HYDRAULIC REPORT

PROJECT ROUTE:	Interstate 55 (Stevenson Expressway)
SECTION:	0404-640R and 0101(.)R-1
LIMITS:	Station 742+00 to Station 750+00
WATERWAY CROSSING:	Des Plaines River
MUNICIPALITY/COUNTY:	Hodgkins & Bedford Park/Cook County
JOB NUMBER:	P-91-219-17
EXISTING STRUCTURE NO.:	016-2704
PROPOSED STRUCTURE NO.:	n/a

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CBBEL Project No. 11-203.00001

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SECTION 1

NARRATIVE

SECTION 1

NARRATIVE

A. PROJECT DESCRIPTION

The Illinois Department of Transportation (IDOT) is currently preparing a Preliminary Engineering and Environmental Study (Phase 1) for the Interstate 55 (I-55) Managed Lanes Project. The project study area includes the I-55 corridor (Stevenson Expressway) from I-355 to I-90/94 at the east.

This project is proposed to add two managed lanes in each direction within the existing median of the expressway. The term 'Managed Lanes' includes the implementation of travel lanes for High Occupancy Vehicle (HOV), High Occupancy Toll (HOT), Congestion Pricing, as well as other concepts to improve the overall flow of traffic. This project has been identified in the Chicago Metropolitan Area for Planning (CMAP) Go To 2040 Plan as a priority project.

This report provides a hydraulic evaluation of the existing bridge carrying I-55 over the Des Plaines River, Structure Number 016-2704. The bridge is located in the Villages of Hodgkins and Bedford Park, Lyons Township, Cook County, Illinois. The subject 5-span steel bridge conveys I-55 over the Des Plaines River between LaGrange Road (US Routes 12/20/45) and the Indiana Harbor Belt Railroad. The recommended work is to widen the existing bridge to the outside to provide two added lanes in each direction. Refer to Exhibit 4.1 for the project location shown on the USGS Quadrangle Map.

B. DESCRIPTION OF EXISTING STRUCTURE AND FLOODPLAIN

SITE DESCRIPTION

The upstream limit of the study is located approximately 7555 feet northeast of the I-55 crossing to FIS cross section O, the end of the detailed study, located downstream of the Indiana Harbor Line Railroad bridge. There are no other bridges across the river between FIS cross section O and the subject structure. The Des Plaines River flows southwesterly through an industrial area with paved parking in the Village of Hodgkins in Cook County. Leon Cook Road passes under western end of the bridge. The I-55 bridge is a high-level crossing with design clearance more than 17 feet above the 50-year flood water surface elevation.

Downstream of I-55, the Des Plaines River continues southwest. The study limits extend 4,720 feet downstream of the I-55 crossing to FIS cross section L, which is located approximately 130 feet upstream of the two 30-span bridges carrying NB LaGrange Road and SB LaGrange Road (US Routes 12/20/45), Structure Numbers 016-2467 and 016-2407 respectively. There are no other bridges across the river between FIS cross section L and the subject structure.

STRUCTURE DESCRIPTION

The existing bridge structure carries I-55 (Stevenson Expressway) over the Des Plaines River and Leon Cook Road, which is located at the top of the west bank of the Des Plaines River. The existing structure was originally constructed as twin structures carrying I-55 EB and I-55 WB, SN 016-0010 and 019-0011 respectively. The original twin structures were constructed as part of F.A.I. Route 55 Section 0404-676B, Project I-55-7(38)272, dated 1963. In 2000 and 2002, the original twin structures were removed and replaced with a wider single structure. The WB portion of single structure was constructed as part of FAI Route 55 Project 55-7(219)277, Section 0404-676B, Contract 82969, dated 2000; while the EB portion was constructed as part of FAI Route 55 Project 55-7(219)277, Section 0404-640R&0101(.)R-1, Contract 82979, dated 2002. Historic plan excerpts are provided in Section 10A. The single structure, now the existing structure, is noted as IDOT structure number 016-2704.

The structure is a five-span steel bridge crossing the Des Plaines River. According to the Stantec Bridge Condition Report (BCR) approved October 23, 2017, the I-55 roadway has a skew of 57° relative to the Des Plaines River. The structure width is approximately 139' out-to-out of deck (typical) but widens from west to east. The length of the structure is approximately 689' face-to-face of the abutments measured along the local tangent and the span lengths measured along the local tangent from west to east are 172.9' – 150.9' – 164.6' – 127.9' – 72.5'. There is concrete slopewall at a 1.5H:1V slope under the western end of bridge and riprap at a 2H:1V slope under the eastern end of the bridge. The pier caps are supported on drilled shaft columns embedded into rock. Both the concrete slopewall and the riprap are shown on photos on Section 5 and the historic plans in Section 10A.

