 TO STA. 766+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
270	60B-1	MADISON	13	6
P-98-001-15 CONTRACT NO.				
FED. ROAD DIST. NO. 8 ILLINOIS FED. AID PROJECT				

OUTLET 5	
TRIB. AREA I.D.	TRIB. AREA (AC)
5.A	5.27
5.B	1.97
5.C	4.70
5.D	16.64
5.E	0.70
5.F	1.12
5.G	15.49
5.H	9.84
TOTAL	57.19

OUTLET 6	
TRIB. AREA I.D.	TRIB. AREA (AC)
6.A	11.80
6.B	2.78
6.C	1.41
6.D	1.30
6.E	9.80
TOTAL	27.10



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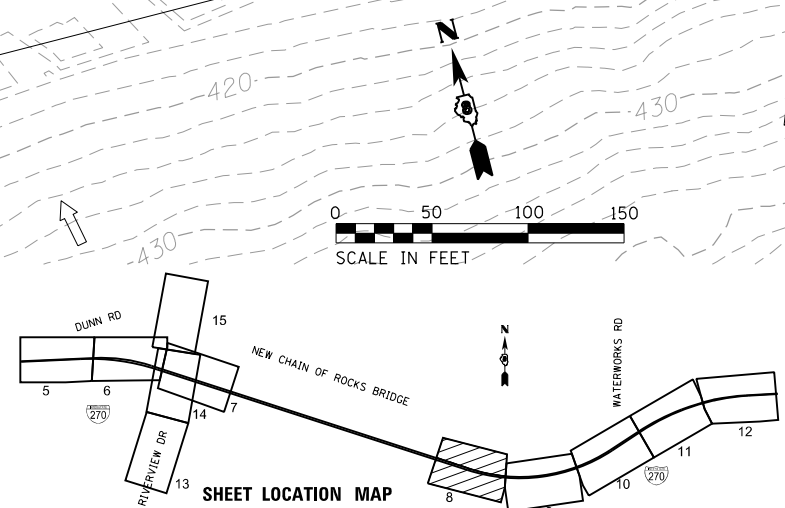
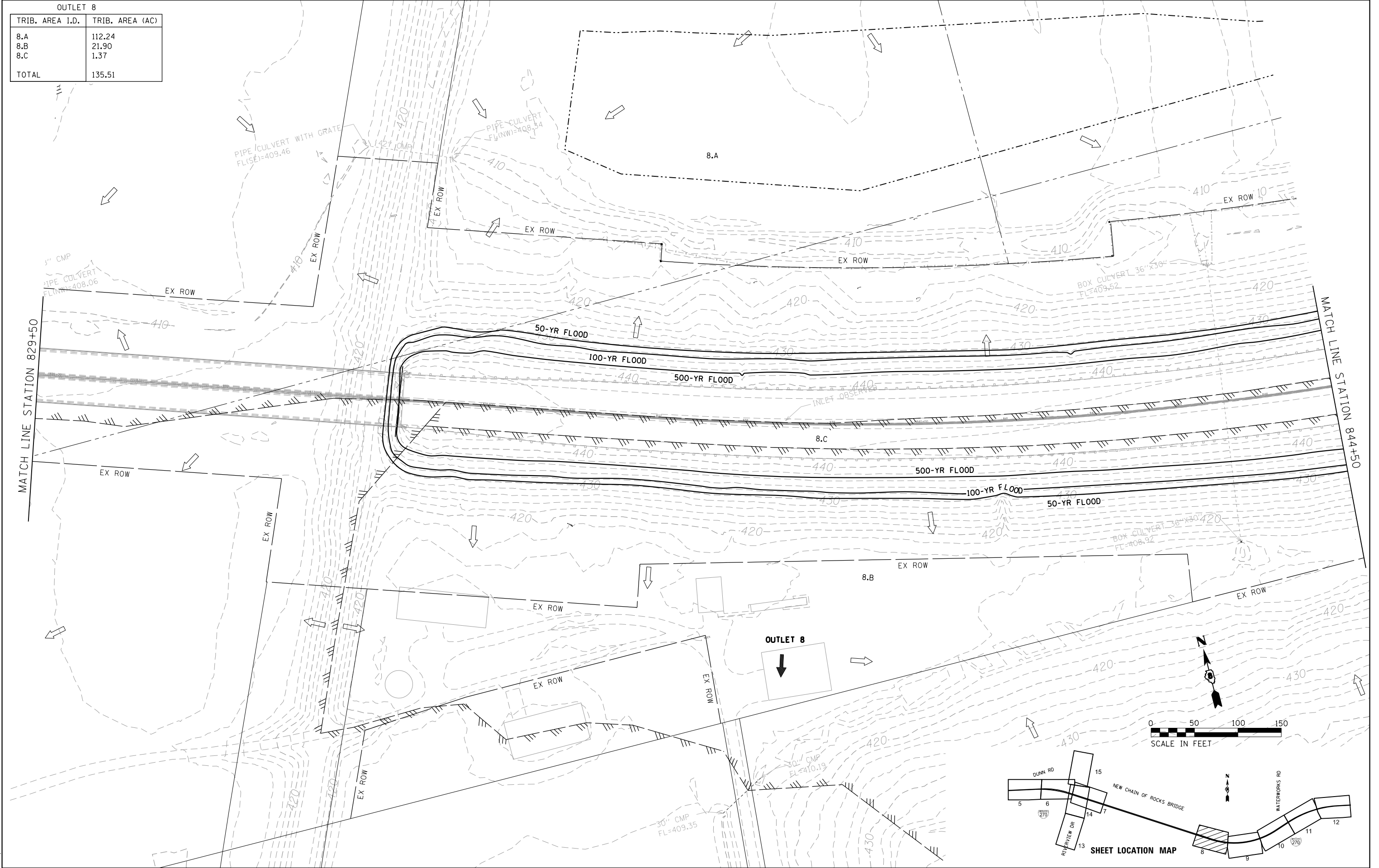
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DATE - 6/19/2020	REVISED -

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DEPARTMENT OF TRANSPORTATION

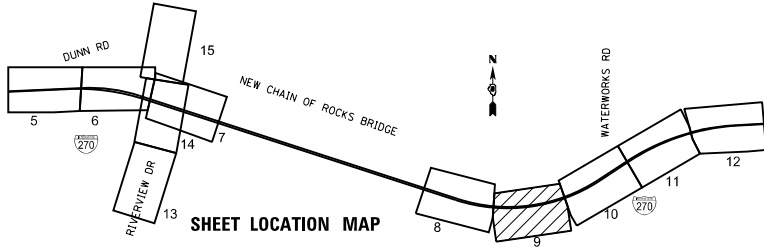
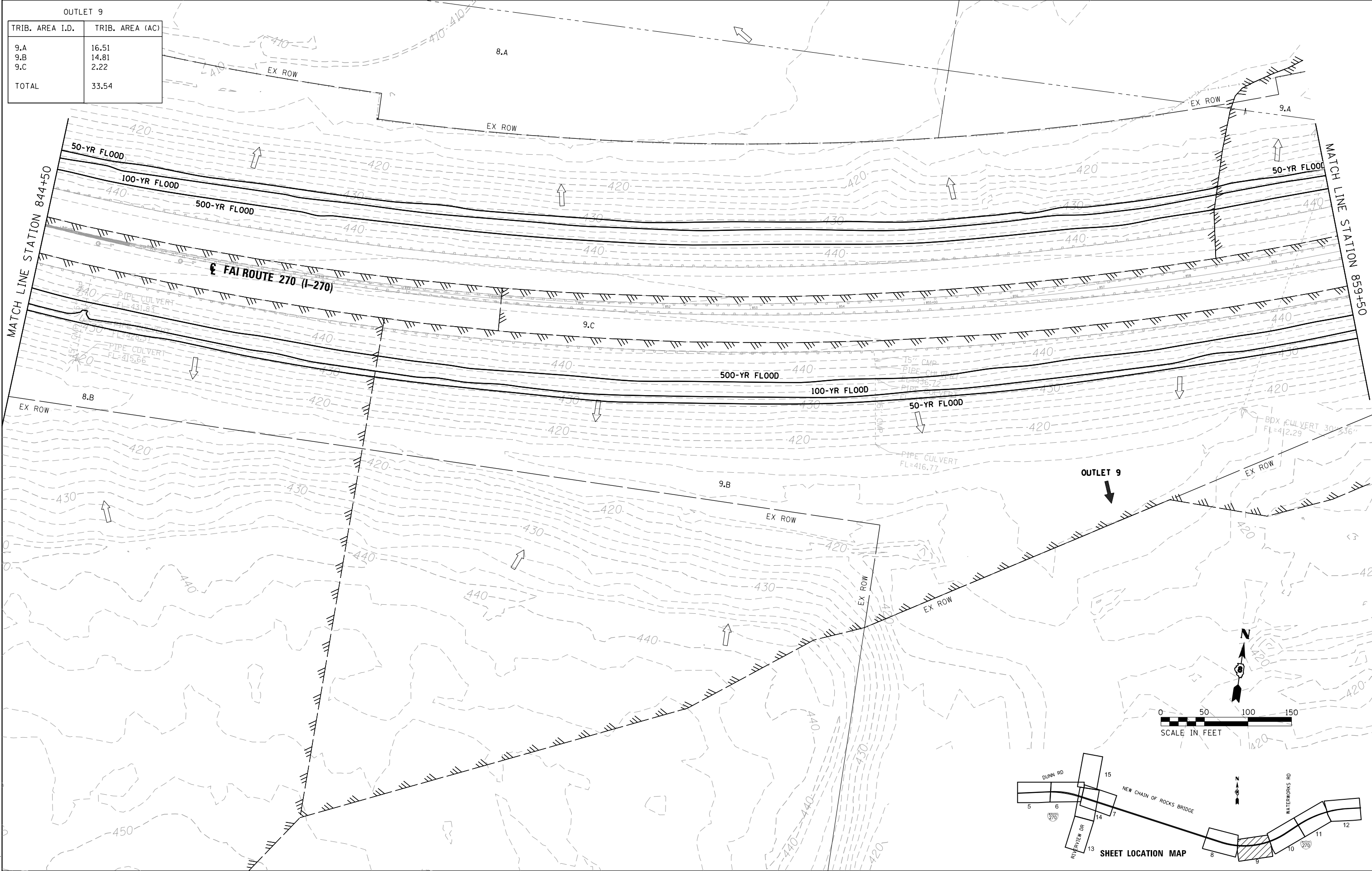
EXISTING DRAINAGE PLAN I-270 OVER MISSISSIPPI			
SCALE: 1"=50'	SHEET NO. 7 OF 18 SHEETS	STA. 766+00	TO STA. 780+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
270	60B-1	MADISON	15	7
P-98-001-15 CONTRACT NO.				
FED. ROAD DIST. NO. 8 ILLINOIS FED. AID PROJECT				

OUTLET 8	
TRIB. AREA I.D.	TRIB. AREA (AC)
8.A	112.24
8.B	21.90
8.C	1.37
TOTAL	135.51

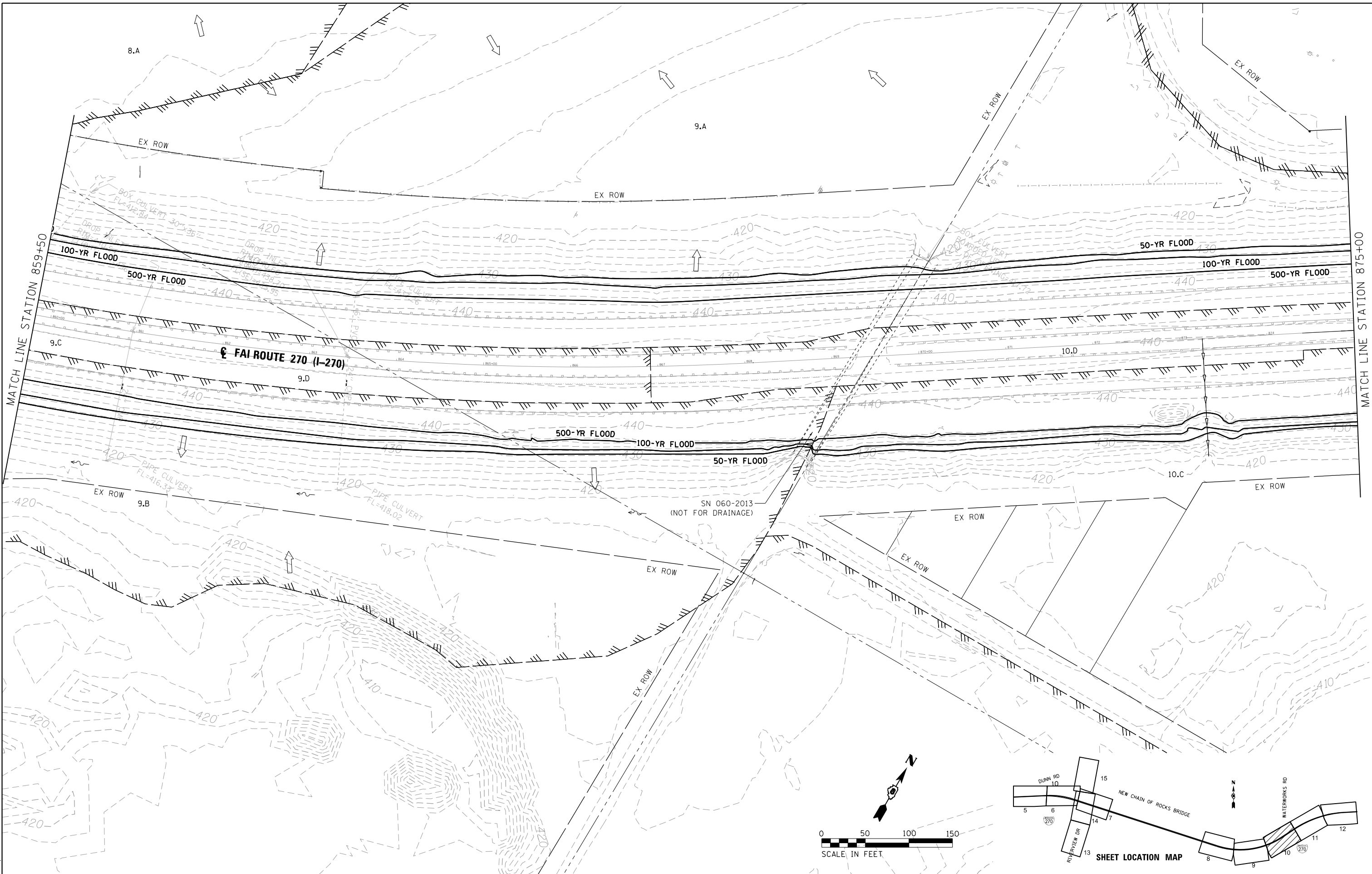


OUTLET 9	
TRIB. AREA I.D.	TRIB. AREA (AC)
9.A	16.51
9.B	14.81
9.C	2.22
TOTAL	33.54



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USER NAME = stlopez

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	MILLENNIA PROFESSIONAL SERVICES					P-98-001-15		CONTRACT NO.		FED. ROAD DIST. NO. 8 ILLINOIS FED. AID PROJECT					



MATCH LINE STATION 859+50

MATCH LINE STATION 875+00

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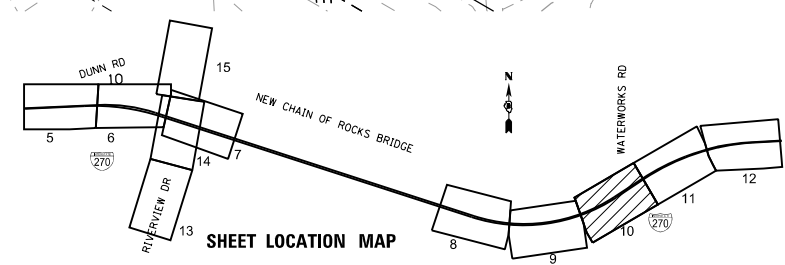
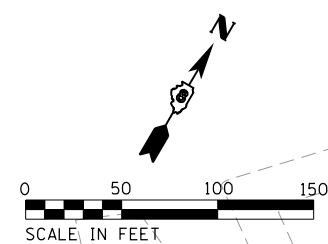
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DATE - 4/21/2020	REVISED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

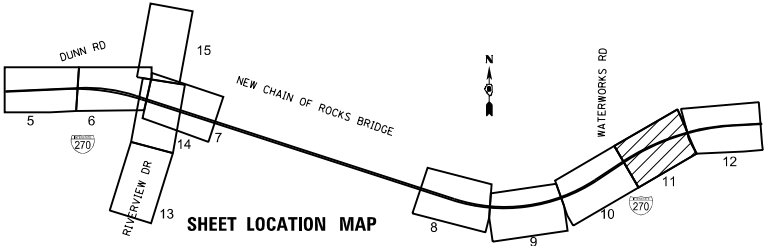
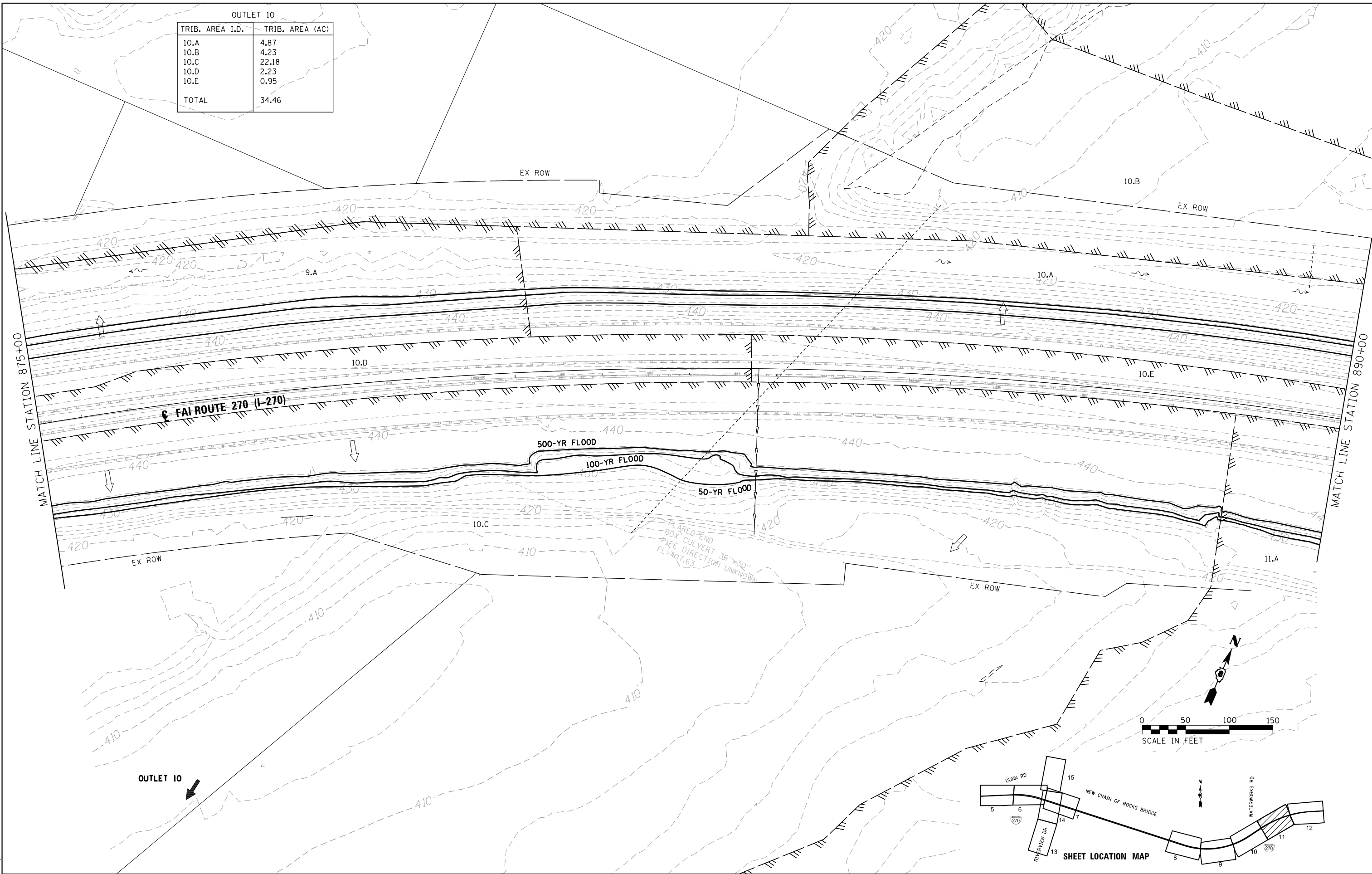
**EXISTING DRAINAGE PLAN
I-270 OVER MISSISSIPPI**

SCALE: 1"=50' SHEET NO. 10 OF 15 SHEETS STA. 859+50 TO STA. 875+00

F.A.P. RTE. 270	SECTION 60B-1	COUNTY MADISON	TOTAL SHEETS 15	SHEET NO. 10
P-98-001-15 CONTRACT NO.				
FED. ROAD DIST. NO. 8 ILLINOIS FED. AID PROJECT				



OUTLET 10	
TRIB. AREA I.D.	TRIB. AREA (AC)
10.A	4.87
10.B	4.23
10.C	22.18
10.D	2.23
10.E	0.95
TOTAL	34.46



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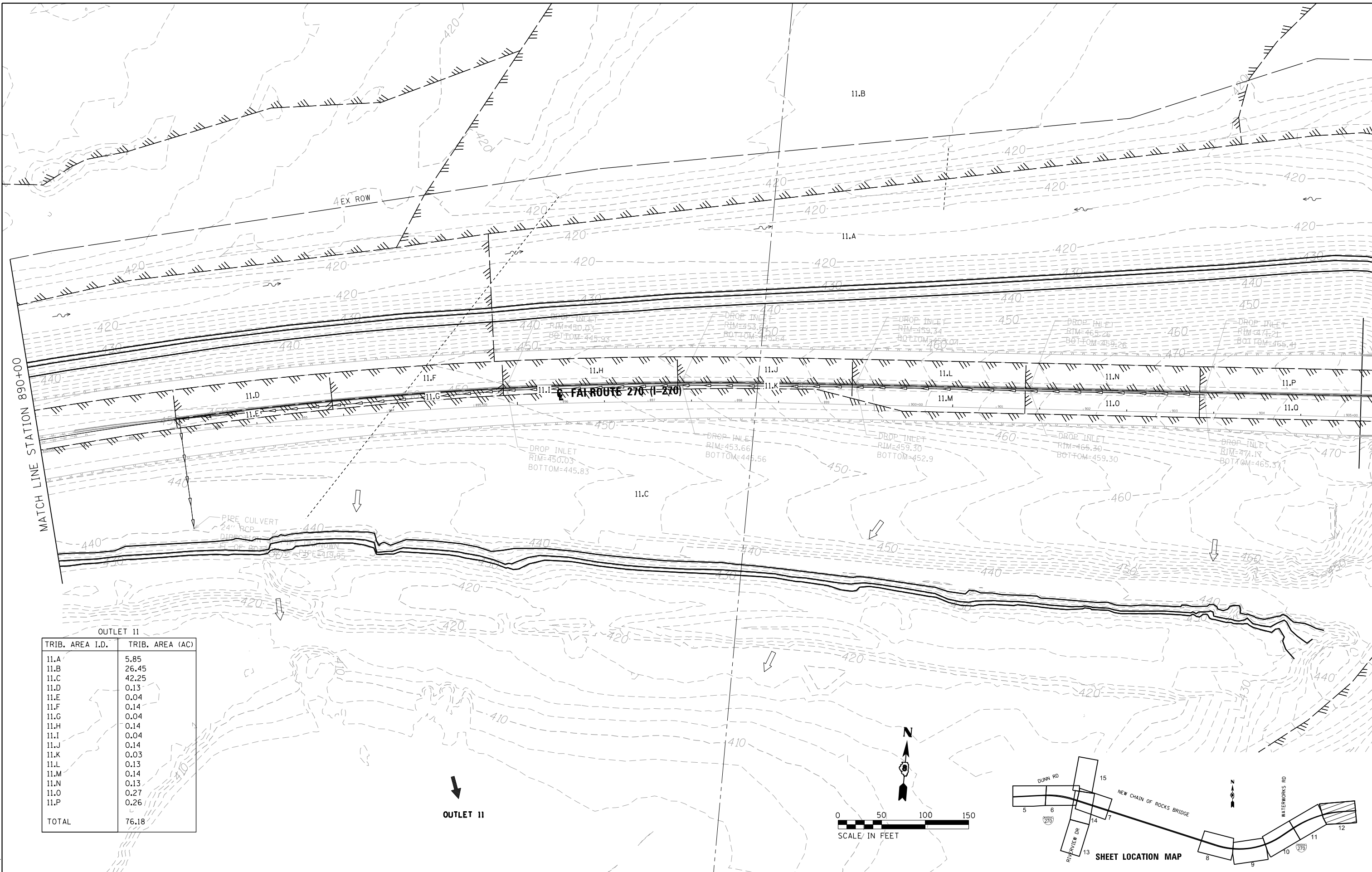
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CHECKED -	MJR	REVISED -	
DATE -	4/21/2020	REVISED -	

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

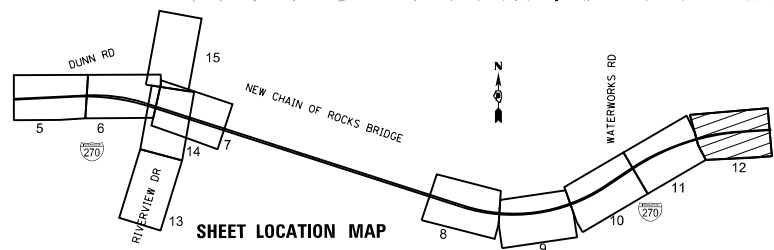
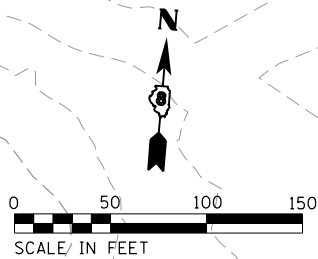
EXISTING DRAINAGE PLAN I-270 OVER MISSISSIPPI			
SCALE: 1"=50'	SHEET NO. 11 OF 15 SHEETS	STA. 875+00	TO STA. 890+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
270	60B-1	MADISON	15	11
P-98-001-15		CONTRACT NO.		
FED. ROAD DIST. NO. 8 ILLINOIS FED. AID PROJECT				



TRIB. AREA I.D.	TRIB. AREA (AC)
11.A	5.85
11.B	26.45
11.C	42.25
11.D	0.13
11.E	0.04
11.F	0.14
11.G	0.04
11.H	0.14
11.I	0.04
11.J	0.14
11.K	0.03
11.L	0.13
11.M	0.14
11.N	0.13
11.O	0.27
11.P	0.26
TOTAL	76.18

OUTLET 11



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PLOT SCALE = 1/8"=1'-0"
USER NAME : stlopes



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CHECKED - MJR	REVISED -
DATE - 4/21/2020	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

EXISTING DRAINAGE PLAN
I-270 OVER MISSISSIPPI

SCALE: 1"=50' SHEET NO. 12 OF 15 SHEETS STA. 890+00 TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
270	60B-1	MADISON	15	12
P-98-001-15 CONTRACT NO.				
FED. ROAD DIST. NO. 8 [ILLINOIS] FED. AID PROJECT				

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USER NAME = stlopez



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CHECKED	-	MJR	REVISED	-
DATE	-	3/26/2020	REVISED	-

**STATE OF ILLINOIS
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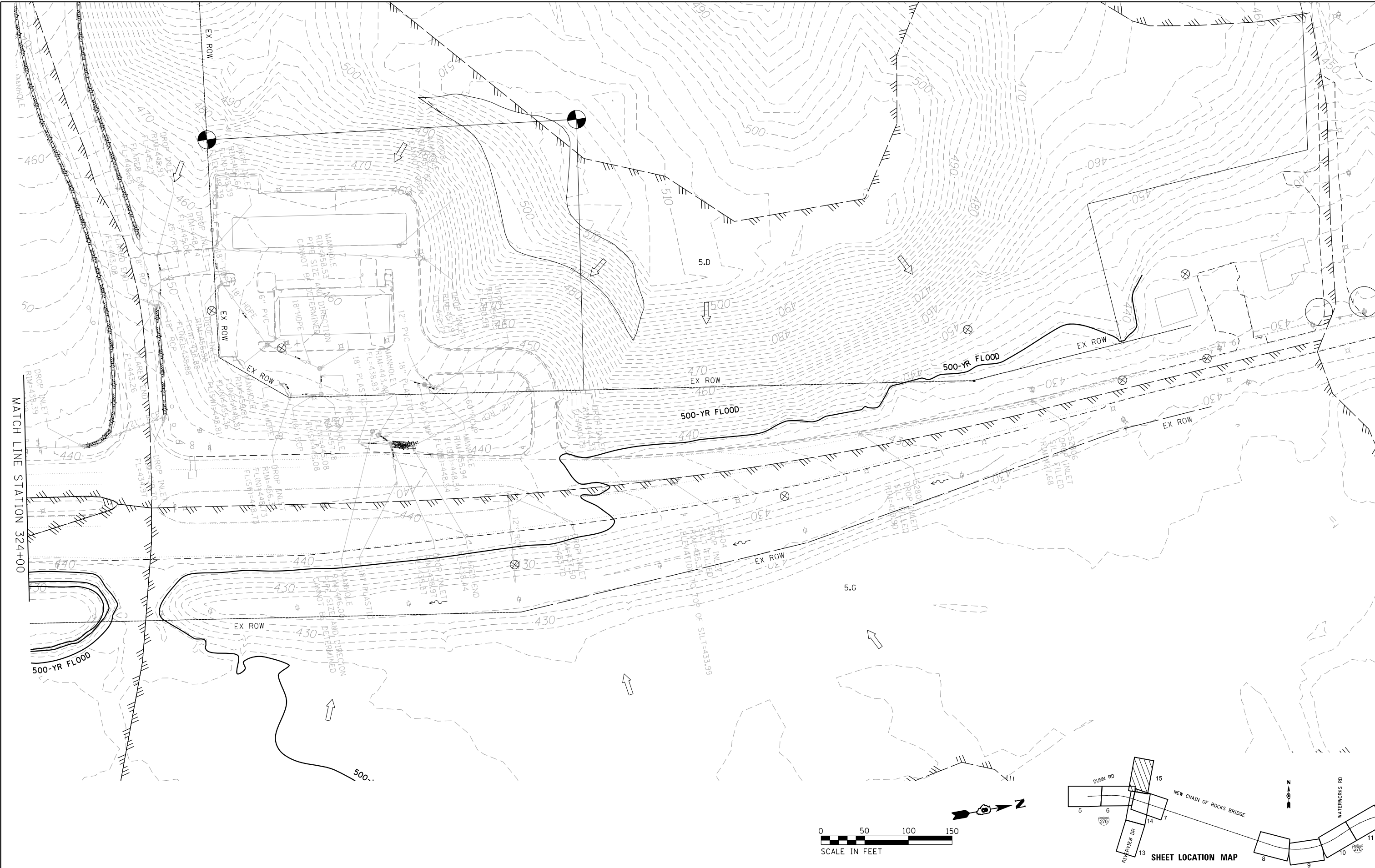
**EXISTING DRAINAGE PLAN
I-270 OVER MISSISSIPPI**

SCALE: 1"=50' SHEET NO. 11 OF 15 SHEETS STA. TO STA. 310+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
270	60B-1	MADISON	15	11
P-98-001-15		CONTRACT NO.		
FED. ROAD DIST. NO. 8 ILLINOIS FED. AID PROJECT				



FILE NAME = F:\2015\ME1501018.FTB 174-014 1-270 Over Mississippi WDIB\CADD\pwr\oj\mpa\ve\dnst7725 087679g-Drain-EDP-Sht15.dgn
PLOT SCALE = 100.0000' / in.
USER NAME = jlopez



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DESIGNED -	ERO	REVISED -	
DRAWN -	RAW	REVISED -	
CHECKED -	MJR	REVISED -	
DATE -	6/19/2020	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

EXISTING DRAINAGE PLAN
I-270 OVER MISSISSIPPI

SCALE: 1"=50' SHEET NO. 13 OF 15 SHEETS STA. 324+00 TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
270	60B-1	MADISON	15	13
P-98-001-15		CONTRACT NO.		
FED. ROAD DIST. NO. 8 ILLINOIS FED. AID PROJECT				

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the **Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations** tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was NAD 1983 State Plane Missouri East, zone 2401. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, or projection used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov/> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS12
National Geodetic Survey
SSM-C-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov/>.

Base map information shown on this FIRM was provided in digital format by Missouri Spatial Data Information Service (MSDIS). This information was photogrammetrically compiled at a scale of 1:24000 from aerial photography dated 2007 or later.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations** and **floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

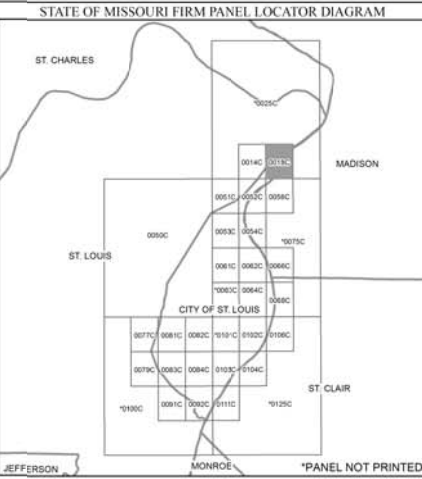
The "profile base lines" depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the "profile base line", in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels and the community map repository address.

Contact the **FEMA Map Service Center (MSC)** via the FEMA Map Information eXchange (FMIX) at 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The MSC may also be reached by Fax at 1-800-358-9620 and its website at <http://msc.fema.gov/>.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/business/nfip/>.





KEY TO MAP

500-Year Flood Boundary
100-Year Flood Boundary
Zone Designations*

100-Year Flood Boundary
500-Year Flood Boundary
Base Flood Elevation Line With Elevation In Feet**
Base Flood Elevation in Feet Where Uniform Within Zone**
Elevation Reference Mark
Zone D Boundary
River Mile

512
(EL 987)
RM7X
+M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

***EXPLANATION OF ZONE DESIGNATIONS**

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard area (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION:
JANUARY 31, 1975

FLOOD HAZARD BOUNDARY MAP REVISIONS:
OCTOBER 1, 1976

FLOOD INSURANCE RATE MAP EFFECTIVE:
APRIL 15, 1982

FLOOD INSURANCE RATE MAP REVISIONS:

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6629.

APPROXIMATE SCALE
1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM
FLOOD INSURANCE RATE MAP**

COUNTY OF
MADISON,
ILLINOIS
(UNINCORPORATED AREAS)

PANEL 135 OF 160
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
170436 0135 B

EFFECTIVE DATE:
APRIL 15, 1982

Federal Emergency Management Agency

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov/> or contact the National Geodetic Survey at the following address:

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov/>.

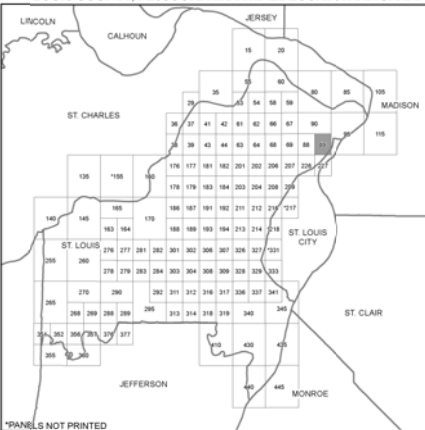
Base map information shown on this map was provided in digital format by the U.S. Farm Service Agency, National Agricultural Imagery Program (NAIP), published in 2010 at a scale of 1:12000.

The "profile base lines" depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the "profile base line" in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

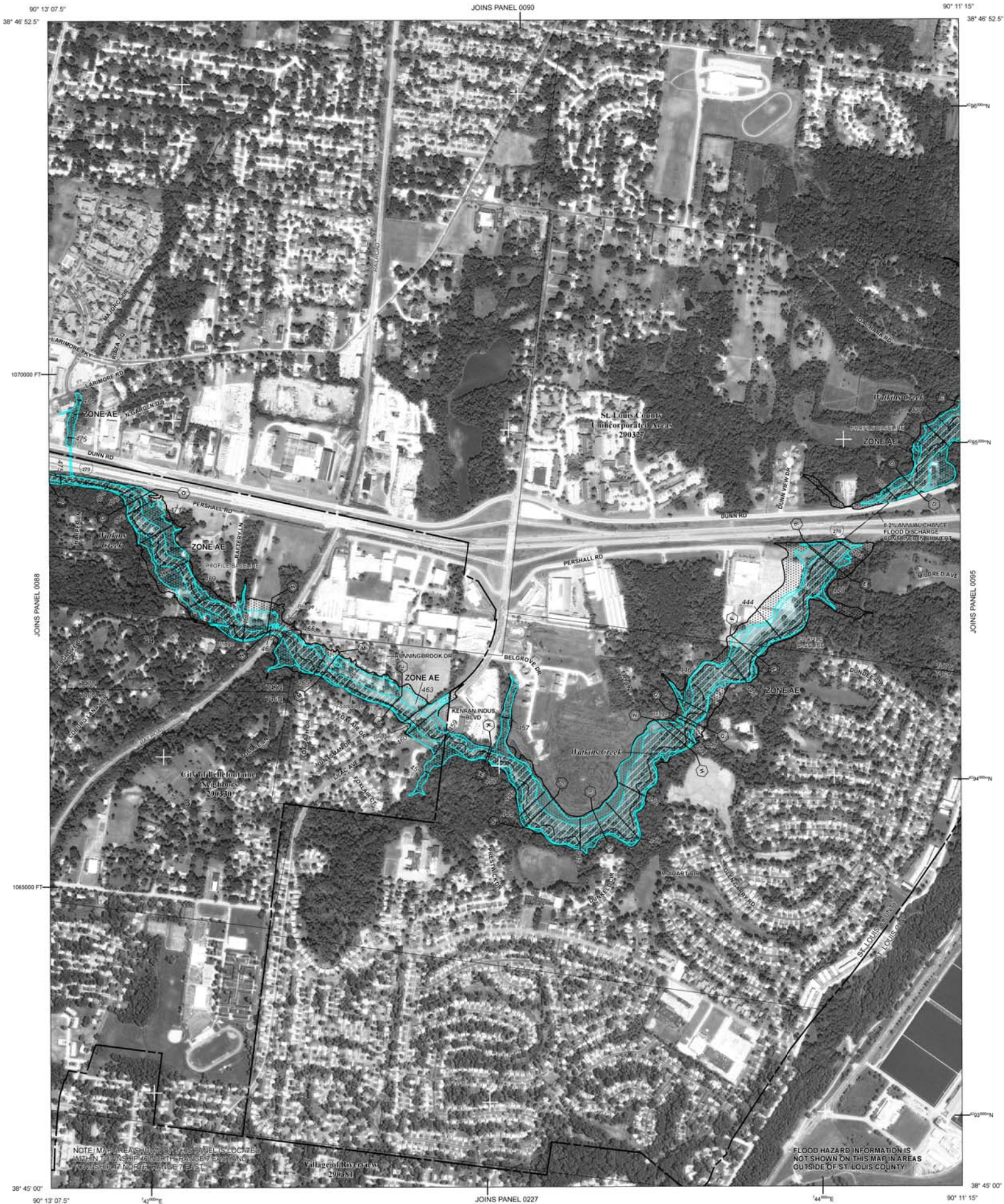
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Contact the **FEMA map Service Center (MSC)** via the FEMA Map Information eExchange (FMIX) at 1-877-336-2627 for information on available products associated with this FIRB. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA MSC may also be reached by Fax at 1-800-358-9620 and its website at <http://msc.fema.gov/>.

ST. LOUIS COUNTY, MISSOURI FIRM PANEL LOCATOR DIAGRAM



*PANELS NOT PRINTED

 SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system (usually artificially identified). ZONE AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area not protected from 1% annual chance flood by a Federal Flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

 OTHERWISE PROTECTED AREAS (OPAS)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

 1% annual chance floodplain boundary
 0.2% annual chance floodplain boundary
 Floodway boundary
 Zone D boundary
 Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

..... CBRS and OPA boundary
 ----- International, State, or County boundary
 ----- Corporate, Extraterritorial Jurisdiction, or Urban Growth boundary
 ----- Area Not Included boundary
 + + + + + Military Reservation, Native American Lands boundary
 ----- 513
 ----- Base Flood Elevation line and value; elevation in feet*
 ----- Base Flood Elevation value where uniform within zone; elevation in feet*
 (EL 967)

* Referenced to the North American Vertical Datum of 1988

 Cross section line

 Transect line

87°07'45", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

4276000E	1000-meter Universal Transverse Mercator grid values, zone 15
600000 FT	5000-foot grid ticks: Missouri State Plane coordinate system, east zone (FIPSZONE 2401), Transverse Mercator projection

DX5510 x	Bench mark (see explanation in Notes to Users section of this FIRM panel)
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● M1.5 River Mile

 Aqueduct, Culvert, Flume, Penstock, or Storm Sewer
 Road or Railroad Bridge

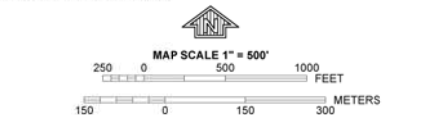
MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
AUGUST 2, 1995

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

February 4, 2015 – to update corporate limits, to change Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to change zone designations, to add roads and road names, to incorporate previously issued Letters of Map Revision, to reflect updated topographic information.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



NFIP

PANEL 0089K

FIRM

ST. LOUIS COUNTY,
MISSOURI
AND INCORPORATED AREAS

PANEL 89 OF 445
(SEE LOCATOR DIAGRAM OR MAP INDEX
FOR FIRM PANEL LAYOUT)

<u>COMMUNITY</u>	<u>NUMBER</u>	<u>PANEL</u>	<u>SUFFIX</u>
BELLEFONTAINE NEIGHBORS, CITY OF	290330	0089	K
RIVERVIEW, VILLAGE OF	290381	0089	K
ST. LOUIS COUNTY	290327	0089	K

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.



Federal Emergency Management Agency



MAP NUMBER
29189C0089K



MAP REVISED
FEBRUARY 4, 2015



WATERWAY INFORMATION TABLE

Route: FAI 270 (I-270)
 Section: 60B-1
 County: Madison, IL & St. Louis City, MO
 Prepared by: C. Elsten Date: 12/1/2017

Existing SN: 060-0035
 Proposed SN: TBD
 Waterway: Mississippi River
 Checked by: C. Goodwin Date: 12/1/2017

Drainage Area = 697,000 sq. mi.			Existing Overtopping Elev.		= 440.10 feet	at Sta.		838+01.46	
			Proposed Overtopping Elev.		= 438.32 feet	at Sta.		867+13.13	
Flood Event	Freq. Yr.	Discharge Ft³/s	Waterway Opening - ft²		Natural H.W.E. ft.	Head – ft.		Headwater Elevation ft.	
			Existing	Proposed		Existing	Proposed	Existing	Proposed
Design	50	984,883	185,985	188,360	433.3	0.2	0.2	433.5	433.5
Base	100	1.067M	196,184	198,585	435.4	0.2	0.1	435.6	435.5
Scour Design Check	200	1.146M	208,639	210,948	437.8	0.2	0.2	438.0	438.0
Overtop Existing									
Overtop Proposed									
Max. Calc.	500	1.247M	220,869	223,043	440.1	0.4	0.3	440.5	440.4

10 YEAR VELOCITY THROUGH EXISTING BRIDGE = 6.4 ft/s

10 YEAR VELOCITY THROUGH PROPOSED BRIDGE = 6.3 ft/s

ALL-TIME H.W.E. & DATE: 429.16 feet; August 1st 1993

Scope of Work: Remove and replace FAI 270 (I-270) bridge over the Mississippi River

EXISTING STRUCTURE

TYPE: Steel plate girder
 LENGTH: 5,409 feet
 # SPANS: 43
 LOW BEAM: 440.30 feet
 SKEW: 0 degrees
 LOW E.O.P.: 443.30 feet

PROPOSED STRUCTURE

TYPE: Steel plate girder
 LENGTH: 5,383 feet
 # SPANS: 24
 LOW BEAM: 443.09 feet
 SKEW: 0 degrees
 LOW E.O.P.: 456.09 feet

NOTE: PROPOSED STRUCTURE DETAILS ARE PRELIMINARY; SUBJECT TO REFINEMENT IN TSL STAGE.



WATERWAY INFORMATION TABLE

Route: FAI 270 (I-270)
 Section: 60B-1
 County: Madison, IL & St. Louis City, MO
 Prepared by: C. Elsten Date: 12/1/2017

Existing SN: 060-0035
 Proposed SN: TBD
 Waterway: Mississippi River
 Checked by: C. Goodwin Date: 12/1/2017

Drainage Area = 697,000 sq. mi.			Existing Overtopping Elev.		= 440.10 feet	at Sta.		838+01.46	
			Proposed Overtopping Elev.		= 438.32 feet	at Sta.		867+13.13	
Flood Event	Freq. Yr.	Discharge Ft³/s	Waterway Opening - ft²		Natural H.W.E. ft.	Head – ft.		Headwater Elevation ft.	
			Existing	Proposed		Existing	Proposed	Existing	Proposed
Design	50	984,883	185,985	177,942	433.3	0.2	0.4	433.5	433.7
Base	100	1.067M	196,184	187,575	435.4	0.2	0.3	435.6	435.7
Scour Design Check	200	1.146M	208,639	199,335	437.8	0.2	0.4	438.0	438.2
Overtop Existing									
Overtop Proposed									
Max. Calc.	500	1.247M	220,869	210,858	440.1	0.4	0.5	440.5	440.6

10 YEAR VELOCITY THROUGH EXISTING BRIDGE = 6.4 ft/s

10 YEAR VELOCITY THROUGH PROPOSED BRIDGE = 6.6 ft/s

ALL-TIME H.W.E. & DATE: 429.16 feet; August 1st 1993

Scope of Work: Remove and replace FAI 270 (I-270) bridge over the Mississippi River

EXISTING STRUCTURE

TYPE: Steel plate girder
 LENGTH: 5,409 feet
 # SPANS: 43
 LOW BEAM: 440.30 feet
 SKEW: 0 degrees
 LOW E.O.P.: 443.30 feet

PROPOSED STRUCTURE

TYPE: Steel plate girder and existing structure
 LENGTH: 5,383 feet (proposed) & 5,409 (existing)
 # SPANS: 24 (proposed) & 43 (existing)
 LOW BEAM: 443.09 feet (proposed) & 440.30 (existing)
 SKEW: 0 degrees
 LOW E.O.P.: 456.09 feet

NOTE: PROPOSED STRUCTURE DETAILS ARE PRELIMINARY; SUBJECT TO REFINEMENT IN TSL STAGE.



WATERWAY INFORMATION TABLE

Route: FAI 270 (I-270)
 Section: 60B-1
 County: Madison, IL & St. Louis City, MO
 Prepared by: C.Goodwin Date: 12/1/2017

Existing SN: 060-0035
 Proposed SN: TBD
 Waterway: Mississippi River
 Checked by: C.Elsten Date: 12/1/2017

Drainage Area = 697,000 sq. mi.			Existing Overtopping Elev.		= 440.10 feet	at Sta.		838+01.46	
			Proposed Overtopping Elev.		= 438.32 feet	at Sta.		867+13.13	
Flood Event	Freq. Yr.	Discharge Ft³/s	Waterway Opening - ft²		Natural H.W.E. ft.	Head – ft.		Headwater Elevation ft.	
			Existing	Proposed		Existing	Proposed	Existing	Proposed
Design	50	0.985M	179,011	187,837	433.3	0.2	0.1	433.5	433.4
Base	100	1.067M	188,974	198,115	435.4	0.1	0.1	435.5	435.5
Scour Design Check	200	1.146M	201,158	210,854	437.8	0.2	0.2	438.0	438.0
Overtop Existing									
Overtop Proposed									
Max. Calc.	500	1.247M	211,346	221,116	439.9	0.2	0.2	440.1	440.1

10 YEAR VELOCITY THROUGH EXISTING BRIDGE = 5.37 ft/s

10 YEAR VELOCITY THROUGH PROPOSED BRIDGE = 5.10 ft/s

ALL-TIME H.W.E. & DATE: 429.16 feet; August 1st 1993

Scope of Work: Remove and replace FAI 270 (I-270) bridge over the Mississippi River

EXISTING STRUCTURE

TYPE: Steel plate girder
 LENGTH: 5,409 feet
 # SPANS: 43
 LOW BEAM: 440.30 feet
 SKEW: 0 degrees
 LOW E.O.P.: 443.30 feet

PROPOSED STRUCTURE

TYPE: Steel plate girder
 LENGTH: 5,383 feet
 # SPANS: 24
 LOW BEAM: 443.09 feet
 SKEW: 0 degrees
 LOW E.O.P.: 456.09 feet

NOTE: PROPOSED STRUCTURE DETAILS ARE PRELIMINARY; SUBJECT TO REFINEMENT IN TSL STAGE.



WATERWAY INFORMATION TABLE

Route: FAI 270 (I-270)
 Section: 60B-1
 County: Madison, IL & St. Louis City, MO
 Prepared by: C. Goodwin Date: 12/1/2017

Existing SN: 060-0035
 Proposed SN: TBD
 Waterway: Mississippi River
 Checked by: C.Elsten Date: 12/1/2017

Drainage Area = 697,000 sq. mi.			Existing Overtopping Elev.		= 440.10 feet	at Sta.		838+01.46	
			Proposed Overtopping Elev.		= 438.32 feet	at Sta.		867+13.13	
Flood Event	Freq. Yr.	Discharge Ft³/s	Waterway Opening - ft²		Natural H.W.E. ft.	Head – ft.		Headwater Elevation ft.	
			Existing	Proposed		Existing	Proposed	Existing	Proposed
Design	50	0.985M	179,011	171,151	433.3	0.2	0.2	433.5	433.5
Base	100	1.067M	188,974	180,576	435.4	0.1	0.2	435.5	435.6
Scour Design Check	200	1.146M	201,158	192,087	437.8	0.2	0.3	438.0	438.1
Overtop Existing									
Overtop Proposed									
Max. Calc.	500	1.247M	211,346	201,674	439.9	0.2	0.3	440.1	440.2

10 YEAR VELOCITY THROUGH EXISTING BRIDGE = 5.37 ft/s

10 YEAR VELOCITY THROUGH PROPOSED BRIDGE = 5.60 ft/s

ALL-TIME H.W.E. & DATE: 429.16 feet; August 1st 1993

Scope of Work: Remove and replace FAI 270 (I-270) bridge over the Mississippi River

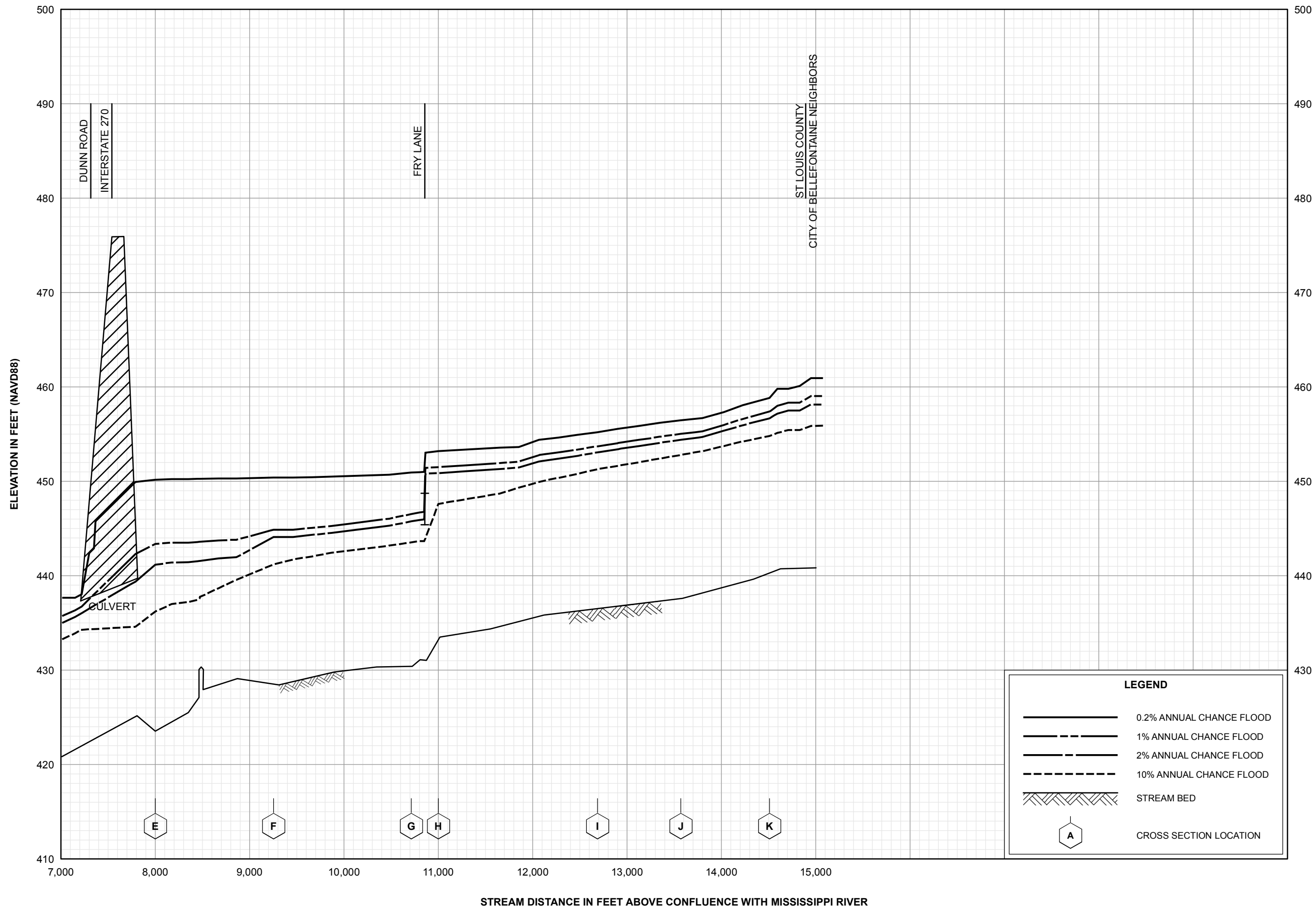
EXISTING STRUCTURE

TYPE: Steel plate girder
 LENGTH: 5,409 feet
 # SPANS: 43
 LOW BEAM: 440.30 feet
 SKEW: 0 degrees
 LOW E.O.P.: 443.30 feet

PROPOSED STRUCTURE

TYPE: Steel plate girder with existing structure
 LENGTH: 5,383 feet (proposed) and 5,409 feet (existing)
 # SPANS: 24 (proposed) and 43 (existing)
 LOW BEAM: 443.09 feet (proposed) and 440.30 feet (existing)
 SKEW: 0 degrees
 LOW E.O.P.: 456.09 feet

NOTE: PROPOSED STRUCTURE DETAILS ARE PRELIMINARY; SUBJECT TO REFINEMENT IN TSL STAGE.



F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FA1270	60B-1	MADISON	15	1
FED. ROAD DIST. NO. 8	ILLINOIS	CONTRACT NO.	----	

P-98-001-15





11 EXECUTIVE DRIVE, SUITE 12,
FAIRVIEW HEIGHTS, IL 62208
618.624.8610 VOICE, 618.624.8611 FAX
WWW.MPS-IL.COM

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
**PROPOSED
DRAINAGE PLAN
EXHIBIT 2-00a**
I-270 BRIDGE
OVER MISSISSIPPI RIVER



T 4 N

R 10 W

LOCATION MAP

SYMBOL LEGEND

REFERENCE LINE / CENTERLINE
AND STATIONING
RIGHT OF WAY LINE
INTERPRETED DRAINAGE AREA
TO OUTLET / SUB-DIVIDE
WETLAND AREA
DRAINAGE SUMMIT
FLOW DIRECTION
SWALE
SHALLOW CONC./GUTTER FLOW
DITCH
OUTLET
SHEET FLOW
OVERFLOW
STORM SEWER
CULVERT PIPE
CULVERT END SECTION
STORM CATCH BASIN
HEADWALL/ENDWALL
INLET
MANHOLE/VALVE VAULT
DRAINAGE BASIN ID
(TRIBUTARY TO OUTLET A,
SUB AREA 2)
WATER MAIN
ELECTRIC LINE
TELEPHONE LINE
GAS LINE
CABLE TV LINE
TREE
FIRE HYDRANT
LIGHT POLE
TELEPHONE POLE
UTILITY POLE
REGULATORY SIGN
CENTERLINE
FLOODPLAIN (ZONE A)
FLOODPLAIN (ZONE X)
EASEMENT

EXISTING

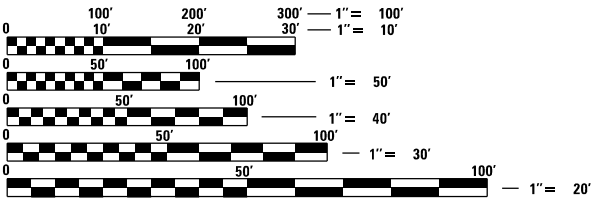
PROPOSED

A.2 = xx AC.

A.2 = xx AC.

W E T G CTV CTV

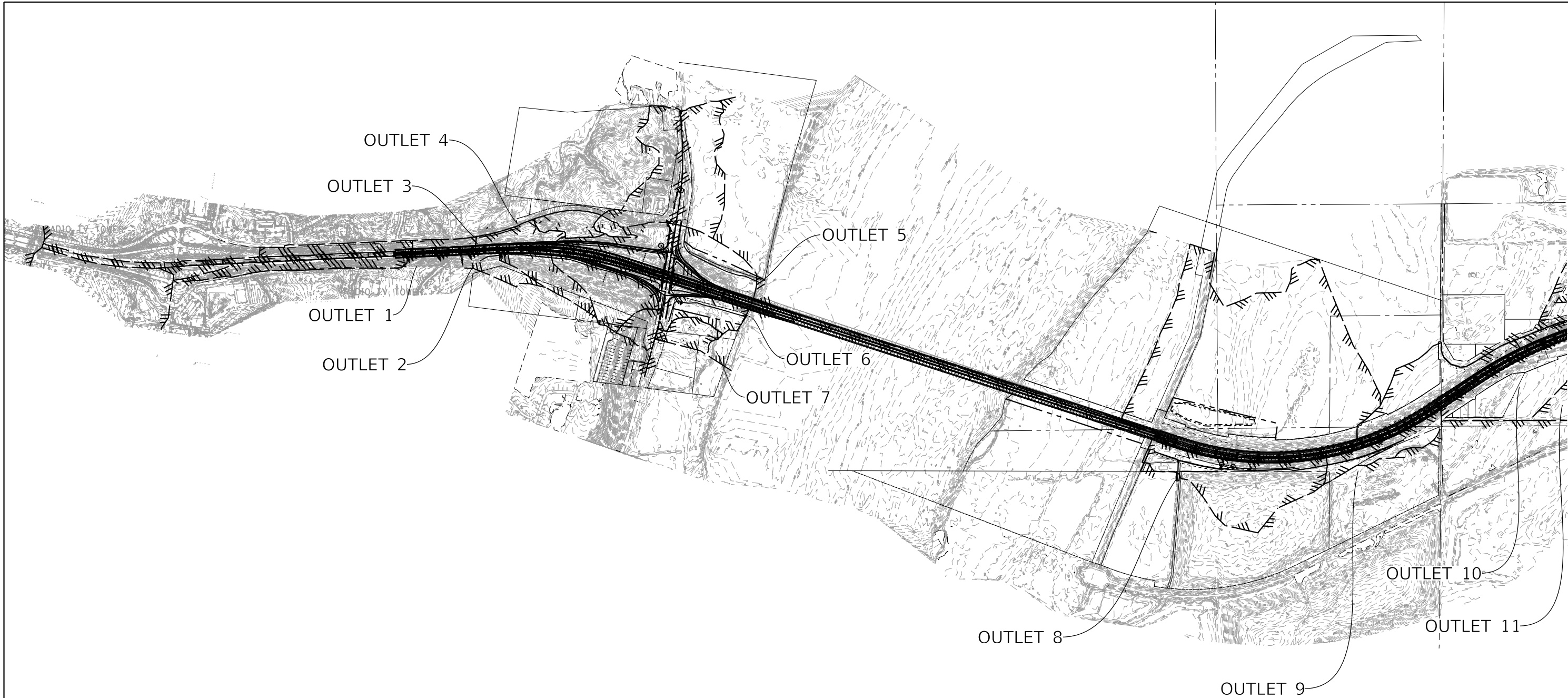
11 11 11 11 11 11



FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD
ENGINEERING SCALES. REDUCED SIZED PLANS WILL NOT
CONFORM TO STANDARD SCALES. IN MAKING MEASUREMENTS
ON REDUCED PLANS, THE ABOVE SCALES MAY BE USED.

J.U.L.I.E.
JOINT UTILITY LOCATION INFORMATION FOR EXCAVATION
1-800-892-0123 OR 811

CONTRACT NO.



FILE NAME = C:\proj\proj\mgs\te\dms\1725\08763\90-Drain-PDP-Sht02.dgn
PLOT SCALE = 1/16" = 1200.0000'
USER NAME = jlopez



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DESIGNED	-	ERO
DRAWN	-	RAW
CHECKED	-	MJR
DATE	-	8/31/2020

REVISED	-
REVISED	-
REVISED	-
REVISED	-

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PROPOSED DRAINAGE PLAN - OVERALL
I-270 OVER MISSISSIPPI

SCALE: 1"=600' SHEET NO. 2 OF 15 SHEETS STA. TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
270	60B-1	MADISON	15	2
P-98-001-15 CONTRACT NO.				
FED. ROAD DIST. NO. 8 ILLINOIS FED. AID PROJECT				

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PLOT SCALE = 600.0000' / in.
USER NAME = jlopez



MILLENNIA
PROFESSIONAL SERVICES
www.millennia.pro

DESIGNED	-	ERO
DRAWN	-	RAW
CHECKED	-	MJR
DATE	-	8/31/2020

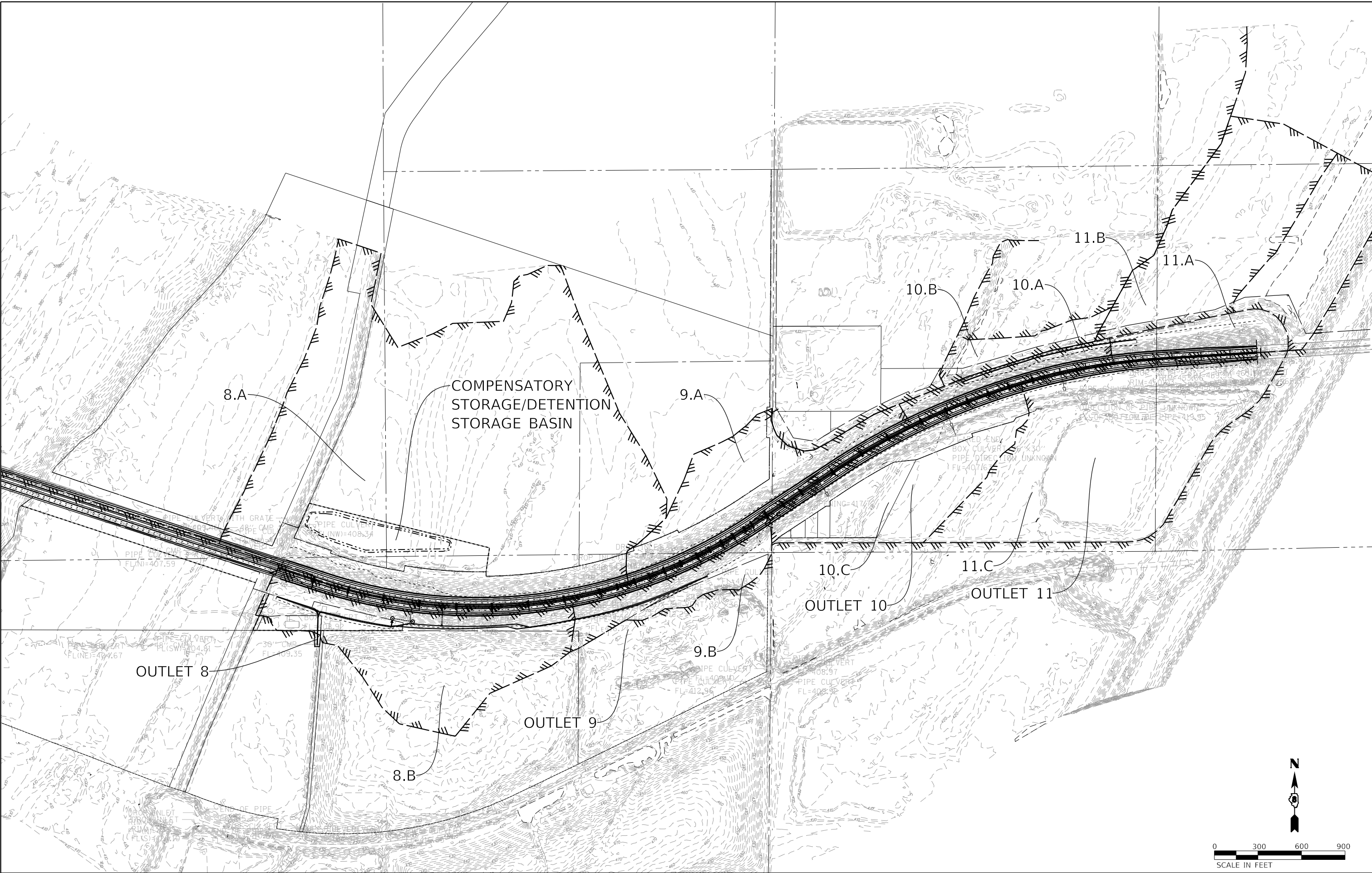
REVISED	-
REVISED	-
REVISED	-
REVISED	-

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PROPOSED DRAINAGE PLAN - OVERALL ILLINOIS
I-270 OVER MISSISSIPPI

SCALE: 1"=300'	SHEET NO. 4 OF 15 SHEETS	STA.	TO STA.
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F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
270	60B-1	MADISON	15	4
P-98-001-15		CONTRACT NO.		
FED. ROAD DIST. NO. 8 ILLINOIS FED. AID PROJECT				





OUTLET 9		OUTLET 9	
TRIB. AREA I.D.	TRIB. AREA (AC)	TRIB. AREA I.D.	TRIB. AREA (AC)
9.A	16.75	9.V	0.11
9.B	8.11	9.W	0.05
9.C	0.09	9.X	0.17
9.D	0.30	9.Y	0.07
9.E	0.08	9.Z	0.15
9.F	0.28	9.AA	0.11
9.G	0.08	9.AB	0.10
9.H	0.29	9.AC	0.13
9.I	0.08	9.AD	0.09
9.J	0.28	9.AE	0.27
9.K	0.07	9.AF	0.15
9.L	0.28		
9.M	0.07	TOTAL	29.41
9.N	0.28		
9.O	0.06		
9.P	0.25		
9.Q	0.08		
9.R	0.28		
9.S	0.06		
9.T	0.22		
9.U	0.03		



DESIGNED	-	ERO
DRAWN	-	RAW
CHECKED	-	MJR
DATE	-	9/4/2020

REVISED	-
REVISED	-
REVISED	-
REVISED	-

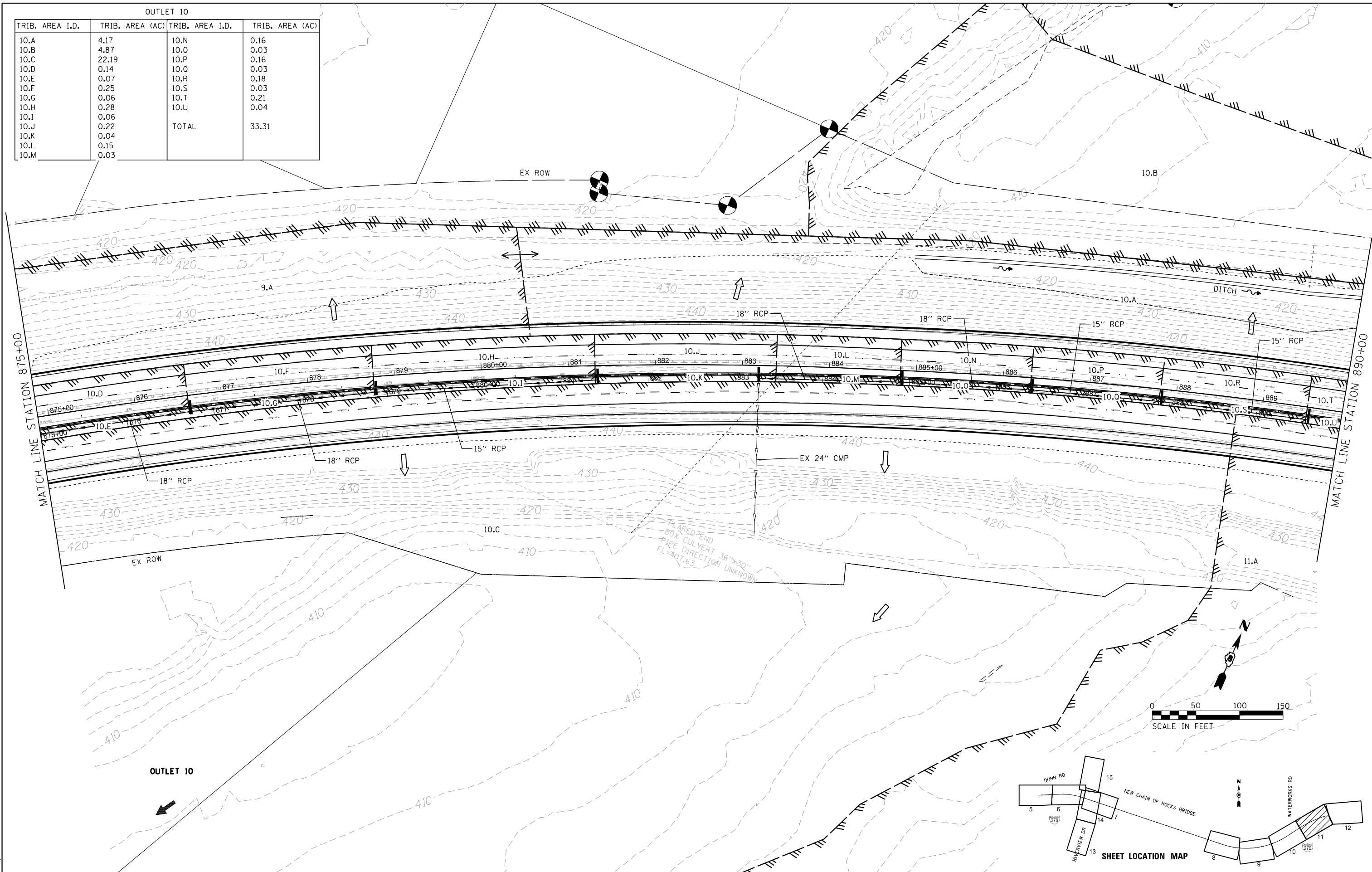
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PROPOSED DRAINAGE PLAN I-270 OVER MISSISSIPPI

SCALE: 1"=50'	SHEET NO. 9 OF 15 SHEETS	STA. 844+50 TO STA. 859+50
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F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
270	60B-1	MADISON	15	9
P-98-001-15		CONTRACT NO.		
FED. ROAD DIST. NO. 8 ILLINOIS FED. AID PROJECT				

OUTLET 10			
TRIB. AREA I.D.	TRIB. AREA (AC)	TRIB. AREA I.D.	TRIB. AREA (AC)
10.A	4.17	10.N	0.16
10.B	4.87	10.O	0.03
10.C	22.19	10.P	0.16
10.D	0.14	10.Q	0.03
10.E	0.07	10.R	0.18
10.F	0.25	10.S	0.03
10.G	0.06	10.T	0.21
10.H	0.28	10.U	0.04
10.I	0.06		
10.J	0.22	TOTAL	33.31
10.K	0.04		
10.L	0.15		
10.M	0.03		



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USER NAME : jlopez

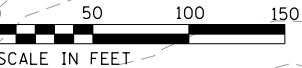
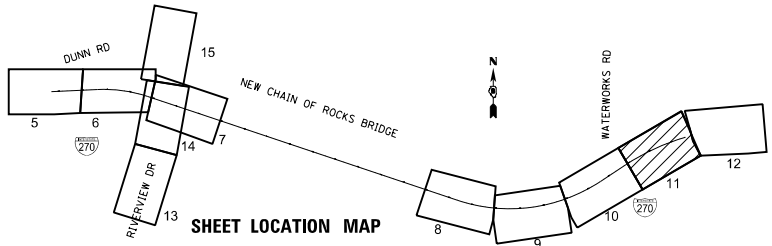


DESIGNED -	ERO	REVISED -	
DRAWN -	RAW	REVISED -	
CHECKED -	MJR	REVISED -	
DATE -	8/28/2020	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