Stantec performed an inspection of the current conditions for the existing bridge between May and June of 2017. The Stantec BCR notes that the bridge is in overall good condition with the deck and superstructure receiving a rating of 7 and the substructure receiving an 8.

FLOODPLAIN DESCRIPTION

Per the Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) 17031CV001G, the total drainage area to the I-55 bridge is approximately 650 square miles. The Des Plaines River channel is found to be between 150' and 250' in width and consists of a fairly consistent cross section throughout the study limits. The channel consists of a silty bottom with trees and brush on the banks. The floodplain near the crossing includes part of Leon Cook Road.

There is mapped FEMA floodplain and floodway for the Des Plaines River, extending upstream and downstream of the subject crossing. The Des Plaines River floodplain is mapped as Zone AE by FEMA with defined base flood elevations. In this reach, the floodplain and floodway limits are largely coincident and contained within the channel. The Flood Insurance Rate Map

(FIRM) Panel No. 17031C0488J for Cook County, Illinois and Incorporated Areas, effective August 19, 2008 is included in Section 4 as Exhibit 4.4.

C. FIELD OBSERVATIONS

The overbank field survey was performed by CBBEL in June 2017. Lin Engineering performed the bridge low beam survey and Collins Engineering performed the channel hydrosurvey, also in June 2017. A follow up site visit was made by CBBEL in July 2017. The stream bed consists of exposed dirt and exposed rocks and stones. The stream banks at the I-55 crossing are composed of some vegetation along with some exposed rocks. The western overbank consists of a paved frontage road and industrial and commercial properties. Upstream of the crossing, I-55 runs adjacent to the Des Plaines River near the top of the bank. Downstream of the crossing, the eastern overbank consists of a paved frontage road and MWRD's Lawndale Avenue Solids Management Area. Photographs are included in Section 5 and survey notes are included in Section 18.

D. HISTORICAL OBSERVATIONS/RECORDS

The 1967 Hydrologic Investigations Atlas HA-252 (Berwyn), prepared by the United States Geological Survey (USGS) in cooperation with the Northeastern Illinois Metropolitan Area Planning Commission, is plotted on a 1963 USGS base map that predates the construction of I-55. The portion of HA-252 showing the project area is provided as Exhibit 4.2 with I-55 overlaid for reference only. The 1980 USGS Quadrangle map is provided as Exhibit 4.1 which includes the I-55 crossing.

The HA includes the extreme storm events from April 1950, July 1957, and May 1966. The floods are mapped on the Des Plaines River flood profile as shown on Exhibit 4.3. The flood profile at the I-55 crossing indicates a record storm level of approximately 597.0 feet (NGVD 29) for the July 1957 event. The 1957 high water elevation of approximately 596.72 feet is well below the low beam elevation of 615.64 feet and low pavement elevation of 620.5 feet in the floodplain for the subject bridge, all NAVD 88.

Stream gage USGS 05532600 DES PLAINES RIVER AT LYONS, IL is identified as the nearest gage to the I-55 crossing approximately 3.7 river miles upstream of the project vicinity where 47th Street crosses the Des Plaines River. The drainage area at the gage is 631.6 square miles, whereas the drainage area at the project location is 650 square miles. The gage was established in 2013 and is currently active. The gage datum is 578.83 feet (NAVD88) and the peak gage height of 19.66 feet was recorded on June 15, 2015. The projected peak water surface elevation is therefore 578.83 feet + 19.66 feet = 598.49 feet. A corresponding peak discharge could not be determined because the stream gage data is limited to gage height only. For comparison purposes, the gage peak water surface elevation was compared to the water surface elevation

from the HA July 1957 Flood profile at 47th Street. The HA July 1957 flood profile indicates a record storm level of 599.12 feet (NAVD88) at 47th Street and is higher than the maximum water surface elevation provided by the gage. The USGS gage summary is included in Section 6 of this report.

E. OTHER STUDIES & AFFECTED AGENCIES

According to the FEMA FIRM 17031C0488J for Cook County and Incorporated Areas, effective August 19, 2008, the Des Plaines River is mapped as Zone AE Special Flood Hazard Area (SFHA) with defined Base Flood Elevations at the proposed project site. The FIRM has been provided as Exhibit 4-3 in Section 4.

FEMA also retains FIS 17031CV001G for Cook County and Incorporated Areas, revised August 19, 2008. Referring to the project Cross Section Location Map in Section 9, four FIS cross sections were plotted from the FIRM portraying their respective locations (cross sections L, M, N, and O).