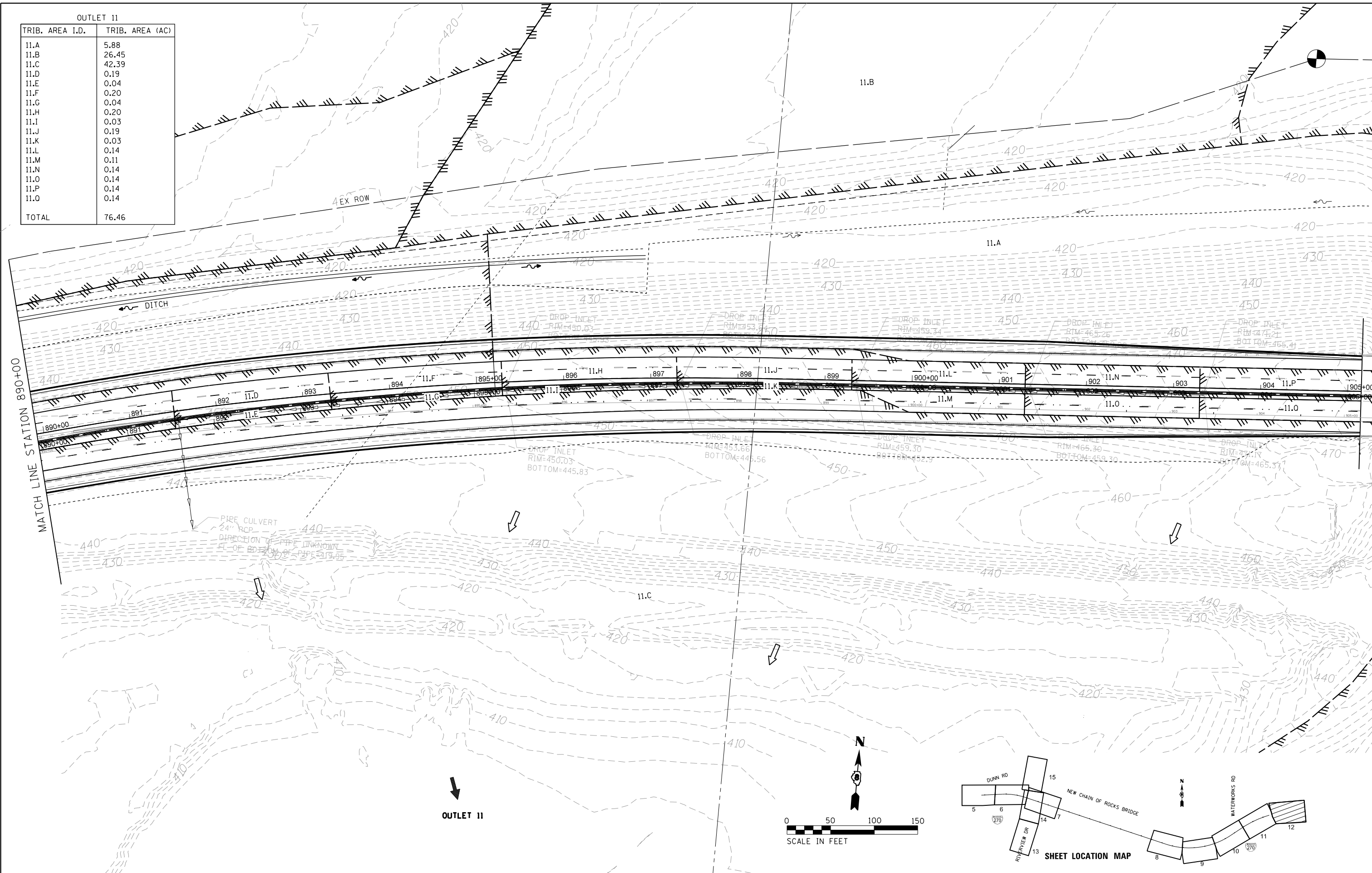
PROPOSED DRAINAGE PLAN
I-270 OVER MISSISSIPPI

SCALE: 1"=50' SHEET NO. 11 OF 15 SHEETS STA. 875+00 TO STA. 890+00



F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
270	60B-1	MADISON	15	11
P-98-001-15 CONTRACT NO.				
FED. ROAD DIST. NO. 8 ILLINOIS FED. AID PROJECT				

OUTLET 11		
TRIB.	AREA I.D.	TRIB. AREA (AC)
11.A		5.88
11.B		26.45
11.C		42.39
11.D		0.19
11.E		0.04
11.F		0.20
11.G		0.04
11.H		0.20
11.I		0.03
11.J		0.19
11.K		0.03
11.L		0.14
11.M		0.11
11.N		0.14
11.O		0.14
11.P		0.14
11.O		0.14
TOTAL		76.46



OUTLET 11

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USER NAME = jlopez



DESIGNED -	ERO	REVISED -	
DRAWN -	RAW	REVISED -	
CHECKED -	MJR	REVISED -	
DATE -	8/28/2020	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PROPOSED DRAINAGE PLAN
I-270 OVER MISSISSIPPI

SCALE: 1"=50' SHEET NO. 12 OF 15 SHEETS STA. 890+00 TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
270	60B-1	MADISON	15	12
P-98-001-15		CONTRACT NO.		
FED. ROAD DIST. NO. 8		ILLINOIS FED. AID PROJECT		

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PLOT SCALE = 100.0000' / in.
USER NAME = jlopez



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DESIGNED	-	ERO
DRAWN	-	RAW
CHECKED	-	MJR
DATE	-	8/28/2020

REVISED	-
REVISED	-
REVISED	-
REVISED	-

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PROPOSED DRAINAGE PLAN
I-270 OVER MISSISSIPPI

SCALE: 1"=50' SHEET NO. 11 OF 15 SHEETS STA. TO STA. 310+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
270	60B-1	MADISON	15	13
P-98-001-15 CONTRACT NO.				
FED. ROAD DIST. NO. 8 ILLINOIS FED. AID PROJECT				



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PLOT SCALE = 100.0000' / in.
USER NAME = jlopez



DESIGNED -	ERO	REVISED -	
DRAWN -	RAW	REVISED -	
CHECKED -	MJR	REVISED -	
DATE -	8/28/2020	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

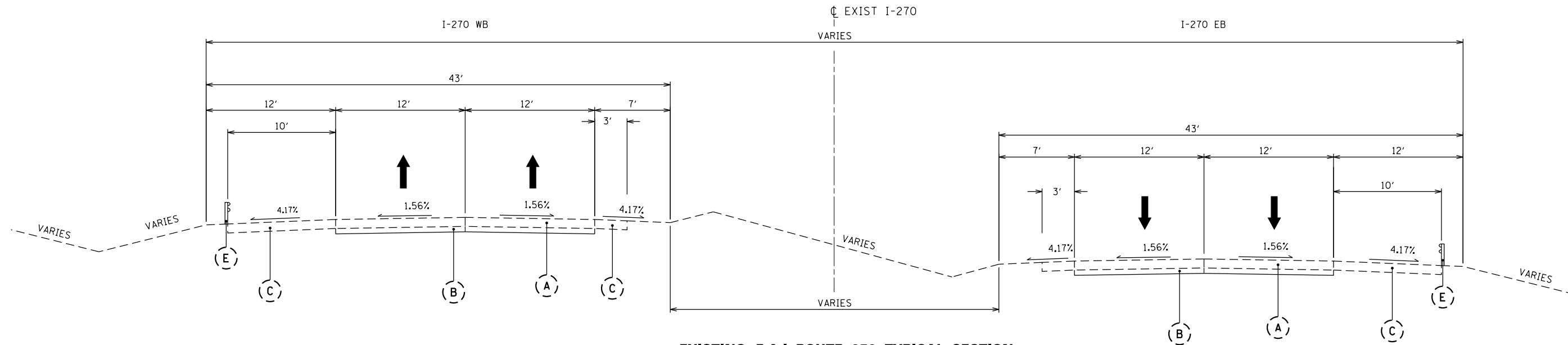
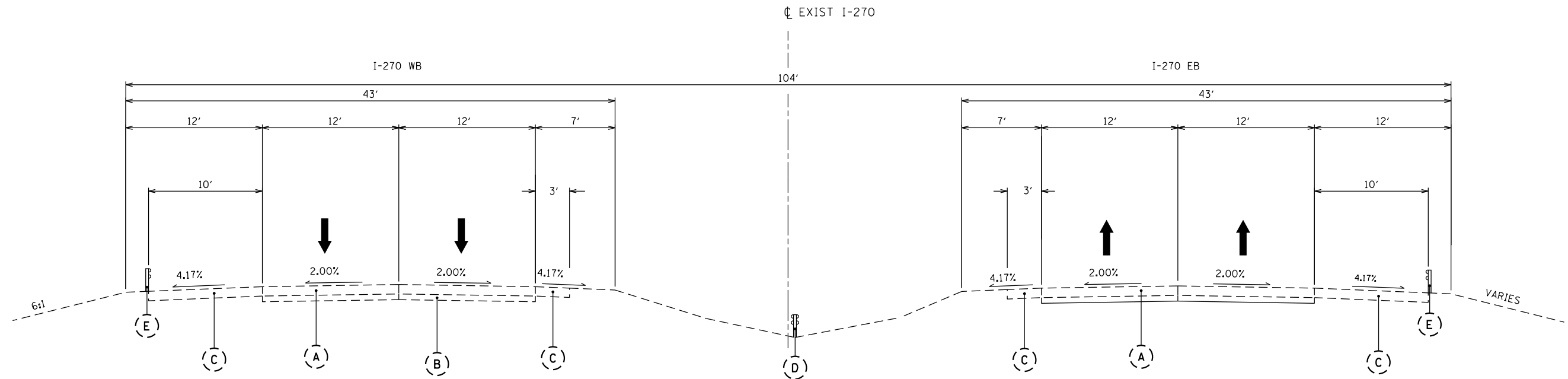
PROPOSED DRAINAGE PLAN
I-270 OVER MISSISSIPPI

SCALE: 1"=50' SHEET NO. 13 OF 15 SHEETS STA. 324+00 TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
270	60B-1	MADISON	15	15
P-98-001-15		CONTRACT NO.		
FED. ROAD DIST. NO. 8		ILLINOIS FED. AID PROJECT		



FILE NAME = par\\tupla02\\run01\\parsons\\com\\Illinois State\\Documents\\I-270 Phase 1\\40 - Design\\CAD\\Roadway\\Sheets\\0876\\908-ent-typical.dgn



EXISTING LEGEND

- (A) PORTLAND CEMENT CONCRETE PAVEMENT
- (B) STABILIZED SUBBASE
- (C) EXISTING SHOULDER
- (D) EXISTING HIGH TENSION CABLE BARRIER
- (E) EXISTING GUARDRAIL

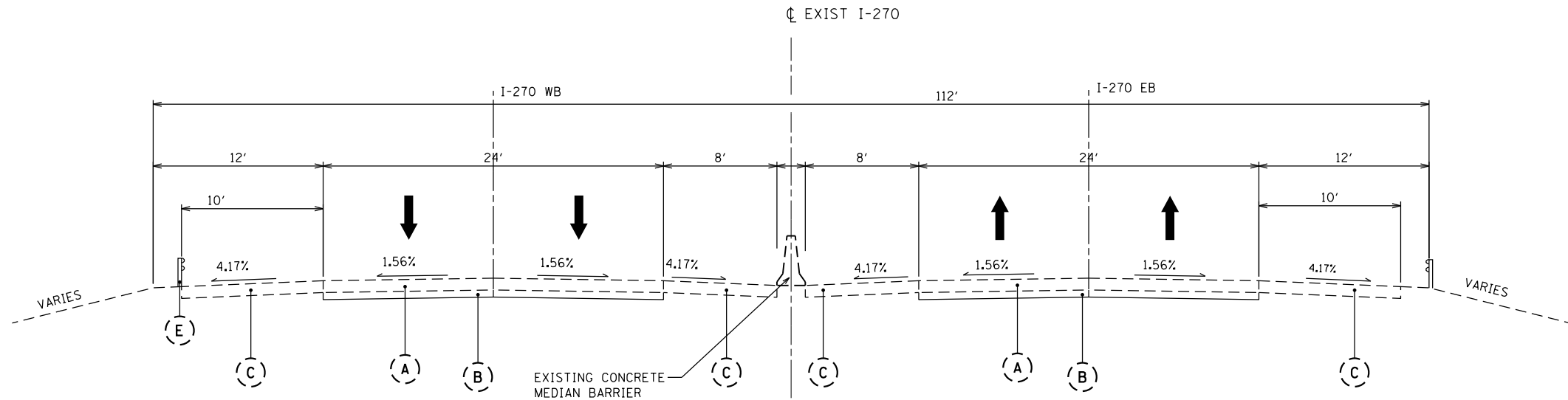
PROPOSED LEGEND

- ① 12" PORTLAND CEMENT CONCRETE (JOINTED)
- ② 4" SLAB SUBBASE
- ③ 12" AGGREGATE BASE COURSE, TYPE A
- ④ 12" PCC SHOULDER
- ⑤ SHOULDER SUBGRADE
- ⑥ SHOULDER STABILIZATION
- ⑦ CONCRETE MEDIAN BARRIER
- ⑧ PCC COMBINATION CURB & GUTTER
- ⑨ ROUNDABOUT APRON
- ⑩ CONCRETE MEDIAN
- ⑪ LIMESTONE FILL

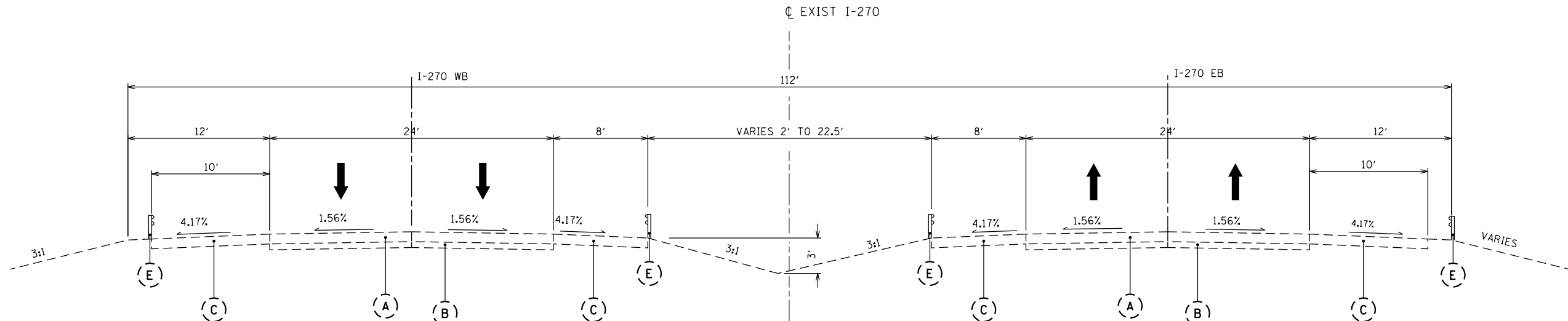
Exhibit 2-01a

NOTE: PROPOSED MATERIALS AND THICKNESSES TO BE FINALIZED DURING PHASE II DESIGN.

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EXISTING F.A.I. ROUTE 270 TYPICAL SECTION
F.A.I. 270 EX ϕ STA 834+36.79 TO STA 845+81.491



EXISTING F.A.I. ROUTE 270 TYPICAL SECTION
F.A.I. 270 EX ϕ STA 770+20.40 TO STA 771+70.76
F.A.I. 270 EX ϕ STA 845+81.49 TO STA 874+40.54

EXISTING LEGEND

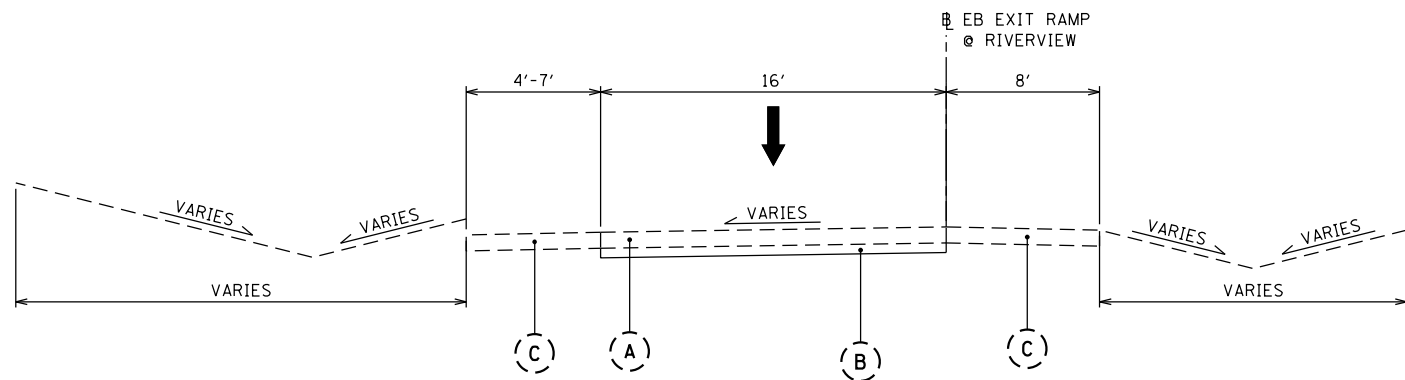
- (A) PORTLAND CEMENT CONCRETE PAVEMENT
- (B) STABILIZED SUBBASE
- (C) EXISTING SHOULDER
- (D) EXISTING HIGH TENSION CABLE BARRIER
- (E) EXISTING GUARDRAIL

PROPOSED LEGEND

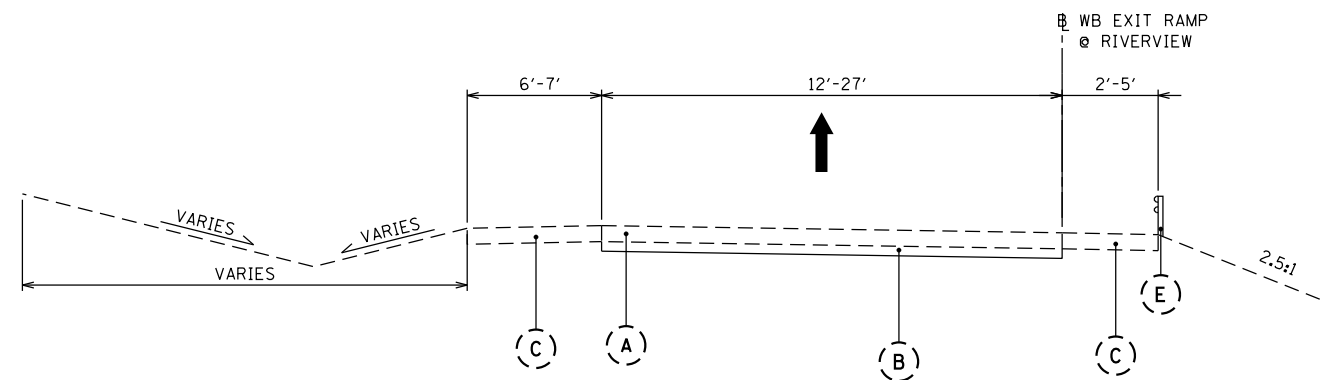
- (1) 12" PORTLAND CEMENT CONCRETE (JOINTED)
- (2) 4" SLAB SUBBASE
- (3) 12" AGGREGATE BASE COURSE, TYPE A
- (4) 12" PCC SHOULDER
- (5) SHOULDER SUBGRADE
- (6) SHOULDER STABILIZATION
- (7) CONCRETE MEDIAN BARRIER
- (8) PCC COMBINATION CURB & GUTTER
- (9) ROUNDABOUT APRON
- (10) CONCRETE MEDIAN
- (11) LIMESTONE FILL

NOTE: PROPOSED MATERIALS AND THICKNESSES TO BE FINALIZED DURING PHASE II DESIGN.

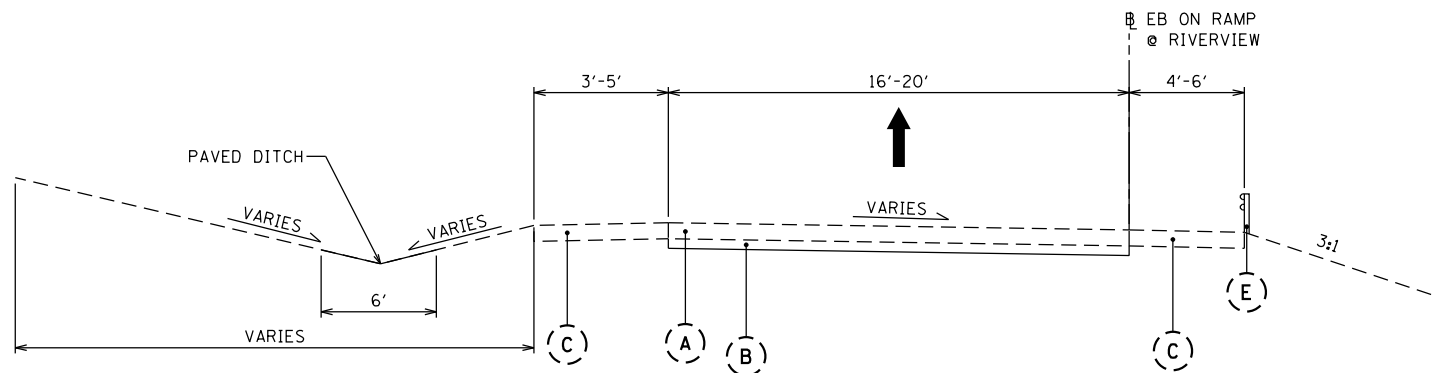
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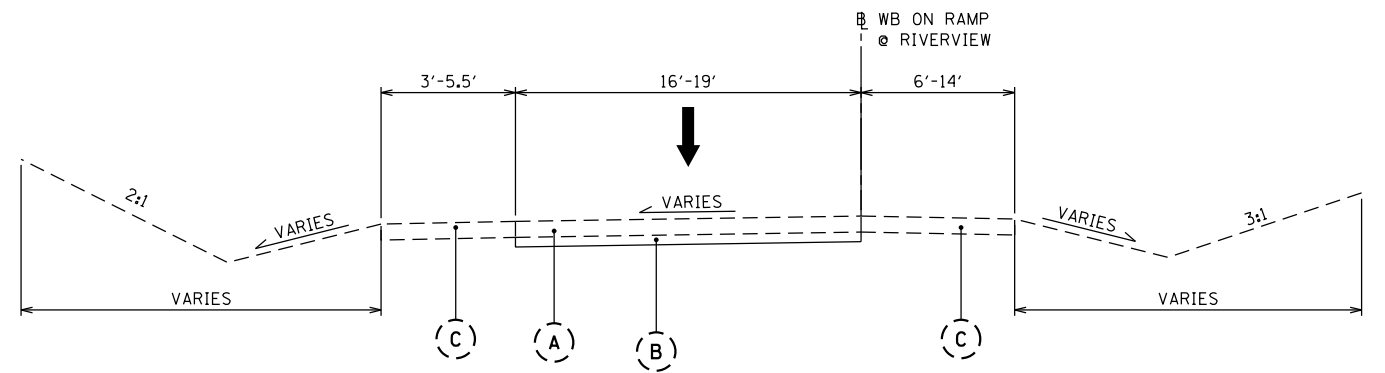
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RIVERVIEW DRIVE (LOOKING WEST)



EXISTING I-270 WB EXIT RAMP
RIVERVIEW DRIVE (LOOKING WEST)



EXISTING I-270 EB ENTRANCE RAMP
RIVERVIEW DRIVE (LOOKING EAST)



EXISTING I-270 WB ENTRANCE RAMP
RIVERVIEW DRIVE (LOOKING EAST)

EXISTING LEGEND

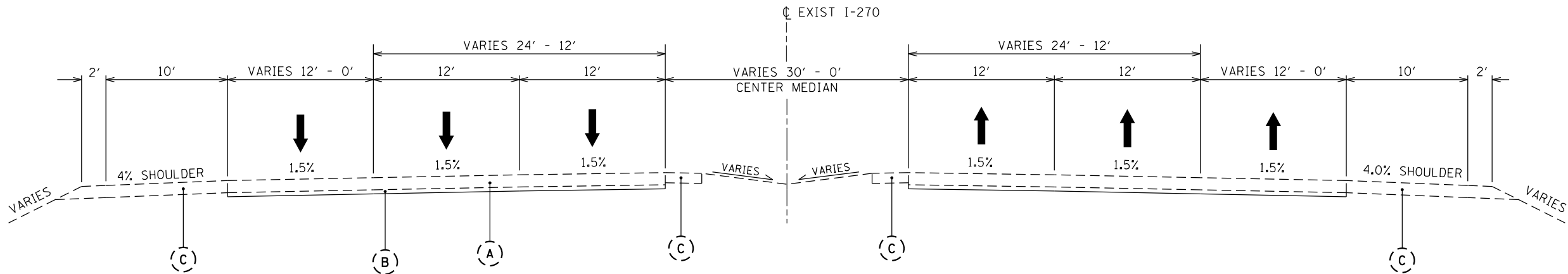
- (A) PORTLAND CEMENT CONCRETE PAVEMENT
- (B) STABILIZED SUBBASE
- (C) EXISTING SHOULDER
- (D) EXISTING HIGH TENSION CABLE BARRIER
- (E) EXISTING GUARDRAIL

PROPOSED LEGEND

- (1) 12" PORTLAND CEMENT CONCRETE (JOINTED)
- (2) 4" SLAB SUBBASE
- (3) 12" AGGREGATE BASE COURSE, TYPE A
- (4) 12" PCC SHOULDER
- (5) SHOULDER SUBGRADE
- (6) SHOULDER STABILIZATION
- (7) CONCRETE MEDIAN BARRIER
- (8) PCC COMBINATION CURB & GUTTER
- (9) ROUNDABOUT APRON
- (10) CONCRETE MEDIAN
- (11) LIMESTONE FILL

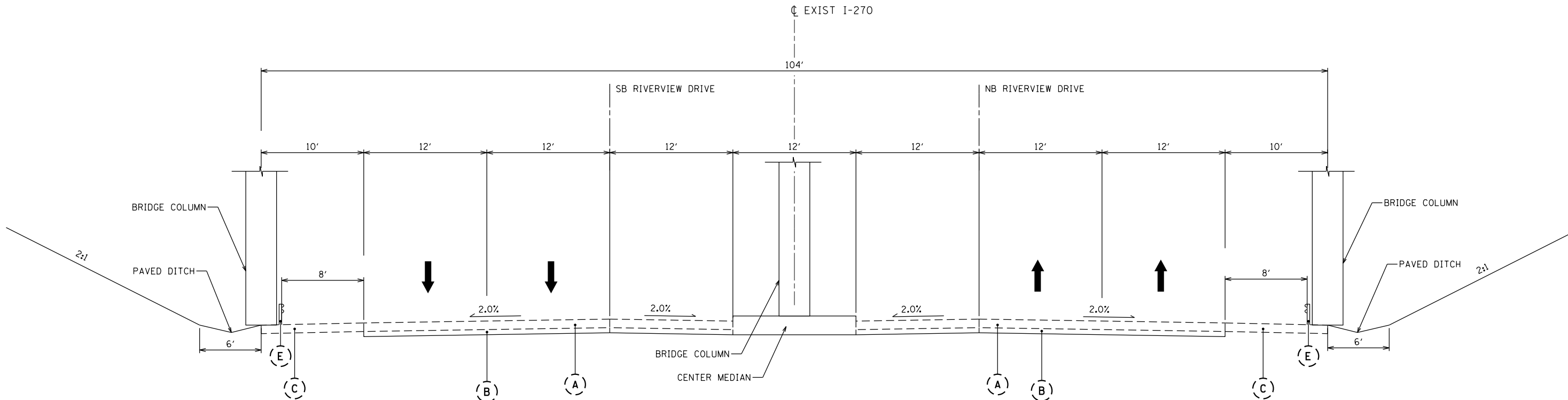
NOTE: PROPOSED MATERIALS AND THICKNESSES TO BE
FINALIZED DURING PHASE II DESIGN.

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RIVERVIEW DRIVE

STA 308+86.74 TO STA 317+84.86
STA 325+49.14 TO STA 332+85.11



EXISTING RIVERVIEW DRIVE

STA 318+32.41 TO STA 321+48.64

EXISTING LEGEND

- (A) PORTLAND CEMENT CONCRETE PAVEMENT
- (B) STABILIZED SUBBASE
- (C) EXISTING SHOULDER
- (D) EXISTING HIGH TENSION CABLE BARRIER
- (E) EXISTING GUARDRAIL

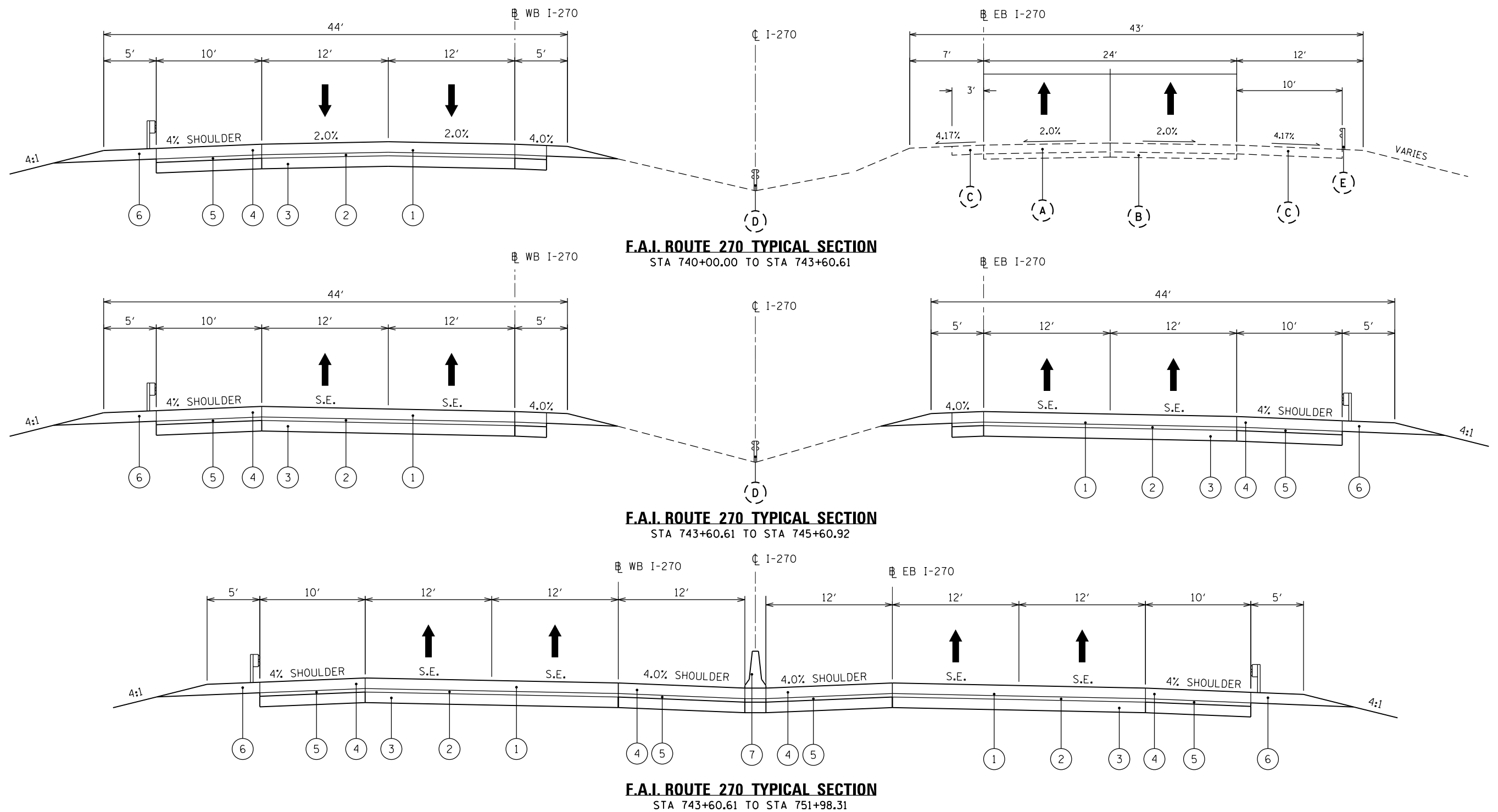
PROPOSED LEGEND

- (1) 12" PORTLAND CEMENT CONCRETE (JOINTED)
- (2) 4" SLAB SUBBASE
- (3) 12" AGGREGATE BASE COURSE, TYPE A
- (4) 12" PCC SHOULDER
- (5) SHOULDER SUBGRADE
- (6) SHOULDER STABILIZATION
- (7) CONCRETE MEDIAN BARRIER
- (8) PCC COMBINATION CURB & GUTTER
- (9) ROUNDABOUT APRON
- (10) CONCRETE MEDIAN
- (11) LIMESTONE FILL

NOTE: PROPOSED MATERIALS AND THICKNESSES TO BE
FINALIZED DURING PHASE II DESIGN.

HORNER SHIFRIN PARSONS	USER NAME = jrbaily	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	EXISTING TYPICAL SECTIONS RIVERVIEW DRIVE			F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	PLOT SCALE = 10.0000' / in.	DRAWN -	REVISED -					270	60B-1	MADISON	4	4
	PLOT DATE = 2/20/2018	CHECKED -	REVISED -		SCALE: SHEET 4 OF 10 SHEETS STA. TO STA.			CONTRACT NO. 76J90				
		DATE -	REVISED -					ILLINOIS FED. AID PROJECT				

FILE NAME = par\\tupla02\\run01\\parsons\\com\\illinois State\\Documents\\I-270 Phase 1\\40 - Design\\CAD\\Roadway\\Sheets\\0876\\98-sh1-typical.dwg



EXISTING LEGEND

- (A) PORTLAND CEMENT CONCRETE PAVEMENT
- (B) STABILIZED SUBBASE
- (C) EXISTING SHOULDER
- (D) EXISTING HIGH TENSION CABLE BARRIER
- (E) EXISTING GUARDRAIL

PROPOSED LEGEND

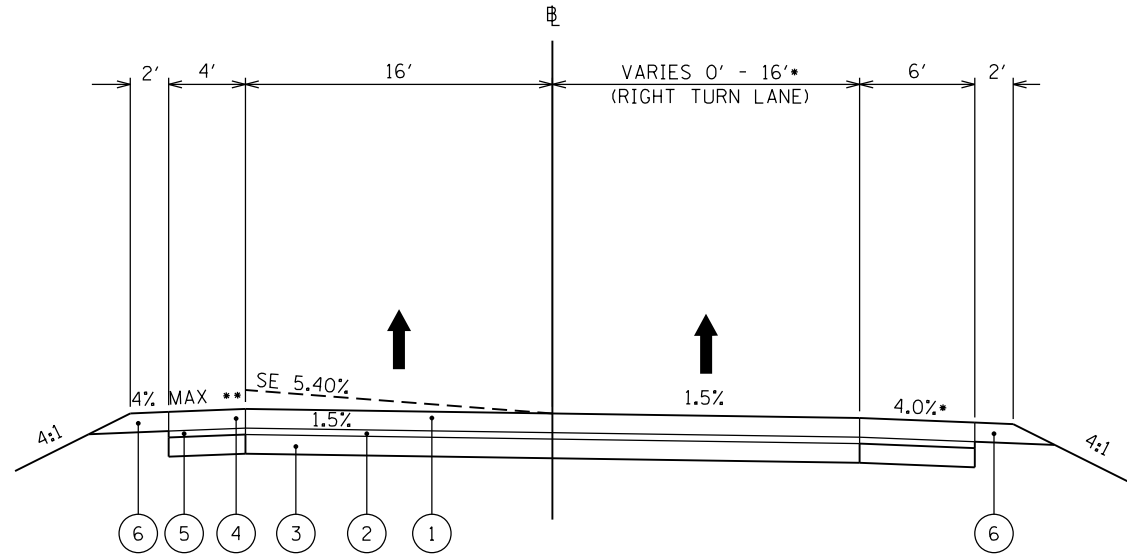
- (1) 12" PORTLAND CEMENT CONCRETE (JOINTED)
- (2) 4" SLAB SUBBASE
- (3) 12" AGGREGATE BASE COURSE, TYPE A
- (4) 12" PCC SHOULDER
- (5) SHOULDER SUBGRADE
- (6) SHOULDER STABILIZATION
- (7) CONCRETE MEDIAN BARRIER
- (8) PCC COMBINATION CURB & GUTTER
- (9) ROUNDABOUT APRON
- (10) CONCRETE MEDIAN
- (11) LIMESTONE FILL

Exhibit 2-01b

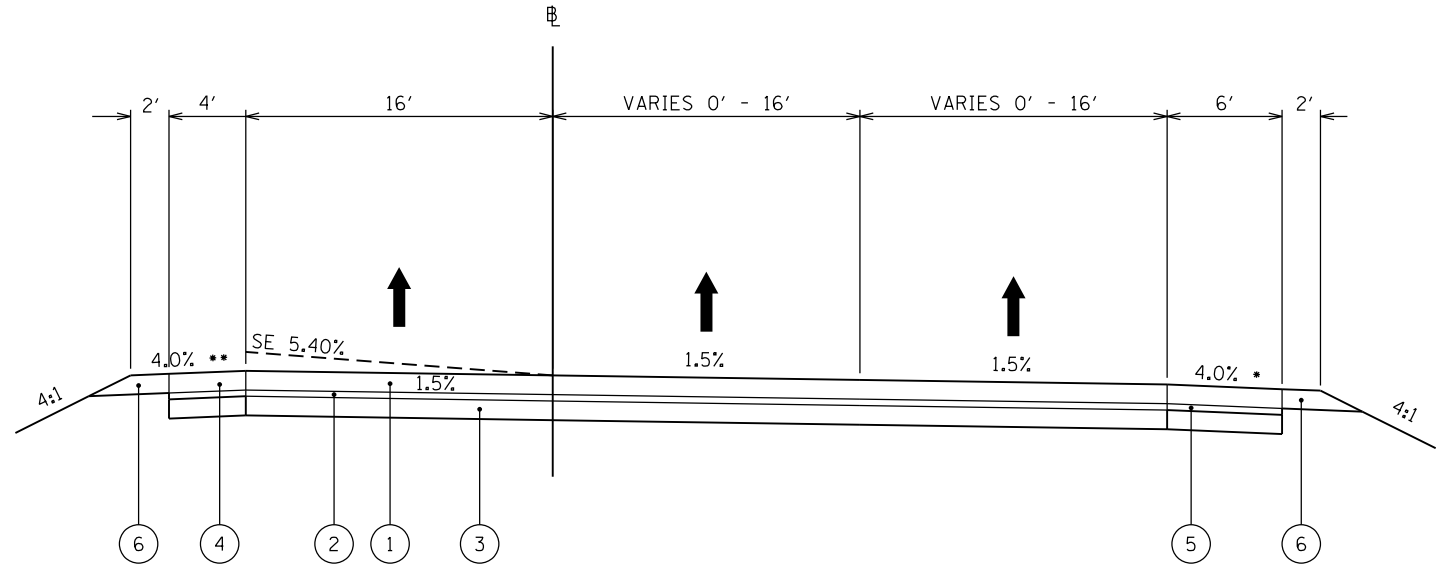
NOTE: PROPOSED MATERIALS AND THICKNESSES TO BE FINALIZED DURING PHASE II DESIGN.

HORNER SHIFRIN PARSONS	USER NAME = jrbaley	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	PROPOSED TYPICAL SECTIONS MAINLINE				F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	PLOT SCALE = 10.0000 ' / in.	DRAWN -	REVISED -						270	60B-1	MADISON	5	5
	PLOT DATE = 2/20/2018	CHECKED -	REVISED -		CONTRACT NO. 76J90								
					SCALE:	SHEET 5	OF 10 SHEETS	STA.	TO STA.	ILLINOIS FED. AID PROJECT			

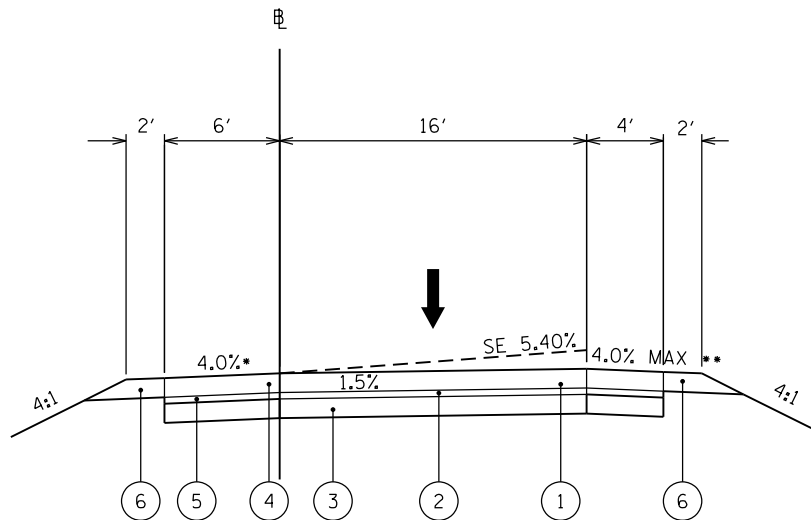
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EAST BOUND EXIT RAMP TYPICAL
F.A.I. 270 CL STA 755+26.31 TO STA 763+74.54
EB EXIT RAMP CL STA 630+00.00 TO STA 637+38.19



WEST BOUND EXIT RAMP TYPICAL
F.A.I. 270 PR CL 791+45.29 TO STA 782+95.58
WB EXIT RAMP CL STA 10+00.00 TO STA 19+75.30



ENTRANCE RAMPS
WB ENTRANCE RAMP CL STA 20+00.00 TO STA 30+85.72
EB ENTRANCE RAMP CL STA 440+00.00 TO STA 450+14.43

- 4.0% SHOULDER SLOPE UNLESS SUPERELEVATION RATE IS GREATER THAN 4.0%.
- MAXIMUM DEFLECTION BETWEEN SHOULDER AND TRAVEL LANE IS 8.0%.

EXISTING LEGEND

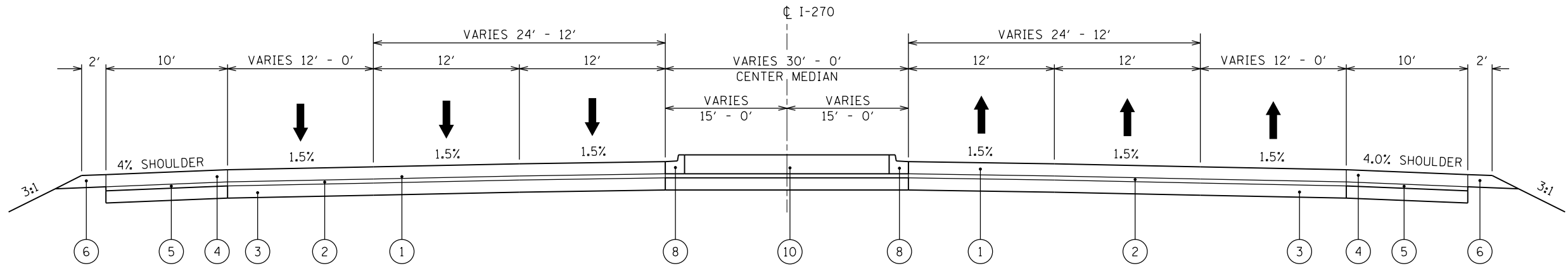
- (A) PORTLAND CEMENT CONCRETE PAVEMENT
- (B) STABILIZED SUBBASE
- (C) EXISTING SHOULDER
- (D) EXISTING HIGH TENSION CABLE BARRIER
- (E) EXISTING GUARDRAIL

PROPOSED LEGEND

- (1) 12" PORTLAND CEMENT CONCRETE (JOINTED)
- (2) 4" SLAB SUBBASE
- (3) 12" AGGREGATE BASE COURSE, TYPE A
- (4) 12" PCC SHOULDER
- (5) SHOULDER SUBGRADE
- (6) SHOULDER STABILIZATION
- (7) CONCRETE MEDIAN BARRIER
- (8) PCC COMBINATION CURB & GUTTER
- (9) ROUNDABOUT APRON
- (10) CONCRETE MEDIAN
- (11) LIMESTONE FILL

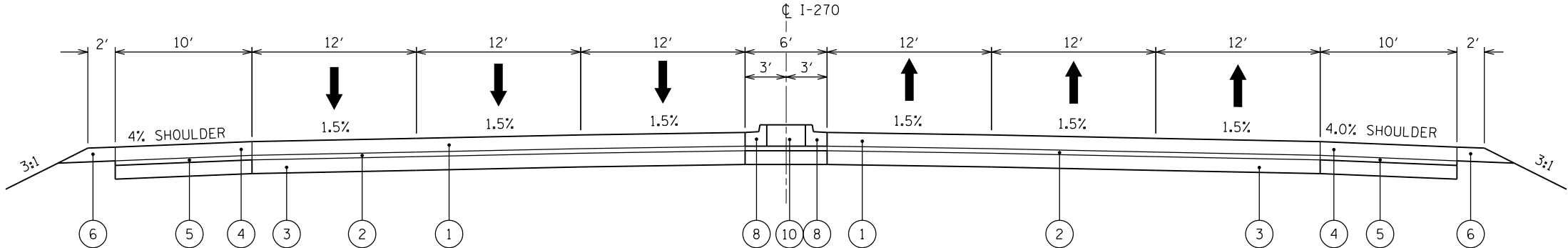
NOTE: PROPOSED MATERIALS AND THICKNESSES TO BE FINALIZED DURING PHASE II DESIGN.

FILE NAME = par\\tupla02\\munt01\\parsons\\com\\illinois State\\Documents\\I-270 Phase 1\\40 - Design\\CAD\\Roadway\\Sheets\\0876\\90-shi-typocrd.dwg



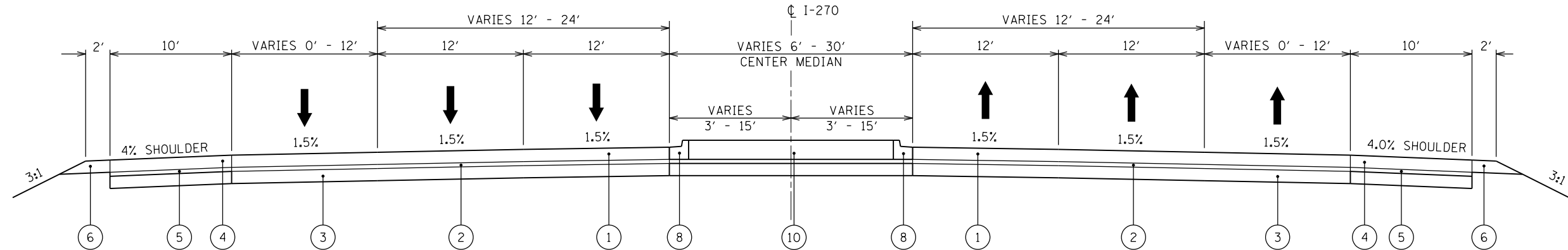
RIVERVIEW DRIVE

STA 321+63.97 TO STA 332+55.18



RIVERVIEW DRIVE UNDER F.A.I. 270

STA 317+58.18 TO STA 320+95.07



RIVERVIEW DRIVE

STA 311+95.65 TO STA 316+59.70

EXISTING LEGEND

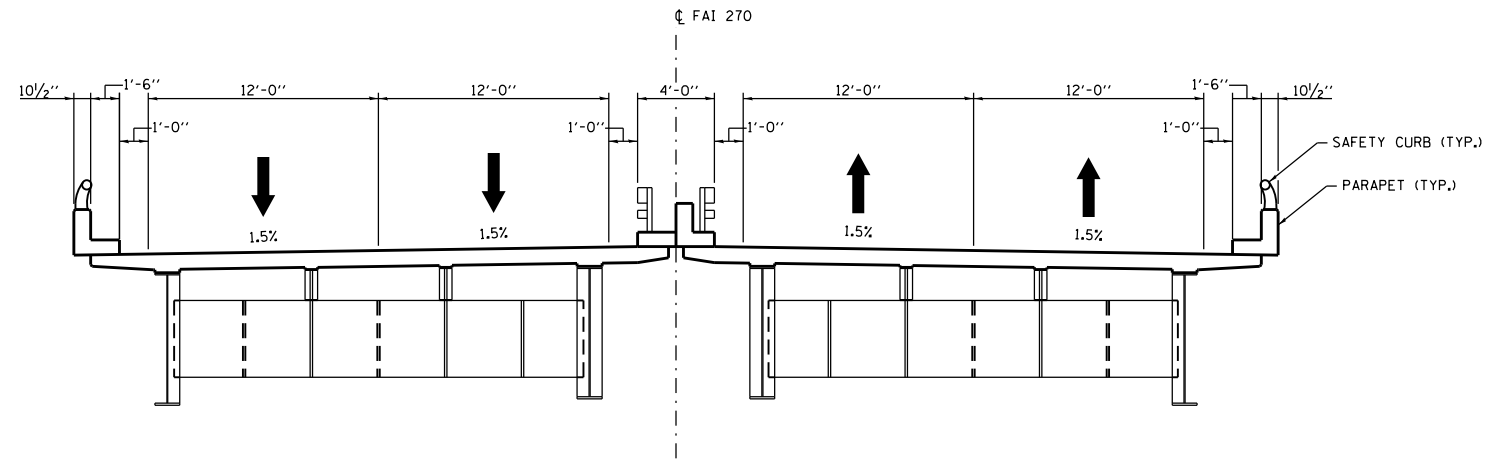
- (A) PORTLAND CEMENT CONCRETE PAVEMENT
- (B) STABILIZED SUBBASE
- (C) EXISTING SHOULDER
- (D) EXISTING HIGH TENSION CABLE BARRIER
- (E) EXISTING GUARDRAIL

PROPOSED LEGEND

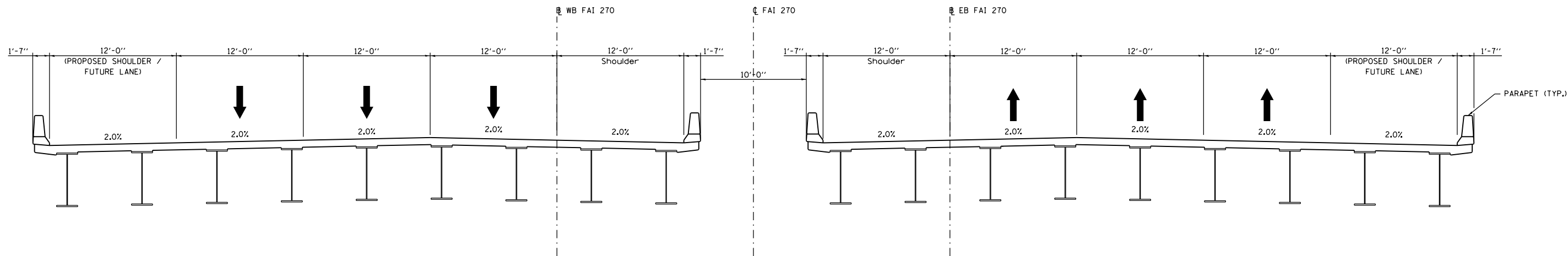
- (1) 12" PORTLAND CEMENT CONCRETE (JOINTED)
- (2) 4" SLAB SUBBASE
- (3) 12" AGGREGATE BASE COURSE, TYPE A
- (4) 12" PCC SHOULDER
- (5) SHOULDER SUBGRADE
- (6) SHOULDER STABILIZATION
- (7) CONCRETE MEDIAN BARRIER
- (8) PCC COMBINATION CURB & GUTTER
- (9) ROUNDABOUT APRON
- (10) CONCRETE MEDIAN
- (11) LIMESTONE FILL

NOTE: PROPOSED MATERIALS AND THICKNESSES TO BE FINALIZED DURING PHASE II DESIGN.

FILE NAME = p:\t\p\1022\m\10\p\parsons\com\illinois State Documents\I-270 Phase 1\40 - Design\CAD\Roadway\Sheets\0876\98-shi-typsec.dwg



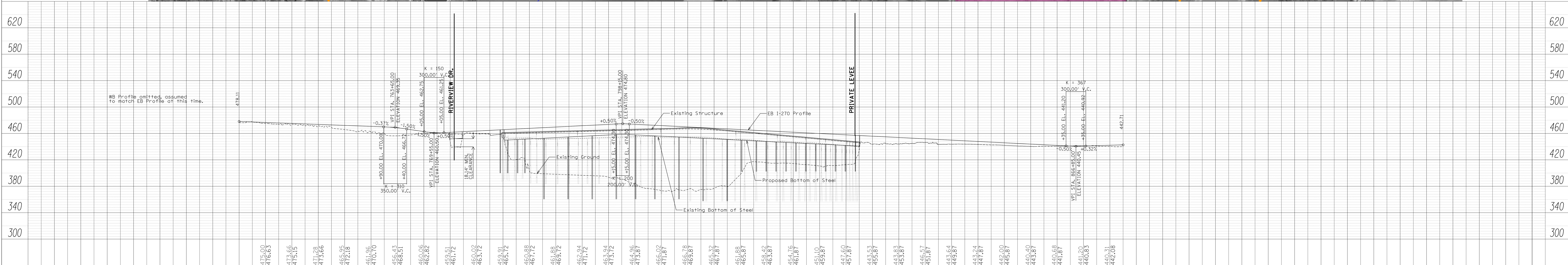
EXISTING BRIDGE TYPICAL SECTION



PROPOSED BRIDGE TYPICAL SECTION
STA 779+59.77 TO STA 833+48.34

HORNER SHIFRIN PARSONS	USER NAME = jrbaily	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	PROPOSED TYPICAL SECTIONS EXISTING / PROPOSED STRUCTURE			F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	PLOT SCALE = 10.0000' / in.	DRAWN -	REVISED -					270	60B-1	MADISON	10	10
	PLOT DATE = 2/20/2018	CHECKED -	REVISED -					CONTRACT NO. 76J90				
		DATE -	REVISED -					ILLINOIS FED. AID PROJECT				
SCALE:		SHEET 10 OF 10 SHEETS		STA.		TO STA.						

PROFILE	SURVEYED _____	BY _____	DATE _____
	PLOTTED _____		
NOTE BOOK	GRADES CHECKED _____		
	B.M. NOTED _____		
NO. _____	STRUCTURE NOTATIONS CHK'D _____		



FILE NAME :	USER NAME : jepettibone	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION FAI 270 EXISTING MISSISSIPPI RIVER CROSSING	F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
p:\xpl02\pant01\persons.com\illinois\State\Documents\1\270 Phase 1\40 - Design\Drawings\Exhibits\0876J90-FAI270D53.dgn		CHECKED -	REVISED -		270				
PLOT SCALE = 400,0000 ' / in.					CONTRACT NO.				
PLOT DATE = 10/31/2017					ILLINOIS FED. AID PROJECT				

5-00 Appendix C: Correspondence

Meeting Minutes

- Dated: March 23, 2017
Location: MSD – 2350 Market Street, St. Louis, MO
Subject: Project Discussion - Review Agency Coordination with MSD
- Dated: May 11, 2017
Location: Waste Management – Closed Landfill Site along W. Chain of Rocks Road
Subject: Project Discussion - Landfill

Memorandums

- Dated: *(Requested)*
Subject: IDOT District 8 Flooding Reports
- Dated: *(Sunshine Request Required)*
Subject: MSD Flooding Reports



Illinois Department of Transportation

MEETING MINUTES

PROJECT: I-270 over the Mississippi River Bridge Replacement**MEETING DATE/TIME:** Thursday, March 23, 2017 @ 9:00a.m.**MEETING LOCATION:** MSD – 2350 Market Street, St. Louis, MO**MEETING PURPOSE:** Project Discussion – MSD**ATTENDEES:**

NAME	INITIAL	ORGANIZATION/TITLE	PHONE	E-MAIL
Cindy Stafford		IDOT - D8 – Location Studies	618-346-3151	cindy.stafford@illinois.gov
Karen Geldert	KG	IDOT – D8 – Location Studies	618-346-3157	karen.geldert@illinois.gov
John Alexander	JCA	MSD – Principal Engineer-Development Review	314-768-2707	JCALEX@stlmsd.com
Brad Riechmann	BER	Horner & Shifrin – Project Manager	618-622-6827	beriechmann@hornershifrin.com
Travis Pfeiffer	TP	Parsons – Sr. Roadway Engineer	314-819-5084	Travis.pfeiffer@parsons.com

DISTRIBUTION: All Attendees**PREPARED BY:** Brad Riechmann**DISTRIBUTION DATE:** April 26, 2017

Introductions: Karen Geldert (IDOT) started the meeting with introductions. Brad Riechmann (Horner & Shifrin, Inc.) then explained IDOT has begun a Phase I study to replace the I-270 bridge over the Mississippi River (Chain of Rocks Bridge) because of the age and condition of the bridge. He explained that MoDOT is currently finalizing an Environmental Assessment (EA) for the widening of I-270 to six-lanes in Missouri from I-70 to the Chain of Rocks Bridge. IDOT has discussed studying the widening of I-270 to six lanes on the Illinois side but this study has not yet begun. The funding for the IDOT six lane study is currently included in later years of the Department's Multi-Year Program (MYP). The purpose of the meeting was to discuss MSD known projects and interests in the area including a MSD force main that runs along Riverview Drive which was discovered during an underground utility investigation conducted as part of this phase I project.

Overview of Project: The I-270 Bridge over the Mississippi River is being replaced because it is deteriorating. IDOT has funding for this Phase I study, and funding for Phase II design is programmed, but there currently is no funding for construction. The IDOT Phase I study currently being conducted consists of preliminary

engineering, identifies right-of-way needs and environmental issues. This study is being processed as a Federally Approved Categorical Exclusion. IDOT would like to construct the new I-270 bridge where the bridge remained open to traffic, similar to the Canal Bridge project.

Details of Project: Brad (H&S) provided details of the I-270 study. A goal of the study is to identify a replacement bridge that can accommodate up to six lanes; however, it is assumed that only 4 lanes would be open initially. The ultimate six lane configuration would be compatible with the on-going MoDOT EA for the widening of I-270 in Missouri and with the future IDOT I-270 six-lane study. The next step in the structure replacement study process is to develop alternative concepts.

The bridge was constructed in 1966 and is nearing the end of its design life. It has two lanes in each direction with narrow shoulders. A segment on the bridge has been identified as a 5% selected segment, meaning it has been identified as being in the top 5% of crashes in the State of Illinois for roadways of similar types. The bridge currently has an ADT of 51,000 vpd with 17 percent truck traffic during the work week. On the weekends, the ADT drops to approximately 36,000 indicating that this bridge serves as a significant commuter bridge. IDOT has completed numerous repairs of the last few years and now has decided that the best use of the funding would be to replace it.

Public Involvement: Brad (H&S) provided an overview of the public involvement activities:

- The public involvement for the project is being carried out using IDOT's Context Sensitive Solutions (CSS) process, which is a way for the IDOT to interact with the public to receive comments, which help IDOT shape the project to fit within the public's context.
- A Community Advisory Group (CAG) has been formed for the project. IDOT held its first CAG meeting in October 2016. The CAG echoed some of the same issues and topics the Study Team has considered: Chouteau Island is used for recreation; the Bridge is of regional and national importance for the movement of goods and services; keep the bridge open during construction as many use to commute to work.
- There were two public informational meetings held in the Summer 2016. One was held in Illinois, the other in Missouri. They provided the same information. The public comments received reiterated those of the CAG.
- A project newsletter was recently sent out. Brad mentioned that the newsletter along with other project materials are available for viewing on the project website. The website address was pointed out on the materials provided for MSD use. The project team will add John to the project mailing list so he may receive future project emails.
- The Study Team (IDOT and Consultant) have held numerous stakeholder meetings to gather input on the project. Stakeholder meetings that have taken place include: City of St. Louis, Great Rivers Greenway (GRG), Heartlands Conservancy, the Army Corp of Engineers (COE), Coast Guard, and Lighthouse Development.

Environment: Brad (H&S) explained that as a part of the Phase I study environmental concerns are also considered during the alternative analysis. Those considered are wetlands, threatened & endangered species, USFWS coordination, floodplains, cultural resources, special waste and section (4f) lands. As stated earlier the project is being processed as a Federally Approved Categorical Exclusion.

Input from MSD: John Alexander (MSD) asked if we were aware of the development to the north of the existing I-270 corridor. The project team informed John that we have previously met with the developer during our outreach.

John (MSD) informed the group the developer received an approved Letter of Map Revision (LOMR) from the USACE allowing the development to fill in the proposed development out of the flood plain.

John (MSD) provided copies of MoDOT EA study sheets near the Riverview Drive interchange for the team's use. IDOT reiterated that throughout this project IDOT and MoDOT have been in close coordination. John also provided detailed existing MSD utility information for the team's use.

The results of IDOT's Phase I project Subsurface Utility Engineering (SUE) investigation was discussed. Brad shared the results of the investigation stating that MSD was contacted and the location of the force main was not able to be found outside of information provided by MDS which was shared. John subsequently provided clearer information on the utility and suggested they would send additional as-built information for our use. A SUE level "A" pot hole will most likely be required in this utility. *(John provided the as built information via email on 3/23/2017. Also included in the email was notification of MSD plans to slip line the existing force main and place a new line adjacent to the existing force main. This approximate timeline for this project is 2022.)*

John suggested even with detailed locations of the force main, MSD may prefer drilled shafts rather than pile driving for the foundation of the replacement structure carrying I-270 over Riverview drive due to its close proximity to the force main. John (MSD) explained that MSD has been considering plans to relocate the existing pump station south of Watkins Creek to a location, which is out of the flood plain.

John (MSD) stated that a full water quality review by MSD might not be required for the project since it most likely will fall under either IDOT's or MoDOT's MS4 permit.

John (MSD) referred the project team to St. Louis City Water Department on river intake items along with water treatment facility south of the old Chain of Rocks Bridge. MSD does not operate a treatment facility near the project area.

The team was informed that final MSD signoff will be required on the plans. They will be reviewing outfall information along with erosion control as it pertains to MSD existing utilities. MSD will need to approve any permits required along with any work affecting MSD sewer manholes. No approval required for work on MoDOT manholes. MSD would prefer to review the plans after a 50% level. IDOT suggested a commitment be made going into phase II plan development that would allow for this review to happen. Phase I plans will not be developed to this level.

John (MSD) provided a rough outline for time of MSD review including a general 3-week initial review followed by 2-week reviews. Depending on whether a permit is required, either 4 sets or 9 sets of plans will be required.

End of Meeting Minutes

Contact Brad Riechmann at beriechmann@hornersshifrin.com for any additions or corrections to these minutes within seven calendar days of the distribution date or they will be considered final.



Illinois Department of Transportation

MEETING MINUTES

PROJECT: I-270 over the Mississippi River Bridge Replacement**MEETING DATE/TIME:** Thursday, May 11, 2017 @ 9:00a.m.**MEETING LOCATION:** Waste Management – Closed Landfill site along W. Chain of Rocks Road.**MEETING PURPOSE:** Project Discussion**ATTENDEES:**

NAME	INITIAL	ORGANIZATION/TITLE	PHONE	E-MAIL
Cindy Stafford		IDOT - D8 – Location Studies	618-346-3151	cindy.stafford@illinois.gov
Karen Geldert	KBG	IDOT – D8 – Location Studies	618-346-3157	karen.geldert@illinois.gov
Mike Peterson	MP	Waste Management – District Manager, Closed Sites	414-788-0537	Mpetero2@wm.com
Michael Prattke				
Brad Riechmann	BER	Horner & Shifrin – Project Manager	618-622-6827	beriechmann@hornershifrin.com
Bridgett Jacquot	BJ	Horner & Shifrin – Environmental/Public Involvement Mngr	618-622-6831	bjjacquot@hornershifrin.com

DISTRIBUTION: All Attendees**PREPARED BY:** Bridgett Jacquot**DISTRIBUTION DATE:** June 1, 2017

Purpose of Meeting: Waste Management has three close landfills on Chouteau Island within the project study area.

1. Overview of Project

Brad Riechmann (H&S) opened the meeting by providing details of the project:

- The project is to replace the existing I-270 bridge over the Mississippi River
- When the bridge is replaced, the approaching roadway must be adjusted to conform with the new bridge.
- MoDOT recently completed a study to expand I-270 in Missouri to six lanes.
- IDOT will be starting a study to evaluate expanding I-270 on the Illinois side to six lanes.
- The bridge is heavily traveled as it carries 51,000 vehicles per day with 17 percent truck traffic.
- The existing I-270 Mississippi River bridge is two lanes in each direction with very narrow shoulders.
- The bridge is considered to be a high crash location. The crashes that occur on the bridge are mostly rear-end crashes. The narrow shoulders that do not allow for vehicles to pull over has contributed to these crashes.
- The purpose of the study is to identify the best way to cross the Mississippi River with a new bridge. IDOT has conducted numerous repairs over the years to the bridge and the number of repairs necessary has been increasing over the years. In turn, the cost of maintaining the bridge is continuing to increase. IDOT has decided that replacing the bridge is a better expenditure of funding.
- IDOT's goal is to replace the bridge that will accommodate six-lanes of traffic.

- There are some geometric concerns with the Riverview Drive interchange in Missouri. The interchange sits very close to the existing Chain of Rocks bridge. There has been frequent coordination between MoDOT and IDOT regarding this interchange.
- IDOT carries out their projects in three phases. Phase I (preliminary engineering and environmental study) is the phase the project is currently in; Phase II (contract plans preparation and land acquisition) is funded; and Phase III (construction) is not funded.

2. Environmental

- Bridgett (H&S) gave an overview of the environmental issues.
- Bridgett (H&S) explained IDOT is conducting an environmental study concurrently with the preliminary engineering. The environmental study identifies issues or resources IDOT needs to be aware of during planning and construction. For example, IDOT is aware of the possibility of the Pallid Sturgeon in the Mississippi River and also the possibility of archaeological sites.

3. Public Involvement

- Bridgett (H&S) stated that IDOT has been carrying out public involvement activities for the project. This includes a Community Advisory Group (CAG) and also public meetings.
- Two public meetings were held in July 2016; one in Illinois and one in Missouri. Both meetings had the same information but IDOT wanted to try to capture people on both sides of the river.
- The outcome of the public involvement was that the public wants wider shoulders on the new bridge and also want the bridge left open during construction.

4. Discussion

- Mike Peterson (WM) gave us an overview of the landfills on Chouteau Island.
- Mike said there are three closed landfills: one has been transferred to the city of Madison, IL and the other two are still owned by Waste Management.
- Mike showed on a map the locations and boundaries of these three closed landfills. Please see the attached map.
- Mike stated the closed landfill that has been transferred to the city of Madison sits directly to the south of I-270 (see attached map). This landfill has been closed for over 20 years and was a municipal waste landfill. He stated the contents have mostly decomposed as there is little gas that is being released by this site. Bridgett asked why the city of Madison would want this site. Mike stated they used a portion of the site to construct an additional parking lot for the Old Chain of Rocks bridge.
- Mike said the other two sites have been closed for approximately 30 years and Waste Management will most likely monitor them in perpetuity.
- Drainage was discussed. Drainage would be the main reason IDOT would need to excavate within the closed landfill site owned by the city of Madison. It is common construction practice when constructing on special waste sites, to avoid excavation if possible and only fill as it serves as “cap” for the site. IDOT typically does not purchase landfill property; therefore, discussions with IDOT’s Land Acquisition Division will need to take place prior to the selection of a preferred.
- Possible drainage options were discussed:
 - o Force roadway water runoff into the pond owned by Waste Management (see map).
 - o A goal is to establish no drainage through the Madison owned closed landfill site.
 - o Try to force the drainage north of I-270.
 - o There is a culvert under I-270. Need to investigate where the water goes.
- Other notable points were there is one resident on Chouteau Island. He farms on the island.
- Roman Road located on Chouteau Island has been closed permanently.



End of Meeting Minutes

Contact Bridgett Jacquot bljacquot@hornersshifrin.com for any additions or corrections to these minutes within seven calendar days of the distribution date or they will be considered final.

5-00 Appendix D: Supporting Documents

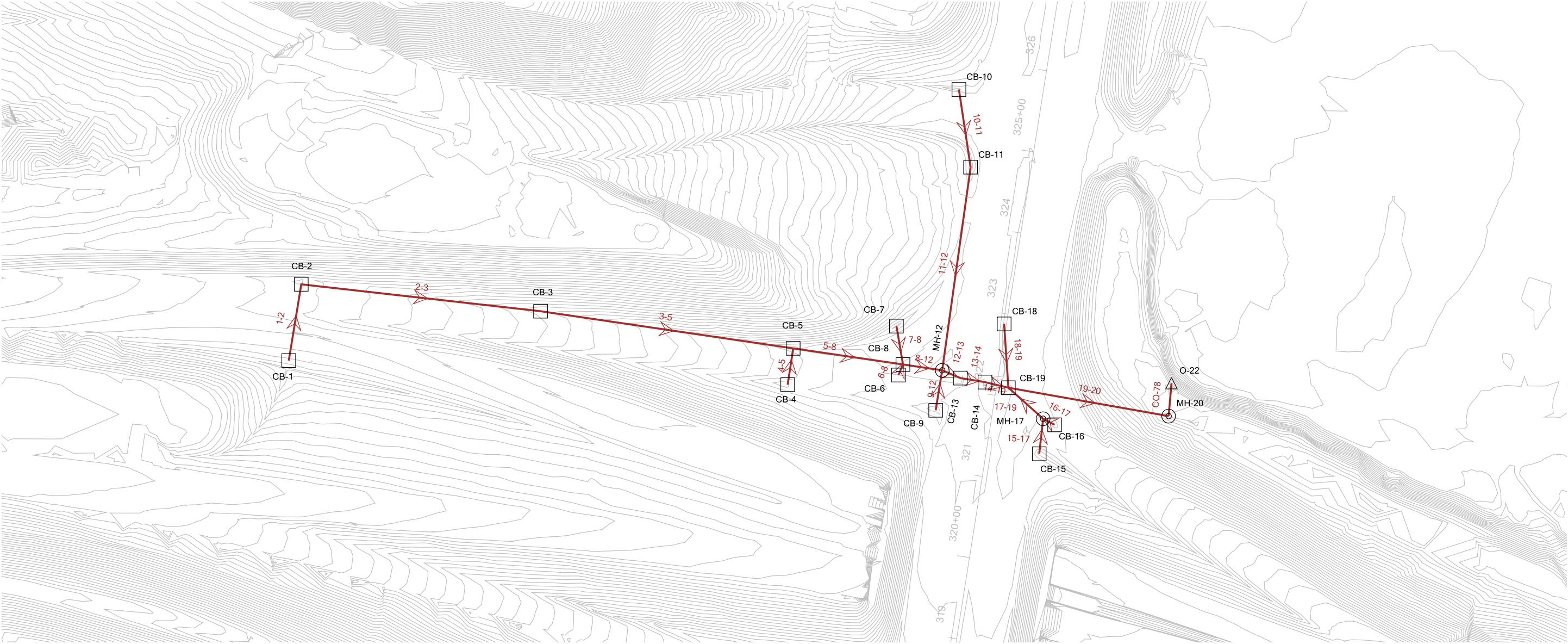
Calculations

- Hydrology
- “Bentley StormCAD” Software Storm Sewers Design Data
- “Bentley CulvertMaster” Software Culvert Design Data
- Ditch Conveyance Calculations – Proposed
- Stormwater Detention Calculations
- Compensatory Storage Calculations

Hydraulic Report

- I-270 Bridge over Mississippi River – Submitted under separate cover with detailed Major Waterway Crossing information.