The original FIS for Village of Hodgkins, Cook County, Illinois, dated March 1979, was conducted by the U.S. Department of Housing & Urban Development, Federal Insurance Administration. The corresponding HEC-2 modeling for the study was done in NGVD 29 datum and was completed in August of 1977. FIRM Panel 170106 005 B for Village of Hodgkins, Illinois Cook County, effective date September 14, 1979 is the accompanying FIRM to the March 1979 FIS. FIRM 170106 005 B shows four cross sections, A, B, C, and D, that match the locations of current FIRM cross sections L, M, N, and O, respectively, from FIRM Panel 17031C0488J. Water surface elevations and reach lengths for cross sections A, B, C, and D also match those of cross sections L, M, N, and O, once the datums are correlated.

F. DATUM CORRELATION

A continuous SONAR streambed survey was conducted by Collins Engineering Inc. within 1000' upstream and downstream of the I-55 crossing. CBBEL surveyed overbank cross sections near the bridge faces and at approximately 500' intervals upstream and downstream along the Des Plaines River. Lin Engineering surveyed the bridge low beams. All survey was completed June 2017 on the North American Vertical Datum 1988 (NAVD 88). The Cross Section Location Map found in Section 9 shows the cross section locations and topography along the entire length of the hydraulic modeling. Because the FEMA regulatory model used the National Geodetic Vertical Datum 1929 (NGVD 29), all cross sections transferred into the HEC-RAS model were converted to NAVD 88 by subtracting 0.28' from the given HEC-2 elevations. Supporting documentation from the Lin and Collins Surveys and the NOAA VERTCON website is provided in Section 18.

G. SENSITIVE FLOOD RECEPTORS

There are no potential flood receptors located within the regulatory floodplain within project limits.

H. HYDROLOGIC METHODOLOGY

PERMIT MODEL

This section summarizes the hydrologic methodology used to determine the peak flow rates for the Des Plaines River at the location of the I-55 crossing. The source hydrology was taken from the current FEMA Flood Insurance Study (FIS) of Cook County, Illinois and Incorporated Areas, 17031CV001G. The HEC-2 model titled "DES PLAINES RIVER IN WILLOW SPRINGS AND HODGKINS" as prepared by Harza Engineering Company, dated August 1976, was provided by FEMA and is the regulatory model. The design discharges identified in the HEC-2 model correlate with the published FIS flows and are part of the analysis. The summary of these flow rates is found in Table H-1. The historic bridge plans provided in Section 8 include a WIT listing flows that match both the regulatory HEC-2 model and the FIS flows.

MWRD MODEL

The Metropolitan Water Reclamation District of Greater Chicago (MWRD) commissioned CBBEL to do a complete restudy of the Lower Des Plaines River Watershed using HEC-HMS and unsteady HEC-RAS. The Final Report titled "Detailed Watershed Plan for the Lower Des Plaines River Watershed" is dated February 28, 2011. The hydrologic models were developed with the USACOE HEC-HMS Version 3.1.0 application, and the runoff hydrographs used as input to an unsteady HEC-RAS model. The Lower Des Plaines River models were calibrated to storm events that are detailed in the MWRD Report excerpts included in Section 20 of this report. The MWRD model is provided to demonstrate that the proposed bridge widening will not adversely impact computed water surface elevations upstream or downstream of the bridge. The summary of these flow rates is found in Table H-1.

Analysis Method	10-year Peak Flow (cfs)	50-year Peak Flow (cfs)	100-year Peak Flow (cfs)	500-year Peak Flow (cfs)
FIS HEC-2 Regulatory Model	6,000	7,500	8,400	9,300
MWRD Model	7074.99	8948.80	9659.60	11571.11

Table H-1 Peak Flow Summary Comparison for Des Plaines River at I-55

I. HYDRAULIC METHODOLOGY

PERMIT MODEL

The HEC-2 model titled "DES PLAINES RIVER IN WILLOW SPRINGS AND HODGKINS" as prepared by Harza Engineering Company, dated August 1976, was provided by FEMA and is the regulatory model. The regulatory model uses a normal depth calculation with a slope of .0012 as the downstream boundary condition. The HEC-2 model extends approximately 22,040 feet downstream of the I-55 crossing; therefore, a truncated HEC-RAS model plan titled "FIS TRUNC (NGVD29)" was created by truncating the full model at HEC-2 cross section "6". FIS cross section "L" corresponds to HEC-2 cross section "6" with matching elevations for the 100-YR storm event. The starting water surface elevations from the regulatory HEC-2 model at cross section "6" were used as the starting water surface elevations for the truncated model. The truncated model was run in HEC-RAS and the computed water surface elevations match within 0.02 feet. Once the truncated model was confirmed to match in NGVD 29, it was converted to NAVD 88 using the datum correlation value of 0.28'. Both the geometry and starting water surface elevations were converted. The new baseline model plan is titled "FIS TRUNC (NAVD88)". The summary of the starting water surface elevations is found in Table I-1.