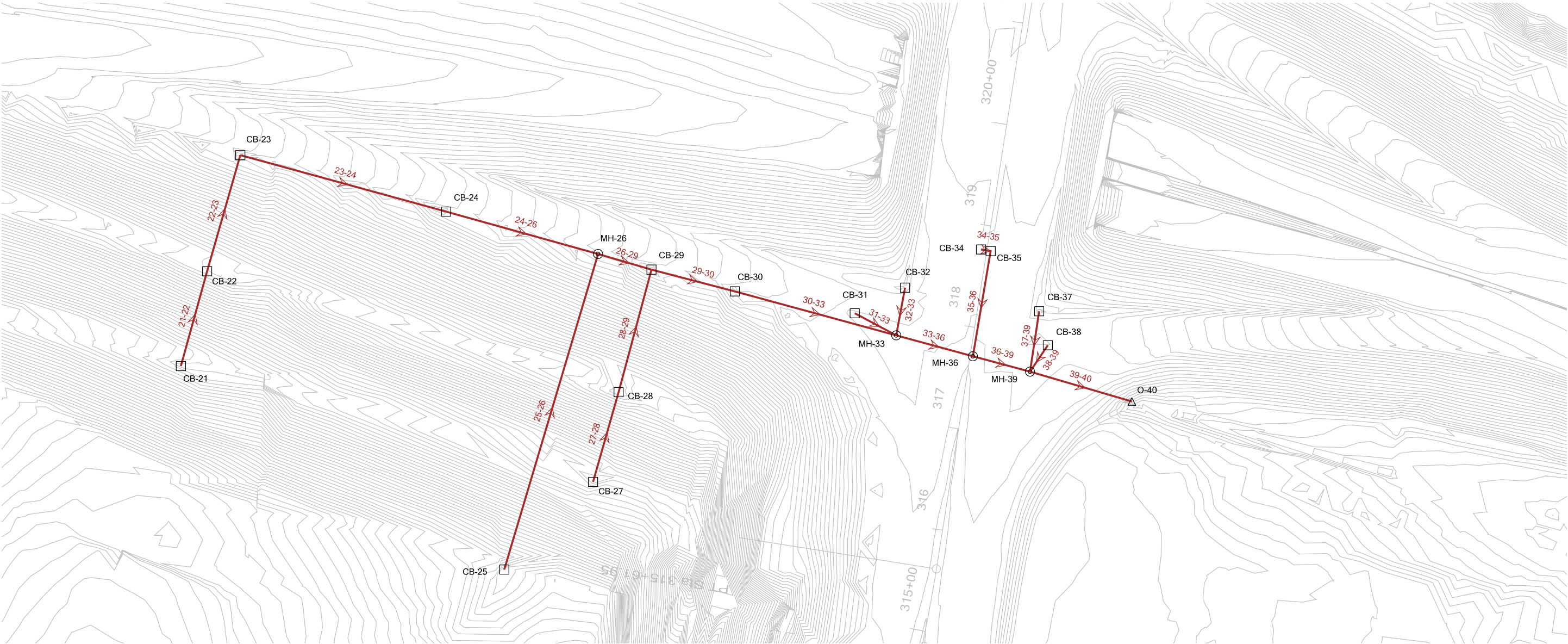
Scenario: Base



Conduit FlexTable: Report

Label	-Node- Upstream Downstream	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Invert- Upstream Downstream (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Section Type	Material	System CA (acres)	System Intensity (in/h)	Flow (cfs)	Velocity (ft/s)
10-11	CB-11	438.39	435.63	434.09	95.6	-0.009	Circle		0.000	8.000	2.40	4.71
	CB-10	439.70	434.71	434.97	95.6		<None>					
1-2	CB-1	456.56	454.88	453.76	94.1	0.027	Circle	Concrete	0.000	8.000	9.87	9.99
	CB-2	457.00	451.93	451.23	94.1		<None>					
2-3	CB-2	457.00	451.63	451.23	293.1	0.027	Circle	Concrete	0.000	8.000	1.35	5.60
	CB-3	450.51	443.77	443.36	293.1		<None>					
3-5	CB-3	450.51	443.77	443.36	310.9	0.027	Circle	Concrete	0.000	8.000	1.44	5.71
	CB-5	441.25	435.44	434.99	310.9		<None>					
5-8	CB-5	441.25	435.44	434.99	135.1	0.027	Circle	Concrete	0.000	8.000	1.68	5.97
	CB-8	440.52	432.18	431.37	135.1		<None>					
8-12	CB-8	440.52	432.18	431.37	48.3	0.000	Circle	Concrete	0.000	8.000	3.70	0.52
	MH-12	441.18	431.97	429.87	48.3		<None>					
4-5	CB-4	440.52	437.02	436.42	44.6	0.032	Circle	Concrete	0.000	8.000	2.53	7.42
	CB-5	441.25	435.36	434.99	44.6		<None>					
6-8	CB-6	439.90	436.72	436.45	14.0	0.002	Circle	Concrete	0.000	8.000	0.30	1.59
	CB-8	440.52	436.65	431.37	14.0		<None>					
7-8	CB-7	437.76	433.82	433.26	47.4	0.040	Circle	Concrete	0.000	8.000	1.72	7.45
	CB-8	440.52	432.18	431.37	47.4		<None>					
9-12	CB-9	438.40	435.45	434.95	49.3	0.016	Circle	Concrete	0.000	8.000	1.41	5.04
	MH-12	441.18	434.56	429.87	49.3		<None>					
15-17	CB-15	438.17	434.02	433.42	42.9	0.021	Circle	Concrete	0.000	8.000	1.95	6.16
	MH-17	439.10	433.12	432.50	42.9		<None>					
16-17	CB-16	439.97	433.26	433.10	15.8	0.038	Circle	Concrete	0.000	8.000	0.15	3.58
	MH-17	439.10	433.12	432.50	15.8		<None>					
18-19	CB-18	440.54	438.17	437.82	77.9	0.006	Circle	Concrete	0.000	8.000	0.71	3.02
	CB-19	440.42	437.66	427.64	77.9		<None>					
12-13	MH-12	441.18	430.81	429.87	24.0	0.027	Circle	Concrete	0.000	8.000	8.80	9.24
	CB-13	440.20	429.87	429.23	24.0		<None>					
13-14	CB-13	440.20	429.45	429.23	30.4	0.027	Circle	Concrete	0.000	8.000	0.49	3.88
	CB-14	440.27	428.74	428.42	30.4		<None>					
14-19	CB-14	440.27	428.74	428.42	29.2	0.027	Circle	Concrete	0.000	8.000	1.08	4.94
	CB-19	440.42	427.85	427.64	29.2		<None>					
19-20	CB-19	440.42	427.80	427.64	198.2	0.027	Circle	Concrete	0.000	8.000	0.27	3.23
	MH-20	425.32	422.43	422.32	198.2		<None>					
17-19	MH-17	439.10	433.12	432.50	56.7	0.086	Circle	Concrete	0.000	8.000	2.10	10.39
	CB-19	440.42	427.94	427.64	56.7		<None>					
11-12	MH-12	441.18	434.69	429.87	249.7	-0.017	Circle	Concrete	0.000	8.000	3.69	6.10
	CB-11	438.39	430.81	434.09	249.7		<None>					
CO-78	MH-20	425.32	(N/A)	422.32	40.2	0.050	Circle	Concrete	(N/A)	(N/A)	(N/A)	(N/A)
	O-22	422.32	(N/A)	420.32	40.2		<None>					

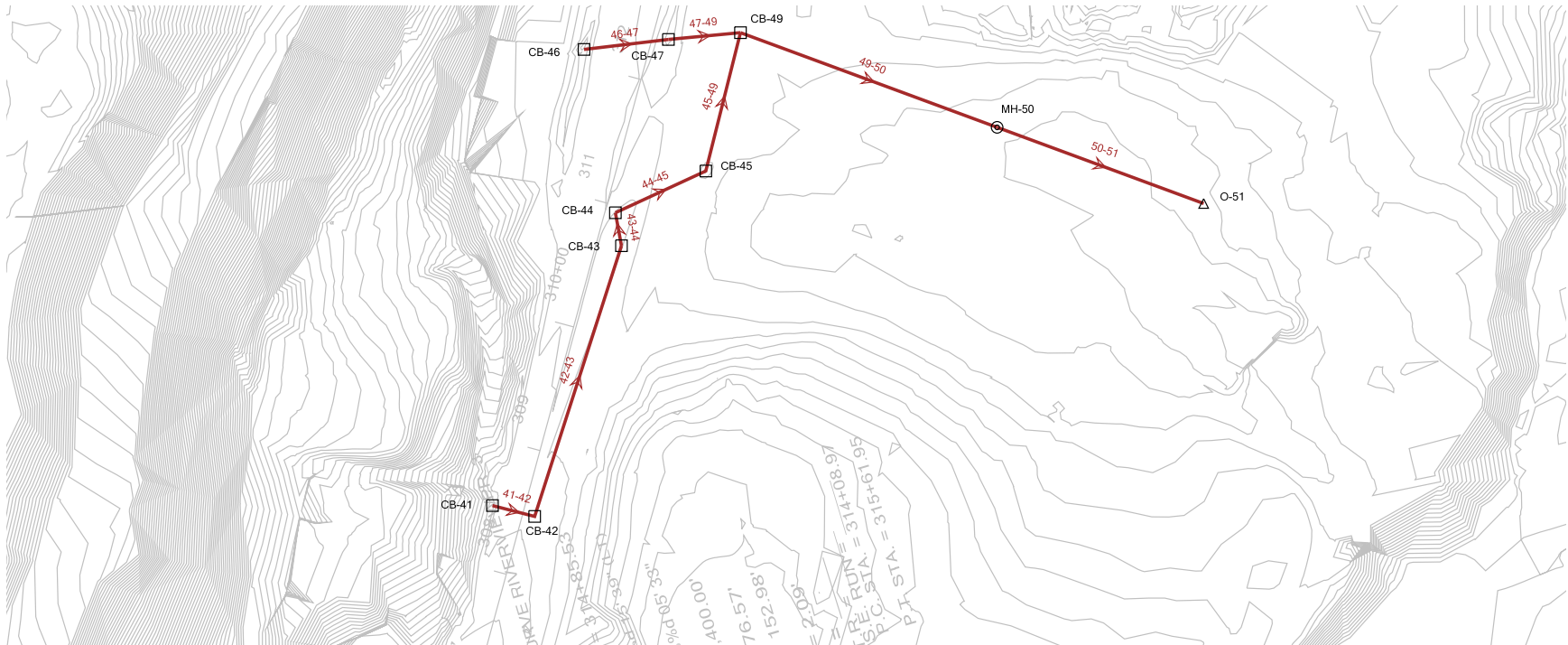
Scenario: Base



Conduit FlexTable: Report

Label	-Node- Upstream Downstream	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Invert- Upstream Downstream (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Section Type	Material	System CA (acres)	System Intensity (in/h)	Flow (cfs)	Velocity (ft/s)
23-24	CB-23	460.32	456.46	455.72	207.9	0.046	Circle	Concrete	0.000	8.000	3.78	9.43
	CB-24	451.10	446.67	446.25	207.9		<None>					
29-30	CB-29	441.99	437.44	437.09	83.9	0.046	Circle	Concrete	0.000	8.000	1.05	6.26
	CB-30	438.74	433.44	433.24	83.9		<None>					
27-28	CB-27	500.10	498.61	498.06	90.9	0.399	Circle	CMP	0.000	8.000	1.91	11.03
	CB-28	475.20	462.41	461.79	90.9		<None>					
28-29	CB-28	475.20	462.31	461.79	123.5	0.200	Circle	CMP	0.000	8.000	1.74	8.41
	CB-29	441.99	437.37	437.09	123.5		<None>					
30-33	CB-30	438.74	433.50	433.24	162.9	0.013	Circle	Concrete	0.000	8.000	0.63	3.36
	MH-33	438.26	432.29	431.11	162.9		<None>					
39-40	MH-39	438.08	422.39	421.28	103.4	0.022	Circle	Concrete	0.000	8.000	10.90	9.39
	O-40	421.50	419.72	419.00	103.4		<None>					
33-36	MH-33	438.26	432.00	431.11	77.4	0.063	Circle	Concrete	0.000	8.000	7.14	12.08
	MH-36	438.10	427.46	426.20	77.4		<None>					
36-39	MH-36	438.10	427.15	426.20	57.6	0.085	Circle	Concrete	0.000	8.000	8.11	13.92
	MH-39	438.08	422.81	421.28	57.6		<None>					
34-35	CB-34	438.70	435.88	435.50	9.5	0.066	Circle	Concrete	0.000	8.000	0.82	7.22
	CB-35	438.72	435.41	434.87	9.5		<None>					
35-36	CB-35	438.72	435.28	434.87	103.8	0.083	Circle	Concrete	0.000	8.000	0.97	8.24
	MH-36	438.10	427.46	426.20	103.8		<None>					
24-26	CB-24	451.10	446.68	446.25	153.6	0.044	Circle	Concrete	0.000	8.000	1.29	6.81
	MH-26	444.37	440.54	439.48	153.6		<None>					
26-29	MH-26	444.37	440.34	439.48	54.3	0.044	Circle	Concrete	0.000	8.000	5.91	10.30
	CB-29	441.99	437.57	437.09	54.3		<None>					
25-26	CB-25	527.92	526.68	525.92	320.6	0.270	Circle	Concrete	0.000	8.000	4.62	18.14
	MH-26	444.37	440.54	439.48	320.6		<None>					
31-33	CB-31	437.97	435.93	435.77	45.8	0.102	Circle	Concrete	0.000	8.000	0.16	5.17
	MH-33	438.26	432.29	431.11	45.8		<None>					
32-33	CB-32	436.55	432.89	432.00	47.3	0.019	Circle	Concrete	0.000	8.000	6.35	7.76
	MH-33	438.26	432.29	431.11	47.3		<None>					
37-39	CB-37	436.91	433.28	432.66	59.5	0.018	Circle	Concrete	0.000	8.000	2.42	6.07
	MH-39	438.08	432.03	421.28	59.5		<None>					
38-39	CB-38	438.14	434.08	433.84	31.1	0.073	Circle	Concrete	0.000	8.000	0.37	5.72
	MH-39	438.08	431.71	421.28	31.1		<None>					
21-22	CB-21	515.17	512.71	512.07	95.9	0.285	Circle	Concrete	0.000	8.000	2.25	16.28
	CB-22	488.76	485.50	484.76	95.9		<None>					
22-23	CB-22	488.76	485.37	484.76	117.6	0.247	Circle	Concrete	0.000	8.000	2.05	15.04
	CB-23	460.32	456.70	455.72	117.6		<None>					

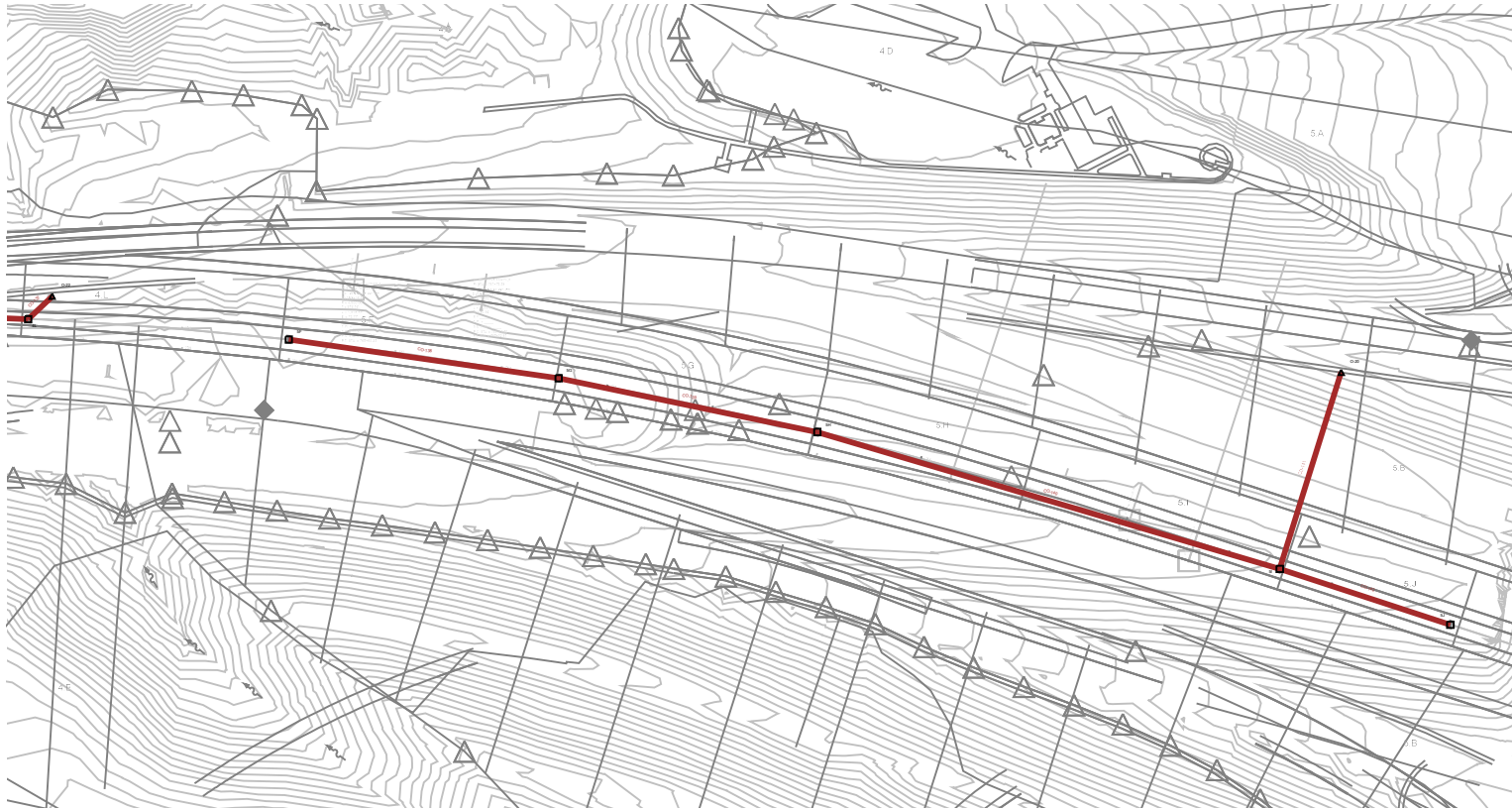
Scenario: Base



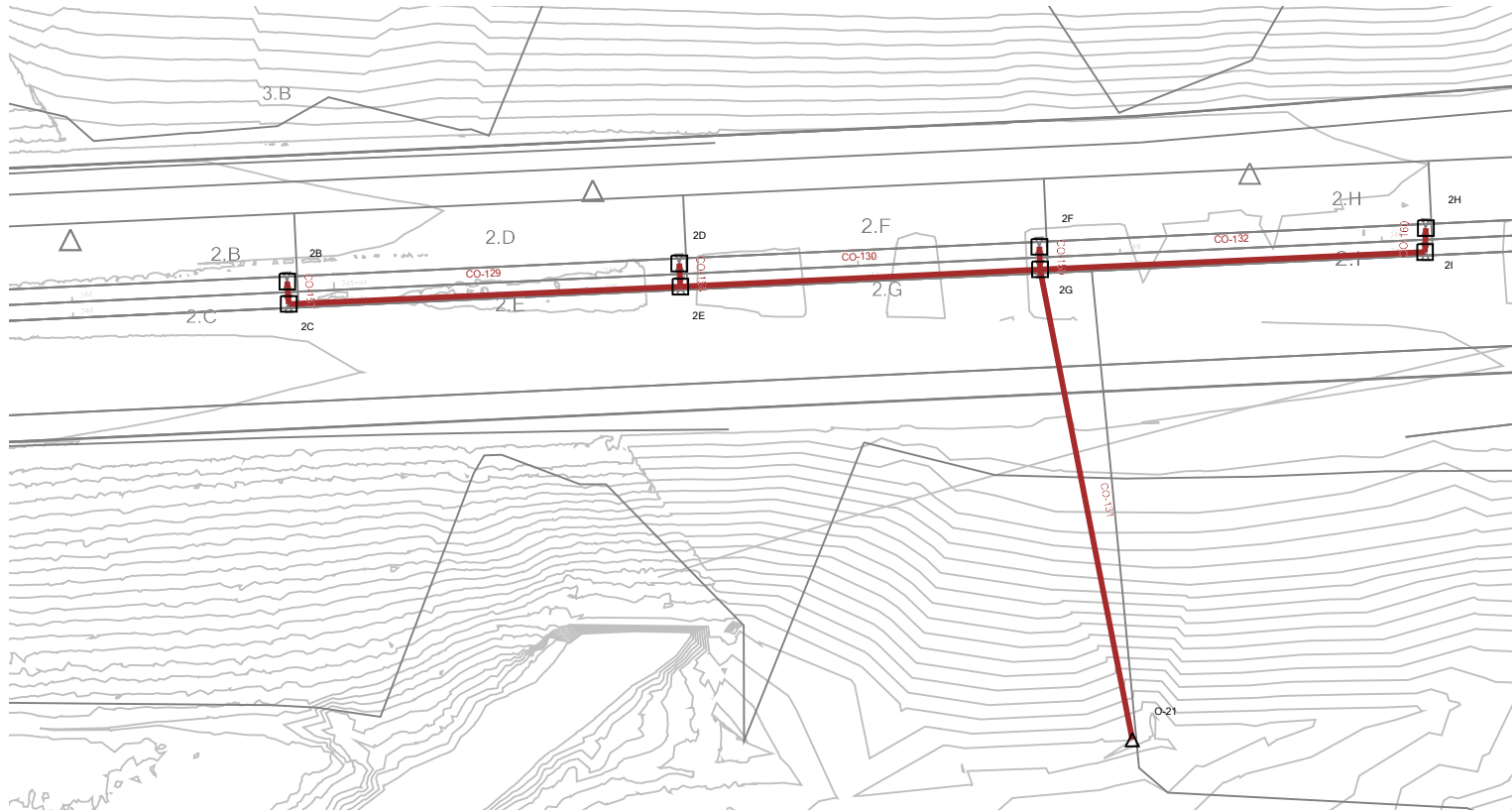
Conduit FlexTable: Report

Label	-Node- Upstream Downstream	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Invert- Upstream Downstream (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Section Type	Material	System CA (acres)	System Intensity (in/h)	Flow (cfs)	Velocity (ft/s)
46-47	CB-46	433.50	430.88	429.70	66.4	0.013	Circle	Concrete	0.000	8.000	9.40	7.56
	CB-47	433.72	429.82	428.82	66.4		<None>					
41-42	CB-41	435.68	433.89	433.68	34.0	0.020	Circle	Concrete	0.000	8.000	0.29	3.39
	CB-42	437.00	433.27	433.00	34.0		<None>					
42-43	CB-42	437.00	433.21	433.00	221.7	0.007	Circle	Concrete	0.000	8.000	0.29	2.37
	CB-43	435.09	431.73	431.39	221.7		<None>					
44-45	CB-44	435.27	429.66	429.47	77.8	0.016	Circle	Concrete	0.000	8.000	0.26	2.96
	CB-45	434.92	428.72	428.22	77.8		<None>					
45-49	CB-45	434.92	428.63	428.22	111.2	0.006	Circle	Concrete	0.000	8.000	1.22	3.40
	CB-49	434.80	428.01	427.50	111.2		<None>					
47-49	CB-47	433.72	429.55	428.82	56.5	0.023	Circle	CMP	0.000	8.000	3.66	4.71
	CB-49	434.80	428.18	427.50	56.5		<None>					
43-44	CB-43	435.09	431.67	431.39	26.2	0.073	Circle	Concrete	0.000	8.000	0.59	6.45
	CB-44	435.27	429.62	429.47	26.2		<None>					
50-51	MH-50	434.00	426.40	426.00	172.0	0.005	Circle	Concrete	0.000	8.000	1.31	3.12
	O-51	433.40	425.48	425.10	172.0		<None>					
49-50	CB-49	434.80	427.90	427.50	213.8	0.007	Circle	Concrete	0.000	8.000	1.31	3.46
	MH-50	434.00	426.36	426.00	213.8		<None>					

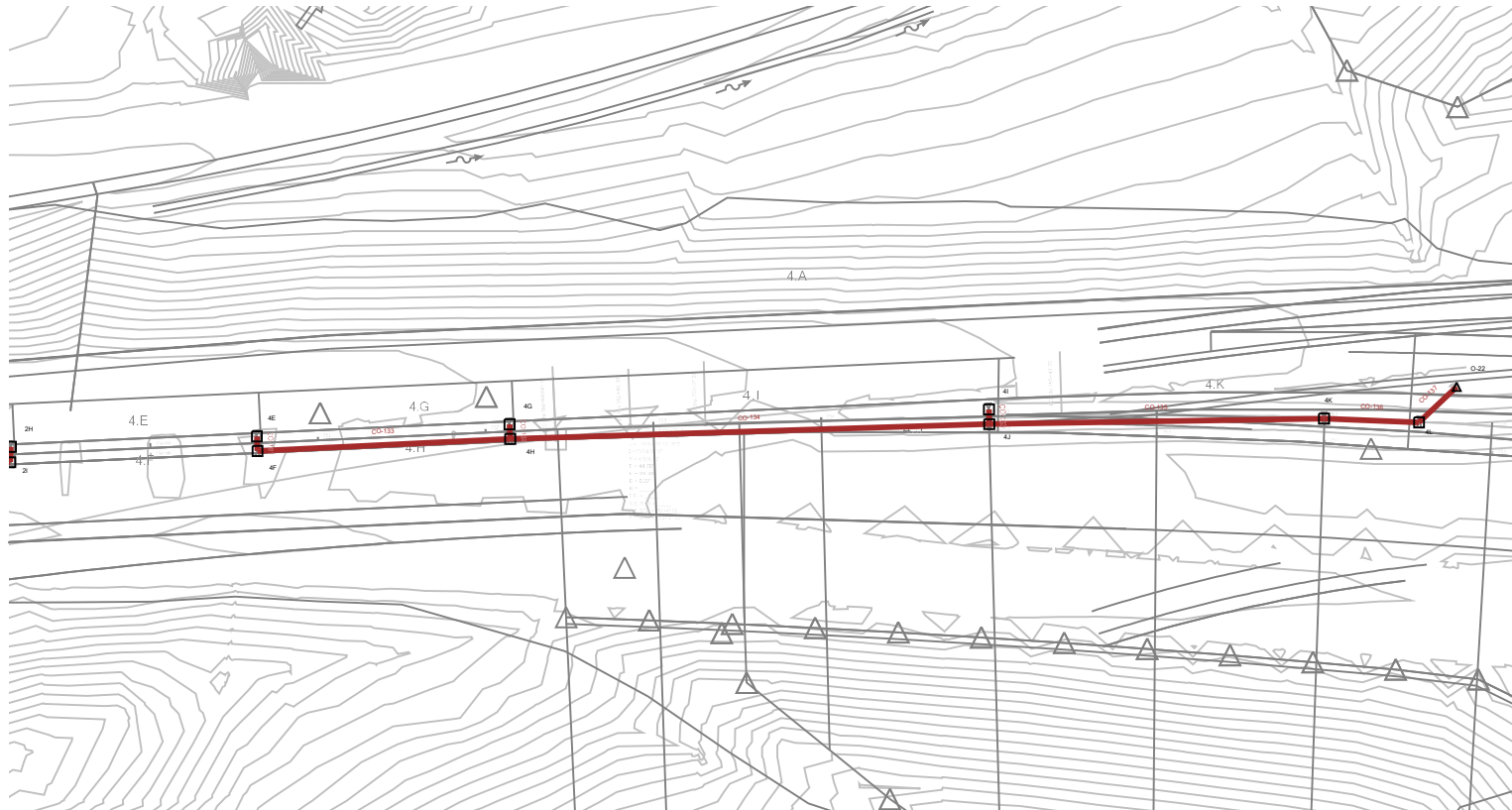
Scenario: Base



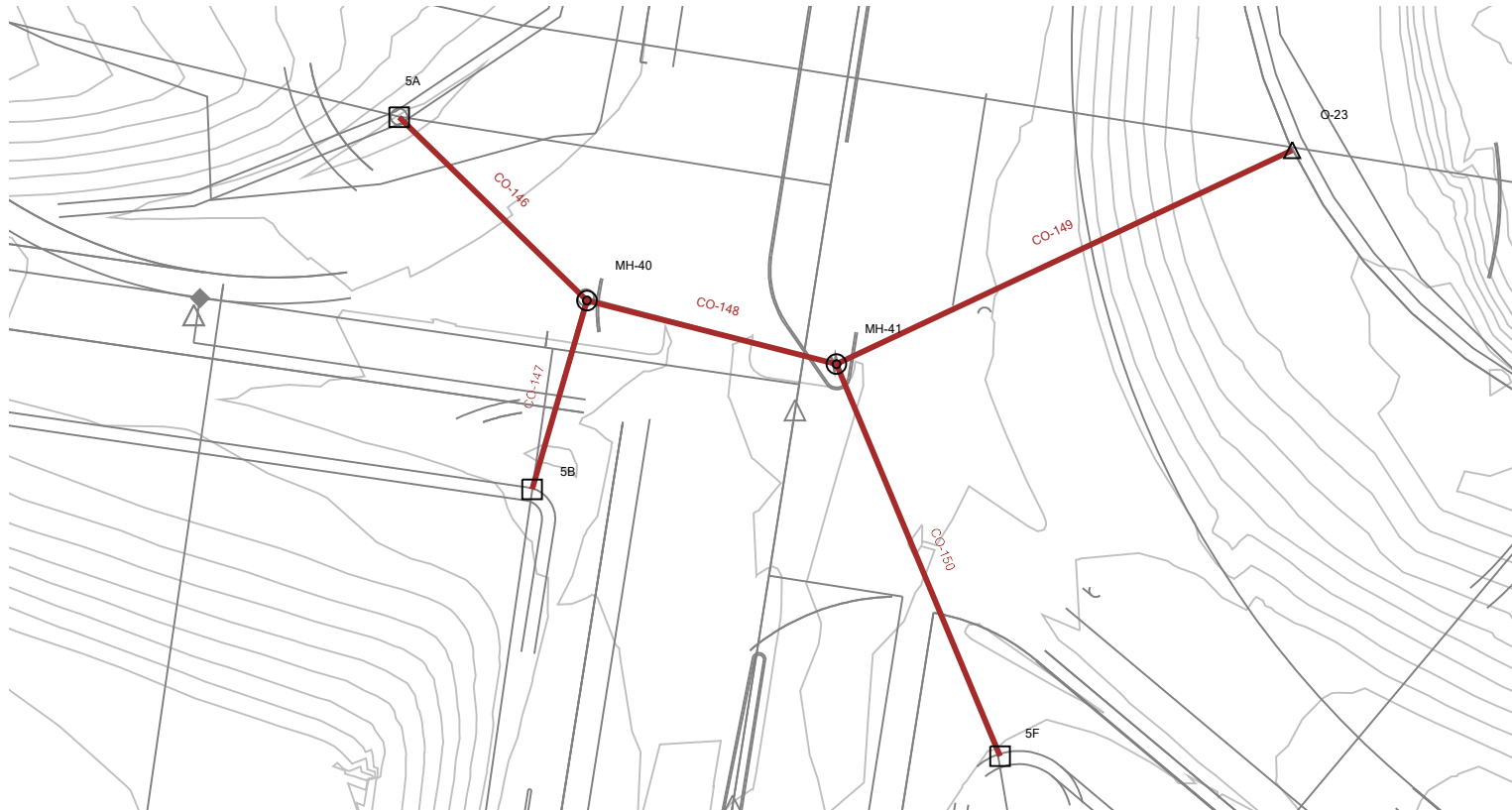
Scenario: Base



Scenario: Base



Scenario: Base



[illegible]

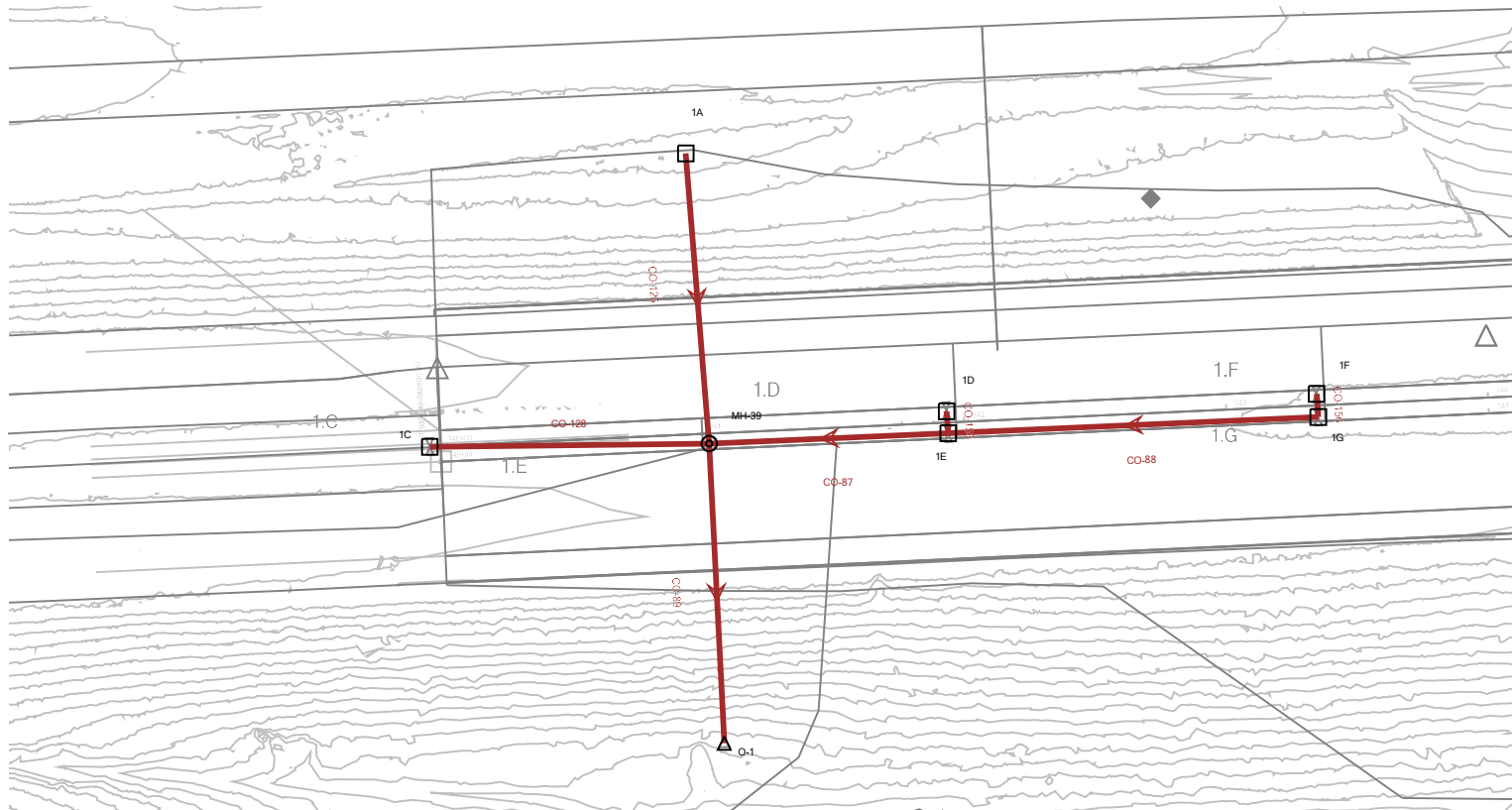
Scenario: Base



Scenario: Base



Scenario: Base



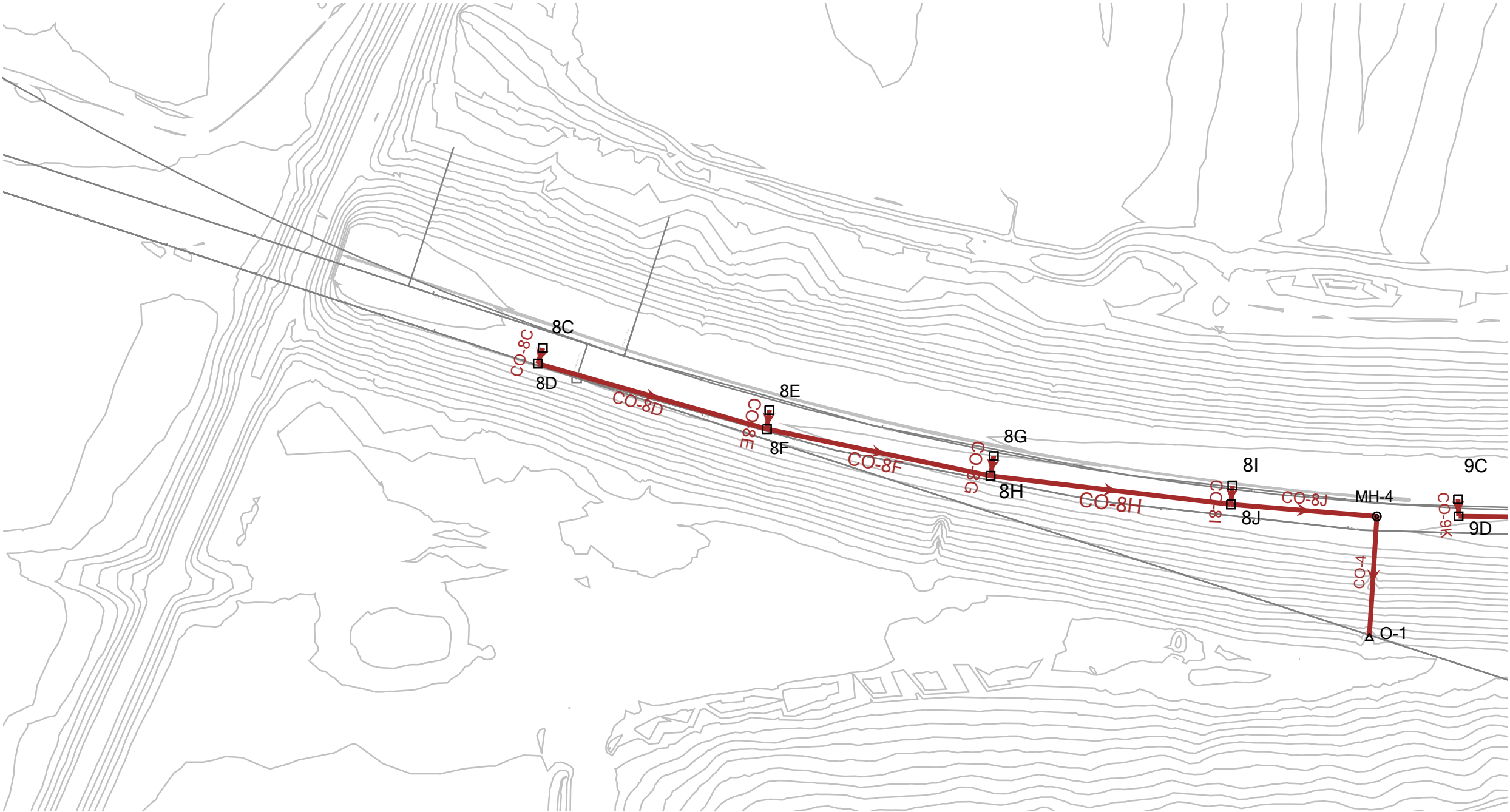
Conduit FlexTable: Table - 1

Label	Upstream Structure	Upstream Structure Hydraulic Grade Line (In) (ft)	Length (User Defined) (ft)	Slope (Calculated) (ft/ft)	Section Type	Diameter (in)	Material	System CA (acres)	System Intensity (in/h)	Flow (cfs)	Velocity (ft/s)
CO-87	1E	471.17		0.008	Circle	12.0	Concrete	0.000	11.921	0.30	0.38
CO-88	1G	471.18		0.000	Circle	12.0	Concrete	0.000	11.969	0.22	0.27
CO-89	MH-39	471.14		0.181	Circle	12.0	Concrete	0.000	11.899	0.51	8.98
CO-125	1A	463.93		-0.124	Circle	12.0	Concrete	0.000	11.972	12.38	15.76
CO-128	1C	472.53		0.012	Circle	12.0	Concrete	0.000	11.972	1.11	4.25
CO-129	2C	467.25		0.003	Circle	12.0	Concrete	0.000	11.972	0.22	1.72
CO-130	2E	466.76		0.004	Circle	12.0	Concrete	0.000	11.964	0.23	1.78
CO-131	2G	466.25		0.099	Circle	12.0	Concrete	0.000	11.957	0.21	5.51
CO-132	2I	466.75		0.003	Circle	12.0	Concrete	0.000	11.972	0.22	1.73
CO-133	4F	465.24		0.007	Circle	12.0	Concrete	0.000	11.972	0.22	2.19
CO-134	4H	464.26		0.004	Circle	12.0	Concrete	0.000	11.966	0.23	1.75
CO-135	4J	463.36		0.004	Circle	12.0	Concrete	0.000	11.950	0.44	2.23
CO-136	4K	462.82		0.002	Circle	12.0	Concrete	0.000	11.942	0.99	2.04
CO-137	4L	462.68		0.003	Circle	12.0	Concrete	0.000	11.940	1.08	2.62
CO-138	5F	464.09		0.004	Circle	12.0	Concrete	0.000	11.972	1.22	2.91
CO-139	5G	463.17		0.002	Circle	12.0	Concrete	0.000	11.964	1.17	2.23
CO-140	5H	462.70		0.001	Circle	12.0	Concrete	0.000	11.954	0.94	1.68
CO-141	5I	462.09		0.086	Circle	12.0	Concrete	0.000	11.929	1.14	8.72
CO-142	5J	462.48		0.003	Circle	12.0	Concrete	0.000	11.972	0.77	2.34
CO-143	6G	449.46		0.005	Circle	12.0	Concrete	0.000	11.949	0.83	2.86
CO-144	6F	448.38		0.004	Circle	12.0	Concrete	0.000	11.943	0.56	2.42
CO-145	6E	447.42		0.078	Circle	12.0	Concrete	0.000	11.933	0.69	7.27
CO-146	5A	438.22		0.002	Circle	24.0	Concrete	0.000	11.972	16.81	5.35
CO-147	5B	438.23		-0.003	Circle	24.0	Concrete	0.000	11.972	9.54	3.04
CO-148	MH-40	438.05		0.003	Circle	36.0	Concrete	0.000	11.970	26.35	3.73
CO-149	MH-41	437.76		0.063	Circle	36.0	Concrete	0.000	11.968	48.46	20.44
CO-150	5E	439.38		0.003	Circle	24.0	Concrete	0.000	11.972	22.11	7.04
CO-151	6B	438.95		0.021	Circle	12.0	Concrete	0.000	11.972	8.66	11.03
CO-152	MH-37	437.53		-0.261	Circle	12.0	Concrete	0.000	11.971	8.66	11.03
CO-153	6D	438.36		0.004	Circle	12.0	Concrete	0.000	11.932	4.85	6.17

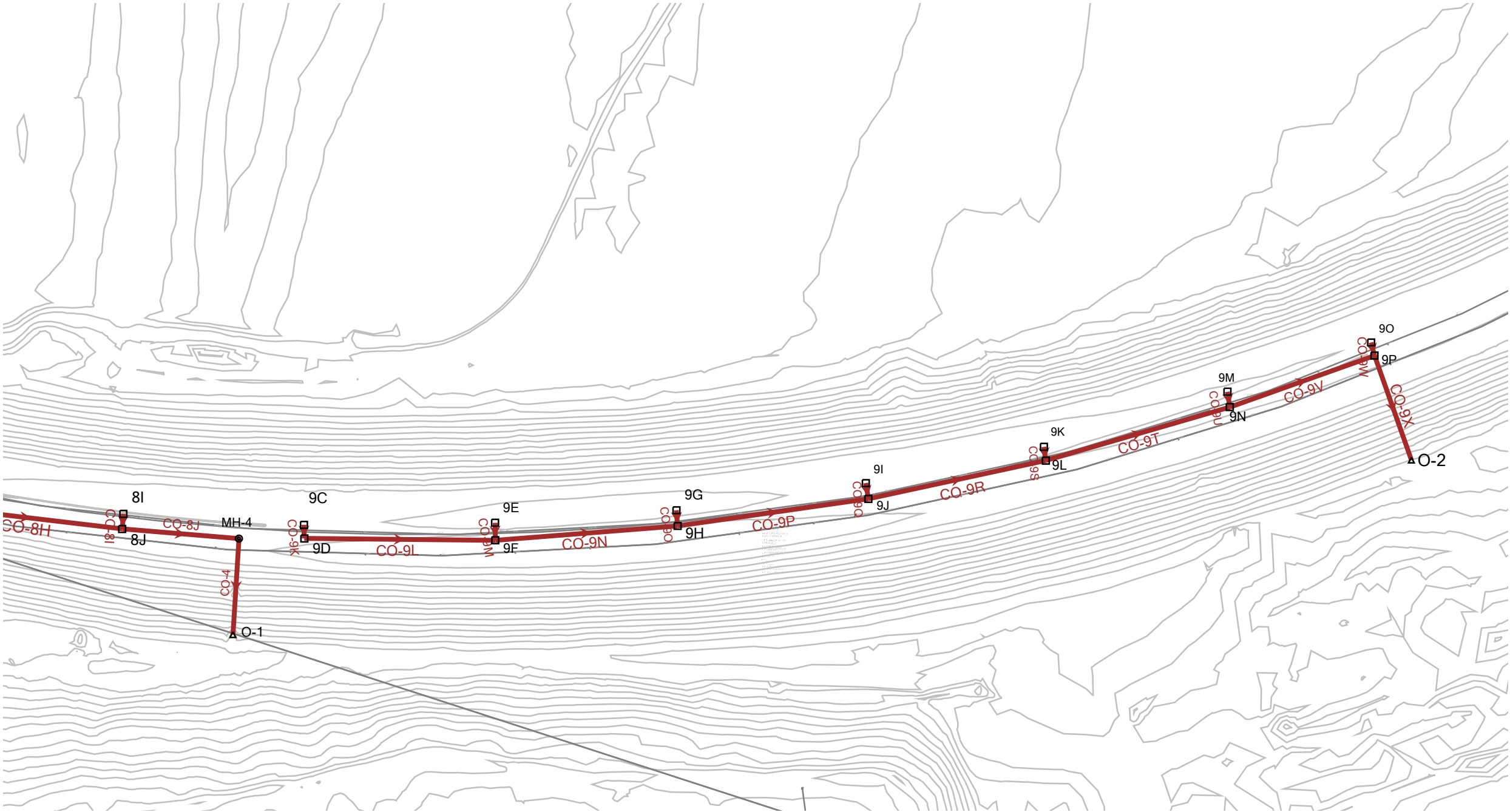
Conduit FlexTable: Table - 1

Label	Upstream Structure	Upstream Structure Hydraulic Grade Line (In) (ft)	Length (User Defined) (ft)	Slope (Calculated) (ft/ft)	Section Type	Diameter (in)	Material	System CA (acres)	System Intensity (in/h)	Flow (cfs)	Velocity (ft/s)
CO-154	5C	437.83		-0.046	Circle	24.0	Concrete	0.000	11.972	33.72	16.67
CO-155	1D	471.27		0.119	Circle	12.0	Concrete	0.000	11.972	0.30	6.58
CO-156	1F	471.18		0.000	Circle	12.0	Concrete	0.000	11.972	0.22	0.27
CO-157	2B	467.33		0.012	Circle	12.0	Concrete	0.000	11.972	0.22	2.66
CO-158	2D	466.83		0.011	Circle	12.0	Concrete	0.000	11.972	0.23	2.66
CO-159	2F	466.32		0.012	Circle	12.0	Concrete	0.000	11.972	0.21	2.62
CO-160	2H	466.83		0.011	Circle	12.0	Concrete	0.000	11.972	0.22	2.62
CO-161	4E	465.33		0.011	Circle	12.0	Concrete	0.000	11.972	0.22	2.65
CO-162	4G	464.33		0.011	Circle	12.0	Concrete	0.000	11.972	0.22	2.65
CO-163	4I	463.98		0.057	Circle	12.0	Concrete	0.000	11.972	0.94	7.10
CO-164	6H	449.93	322.0	0.001	Circle	12.0	Concrete	0.000	11.972	0.87	1.29

Scenario: Base



Scenario: Base



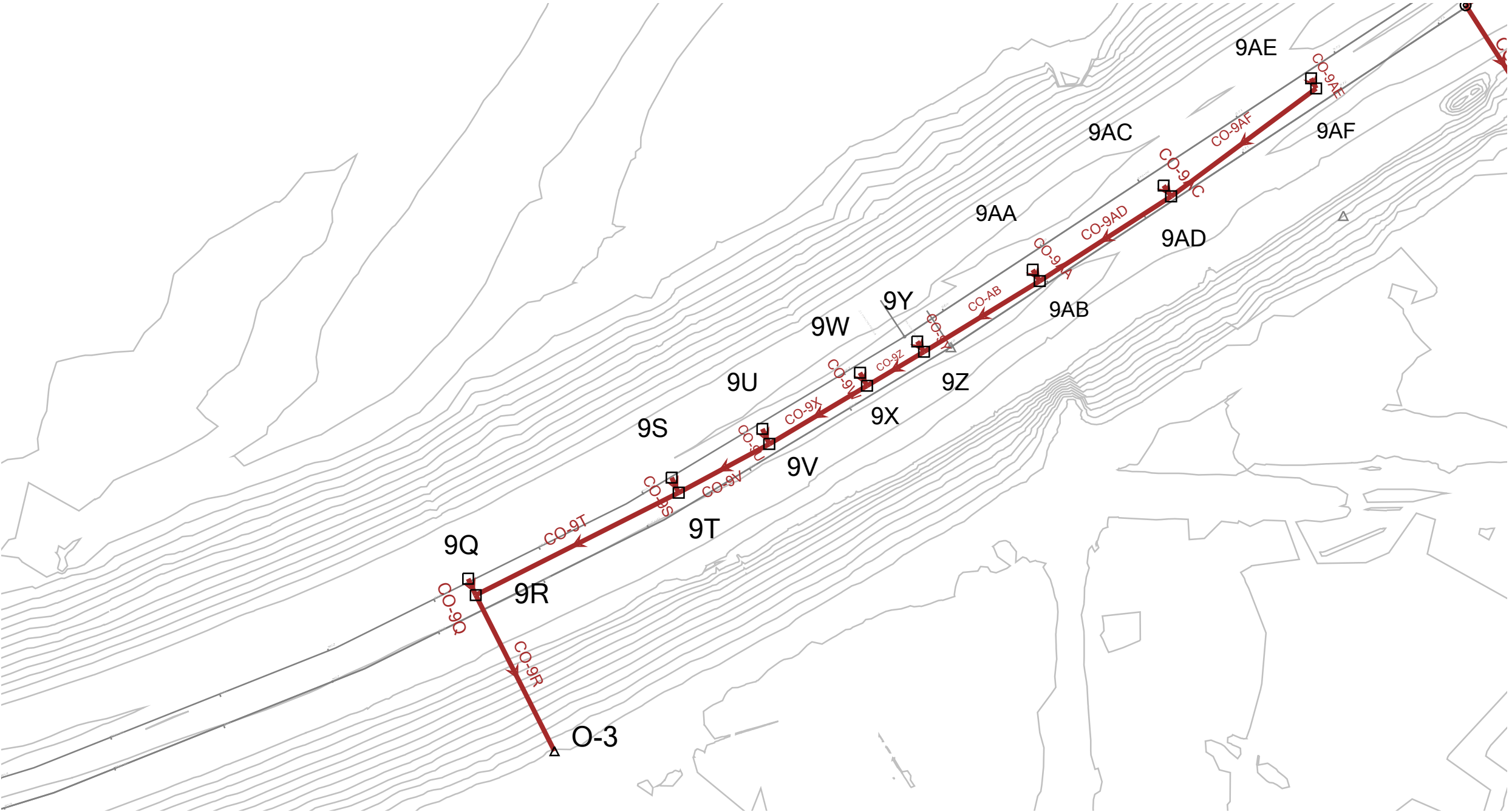
Conduit FlexTable: Report

-Node- Upstream Downstream m	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Invert- Upstream Downstream (ft)	Slope (Calculated) (ft/ft)	Section Type	Material	System CA (acres)	System Intensity (in/h)	Flow (cfs)	Velocity (ft/s)	Length (User Defined) (ft)	Diameter (in)
8D	455.39	451.05	450.37	0.005	Circle	Concrete	0.371	10.186	3.81	4.21	249.6	24.0
8F	454.14	450.37	449.09		<None>							
8F	454.14	450.07	449.09	0.005	Circle	Concrete	0.747	10.009	7.54	4.96	249.1	24.0
8H	452.89	449.48	447.88		<None>							
8H	452.89	449.10	447.88	0.005	Circle	Concrete	1.113	9.860	11.06	5.53	249.5	24.0
8J	451.64	448.51	446.61		<None>							
9D	450.39	446.04	445.38	0.005	Circle	Concrete	0.351	10.191	3.61	4.15	249.4	24.0
9F	449.14	445.24	444.10		<None>							
9F	449.14	445.03	444.10	0.005	Circle	Concrete	0.675	10.012	6.81	4.85	249.6	24.0
9H	447.89	444.29	442.88		<None>							
9H	447.89	444.01	442.88	0.005	Circle	Concrete	1.003	9.859	9.97	5.42	249.4	24.0
9J	446.64	443.28	441.60		<None>							
9J	446.64	442.99	441.60	0.005	Circle	Concrete	1.327	9.722	13.00	5.60	249.4	24.0
9L	445.39	442.28	440.39		<None>							
9L	445.39	441.94	440.39	0.006	Circle	Concrete	1.647	9.589	15.92	6.31	249.4	24.0
9N	444.14	440.94	438.90		<None>							
9N	444.14	440.46	438.90	0.013	Circle	Concrete	1.967	9.472	18.78	9.01	216.6	24.0
9P	442.89	438.24	436.04		<None>							
9O	442.89	439.21	438.89	0.023	Circle	Concrete	0.058	10.196	0.60	4.53	9.5	12.0
9P	442.89	438.90	436.04		<None>							
9M	444.14	440.93	440.14	0.022	Circle	Concrete	0.066	10.196	0.68	4.61	9.7	12.0
9N	444.14	440.94	438.90		<None>							
9K	445.39	442.29	441.39	0.023	Circle	Concrete	0.066	10.196	0.68	4.72	9.4	12.0
9L	445.39	442.28	440.39		<None>							
9I	446.64	443.27	442.64	0.023	Circle	Concrete	0.068	10.196	0.70	4.73	9.6	12.0
9J	446.64	443.28	441.60		<None>							
9G	447.89	444.24	443.89	0.023	Circle	Concrete	0.070	10.196	0.72	4.76	9.7	12.0
9H	447.89	444.29	442.88		<None>							
9E	449.14	445.50	445.14	0.024	Circle	Concrete	0.071	10.196	0.73	4.86	9.7	12.0
9F	449.14	445.17	444.10		<None>							
9C	450.39	446.77	446.39	0.024	Circle	Concrete	0.079	10.196	0.81	5.06	9.4	12.0
9D	450.39	446.43	445.38		<None>							

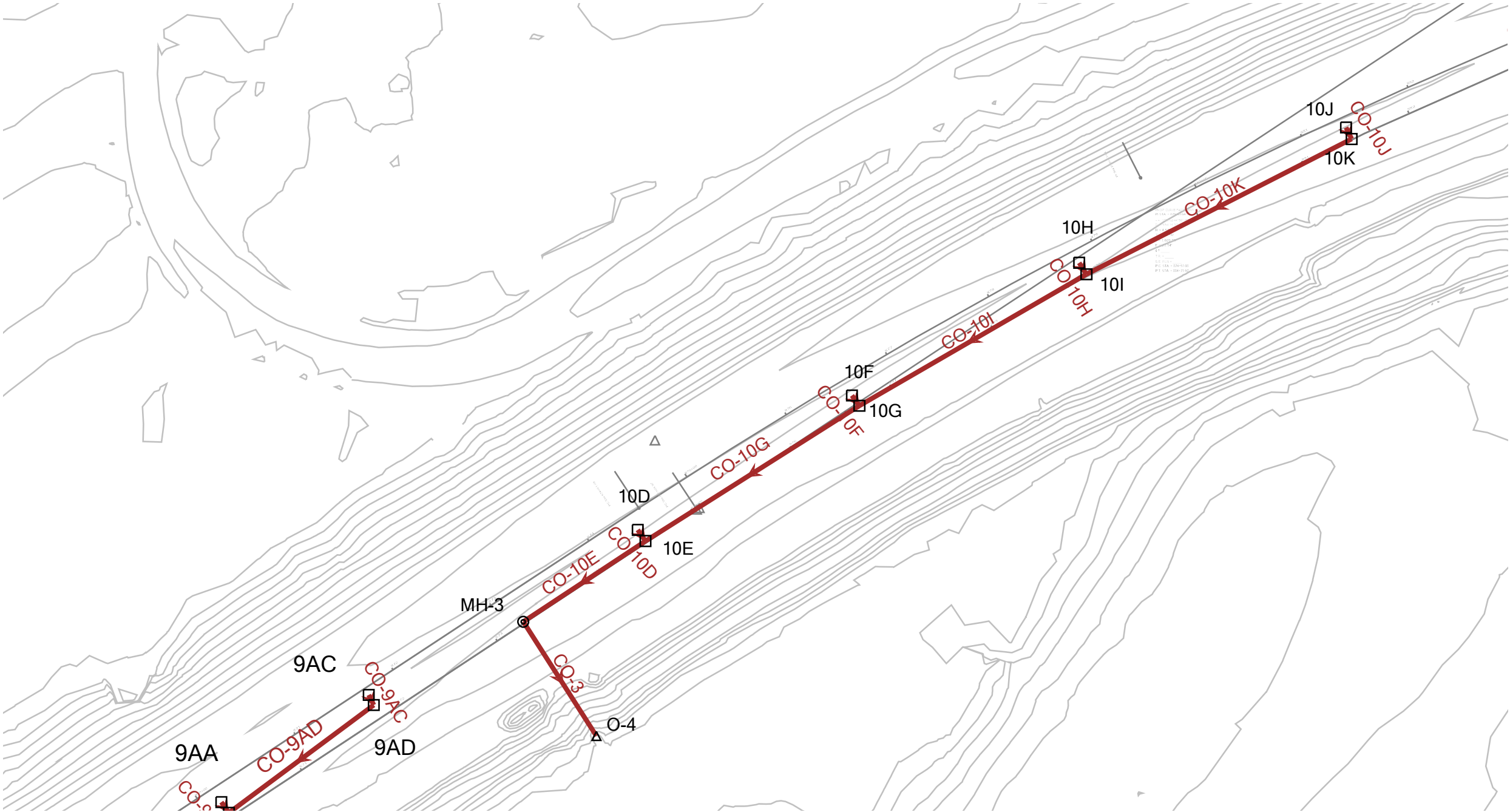
Conduit FlexTable: Report

-Node- Upstream Downstream m	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Invert- Upstream Downstream (ft)	Slope (Calculated) (ft/ft)	Section Type	Material	System CA (acres)	System Intensity (in/h)	Flow (cfs)	Velocity (ft/s)	Length (User Defined) (ft)	Diameter (in)
8I	451.64	448.51	447.64	0.025	Circle	Concrete	0.082	10.196	0.84	5.14	9.7	12.0
8J	451.64	448.51	446.61		<None>							
8G	452.89	449.45	448.89	0.023	Circle	Concrete	0.089	10.196	0.91	5.12	9.6	12.0
8H	452.89	449.48	447.88		<None>							
8E	454.14	450.55	450.14	0.025	Circle	Concrete	0.095	10.196	0.98	5.41	13.4	12.0
8F	454.14	450.37	449.09		<None>							
8C	455.39	451.93	451.39	0.011	Circle	Concrete	0.159	10.196	1.63	4.65	16.7	12.0
8D	455.39	451.66	450.37		<None>							
9P	442.89	437.69	436.04	0.129	Circle	CMP	2.246	9.400	21.28	13.88	152.9	24.0
O-2	418.33	417.31	416.33		<None>							
8J	451.64	448.11	446.61	0.005	Circle		1.464	9.726	14.35	5.76	161.6	24.0
MH-4	451.00	447.53	445.80		<None>							
MH-4	451.00	447.16	445.80	0.249	Circle	CMP	1.464	9.642	14.23	15.87	120.9	24.0
O-1	415.66	416.32	415.66		<None>							

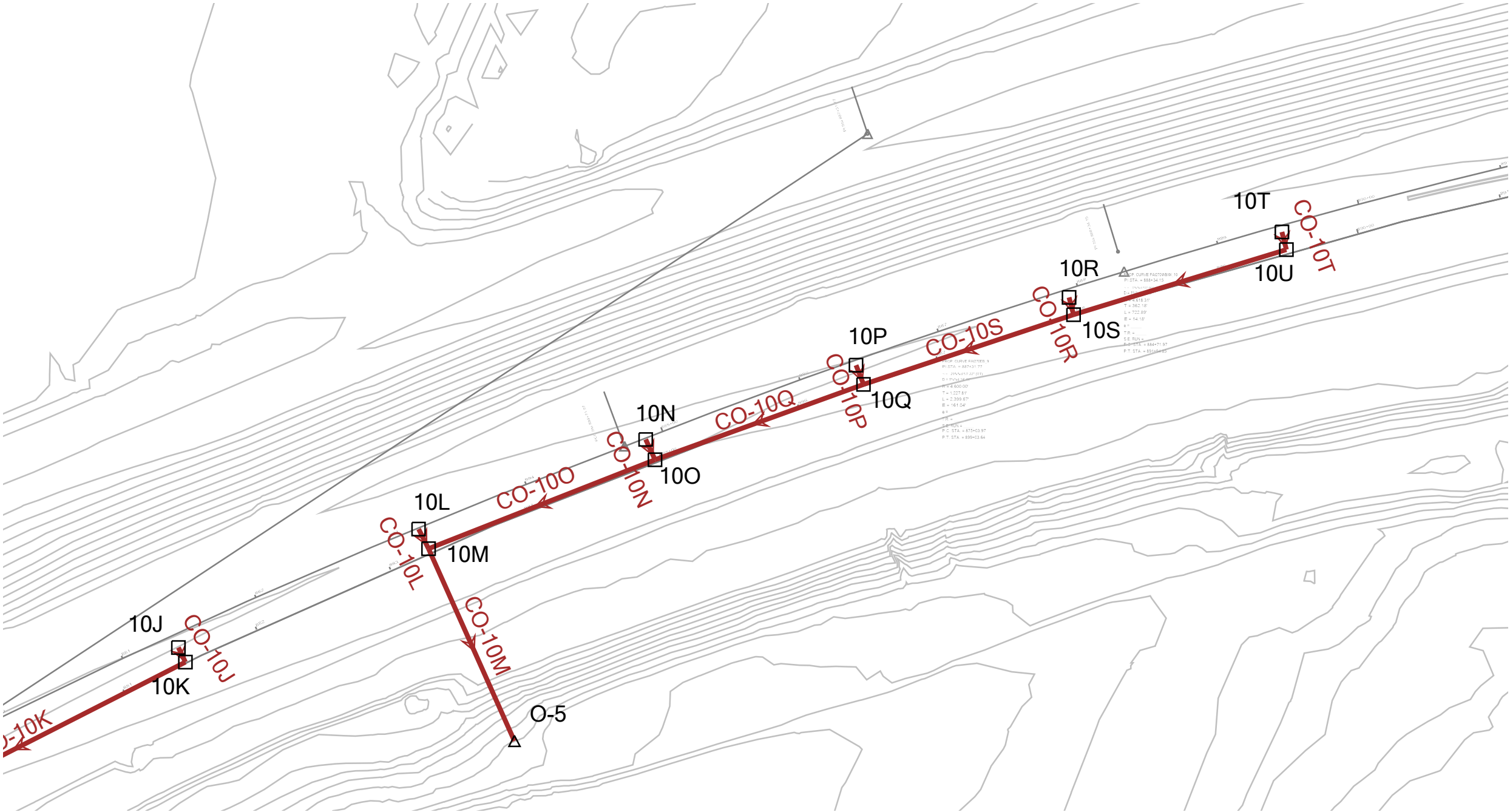
Scenario: Base



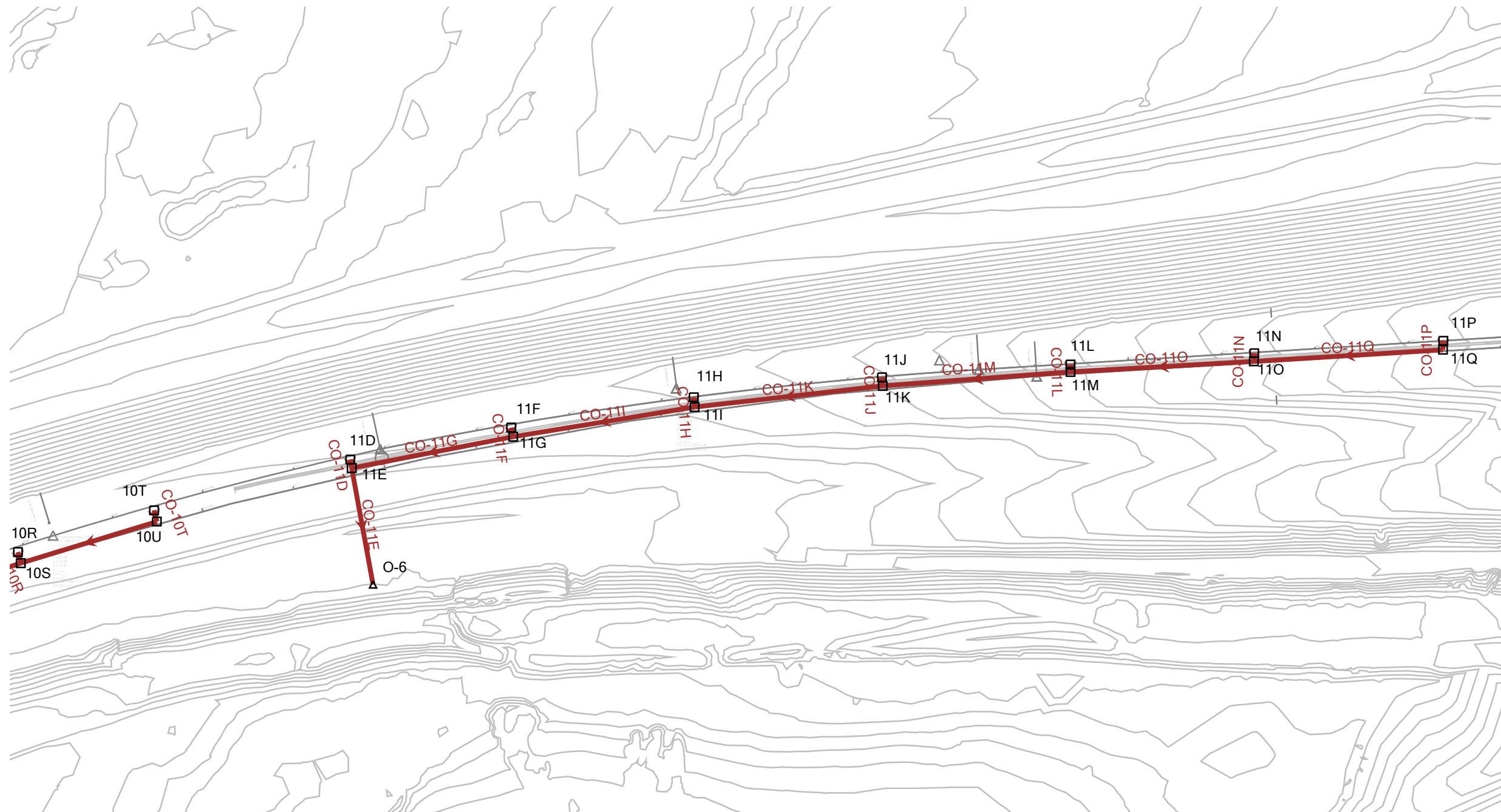
Scenario: Base



Scenario: Base



Scenario: Base



Conduit FlexTable: Report

-Node- Upstream Downstream	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Invert- Upstream Downstream (ft)	Slope (Calculated) (ft/ft)	Section Type	Material	System CA (acres)	System Intensity (in/h)	Flow (cfs)	Velocity (ft/s)	Length (User Defined) (ft)	Diameter (in)
9X	440.64	439.55	437.08	0.003	Circle	Concrete	1.157	9.645	11.25	3.58	0.0	24.0
9V	440.44	439.31	436.79		<None>							
9T	440.45	438.70	436.53	0.003	Circle	Concrete	1.530	9.498	14.65	4.66	0.0	24.0
9R	441.64	437.90	435.95		<None>							
9V	440.44	439.17	436.79	0.003	Circle	Concrete	1.283	9.564	12.37	3.94	0.0	24.0
9T	440.45	438.91	436.53		<None>							
9W	440.64	439.67	438.05	0.077	Circle	Concrete	0.042	10.196	0.43	0.55	0.0	12.0
9X	440.64	439.67	437.08		<None>							
9U	440.44	439.31	437.70	0.065	Circle	Concrete	0.027	10.196	0.28	0.36	0.0	12.0
9V	440.44	439.31	436.79		<None>							
9S	440.45	438.91	437.45	0.065	Circle	Concrete	0.053	10.196	0.54	0.69	0.0	12.0
9T	440.45	438.91	436.53		<None>							
9Q	441.64	438.99	438.64	0.174	Circle	Concrete	0.068	10.196	0.70	9.68	0.0	12.0
9R	441.64	437.90	435.95		<None>							
9R	441.64	437.46	435.95	0.116	Circle	CMP	1.854	9.374	17.52	12.72	154.0	24.0
O-3	420.02	418.92	418.02		<None>							
9AE	442.70	440.27	439.01	0.061	Circle	Concrete	0.240	10.196	2.47	3.14	9.0	12.0
9AF	442.70	440.22	438.46		<None>							
9AD	441.90	440.13	438.00	0.003	Circle	Concrete	0.578	10.056	5.86	1.86	0.0	24.0
9AB	441.20	440.04	437.60		<None>							
9AB	441.20	439.99	437.60	0.003	Circle	Concrete	0.767	9.843	7.61	2.42	0.0	24.0
9Z	440.80	439.85	437.25		<None>							
9Z	440.80	439.77	437.25	0.003	Circle	Concrete	0.965	9.701	9.44	3.00	0.0	24.0
9X	440.64	439.67	437.08		<None>							
9Y	440.84	439.86	437.63	0.036	Circle	Concrete	0.064	10.196	0.66	0.84	0.0	12.0
9Z	440.80	439.85	437.25		<None>							
9AA	441.20	440.05	438.17	0.050	Circle	Concrete	0.098	10.196	1.01	1.28	0.0	12.0
9AB	441.20	440.04	437.60		<None>							
9AC	441.90	440.17	438.55	0.061	Circle	Concrete	0.119	10.196	1.22	1.56	9.0	12.0
9AD	441.90	440.16	438.00		<None>							
11N	465.26	460.23	459.08	0.005	Circle	Concrete	0.122	10.196	1.25	1.60	5.0	12.0
11O	465.30	460.23	459.05		<None>							

Conduit FlexTable: Report

-Node- Upstream Downstream m	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Invert- Upstream Downstream (ft)	Slope (Calculated) (ft/ft)	Section Type	Material	System CA (acres)	System Intensity (in/h)	Flow (cfs)	Velocity (ft/s)	Length (User Defined) (ft)	Diameter (in)
11O	465.30	459.97	459.05	0.030	Circle	Concrete	0.501	10.114	5.11	8.90	197.0	15.0
11M	459.30	454.26	452.91		<None>							
11M	459.30	453.97	452.91	0.029	Circle	Concrete	0.733	10.048	7.42	9.60	197.0	18.0
11K	453.66	447.96	445.28		<None>							
11K	453.66	446.78	445.28	0.009	Circle	Concrete	0.931	9.987	9.37	5.30	197.0	18.0
11I	450.03	445.21	441.51		<None>							
11I	450.03	444.83	441.51	0.005	Circle	Concrete	1.140	9.877	11.35	6.42	197.0	18.0
11G	448.35	442.52	438.54		<None>							
11L	459.34	454.26	452.94	0.005	Circle	Concrete	0.130	10.196	1.34	1.70	5.0	12.0
11M	459.30	454.26	452.91		<None>							
11J	453.64	446.80	445.31	0.005	Circle	Concrete	0.173	10.196	1.78	2.26	5.0	12.0
11K	453.66	446.78	445.28		<None>							
11H	450.03	445.23	441.54	0.005	Circle	Concrete	0.178	10.196	1.83	2.33	5.0	12.0
11I	450.03	445.21	441.51		<None>							
11F	448.41	442.53	438.57	0.005	Circle	Concrete	0.180	10.196	1.85	2.36	5.0	12.0
11G	448.35	442.52	438.54		<None>							
11G	448.35	441.98	438.54	0.005	Circle	Concrete	1.356	9.785	13.38	7.57	177.0	18.0
11E	447.75	439.02	435.16		<None>							
11E	447.75	436.57	435.16	0.115	Circle	Concrete	1.562	9.716	15.30	19.05	132.2	24.0
O-6	419.95	420.56	419.95		<None>							
11D	447.84	437.04	435.19	0.005	Circle	Concrete	0.168	10.196	1.73	2.20	5.0	12.0
11E	447.75	437.03	435.16		<None>							
11P	471.21	466.15	465.22	0.005	Circle	Concrete	0.129	10.196	1.33	3.25	5.0	12.0
11Q	471.17	466.14	465.19		<None>							
11Q	471.17	465.89	465.19	0.030	Circle	Concrete	0.257	10.192	2.64	7.55	197.0	12.0
11O	465.30	460.23	459.05		<None>							
10U	445.99	433.33	432.63	0.005	Circle	Concrete	0.229	10.188	2.35	3.75	0.0	15.0
10S	445.54	433.17	431.87		<None>							
10S	445.54	433.05	431.87	0.005	Circle	Concrete	0.420	10.068	4.26	4.23	0.0	15.0
10Q	445.08	432.42	431.12		<None>							
10Q	445.08	432.24	431.12	0.005	Circle	Concrete	0.587	9.961	5.89	4.66	0.0	18.0
10O	444.63	431.87	430.36		<None>							

Conduit FlexTable: Report

-Node- Upstream Downstream m	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Invert- Upstream Downstream (ft)	Slope (Calculated) (ft/ft)	Section Type	Material	System CA (acres)	System Intensity (in/h)	Flow (cfs)	Velocity (ft/s)	Length (User Defined) (ft)	Diameter (in)
100	444.63	431.63	430.36	0.005	Circle	Concrete	0.752	9.865	7.48	4.79	0.0	18.0
10M	444.13	430.90	429.53		<None>							
10M	444.13	430.60	429.53	0.102	Circle	CMP	0.911	9.762	8.96	10.09	128.0	24.0
O-5	416.50	417.15	416.50		<None>							
10K	442.45	437.41	436.74	0.005	Circle	Concrete	0.240	10.188	2.47	3.79	0.0	15.0
10I	441.64	437.07	435.47		<None>							
10I	441.64	436.96	435.47	0.005	Circle	Concrete	0.548	9.989	5.52	4.61	0.0	18.0
10G	440.90	436.35	434.36		<None>							
9AD	441.90	440.20	438.00	-0.003	Circle	Concrete	0.378	10.188	3.88	3.48	0.0	24.0
9AF	442.70	440.16	438.46		<None>							
10G	440.90	436.12	434.36	0.005	Circle	Concrete	0.819	9.844	8.12	4.60	0.0	18.0
10E	440.17	434.82	433.28		<None>							
10E	440.17	434.50	433.28	0.005	Circle	Concrete	1.124	9.705	10.99	5.50	0.0	24.0
MH-3	439.73	433.84	432.65		<None>							
MH-3	439.73	433.83	432.65	0.098	Circle	CMP	1.124	9.637	10.92	10.53	128.6	24.0
O-4	420.00	420.73	420.00		<None>							
10D	440.17	434.87	433.32	0.005	Circle	Concrete	0.241	10.196	2.48	3.15	9.7	12.0
10E	440.17	434.82	433.28		<None>							
10F	440.90	436.39	434.40	0.005	Circle	Concrete	0.221	10.196	2.27	2.89	9.7	12.0
10G	440.90	436.35	434.36		<None>							
10H	441.64	437.12	435.52	0.005	Circle	Concrete	0.256	10.196	2.63	3.35	9.7	12.0
10I	441.64	437.07	435.47		<None>							
10J	442.45	437.61	436.79	0.005	Circle	Concrete	0.202	10.196	2.08	3.59	9.7	12.0
10K	442.45	437.58	436.74		<None>							
10L	444.13	430.91	429.58	0.005	Circle	Concrete	0.133	10.196	1.37	1.74	9.7	12.0
10M	444.13	430.90	429.53		<None>							
10N	444.63	431.88	430.41	0.005	Circle	Concrete	0.140	10.196	1.43	1.83	9.7	12.0
10O	444.63	431.87	430.36		<None>							
10P	445.08	432.44	0.00	-44.583	Circle	Concrete	0.140	10.196	1.44	1.84	9.7	12.0
10Q	445.08	432.42	431.12		<None>							
10R	445.54	433.19	431.92	0.005	Circle	Concrete	0.160	10.196	1.64	2.09	9.7	12.0
10S	445.54	433.17	431.87		<None>							

Conduit FlexTable: Report

-Node- Upstream Downstream	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Invert- Upstream Downstream (ft)	Slope (Calculated) (ft/ft)	Section Type	Material	System CA (acres)	System Intensity (in/h)	Flow (cfs)	Velocity (ft/s)	Length (User Defined) (ft)	Diameter (in)
10T	445.99	433.49	432.68	0.005	Circle	Concrete	0.189	10.196	1.94	3.54	9.7	12.0
10U	445.99	433.47	432.63		<None>							

Culvert Extension 843+24 (50 yr storm)

Scenario: Base



Project Name: I-270 Over Mississippi

Date: 12/22/2017

Determine existing runoff rate:**Basin ID:** 843+24

Total Drainage Area= 112.33 Ac.

Determine "CA"

Surface Type	Area	C	C x A
Grass	109.232	0.20	21.846
Pavement	3.096	0.90	2.786

Total Area= 112.33 CA= 24.633

Determine Tc:

T (overland): $T(\text{overland}) = \frac{56L^{0.6} n^{0.6}}{I^{0.4} s^{0.3}}$ L= 100 ft.
n= 0.24
s= 0.020 ft/ft
I (10 year)= 1.52 in/hr
I (100 year)= 2.50 in/hr
I (50 year)= 2.15 in/hr

T50(overland)= 14.96 min.

T (shallow): Paved= 1 L= 224 ft.
Unpaved= 2 s= 0.015 ft/ft
Paved or Unpaved? 2 V= 1.98 ft/sec

T (shallow)= 1.89 min.

T (channel): Actual or assumed velocity? Assume L= 2700 ft.
V= 0.47 ft/sec
T (channel)= 95.74 min.

Tc (50 year)= 112.59 min.

I (50 year)= 2.15 in/hr

Q (50 year)= 52.96 cfs

Culvert Designer/Analyzer Report

843+24
(50-year Storm)

Analysis Component				
Storm Event		Design	Discharge	52.96 cfs
Peak Discharge Method: User-Specified				
Design Discharge		52.96 cfs	Check Discharge	0.00 cfs
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Design Storm.				
Discharge		52.96 cfs	Bottom Elevation	408.92 ft
Depth		2.27 ft	Velocity	2.66 ft/s
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3 x 2.5 ft Box	52.96 cfs	414.52 ft	7.79 ft/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

843+24

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev.	414.52 ft	Discharge	52.96 cfs
Inlet Control HW Elev.	413.22 ft	Tailwater Elevation	411.19 ft
Outlet Control HW Elev.	414.52 ft	Control Type	Outlet Control
Headwater Depth/Height	2.00		
Grades			
Upstream Invert	409.52 ft	Downstream Invert	408.92 ft
Length	320.00 ft	Constructed Slope	0.001875 ft/ft
Hydraulic Profile			
Profile	CompositeM2PressureProfile	Depth, Downstream	2.27 ft
Slope Type	Mild	Normal Depth	N/A ft
Flow Regime	Subcritical	Critical Depth	2.13 ft
Velocity Downstream	7.79 ft/s	Critical Slope	0.006221 ft/ft
Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.00 ft
Section Size	3 x 2.5 ft	Rise	2.50 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	414.52 ft	Upstream Velocity Head	0.77 ft
Ke	0.50	Entrance Loss	0.39 ft
Inlet Control Properties			
Inlet Control HW Elev.	413.22 ft	Flow Control	Submerged
Inlet Type 45° non-offset wingwall flares		Area Full	7.5 ft²
K	0.49700	HDS 5 Chart	12
M	0.66700	HDS 5 Scale	1
C	0.03390	Equation Form	2
Y	0.80300		

Date: 12/22/2017

Basin ID: 859+00

Determine "CA"			
Surface Type	Area	C	C x A
Grass	14.565	0.20	2.913
Pavement	2.267	0.90	2.040
Total Area=		16.83	CA= 4.953

T (overland):	$T(\text{overland}) = \frac{56L^{0.6} n^{0.6}}{I^{0.4} s^{0.3}}$	L=	40 ft.
		n=	0.24
		s=	0.025 ft/ft
	I (10 year)=		2.00 in/hr
	I (100 year)=		3.60 in/hr
	I (50 year)=		3.00 in/hr
	T50 (overland)=		7.07 min.

T (shallow):	Paved= 1	L=	115	ft.
	Unpaved= 2	s=	0.191	ft/ft
	Paved or Unpaved?	V=	7.06	ft/sec
			2	
	T (shallow)=		0.27	min.

T (channel):	Actual or	L=	1937 ft.
	assumed velocity?	V=	0.52 ft/sec
	T (channel)=		62.08 min.

Tc (50 year)= 69.42 min.

I (50 year)= 3.00 in/hr

Q (50 year)= 14.86 cfs

Culvert Designer/Analyzer Report

859+00

(50-year Storm)

Analysis Component			
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Storm Event	Design	Discharge	14.86 cfs
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Peak Discharge Method: User-Specified			
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Design Discharge	14.86 cfs	Check Discharge	0.00 cfs
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Tailwater properties: Trapezoidal Channel			
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Tailwater conditions for Design Storm.			
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Discharge	14.86 cfs	Bottom Elevation	412.29 ft
Depth	1.37 ft	Velocity	1.99 ft/s

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3 x 2.5 ft Box	14.86 cfs	414.52 ft	3.61 ft/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

859+00

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	414.52 ft	Discharge	14.86 cfs
Inlet Control HW Elev.	414.28 ft	Tailwater Elevation	413.66 ft
Outlet Control HW Elev.	414.52 ft	Control Type	Outlet Control
Headwater Depth/Height	0.67		
Grades			
Upstream Invert	412.84 ft	Downstream Invert	412.29 ft
Length	358.00 ft	Constructed Slope	0.001536 ft/ft
Hydraulic Profile			
Profile	M2	Depth, Downstream	1.37 ft
Slope Type	Mild	Normal Depth	1.38 ft
Flow Regime	Subcritical	Critical Depth	0.91 ft
Velocity Downstream	3.61 ft/s	Critical Slope	0.004785 ft/ft
Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.00 ft
Section Size	3 x 2.5 ft	Rise	2.50 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	414.52 ft	Upstream Velocity Head	0.20 ft
Ke	0.50	Entrance Loss	0.10 ft
Inlet Control Properties			
Inlet Control HW Elev.	414.28 ft	Flow Control	N/A
Inlet Type 45° non-offset wingwall flares		Area Full	7.5 ft²
K	0.49700	HDS 5 Chart	12
M	0.66700	HDS 5 Scale	1
C	0.03390	Equation Form	2
Y	0.80300		

Culvert Analysis Report

Culvert-883+00

Culvert Summary			
Computed Headwater Elev.	410.13 ft	Discharge	7.09 cfs
Inlet Control HW Elev.	410.00 ft	Tailwater Elevation	410.00 ft
Outlet Control HW Elev.	410.13 ft	Control Type	Outlet Control
Headwater Depth/Height	0.92		
Grades			
Upstream Invert	408.29 ft	Downstream Invert	407.63 ft
Length	519.04 ft	Constructed Slope	0.001272 ft/ft
Hydraulic Profile			
Profile	CompositePressureProfileM1	Depth, Downstream	2.37 ft
Slope Type	N/A	Normal Depth	0.87 ft
Flow Regime	Subcritical	Critical Depth	0.56 ft
Velocity Downstream	1.18 ft/s	Critical Slope	0.004560 ft/ft
Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.00 ft
Section Size	3 x 2 ft	Rise	2.00 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	410.13 ft	Upstream Velocity Head	0.03 ft
Ke	0.20	Entrance Loss	0.01 ft
Inlet Control Properties			
Inlet Control HW Elev.	410.00 ft	Flow Control	N/A
Inlet Type	90° headwall w 45° bevels	Area Full	6.0 ft²
K	0.49500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	2
C	0.03140	Equation Form	2
Y	0.82000		

Culvert Analysis Report

Culvert-895+00

Culvert Summary			
Computed Headwater Elev.	414.87 ft	Discharge	20.95 cfs
Inlet Control HW Elev.	414.34 ft	Tailwater Elevation	410.00 ft
Outlet Control HW Elev.	414.87 ft	Control Type	Outlet Control
Headwater Depth/Height	0.67		
Grades			
Upstream Invert	412.85 ft	Downstream Invert	411.96 ft
Length	470.55 ft	Constructed Slope	0.000000 ft/ft
Hydraulic Profile			
Profile	H2	Depth, Downstream	0.95 ft
Slope Type	Horizontal	Normal Depth	N/A ft
Flow Regime	Subcritical	Critical Depth	0.95 ft
Velocity Downstream	5.52 ft/s	Critical Slope	0.004205 ft/ft
Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	4.00 ft
Section Size	4 x 3 ft	Rise	3.00 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	414.87 ft	Upstream Velocity Head	0.12 ft
Ke	0.20	Entrance Loss	0.02 ft
Inlet Control Properties			
Inlet Control HW Elev.	414.34 ft	Flow Control	N/A
Inlet Type	90° headwall w 45° bevels	Area Full	12.0 ft²
K	0.49500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	2
C	0.03140	Equation Form	2
Y	0.82000		

Job: I-270 over the Mississippi River

Location: I-270 Mainline, Madison County

Storm Event: 50 yr.

DITCH ANALYSIS

By:

Checked:

Job No.:

Date: 6/19/2020

Date:

Ditch			Drainage Area "A" (acres)		Runoff C	A x C		Flow Time (min)			Intensity (in/hr)	Total Runoff Q=C.I.A (cfs)	Ditch Geometry and Characteristics					Design Data					Notes
Description	Station	Elevation	Increment	Total		Increment	Total	To Previous Location	In Section	Total			Through Slope (ft/ft)	Left Side Slope (H:1V)	Width of Bottom (ft)	Right Side Slope (H:1V)	Manning's	Flow Depth (ft)	Flow Elevation	EOP Grade	Freeboard (ft)	Velocity (ft/s)	
North Side, West of Riverview																							
4A	750+08.00	441.06	0.13	0.13	0.56	0.07	0.07		5.00	5.00	10.20	0.73	0.0100	4.0	4.0	4.0	0.0	0.13	441.19	473.02	31.83	1.18	
	751+00.00	440.13	0.30	0.43	0.54	0.16	0.23	5.00	0.92	5.92	10.20	2.38	0.0100	4.0	4.0	4.0	0.0	0.27	440.40	472.65	32.25	1.81	
	752+00.00	439.68	0.36	0.78	0.54	0.19	0.43	5.92	0.76	6.68	10.15	4.33	0.0100	4.0	4.0	4.0	0.0	0.38	440.06	472.52	32.46	2.19	
	753+00.00	438.63	0.41	1.20	0.53	0.22	0.64	6.68	0.68	7.36	10.00	6.44	0.0100	4.0	4.0	4.0	0.0	0.47	439.10	472.15	33.05	2.46	
	754+00.00	437.58	0.47	1.66	0.52	0.24	0.89	7.36	0.61	7.97	9.98	8.85	0.0100	4.0	4.0	4.0	0.0	0.56	438.14	471.78	33.64	2.71	
	754+73.51	434.26	0.38	2.04	0.51	0.19	1.08	7.97	0.58	8.55	9.80	10.59	0.0100	4.0	4.0	4.0	0.0	0.62	434.88	471.40	36.52	2.87	

South of WB Exit Ramp																							
	777+00.00	449.12	0.60	0.60	0.63	0.38	0.38		5.00	5.00	10.20	3.86	0.026	4.0	4.0	4.0	0.0	0.29	449.41	463.03	13.62	3.01	
	776+00.00	446.62	0.21	0.81	0.56	0.12	0.49	5.00	0.45	5.45	10.20	5.04	0.034	4.0	4.0	4.0	0.0	0.33	446.95	458.80	11.85	3.71	
	775+00.00	443.09	0.24	1.05	0.54	0.13	0.62	5.45	0.36	5.81	10.18	6.34	0.045	4.0	4.0	4.0	0.0	0.38	443.47	453.26	9.79	4.63	
	774+00.00	438.00	0.27	1.31	0.53	0.14	0.76	5.81	0.34	6.15	10.10	7.72	0.045	4.0	4.0	4.0	0.0	0.42	438.42	447.74	9.32	4.89	
	773+24.52	434.22	0.30	1.61	0.53	0.16	0.92	6.15	0.96	7.11	10.00	9.21	0.005	4.0	4.0	4.0	0.0	0.47	434.69	442.74	8.05	1.74	
	773+19.24	434.40	0.34	1.95	0.52	0.17	1.10	7.11	0.91	8.02	9.98	10.93	0.005	4.0	4.0	4.0	0.0	0.51	434.91	438.20	3.29	1.82	

South of WB Entrance Ramp																							
	760+00.00	466.06	0.15	0.15	0.62	0.09	0.09		5.00	5.00	10.20	0.94	0.050	4.0	4.0	4.0	0.0	0.09	415.41	458.69	43.28	2.10	
	765+96.20	454.00	0.07	0.21	0.53	0.11	0.11	0.00	1.02	1.02	10.20	1.15	0.050	4.0	4.0	4.0	0.0	0.06	415.41	458.69	43.28	1.63	
	766+52.22	452.00	0.07	0.28	0.53	0.15	0.15	0.00	1.02	1.02	10.20	1.51	0.050	4.0	4.0	4.0	0.0	0.06	415.41	458.69	43.28	1.63	
	767+18.17	450.00	0.07	0.35	0.53	0.18	0.18	0.00	1.02	1.02	10.20	1.86	0.050	4.0	4.0	4.0	0.0	0.06	415.41	458.69	43.28	1.63	
	767+77.71	448.00	0.07	0.41	0.53	0.22	0.22	5.00	1.02	6.02	10.20	2.21	0.050	4.0	4.0	4.0	0.0	0.06	415.41	458.69	43.28	1.63	
	768+34.45	446.00	0.22	0.63	0.50	0.22	0.44	6.02	0.52	6.54	10.20	4.48	0.050	4.0	4.0	4.0	0.0	0.18	446.18	453.83	7.65	3.19	
	768+88.59	444.00	0.31	0.95	0.49	0.31	0.75	6.54	0.40	6.95	10.18	7.67	0.050	4.0	4.0	4.0	0.0	0.28	444.28	448.98	4.70	4.12	
	769+42.35	442.00	0.31	1.26	0.49	0.31	0.75	6.54	0.40	6.95	10.18	7.67	0.050	4.0	4.0	4.0	0.0	0.28	442.28	448.98	6.70	4.12	
	769+88.31	441.01	0.31	1.58	0.49	0.31	0.75	6.54	0.40	6.95	10.18	7.67	0.050	4.0	4.0	4.0	0.0	0.28	441.29	448.98	7.69	4.12	
	770+63.51	440.00	0.31	1.89	0.49	0.31	1.07	6.95	0.40	7.35	10.18	10.87	0.050	4.0	4.0	4.0	0.0	0.28	440.28	448.98	8.70	4.12	
	771+56.92	439.90	0.15	2.04	0.48	0.15	0.90	6.95	0.37	7.32	10.17	9.15	0.050	4.0	4.0	4.0	0.0	0.32	440.22	443.99	3.77	4.45	

North Side, East of Riverview																							
	773+07.73	425.21	0.90	0.90	0.47	0.90	0.90		0.46	0.46	9.15	8.28	0.005	4.0	4.0	4.0	0.0	1.90	427.11	448.03	20.92	3.58	
	773+79.87	424.00	1.00	1.91	0.47	1.00	1.91	0.46	0.45	0.92	8.90	16.97	0.005	4.0	4.0	4.0	0.0	1.99	425.99	448.03	22.04	3.68	
	775+61.75	420.00	0.88	2.79	0.47	0.88	2.79	0.92	0.44	1.36	8.75	24.41	0.005	4.0	4.0	4.0	0.0	2.06	422.06	448.03	25.97	3.76	
	783+57.43	416.00	0.72	3.51	0.47	0.72	3.51	1.36	0.44	1.80	8.50	29.87	0.005	4.0	4.0	4.0	0.0	2.10	418.10	448.03	29.93	3.80	



Millennia Professional Services

Job: I-270 over the Mississippi River
 Location: I-270 and Riverview Drive, City of St. Louis
 Storm Event: 50 yr.

DITCH ANALYSIS (PROPOSED CONDITIONS)

By: _____ Date: 6/19/2020
 Checked: _____ Date: 6/19/2020
 Job No.: _____

Ditch			Drainage Area "A" (acres)		Runoff C	A x C		Flow Time (min)			Intensity (in/hr)	Total Runoff Q=C.I.A (cfs)	Ditch Geometry and Characteristics						Design Data					Notes	
Description	Station	Elevation	Increment	Total		Increment	Total	To Previous Location	In Section	Total			Through Slope (ft/ft)	Left Side Slope (H:1V)	Width of Bottom (ft)	Right Side Slope (H:1V)	Manning's	Flow Depth (ft)	Flow Elevation	EOP Grade	Freeboard (ft)	Velocity (ft/s)			
South Side, West of Riverview																									
HP - south of EB exit ramp	772+55.48	440.98	0.41	0.41	0.67	0.27	0.27	9.2	1.0	10.2	9.8	2.7	0.0050	4.00	4.00	4.00	0.03	0.46	441.44	464.24	22.80	1.72			
LP	771+76.24	434.00	0.83	10.76	0.26	0.22	2.55	8.8	0.5	9.2	10.0	25.3	0.0260	4.00	4.00	4.00	0.03	0.37	434.37	464.24	29.87	3.48			
	771+00.00	437.76	0.98	9.93	0.24	0.24	2.32	8.3	0.4	8.8	10.0	23.2	0.0260	4.00	4.00	4.00	0.03	0.44	438.20	463.38	25.18	3.83			
	770+00.00	442.00	1.03	8.95	0.24	0.25	2.09	7.9	0.4	8.3	10.0	20.9	0.0260	4.00	4.00	4.00	0.03	0.50	442.50	463.70	21.20	4.11			
	769+00.00	446.16	1.23	7.92	0.25	0.30	1.84	7.5	0.4	7.9	10.1	18.6	0.0260	4.00	4.00	4.00	0.03	0.57	446.73	464.02	17.29	4.42			
	768+00.00	450.26	1.50	6.69	0.27	0.40	1.54	7.2	0.4	7.5	10.1	15.6	0.0260	4.00	4.00	4.00	0.03	0.65	450.91	464.34	13.43	4.75			
	767+00.00	454.22	1.44	5.18	0.22	0.31	1.14	6.9	0.3	7.2	10.2	11.6	0.0260	4.00	4.00	4.00	0.03	0.71	454.93	464.66	9.73	4.98			
add flow	766+00.00	458.22	1.13	3.75	0.21	0.24	0.82	6.5	0.3	6.9	10.2	8.4	0.0260	4.00	4.00	4.00	0.03	0.75	458.97	464.98	6.01	5.13			
	765+00.00	459.93	0.85	2.62	0.22	0.18	0.58	6.2	0.3	6.5	10.2	5.9	0.0260	4.00	4.00	4.00	0.03	0.78	460.71	465.30	4.59	5.25			
	764+00.00	460.43	0.70	1.77	0.22	0.15	0.40	5.9	0.3	6.2	10.2	4.1	0.0270	4.00	4.00	4.00	0.03	0.79	461.22	465.62	4.40	5.38			
	763+00.00	460.93	0.59	1.07	0.22	0.13	0.25	5.6	0.3	5.9	10.2	2.5	0.0270	4.00	4.00	4.00	0.03	0.81	461.74	465.94	4.20	5.46			
EB Exit Ramp	762+00.00	461.43	0.47	0.47	0.24	0.12	0.12	5.3	0.3	5.6	10.2	1.2	0.0270	4.00	4.00	4.00	0.03	0.81	462.24	466.26	4.02	5.46			
High Point	761+00.00	461.93										0.0	0.0270	4.00	4.00	4.00	0.03	0.00	461.93	466.07	4.14	0.08			
	760+00.00	460.93	0.50	0.50	0.37	0.18	0.18	5.0	0.3	5.3	10.2	1.9	0.0270	4.00	4.00	4.00	0.03	0.83	461.76	463.51	1.75	5.53			
	759+00.00	459.93	0.45	0.94	0.45	0.20	0.38		5.0	5.0	10.2	3.9	0.0270	4.00	4.00	4.00	0.03	0.86	460.79	464.21	3.42	5.64			
LP	758+61.43	459.54	3.81	3.81	0.21	0.81	0.81	7.9	0.4	8.3	10.2	8.2	0.0200	4.00	4.00	4.00	0.03	0.67	460.21	464.48	4.27	4.23			
	758+00.00	460.15	0.89	3.03	0.30	0.27	1.00	7.3	0.6	7.9	10.2	10.2	0.0100	4.00	4.00	4.00	0.03	0.59	460.74	464.91	4.17	2.79			
	757+00.00	461.15	0.78	2.14	0.31	0.25	0.73	6.6	0.7	7.3	10.2	7.5	0.0100	4.00	4.00	4.00	0.03	0.50	461.65	465.61	3.96	2.55			
	756+00.00	462.15	0.65	1.36	0.34	0.22	0.49	5.9	0.7	6.6	10.2	4.9	0.0100	4.00	4.00	4.00	0.03	0.40	462.55	466.31	3.76	2.25			
	755+00.00	463.15	0.53	0.71	0.36	0.19	0.27	5.0	0.9	5.9	10.2	2.7	0.0100	4.00	4.00	4.00	0.03	0.29	463.44	467.01	3.57	1.88			
	754+00.00	464.15	0.19	0.19	0.41	0.08	0.08		5.0	5.0	10.2	0.8	0.0100	4.00	4.00	4.00	0.03	0.14	464.29	467.71	3.42	1.23			
High Point	753+51.33	464.63										0.0	0.0100	4.00	4.00	4.00	0.03	0.00	464.63	468.05	3.42	0.05			
	753+00.00	464.37	1.57	1.57	0.23	0.35	0.35		5.0	5.0	10.2	3.6	0.0100	4.00	4.00	4.00	0.03	0.34	464.71	468.41	3.70	2.06			
	752+00.00	463.87	1.57	3.15	0.23	0.35	0.71	5.0	5.0	10.0	10.2	7.2	0.0100	4.00	4.00	4.00	0.03	0.34	464.21	469.11	4.90	2.06			
	751+00.00	463.37	1.57	4.72	0.23	0.35	1.06	10.0	5.0	15.0	10.2	10.9	0.0100	4.00	4.00	4.00	0.03	0.34	463.71	469.81	6.10	2.06			
	750+00.00	458.38	0.47	5.20	0.29	0.14	1.20	5.0	0.7	5.7	10.2	12.3	0.0100	4.00	4.00	4.00	0.03	0.40	458.78	470.51	11.73	2.25			

North of EB Exit Ramp																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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North of EB Entrance Ramp																							
	773+57.90	449.16	0.57	0.57	0.72	0.41	0.41		5.0	5.0	10.2	4.2	0.018	4.00	4.00	4.00	0.03	0.31	449.47	459.13	9.66	2.62	
	775+00.58	443.77	0.30	0.86	0.62	0.18	0.59	5.0	0.6	5.6	10.2	6.0	0.018	4.00	4.00	4.00	0.03	0.38	444.15	456.78	12.63	2.94	
	776+00.55	439.08	0.38	1.24	0.59	0.22	0.82	5.6	0.5	6.1	10.2	8.3	0.018	4.00	4.00	4.00	0.03	0.45	439.53	451.67	12.14	3.23	
	777+00.83	438.08	0.38	1.63	0.71	0.27	1.09	6.1	0.5	6.6	10.1	11.0	0.018	4.00	4.00	4.00	0.03	0.53	438.61	446.15	7.54	3.53	



South Side, East of Riverview																							
add flow	775+00.00	420.80	0.31	0.31	0.26	0.08	0.08		0.2	0.2	10.2	0.8	0.019	4.00	4.00	4.00	0.03	0.45	421.25	436.45	15.20	3.32	
	776+00.00	420.50	0.50	0.80	0.22	0.11	0.19	0.2	0.5	0.7	10.1	1.9	0.019	4.00	4.00	4.00	0.03	0.48	420.98	441.45	20.47	3.44	
	777+00.00	420.20	0.61	1.41	0.22	0.14	0.33	0.7	0.5	1.2	10.0	3.3	0.019	4.00	4.00	4.00	0.03	0.51	420.71	446.46	25.75	3.56	
	778+00.00	419.90	0.57	1.98	0.22	0.13	0.45	1.2	0.4	1.6	10.0	4.5	0.019	4.00	4.00	4.00	0.03	0.55	420.45	451.46	31.01	3.71	
	779+00.00	419.60	0.62	2.60	0.24	0.15	0.60	1.6	0.4	2.1	10.0	6.0	0.019	4.00	4.00	4.00	0.03	0.58	420.18	456.96	36.78	3.82	



Millennia Professional Services

Job: I-270 over the Mississippi River
 Location: I-270 Mainline, Madison County
 Storm Event: 50 yr.

DITCH ANALYSIS (PROPOSED CONDITIONS)

By: TJL
 Checked:
 Job No.:
 Date: 4/17/2020
 Date:

Ditch			Drainage Area "A" (acres)		Runoff C	A x C		Flow Time (min)			Intensity (in/hr)	Total Runoff Q=C.I.A (cfs)	Ditch Geometry and Characteristics						Design Data					Notes
Description	Station	Elevation	Increment	Total		Increment	Total	To Previous Location	In Section	Total			Through Slope (ft/ft)	Left Side Slope (H:1V)	Width of Bottom (ft)	Right Side Slope (H:1V)	Manning's	Flow Depth (ft)	Flow Elevation	EOP Grade	Freeboard (ft)	Velocity (ft/s)		
South Side																								
	834+09.55	411.21	0.59	0.59	0.33	0.19	0.19		5.00	5.0	10.20	2.0	0.005	3.00	4.00	3.0	0.030	0.30	412.10	451.37	39.27	1.37		
	835+00.00	410.77	0.75	1.34	0.38	0.28	0.48	5.0	0.9	5.9	10.2	4.9	0.005	3.00	4.00	3.00	0.03	0.49	411.26	451.02	39.76	1.80		
	836+00.00	410.28	0.83	2.18	0.35	0.29	0.77	5.9	0.8	6.7	10.1	7.7	0.005	3.00	4.00	3.00	0.03	0.63	410.91	450.52	39.61	2.07		
	837+00.00	409.78	0.78	2.95	0.33	0.25	1.02	6.7	0.7	7.5	9.9	10.1	0.005	3.00	4.00	3.00	0.03	0.72	410.50	450.02	39.52	2.23		
	837+20.26	409.63	0.15	3.11	0.29	0.05	1.07	7.5	0.7	8.2	9.8	10.4	0.005	3.00	4.00	3.00	0.03	0.73	410.36	449.92	39.56	2.25		
	854+20.28	414.67	0.00	0.00	0.00	0.00	0.00		0.00	0.0	0.00	0.00	0.005	3.0	4.00	3.0	0.030	0.28	410.90	441.56	30.66	1.31		
	853+00.00	414.07	0.82	0.82	0.28	0.23	0.23	0.0	5.0	5.0	10.20	2.35	0.005	3.0	4.00	3.0	0.030	0.33	410.90	442.04	31.14	1.44		
	852+00.00	413.57	0.97	1.79	0.26	0.25	0.48	5.0	0.9	5.9	10.17	4.88	0.005	3.0	4.00	3.0	0.030	0.49	410.90	442.52	31.62	1.79		
	851+00.00	413.07	1.08	2.87	0.25	0.27	0.75	5.9	0.8	6.7	10.14	7.61	0.005	3.0	4.00	3.0	0.030	0.62	410.90	443.02	32.12	2.04		
	850+00.00	412.56	1.18	4.05	0.25	0.29	1.04	6.7	0.7	7.5	10.00	10.42	0.005	3.0	4.00	3.0	0.030	0.73	410.90	443.52	32.62	2.23		
	849+00.00	412.05	1.29	5.34	0.24	0.31	1.36	7.5	0.7	8.2	9.90	13.42	0.005	2.0	4.00	3.0	0.030	0.86	410.90	444.02	33.12	2.44		
	848+00.00	411.55	1.43	6.78	0.24	0.34	1.70	8.2	0.6	8.8	9.65	16.37	0.005	2.0	4.00	3.0	0.030	0.96	410.90	444.52	33.62	2.59		
	847+00.00	411.05	1.78	8.56	0.23	0.41	2.11	8.8	0.6	9.4	9.4	19.8	0.005	2.00	4.00	3.00	0.03	1.06	412.11	445.02	32.91	2.74		
	846+00.00	410.55	2.17	10.72	0.23	0.49	2.60	9.4	0.6	10.0	9.3	24.2	0.005	2.00	4.00	3.00	0.03	1.17	411.72	445.52	33.80	2.89		
includes storm outlet	845+00.00	410.05	2.19	12.92	0.23	0.49	3.09	10.0	0.5	10.5	9.0	35.9	0.005	2.00	4.00	3.00	0.03	1.43	411.48	446.02	34.54	3.22		
	844+00.00	409.55	2.14	15.05	0.23	0.48	3.57	10.5	0.5	11.1	8.9	31.8	0.005	2.00	4.00	3.00	0.03	1.34	410.89	446.52	35.63	3.11		
	843+00.00	409.04	2.09	17.14	0.23	0.47	4.05	11.1	0.5	11.6	8.8	35.4	0.005	2.00	4.00	3.00	0.03	1.42	410.46	447.02	36.56	3.21		
inlcudes culvert	842+25.53	408.92	113.48	130.62	0.22	24.41	28.46	11.6	112.6	124.2	2.2	61.2	0.005	2.00	4.00	3.00	0.03	1.85	410.77	447.39	36.63	3.79		
	837+20.26	408.89	5.35	135.97	0.25	1.33	29.79	124.2	0.8	124.9	2.2	65.5	0.001	2.00	4.00	3.00	0.03	2.78	411.67	449.92	38.25	2.13		
	854+20.26	414.67	0.00	0.00	0.00	0.00	0.00		0.00	0.0	0.00	0.00	0.0055	3.0	4.00	3.0	0.030	0.28	410.90	441.56	30.66	1.40		
	855+00.00	414.21	0.76	0.76	0.26	0.20	0.20	0.0	5.0	5.0	10.20	2.0	0.0055	3.0	4.00	3.0	0.030	0.29	415.41	441.38	25.97	1.43		
	856+00.00	413.64	0.65	1.41	0.28	0.19	0.38	5.0	0.9	5.9	10.2	3.9	0.0055	3.00	4.00	3.00	0.03	0.42	414.06	441.20	27.14	1.76		
	857+00.00	413.07	0.57	1.98	0.30	0.17	0.55	5.9	0.8	6.8	10.1	5.5	0.0055	3.00	4.00	3.00	0.03	0.51	413.58	441.12	27.54	1.96		
	858+00.00	412.50	0.52	2.51	0.31	0.16	0.71	6.8	0.8	7.6	10.0	7.1	0.0055	3.00	4.00	3.00	0.03	0.58	413.08	441.12	28.04	2.11		
	858+32.59	412.28	0.18	2.69	0.30	0.05	0.77	7.6	0.7	8.3	9.8	7.5	0.0065	3.00	4.00	3.00	0.03	0.57	412.85	441.12	28.27	2.27		
includes storm outlet	863+40.14	418.01	3.29	3.29	0.29	0.96	0.96	0.0	5.0	5.0	10.2	9.8	0.060	3.00	4.00	3.00	0.03	0.36	418.37	441.12	22.75	5.33		
	863+00.00	416.91	0.23	3.52	0.30	0.07	1.03	5.0	0.3	5.3	10.2	25.4	0.026	3.00	4.00	3.00	0.03	0.76	417.67	441.12	23.45	5.32		
	862+00.00	414.19	0.57	4.08	0.30	0.17	1.20	5.3	0.7	6.0	10.2	12.2	0.005	3.00	4.00	3.00	0.03	0.80	414.99	441.12	26.13	2.39		
	861+00.00	413.67	0.64	4.72	0.29	0.18	1.38	6.0	0.7	6.7	10.1	13.9	0.005	3.00	4.00	3.00	0.03	0.85	414.52	441.12	26.60	2.47		
includes storm outlet	860+00.00	413.15	0.57	5.29	0.30	0.17	1.55	6.7	0.6	7.2	10.0	26.9	0.005	3.00	4.00	3.00	0.03	1.19	414.34	441.12	26.78	2.97		
	859+00.00	412.63	0.56	5.84	0.30	0.17	1.71	7.2	0.6	7.9	9.9	17.0	0.005	3.00	4.00	3.00	0.03	0.95	413.58	441.12	27.54	2.63		
includes culvert	858+32.59	412.28	16.98	22.83	0.26	4.49	6.20	7.9	69.4	77.3	3.0	18.6	0.005	3.00	4.00	3.00	0.03	0.99	413.27	441.12	27.85	2.69		



Millennia Professional Services

Job: I-270 over the Mississippi River
 Location: I-270 Mainline, Madison County
 Storm Event: 50 yr.

DITCH ANALYSIS (PROPOSED CONDITIONS)

By: TJL
 Checked: _____
 Job No.: _____
 Date: 4/20/2020
 Date: _____

Ditch			Drainage Area "A" (acres)		Runoff C	A x C		Flow Time (min)			Intensity (in/hr)	Total Runoff Q=C.I.A (cfs)	Ditch Geometry and Characteristics						Design Data					Notes
Description	Station	Elevation	Increment	Total		Increment	Total	To Previous Location	In Section	Total			Through Slope (ft/ft)	Left Side Slope (H:1V)	Width of Bottom (ft)	Right Side Slope (H:1V)	Manning's	Flow Depth (ft)	Flow Elevation	EOP Grade	Freeboard (ft)	Velocity (ft/s)		
South of Waterworks Rd																								
	885+00.00	417.09	1.20	1.20	0.31	0.38	0.38	0.0	5.0	5.0	10.2	3.9	0.007	3.00	4.00	2.00	0.03	0.40	417.49	420.58	3.09	1.99		
	886+00.00	416.37	0.27	1.48	0.31	0.08	0.46	5.0	0.8	5.8	10.2	4.7	0.007	3.00	4.00	2.00	0.03	0.44	416.81	419.45	2.64	2.10		
	887+00.00	415.65	0.26	1.74	0.28	0.07	0.54	5.8	1.0	6.8	10.1	5.4	0.004	3.00	4.00	2.00	0.03	0.56	416.21	418.65	2.44	1.75		
	888+00.00	415.27	0.26	2.00	0.26	0.07	0.60	6.8	0.9	7.7	10.0	6.0	0.004	3.00	4.00	2.00	0.03	0.59	415.86	418.44	2.58	1.80		
	889+00.00	414.89	0.26	2.26	0.26	0.07	0.67	7.7	0.9	8.6	9.5	6.4	0.004	3.00	4.00	2.00	0.03	0.61	415.50	418.52	3.02	1.83		
	889+40.00	414.73	0.10	2.36	0.26	0.03	0.70	8.6	0.9	9.5	9.3	6.5	0.004	3.00	4.00	2.00	0.03	0.62	415.35	418.50	3.15	1.85		
	895+25.00	418.65	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	10.2	0.0	0.006	3.00	4.00	3.00	0.03	0.00	418.65	421.54	2.89	0.00		
	895+00.00	418.50	0.09	0.09	0.34	0.03	0.03	0.0	2.3	2.3	10.2	0.3	0.006	3.00	4.00	3.00	0.03	0.09	418.59	421.73	3.14	0.74		
	894+00.00	417.89	0.33	0.41	0.34	0.11	0.14	2.3	1.3	3.5	10.2	1.4	0.006	3.00	4.00	2.00	0.03	0.23	418.12	421.96	3.84	1.33		
	893+00.00	417.27	0.31	0.73	0.34	0.11	0.25	3.5	1.0	4.5	10.2	2.5	0.006	3.00	4.00	2.00	0.03	0.32	417.59	421.50	3.91	1.62		
	892+00.00	416.65	0.31	1.04	0.34	0.10	0.35	4.5	0.9	5.5	10.2	3.6	0.006	3.00	4.00	2.00	0.03	0.40	417.05	420.76	3.71	1.84		
	891+00.00	416.03	0.31	1.34	0.35	0.11	0.46	5.5	0.8	6.3	10.1	4.6	0.006	3.00	4.00	2.00	0.03	0.46	416.49	419.79	3.30	1.99		
	890+00.00	415.41	0.30	1.64	0.33	0.10	0.56	6.3	0.8	7.1	10.0	5.6	0.006	3.00	4.00	2.00	0.03	0.51	415.92	418.93	3.01	2.11		
	889+40.00	414.73	0.17	1.81	0.29	0.05	0.60	7.1	0.8	7.9	10.0	6.0	0.006	3.00	4.00	2.00	0.03	0.53	415.26	418.50	3.24	2.16		
	895+25.00	418.65	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	10.2	0.0	0.005	3.00	4.00	3.00	0.03	0.00	418.65	421.54	2.89	0.00		
	896+00.00	418.26	0.26	0.26	0.34	0.09	0.09	0.0	1.6	1.6	10.2	0.9	0.005	3.00	4.00	3.00	0.03	0.19	418.45	421.07	2.62	1.06		

Outlets - Missouri Peak Flow Summaries
I-270 over the Mississippi River
 Bridge Replacement
 Pre-Detention Peak Flows

Existing Runoff - 20 Year, 20 Min.	
Outlet #	Q
1	28.65
2	11.58
3	4.80
4	39.46
5	147.34
6	59.11
7	18.00
Proposed Runoff - 20 Year, 20 Min.	
Outlet #	Q
1	31.10
2	10.42
3	5.10
4	40.92
5	150.33
6	56.12
7	16.21

Existing Runoff - 100 Year, 20 Min.	
Outlet #	Q
1	36.90
2	14.91
3	6.18
4	50.80
5	189.80
6	76.10
7	23.17
Proposed Runoff - 100 Year, 20 Min.	
Outlet #	Q
1	40.05
2	13.42
3	6.57
4	52.68
5	193.67
6	72.26
7	20.86

Outlet 1 - Stormwater Detention Storage Calculation

I-270 over the Mississippi River

Bridge Replacement

Combined Site Differential Q

Drainage at Roadway Only

Existing Runoff - 20 Year, 20 Min.			
Type	PI	Area	Q
Impervious	3.70	3.780	13.99
Pervious	1.78	8.240	14.67
Total Existing Runoff =			28.65 cfs
Proposed Runoff - 20 Year, 20 Min.			
Type	PI	Area	Q
Impervious	3.70	4.320	15.98
Pervious	1.78	8.490	15.11
Total Proposed Runoff =			31.10 cfs

Total Site Differential, $Q_{20} = 2.44$ cfs

Total Site Differential Runoff only slightly higher than requirement. Proposed storm sewer system and ditches potentially cover any Detention Storage

Requirement

Time to Peak = 20.00 min

Total Detention Storage, $S_{20} = 2932$ cf

Outlet 1 - Stormwater Detention Storage Calculation

I-270 over the Mississippi River

Bridge Replacement

Combined Site Differential Q

Drainage at Roadway Only

Existing Runoff - 100 Year, 20 Min.			
Type	PI	Area	Q
Impervious	4.77	3.780	18.03
Pervious	2.29	8.240	18.87
Total Existing Runoff =			36.90 cfs
Proposed Runoff - 100 Year, 20 Min.			
Type	PI	Area	Q
Impervious	4.77	4.320	20.61
Pervious	2.29	8.490	19.44
Total Proposed Runoff =			40.05 cfs

Total Site Differential, $Q_{100} = 3.15$ cfs

Total Site Differential Runoff only slightly higher than requirement. Proposed storm sewer system and ditches potentially cover any Detention Storage

Requirement

Time to Peak = 20.00 min

Total Detention Storage, $S_{100} = 3778$ cf

Outlet 2 - Stormwater Detention Storage Calculation

I-270 over the Mississippi River

Bridge Replacement

Combined Site Differential Q

Drainage at Roadway Only

Existing Runoff - 20 Year, 20 Min.			
Type	PI	Area	Q
Impervious	3.70	0.970	3.59
Pervious	1.78	4.490	7.99
Total Existing Runoff =			11.58 cfs
Proposed Runoff - 20 Year, 20 Min.			
Type	PI	Area	Q
Impervious	3.70	1.080	4.00
Pervious	1.78	3.610	6.43
Total Proposed Runoff =			10.42 cfs

Total Site Differential, $Q_{20} = -1.16$ cfs

Total Site Differential Runoff less than 2cfs. Potential No Detention Required.

Time to Peak = 20.00 min

Total Detention Storage, $S_{20} = 0$ cf

Outlet 2 - Stormwater Detention Storage Calculation

I-270 over the Mississippi River

Bridge Replacement

Combined Site Differential Q

Drainage at Roadway Only

Existing Runoff - 100 Year, 20 Min.			
Type	PI	Area	Q
Impervious	4.77	0.970	4.63
Pervious	2.29	4.490	10.28
Total Existing Runoff =			14.91 cfs
Proposed Runoff - 100 Year, 20 Min.			
Type	PI	Area	Q
Impervious	4.77	1.080	5.15
Pervious	2.29	3.610	8.27
Total Proposed Runoff =			13.42 cfs

Total Site Differential, $Q_{100} = -1.49$ cfs

Total Site Differential Runoff less than 2cfs. Potential No Detention Required.

Time to Peak = 20.00 min

Total Detention Storage, $S_{100} = 0$ cf

Bridge Replacement
Combined Site Differential Q

Drainage at Roadway Only (Outlet 1 + 2)

Existing Runoff - 20 Year, 20 Min.			
Type	PI	Area	Q
Impervious	3.70	0.610	2.26
Pervious	1.78	1.430	2.55
Total Existing Runoff =			4.80 cfs
Proposed Runoff - 20 Year, 20 Min.			
Type	PI	Area	Q
Impervious	3.70	0.600	2.22
Pervious	1.78	1.620	2.88
Total Proposed Runoff =			5.10 cfs

Total Site Differential, $Q_{20} = 0.30$ cfs

Total Site Differential Runoff less than 2cfs. Potential No Detention Required.

Time to Peak = 20.00 min

Total Detention Storage, $S_{20} = 361$ cf

Outlet 3 - Stormwater Detention Storage Calculation

I-270 over the Mississippi River

Bridge Replacement

Combined Site Differential Q

Drainage at Roadway Only (Outlet 1 + 2)

Existing Runoff - 100 Year, 20 Min.			
Type	PI	Area	Q
Impervious	4.77	0.610	2.91
Pervious	2.29	1.430	3.27
Total Existing Runoff =			6.18 cfs
Proposed Runoff - 100 Year, 20 Min.			
Type	PI	Area	Q
Impervious	4.77	0.600	2.86
Pervious	2.29	1.620	3.71
Total Proposed Runoff =			6.57 cfs

Total Site Differential, $Q_{100} = 0.39$ cfs

Total Site Differential Runoff less than 2cfs. Potential No Detention Required.

Time to Peak = 20.00 min

Total Detention Storage, $S_{100} = 465$ cf

Outlet 4 - Stormwater Detention Storage Calculation

I-270 over the Mississippi River

Bridge Replacement

Combined Site Differential Q

Drainage at Roadway Only

Existing Runoff - 20 Year, 20 Min.			
Type	PI	Area	Q
Impervious	3.70	3.550	13.14
Pervious	1.78	14.790	26.33
Total Existing Runoff =			39.46 cfs
Proposed Runoff - 20 Year, 20 Min.			
Type	PI	Area	Q
Impervious	3.70	4.410	16.32
Pervious	1.78	13.820	24.60
Total Proposed Runoff =			40.92 cfs

Total Site Differential, $Q_{20} = 1.46$ cfs

Total Site Differential Runoff less than 2cfs. Potential No Detention Required.

Time to Peak = 20.00 min

Total Detention Storage, $S_{20} = 1746$ cf

Outlet 4 - Stormwater Detention Storage Calculation

I-270 over the Mississippi River

Bridge Replacement

Combined Site Differential Q

Drainage at Roadway Only

Existing Runoff - 100 Year, 20 Min.			
Type	PI	Area	Q
Impervious	4.77	3.550	16.93
Pervious	2.29	14.790	33.87
Total Existing Runoff =			50.80 cfs
Proposed Runoff - 100 Year, 20 Min.			
Type	PI	Area	Q
Impervious	4.77	4.410	21.04
Pervious	2.29	13.820	31.65
Total Proposed Runoff =			52.68 cfs

Total Site Differential, $Q_{100} = 1.88$ cfs

Total Site Differential Runoff less than 2cfs. Potential No Detention Required.

Time to Peak = 20.00 min

Total Detention Storage, $S_{100} = 2257$ cf

Outlet 5 - Stormwater Detention Storage Calculation

I-270 over the Mississippi River

Bridge Replacement

Combined Site Differential Q

Drainage Area

Existing Runoff - 20 Year, 20 Min.			
Type	PI	Area	Q
Impervious	3.70	25.050	92.69
Pervious	1.78	30.670	54.59
Total Existing Runoff =			147.28 cfs
Proposed Runoff - 20 Year, 20 Min.			
Type	PI	Area	Q
Impervious	3.70	27.220	100.71
Pervious	1.78	27.830	49.54
Total Proposed Runoff =			150.25 cfs

Total Site Differential, $Q_{20} = 2.97$ cfs

Total Site Differential Runoff less than 2cfs. Potential No Detention Required.

Drainage goes directly to Mississippi River Floodplain.

Time to Peak = 20.00 min

Total Detention Storage, $S_{20} = 3569$ cf

Outlet 5 - Stormwater Detention Storage Calculation

I-270 over the Mississippi River

Bridge Replacement

Combined Site Differential Q

Drainage Area

Existing Runoff - 100 Year, 20 Min.			
Type	PI	Area	Q
Impervious	4.77	25.050	119.49
Pervious	2.29	30.670	70.23
Total Existing Runoff =			189.72 cfs
Proposed Runoff - 100 Year, 20 Min.			
Type	PI	Area	Q
Impervious	4.77	27.220	129.84
Pervious	2.29	27.830	63.73
Total Proposed Runoff =			193.57 cfs

Total Site Differential, $Q_{100} = 3.85$ cfs

Total Site Differential Runoff less than 2cfs. Potential No Detention Required.

Drainage goes directly to Mississippi River Floodplain.

Time to Peak = 20.00 min

Total Detention Storage, $S_{100} = 4617$ cf

Outlet 6 - Stormwater Detention Storage Calculation

I-270 over the Mississippi River

Bridge Replacement

Combined Site Differential Q

Drainage Area

Existing Runoff - 20 Year, 20 Min.			
Type	PI	Area	Q
Impervious	3.70	5.670	20.98
Pervious	1.78	21.420	38.13
Total Existing Runoff =			59.11 cfs
Proposed Runoff - 20 Year, 20 Min.			
Type	PI	Area	Q
Impervious	3.70	5.960	22.05
Pervious	1.78	19.140	34.07
Total Proposed Runoff =			56.12 cfs

Total Site Differential, $Q_{20} = -2.99$ cfs

Total Site Differential Runoff less than 2cfs. Potential No Detention Required.

Drainage goes directly to Mississippi River Floodplain.

Time to Peak = 20.00 min

Total Detention Storage, $S_{20} = 0$ cf

Outlet 6 - Stormwater Detention Storage Calculation

I-270 over the Mississippi River

Bridge Replacement

Combined Site Differential Q

Drainage Area

Existing Runoff - 100 Year, 20 Min.			
Type	PI	Area	Q
Impervious	4.77	5.670	27.05
Pervious	2.29	21.420	49.05
Total Existing Runoff =			76.10 cfs
Proposed Runoff - 100 Year, 20 Min.			
Type	PI	Area	Q
Impervious	4.77	5.960	28.43
Pervious	2.29	19.140	43.83
Total Proposed Runoff =			72.26 cfs

Total Site Differential, $Q_{100} = -3.84$ cfs

Total Site Differential Runoff less than 2cfs. Potential No Detention Required.

Drainage goes directly to Mississippi River Floodplain.

Time to Peak = 20.00 min

Total Detention Storage, $S_{100} = 0$ cf

Outlet 7 - Stormwater Detention Storage Calculation

I-270 over the Mississippi River

Bridge Replacement

Combined Site Differential Q

Drainage Area

Existing Runoff - 20 Year, 20 Min.			
Type	PI	Area	Q
Impervious	3.70	1.280	4.74
Pervious	1.78	7.450	13.26
Total Existing Runoff =			18.00 cfs
Proposed Runoff - 20 Year, 20 Min.			
Type	PI	Area	Q
Impervious	3.70	0.820	3.03
Pervious	1.78	7.400	13.17
Total Proposed Runoff =			16.21 cfs

Total Site Differential, $Q_{20} = -1.79$ cfs

Total Site Differential Runoff less than 2cfs. Potential No Detention Required.

Drainage goes directly to Mississippi River Floodplain.

Time to Peak = 20.00 min

Total Detention Storage, $S_{20} = 0$ cf

Outlet 7 - Stormwater Detention Storage Calculation

I-270 over the Mississippi River

Bridge Replacement

Combined Site Differential Q

Drainage Area

Existing Runoff - 100 Year, 20 Min.			
Type	PI	Area	Q
Impervious	4.77	1.280	6.11
Pervious	2.29	7.450	17.06
Total Existing Runoff =			23.17 cfs
Proposed Runoff - 100 Year, 20 Min.			
Type	PI	Area	Q
Impervious	4.77	0.820	3.91
Pervious	2.29	7.400	16.95
Total Proposed Runoff =			20.86 cfs

Total Site Differential, $Q_{100} = -2.31$ cfs

Total Site Differential Runoff less than 2cfs. Potential No Detention Required.

Drainage goes directly to Mississippi River Floodplain.

Time to Peak = 20.00 min

Total Detention Storage, $S_{100} = 0$ cf

Outlets - Illinois Peak Flow Summaries
I-270 over the Mississippi River
 Bridge Replacement
 Pre-Detention Peak Flows

Existing Runoff - 50 Year	
Outlet #	Q
8	232.07
9	74.18
10	84.32
11	141.16
Proposed Runoff - 50 Year	
Outlet #	Q
8	244.76
9	80.07
10	79.24
11	144.32

Existing Runoff - 100 Year	
Outlet #	Q
8	269.74
9	86.22
10	98.00
11	164.07
Proposed Runoff - 100 Year	
Outlet #	Q
8	284.48
9	93.07
10	92.10
11	167.74

Outlet 8 - Stormwater Detention Storage Calculation

Existing "CA"

Surface Type	Area	C	C x A
Grass / Landscaping	130.830	0.20	26.166
Pavement	4.678	0.90	4.210
Total Drainage Area=		135.51	CA= 30.376

Proposed "CA"

Surface Type	Area	C	C x A
Grass	135.16	0.20	27.032
Pavement	5.560	0.90	5.004
Total Drainage Area=		140.72	CA= 32.036

Determine allowable release rate and maximum storage required:

	Q_{existing} (10-year) =	156.74 cfs
CA Existing =	Q_{existing} (50-year) =	232.07 cfs
CA Proposed =	Q_{existing} (100-year) =	269.74 cfs

Time (min)	Intensity (in/hr)	Q_{exist} (cfs)	Q_{released} (cfs)	$Q_{\text{allowable}}$ (cfs)	$Q_{\text{in basin}}$ (cfs)	Q_{store} (cfs)	Storage (cu ft)
10-Year Storm							
15.00	5.16	156.74	0.00	156.74	165.31	8.57	7710
20.00	4.50	156.74	0.00	156.74	144.16	0.00	0
25.00	4.00	156.74	0.00	156.74	128.14	0.00	0
30.00	3.56	156.74	0.00	156.74	114.05	0.00	0
35.00	3.22	156.74	0.00	156.74	103.16	0.00	0
40.00	2.95	156.74	0.00	156.74	94.51	0.00	0
45.00	2.78	156.74	0.00	156.74	89.06	0.00	0
50.00	2.54	156.74	0.00	156.74	81.37	0.00	0
55.00	2.40	156.74	0.00	156.74	76.89	0.00	0
60.00	2.27	156.74	0.00	156.74	72.72	0.00	0
50-Year Storm							
15.00	7.64	232.07	0.00	232.07	244.76	12.68	11415
20.00	6.45	232.07	0.00	232.07	206.63	0.00	0
25.00	5.76	232.07	0.00	232.07	184.53	0.00	0
30.00	5.24	232.07	0.00	232.07	167.87	0.00	0
35.00	4.77	232.07	0.00	232.07	152.81	0.00	0
40.00	4.43	232.07	0.00	232.07	141.92	0.00	0
45.00	4.07	232.07	0.00	232.07	130.39	0.00	0
50.00	3.79	232.07	0.00	232.07	121.42	0.00	0
55.00	3.55	232.07	0.00	232.07	113.73	0.00	0
60.00	3.32	232.07	0.00	232.07	106.36	0.00	0
100-Year Storm							
15.00	8.88	269.74	0.00	269.74	284.48	14.74	13268
20.00	7.80	269.74	0.00	269.74	249.88	0.00	0
25.00	6.85	269.74	0.00	269.74	219.45	0.00	0
30.00	6.06	269.74	0.00	269.74	194.14	0.00	0
35.00	5.60	269.74	0.00	269.74	179.40	0.00	0
40.00	5.18	269.74	0.00	269.74	165.95	0.00	0
45.00	4.89	269.74	0.00	269.74	156.66	0.00	0
50.00	4.54	269.74	0.00	269.74	145.44	0.00	0
55.00	4.20	269.74	0.00	269.74	134.55	0.00	0
60.00	3.86	269.74	0.00	269.74	123.66	0.00	0

Outlet 9 - Stormwater Detention Storage Calculation

Existing "CA"

Surface Type	Area	C	C x A
Grass / Landscaping	29.250	0.20	5.850
Pavement	4.288	0.90	3.860
Total Drainage Area=	33.54	CA=	9.709

Proposed "CA"

Surface Type	Area	C	C x A
Grass	22.84	0.20	4.568
Pavement	6.570	0.90	5.913
Total Drainage Area=	29.41	CA=	10.481

Determine allowable release rate and maximum storage required:

	Q _{existing} (10-year) =	50.10 cfs
CA Existing =	9.709	Q _{existing} (50-year) = 74.18 cfs
CA Proposed =	10.481	Q _{existing} (100-year) = 86.22 cfs

Time (min)	Intensity (in/hr)	Q _{exist} (cfs)	Q _{released} (cfs)	Q _{allowable} (cfs)	Q _{in basin} (cfs)	Q _{store} (cfs)	Storage (cu ft)
10-Year Storm							
15.00	5.16	50.10	0.00	50.10	54.08	3.98	3583
20.00	4.50	50.10	0.00	50.10	47.16	0.00	0
25.00	4.00	50.10	0.00	50.10	41.92	0.00	0
30.00	3.56	50.10	0.00	50.10	37.31	0.00	0
35.00	3.22	50.10	0.00	50.10	33.75	0.00	0
40.00	2.95	50.10	0.00	50.10	30.92	0.00	0
45.00	2.78	50.10	0.00	50.10	29.14	0.00	0
50.00	2.54	50.10	0.00	50.10	26.62	0.00	0
55.00	2.40	50.10	0.00	50.10	25.15	0.00	0
60.00	2.27	50.10	0.00	50.10	23.79	0.00	0

50-Year Storm							
15.00	7.64	74.18	0.00	74.18	80.07	5.89	5305
20.00	6.45	74.18	0.00	74.18	67.60	0.00	0
25.00	5.76	74.18	0.00	74.18	60.37	0.00	0
30.00	5.24	74.18	0.00	74.18	54.92	0.00	0
35.00	4.77	74.18	0.00	74.18	49.99	0.00	0
40.00	4.43	74.18	0.00	74.18	46.43	0.00	0
45.00	4.07	74.18	0.00	74.18	42.66	0.00	0
50.00	3.79	74.18	0.00	74.18	39.72	0.00	0
55.00	3.55	74.18	0.00	74.18	37.21	0.00	0
60.00	3.32	74.18	0.00	74.18	34.80	0.00	0

100-Year Storm							
15.00	8.88	86.22	0.00	86.22	93.07	6.85	6166
20.00	7.80	86.22	0.00	86.22	81.75	0.00	0
25.00	6.85	86.22	0.00	86.22	71.79	0.00	0
30.00	6.06	86.22	0.00	86.22	63.51	0.00	0
35.00	5.60	86.22	0.00	86.22	58.69	0.00	0
40.00	5.18	86.22	0.00	86.22	54.29	0.00	0
45.00	4.89	86.22	0.00	86.22	51.25	0.00	0
50.00	4.54	86.22	0.00	86.22	47.58	0.00	0
55.00	4.20	86.22	0.00	86.22	44.02	0.00	0
60.00	3.86	86.22	0.00	86.22	40.46	0.00	0

Outlet 10 - Stormwater Detention Storage Calculation

Existing "CA"

Surface Type	Area	C	C x A
Grass / Landscaping	28.545	0.20	5.709
Pavement	5.920	0.90	5.328

Total Drainage Area= 34.46 CA= 11.037

Proposed "CA"

Surface Type	Area	C	C x A
Grass	28.01	0.20	5.602
Pavement	5.300	0.90	4.770

Total Drainage Area= 33.31 CA= 10.372

Determine allowable release rate and maximum storage required:

	Q _{existing} (10-year) =	56.95 cfs
CA Existing = 11.037	Q _{existing} (50-year) =	84.32 cfs
CA Proposed = 10.372	Q _{existing} (100-year) =	98.00 cfs

Time (min)	Intensity (in/hr)	Q _{exist} (cfs)	Q _{released} (cfs)	Q _{allowable} (cfs)	Q _{in basin} (cfs)	Q _{store} (cfs)	Storage (cu ft)
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10-Year Storm

15.00	5.16	56.95	0.00	56.95	53.52	0.00	0
20.00	4.50	56.95	0.00	56.95	46.67	0.00	0
25.00	4.00	56.95	0.00	56.95	41.49	0.00	0
30.00	3.56	56.95	0.00	56.95	36.92	0.00	0
35.00	3.22	56.95	0.00	56.95	33.40	0.00	0
40.00	2.95	56.95	0.00	56.95	30.60	0.00	0
45.00	2.78	56.95	0.00	56.95	28.83	0.00	0
50.00	2.54	56.95	0.00	56.95	26.34	0.00	0
55.00	2.40	56.95	0.00	56.95	24.89	0.00	0
60.00	2.27	56.95	0.00	56.95	23.54	0.00	0

50-Year Storm

15.00	7.64	84.32	0.00	84.32	79.24	0.00	0
20.00	6.45	84.32	0.00	84.32	66.90	0.00	0
25.00	5.76	84.32	0.00	84.32	59.74	0.00	0
30.00	5.24	84.32	0.00	84.32	54.35	0.00	0
35.00	4.77	84.32	0.00	84.32	49.47	0.00	0
40.00	4.43	84.32	0.00	84.32	45.95	0.00	0
45.00	4.07	84.32	0.00	84.32	42.21	0.00	0
50.00	3.79	84.32	0.00	84.32	39.31	0.00	0
55.00	3.55	84.32	0.00	84.32	36.82	0.00	0
60.00	3.32	84.32	0.00	84.32	34.44	0.00	0

100-Year Storm

15.00	8.88	98.00	0.00	98.00	92.10	0.00	0
20.00	7.80	98.00	0.00	98.00	80.90	0.00	0
25.00	6.85	98.00	0.00	98.00	71.05	0.00	0
30.00	6.06	98.00	0.00	98.00	62.85	0.00	0
35.00	5.60	98.00	0.00	98.00	58.08	0.00	0
40.00	5.18	98.00	0.00	98.00	53.73	0.00	0
45.00	4.89	98.00	0.00	98.00	50.72	0.00	0
50.00	4.54	98.00	0.00	98.00	47.09	0.00	0
55.00	4.20	98.00	0.00	98.00	43.56	0.00	0
60.00	3.86	98.00	0.00	98.00	40.04	0.00	0

Outlet 11 - Stormwater Detention Storage Calculation

Existing "CA"

Surface Type	Area	C	C x A
Grass / Landscaping	71.770	0.20	14.354
Pavement	4.581	0.90	4.123
Total Drainage Area=	76.35	CA=	18.477

Proposed "CA"

Surface Type	Area	C	C x A
Grass	71.32	0.20	14.264
Pavement	5.140	0.90	4.626
Total Drainage Area=	76.46	CA=	18.890

Determine allowable release rate and maximum storage required:

	Q_{existing} (10-year) =	95.34 cfs
CA Existing =	Q_{existing} (50-year) =	141.16 cfs
CA Proposed =	Q_{existing} (100-year) =	164.07 cfs

Time (min)	Intensity (in/hr)	Q_{exist} (cfs)	Q_{released} (cfs)	$Q_{\text{allowable}}$ (cfs)	$Q_{\text{in basin}}$ (cfs)	Q_{store} (cfs)	Storage (cu ft)
10-Year Storm							
15.00	5.16	95.34	0.00	95.34	97.47	2.13	1919
20.00	4.50	95.34	0.00	95.34	85.01	0.00	0
25.00	4.00	95.34	0.00	95.34	75.56	0.00	0
30.00	3.56	95.34	0.00	95.34	67.25	0.00	0
35.00	3.22	95.34	0.00	95.34	60.83	0.00	0
40.00	2.95	95.34	0.00	95.34	55.73	0.00	0
45.00	2.78	95.34	0.00	95.34	52.51	0.00	0
50.00	2.54	95.34	0.00	95.34	47.98	0.00	0
55.00	2.40	95.34	0.00	95.34	45.34	0.00	0
60.00	2.27	95.34	0.00	95.34	42.88	0.00	0

50-Year Storm

15.00	7.64	141.16	0.00	141.16	144.32	3.16	2842
20.00	6.45	141.16	0.00	141.16	121.84	0.00	0
25.00	5.76	141.16	0.00	141.16	108.81	0.00	0
30.00	5.24	141.16	0.00	141.16	98.98	0.00	0
35.00	4.77	141.16	0.00	141.16	90.11	0.00	0
40.00	4.43	141.16	0.00	141.16	83.68	0.00	0
45.00	4.07	141.16	0.00	141.16	76.88	0.00	0
50.00	3.79	141.16	0.00	141.16	71.59	0.00	0
55.00	3.55	141.16	0.00	141.16	67.06	0.00	0
60.00	3.32	141.16	0.00	141.16	62.71	0.00	0

100-Year Storm

15.00	8.88	164.07	0.00	164.07	167.74	3.67	3303
20.00	7.80	164.07	0.00	164.07	147.34	0.00	0
25.00	6.85	164.07	0.00	164.07	129.40	0.00	0
30.00	6.06	164.07	0.00	164.07	114.47	0.00	0
35.00	5.60	164.07	0.00	164.07	105.78	0.00	0
40.00	5.18	164.07	0.00	164.07	97.85	0.00	0
45.00	4.89	164.07	0.00	164.07	92.37	0.00	0
50.00	4.54	164.07	0.00	164.07	85.76	0.00	0
55.00	4.20	164.07	0.00	164.07	79.34	0.00	0
60.00	3.86	164.07	0.00	164.07	72.92	0.00	0

Compensatory Storage Calculations

Project Name: IL - I-270
Date: 9/3/2020

Calc. By: T.J.L.
Chkd. By: M.J.R.

LEVEE ELEVATION : 425 FT

STATION 833+50 - 865+00

CUT

SECTION	AREA SQ FT	AVG AREA SQ FT	LENGTH FT	VOLUME CU YD
833+50	0	0	0	0.00
834+00	0	0	50	0.00
835+00	111	55.691975	100	206.27
836+00	143	127.019075	100	470.44
837+00	181	161.737475	100	599.03
838+00	196	188.244025	100	697.20
839+00	138	167.063425	100	618.75
840+00	128	133.015325	100	492.65
841+00	86	106.606225	100	394.84
842+00	63	74.3492	100	275.37
843+00	12	37.31475	100	138.20
844+00	65	38.144825	100	141.28
845+00	66	65.41085	100	242.26
846+00	80	73.003475	100	270.38
847+00	97	88.363525	100	327.27
848+00	96	96.4793	100	357.33
849+00	123	109.58625	100	405.88
850+00	139	131.05445	100	485.39
851+00	13	75.99455	100	281.46
852+00	16	14.597	100	54.06
853+00	31	23.51805	100	87.10
854+00	29	30.0487	100	111.29
855+00	34	31.500725	100	116.67
856+00	46	40.022175	100	148.23
857+00	49	47.927925	100	177.51
858+00	18	33.789425	100	125.15
859+00	64	40.8246	100	151.20
860+00	18	40.698325	100	150.73
861+00	12	14.84895	100	55.00
862+00	11	11.1785	100	41.40
863+00	4	7.4774	100	27.69
864+00	0	2.222875	100	8.23
865+00	0	0	100	0.00
866+00	0	0	100	0.00
867+00	0	0	100	0.00
868+00	0	0	100	0.00

FILL

SECTION	AREA SQ FT	AVG AREA SQ FT	LENGTH FT	VOLUME CU YD
	0	0	0	0.00
	1673	836.50765	50	1549.09
	544	1108.51455	100	4105.61
	694	619.150975	100	2293.15
	649	671.5988	100	2487.40
	549	598.826125	100	2217.87
	658	603.1235	100	2233.79
	533	595.28785	100	2204.77
	536	534.296675	100	1978.88
	567	551.353625	100	2042.05
	192	379.76995	100	1406.56
	45	118.477975	100	438.81
	37	40.603925	100	150.38
	24	30.0721	100	111.38
	10	16.897325	100	62.58
	6	7.9762	100	29.54
	0	2.847775	100	10.55
	0	0	100	0.00
	39	19.253275	100	71.31
	21	29.5747	100	109.54
	10	15.4318	100	57.15
	7	8.680875	100	32.15
	21	14.012825	100	51.90
	15	17.77015	100	65.82
	20	17.412275	100	64.49
	46	32.91845	100	121.92
	57	51.39225	100	190.34
	70	63.7377	100	236.07
	77	73.892425	100	273.68
	81	79.0455	100	292.76
	59	69.6714	100	258.04
	62	60.228325	100	223.07
	71	66.53435	100	246.42
	57	63.949175	100	236.85
	51	53.5674	100	198.40
	0	25.263125	100	93.57

SECTION

7658 YD³

SECTION TOTAL FILL=

26146 YD³

NET VOLUME=	18488	YD ³	OF FILL
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STATION 868+00 - 881+00

Contains no cut or fill below the 100 yr flood elevation

STATION 881+00 - 905+50**CUT**

SECTION	AREA SQ FT	AVG AREA SQ FT	LENGTH FT	VOLUME CU YD
881+00	0	0	0	0.00
882+00	0	0	0	0.00
883+00	0	0	0	0.00
884+00	0	0	0	0.00
885+00	25	12.645325	100	46.83
886+00	24	24.411225	100	90.41
887+00	27	25.361575	100	93.93
888+00	20	23.6371	100	87.54
889+00	20	20.180825	100	74.74
890+00	11	15.820925	100	58.60
891+00	9	10.38265	100	38.45
892+00	7	8.191125	100	30.34
893+00	6	6.62425	100	24.53
894+00	6	6.3776	100	23.62
895+00	9	7.502425	100	27.79
896+00	12	10.501575	100	38.89
897+00	0	6.2425	100	23.12
898+00	0	0	100	0.00
899+00	0	0	100	0.00
900+00	0	0	100	0.00
901+00	0	0	100	0.00
902+00	0	0	100	0.00
903+00	0	0	100	0.00
904+00	0	0	100	0.00
905+18	0	0	118	0.00
905+50	0	0	32	0.00

FILL

SECTION	AREA SQ FT	AVG AREA SQ FT	LENGTH FT	VOLUME CU YD
	0	0	0	0.00
	29	14.28535	0	0.00
	54	41.220775	0	0.00
	63	58.468075	0	0.00
	47	54.996825	100	203.69
	58	52.22395	100	193.42
	53	55.498	100	205.55
	56	54.984925	100	203.65
	61	58.718325	100	217.48
	107	83.77455	100	310.28
	115	110.82	100	410.44
	116	115.404925	100	427.43
	107	111.251425	100	412.04
	103	104.898725	100	388.51
	88	95.56895	100	353.96
	73	80.415325	100	297.83
	147	109.7805	100	406.59
	169	157.987675	100	585.14
	187	177.9064	100	658.91
	206	196.290125	100	727.00
	210	207.75095	100	769.45
	188	198.889825	100	736.63
	151	169.7097	100	628.55
	138	144.756725	100	536.14
	135	136.48565	117.58	594.37
	0	67.327325	32.42	80.84

SECTION TOTAL CUT=**659 YD³****SECTION TOTAL FILL=****9348 YD³**

NET VOLUME=	8689	YD³	OF FILL
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COMP STORAGE REQUIRED =	27177	YD³
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Project Name: IL - I-270
Date: 9/3/2020

Calc. By: T.J.L.
Chkd. By: M.J.R.

LEVEE ELEVATION : 425 FT

STATION 833+50 - 865+00

CUT

SECTION	AREA SQ FT	AVG AREA SQ FT	LENGTH FT	VOLUME CU YD
833+50	0	0	0	0.00
834+00	1673	836.50765	50	1549.09
835+00	544	1108.51455	100	4105.61
836+00	694	619.150975	100	2293.15
837+00	649	671.5988	100	2487.40
838+00	549	598.826125	100	2217.87
839+00	658	603.1235	100	2233.79
840+00	533	595.28785	100	2204.77
841+00	536	534.296675	100	1978.88
842+00	567	551.353625	100	2042.05
843+00	192	379.76995	100	1406.56
844+00	45	118.477975	100	438.81
845+00	37	40.603925	100	150.38
846+00	24	30.0721	100	111.38
847+00	10	16.897325	100	62.58
848+00	6	7.9762	100	29.54
849+00	0	2.847775	100	10.55
850+00	0	0	100	0.00
851+00	39	19.253275	100	71.31
852+00	21	29.5747	100	109.54
853+00	10	15.4318	100	57.15
854+00	7	8.680875	100	32.15
855+00	21	14.012825	100	51.90
856+00	15	17.77015	100	65.82
857+00	20	17.412275	100	64.49
858+00	46	32.91845	100	121.92
859+00	57	51.39225	100	190.34
860+00	70	63.7377	100	236.07
861+00	77	73.892425	100	273.68
862+00	81	79.0455	100	292.76
863+00	59	69.6714	100	258.04
864+00	62	60.228325	100	223.07
865+00	71	66.53435	100	246.42
866+00	57	63.949175	100	236.85
867+00	51	53.5674	100	198.40
868+00	0	25.263125	100	93.57

SECTION TOTAL FILL= 26146 YD³

STATION 868+00 - 881+00

Contains no cut or fill below the 100 yr flood elevation

STATION 881+00 - 905+50**FILL**

SECTION	AREA SQ FT	AVG AREA SQ FT	LENGTH FT	VOLUME CU YD
881+00	0	0	0	0.00
882+00	29	14.28535	0	0.00
883+00	54	41.220775	0	0.00
884+00	63	58.468075	0	0.00
885+00	47	54.996825	100	203.69
886+00	58	52.22395	100	193.42
887+00	53	55.498	100	205.55
888+00	56	54.984925	100	203.65
889+00	61	58.718325	100	217.48
890+00	107	83.77455	100	310.28
891+00	115	110.82	100	410.44
892+00	116	115.404925	100	427.43
893+00	107	111.251425	100	412.04
894+00	103	104.898725	100	388.51
895+00	88	95.56895	100	353.96
896+00	73	80.415325	100	297.83
897+00	147	109.7805	100	406.59
898+00	169	157.987675	100	585.14
899+00	187	177.9064	100	658.91
900+00	206	196.290125	100	727.00
901+00	210	207.75095	100	769.45
902+00	188	198.889825	100	736.63
903+00	151	169.7097	100	628.55
904+00	138	144.756725	100	536.14
905+18	135	136.48565	118	594.37
905+50	0	67.327325	32	80.84

SECTION TOTAL FILL= 9348 YD³

NET FILL =	35494	YD³	OF FILL
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Compensatory Storage Calculations

Project Name: IL - I-270

Calc. By: T.J.L.

Date: 9/3/2020

Chkd. By: M.J.R.

LEVEE ELEVATION : 425 FT

STATION 835+25 - 849+75

COMP STORAGE VOLUME

SECTION	AREA SQ FT	AVG AREA SQ FT	LENGTH FT	VOLUME CU YD
834+00	0	0	0	0.00
834+50	219	109.515125	50	202.81
835+00	151	185.242	50	343.04
835+50	476	313.9657	50	581.42
836+00	818	646.993075	50	1198.14
836+50	911	864.159725	50	1600.30
837+00	970	940.2141	50	1741.14
837+50	1018	993.62285	50	1840.04
838+00	1064	1040.82438	50	1927.45
838+50	1125	1094.48215	50	2026.82
839+00	1163	1143.82563	50	2118.20
839+50	1064	1113.4294	50	2061.91
840+00	907	985.562425	50	1825.12
840+50	799	852.9306	50	1579.50
841+00	814	806.39905	50	1493.33
841+50	853	833.2352	50	1543.03
842+00	730	791.29	50	1465.35
842+50	486	607.973925	50	1125.88
843+00	229	357.215125	50	661.51
843+50	90	159.047075	50	294.53
844+00	171	130.1477	50	241.01
844+50	392	281.184825	50	520.71
845+00	403	397.246275	50	735.64
845+50	199	300.68375	50	556.82
846+00	0	0	50	0.00

TOTAL VOLUME=	27684	YD³	OF CUT
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Compensatory Storage Summary

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LEVEE ELEVATION : 425 FT

VOLUME REQUIREMENT

Storage Required for Additonal Runoff: 13212 cu ft
(see detention storage calcs)

Required Detention Storage: 489.3 cu yd

Proposed Cut Volume from ditch: 8317 cu yd

Cut Volume		Required Detention		Comp Storage from Ditch	
8317	-	489.3	=	7828	cu yd
Net Fill Volume		Storage in Ditch		Total Required Comp Storage	
35494	-	7828	=	27666	cu yd

Provided Storage		Required Storage
27684	>	27666