Location and Analysis Method	10-year WSE (ft)	50-year WSE (ft)	100-year WSE (ft)	500-year WSE (ft)
FIS Cross Section "L", HEC-2 Cross Section "6"	595.5	569.7	597.38	597.99

Table I-1 Starting Water Surface Elevation Summary (NAVD 88)

Manning's n-values were obtained from the FIS cross sections. These n-values were re-verified using field notes, aerial photography, and photographs. Base values for 'n' were adjusted using the FHWA methodology presented in Chapter 5 of the IDOT Drainage Manual, as follows:

$$n = (n_b + n_1 + n_2 + n_3 + n_4) * m.$$

Channel

The channel bottom consists of a gravelly mixture of dense silty sand, and has minor irregularities, alternates gradually, negligible obstructions, small vegetation, and minor meandering. Therefore,

$$n = (0.03 + 0.002 + 0.0 + 0.001 + 0.002) * (1) = 0.035$$

Paved Industrial Surface

The floodplain that consists of a paved surface, minor irregularity, minor obstructions, and small vegetation. Therefore,

$$n = (0.018 + 0.002 + 0.0 + 0.01 + 0.002) * (1) = 0.032$$

Channel Sides and Overbanks Small Vegetation

The floodplain consists of a mixture of dense silty sand and light rocks, and has minor irregularities, alternates occasionally, minor obstructions, small vegetation, and minor meandering. Therefore,

$$n = (0.030+ 0.003+ 0.000 + 0.002 + 0.01) * (1) = 0.045$$

Channel Sides and Overbanks Medium Vegetation

The floodplain consists of a mixture of dense silty sand and light rocks, and has minor irregularities, alternates occasionally, minor obstructions, medium vegetation, and minor meandering. Therefore,

$$n = (0.030+ 0.003+ 0.000 + 0.002 + 0.013) * (1) = 0.048$$

Different contraction and expansion ratios at the bridge are not required for this study because the structure opening width is greater than the waterway width for all the storm events analyzed as part of this study. Contraction and expansion coefficients of 0.1 and 0.3 were used for all cross sections.

MWRD MODEL

The MWRD-commissioned study of the Lower Des Plaines River Watershed uses hydraulic models developed with the USACOE HEC-RAS Version 4.0 unsteady model application. The Lower Des Plaines River models were calibrated to storm events that are detailed in the MWRD Report excerpts included in Section 20 of this report.

Manning's n-values were obtained from the MWRD cross sections. The n-values from the MWRD model were higher than the regulatory model values. Since the MWRD values are higher and therefore more conservative, the MWRD values are maintained. Because of the nature of the unsteady model application, the MWRD model cannot be truncated. Therefore, the full model was run for all cases for comparison purposes.

J. SUMMARY OF DUPLICATE MODELS

PERMIT MODEL

The HEC-2 model titled "DES PLAINES RIVER IN WILLOW SPRINGS AND HODGKINS" as prepared by Harza Engineering Company, dated August 1976, was provided by FEMA and is the regulatory model. A PDF copy of the original HEC-2 input and output can be found in Section 13.A of this report. It should be noted that the regulatory model does not include bridge geometry for the I-55 crossing. A duplicate model titled "FIS DUPLICATE" was created by importing the regulatory HEC-2 model into HEC-RAS Version 5.0.3. Results from the duplicate model match the original HEC-2 results within 0.02 feet for all storm events. Since the downstream limit of the regulatory model extends approximately 22,040 feet from the subject crossing, an additional duplicate model titled "FIS TRUNC (NGVD) 29" was created. The truncated model truncates the regulatory model at cross section 6. Cross section 6 water surface elevations from the original HEC-2 output were used as the starting water surface elevations for the truncated model. The results from the truncated model match those of the regulatory and duplicate models for the cross sections included in the truncated model. The truncated model was then converted to NAVD88, HEC-RAS plan title "FIS TRUNC (NAVD88)", by subtracting 0.28 feet from cross sections and starting water surface elevations. Resultant water surface elevations from the converted NAVD 88 model match the published FIS regulatory elevations for FIS cross sections L through O. Input/output for the model "FIS TRUNC (NAVD88)" are provided in Section 13.B. Flood Insurance Study (FIS) excerpts are provided in Section 6.

MWRD MODEL

The MWRD hydrologic and hydraulic models were developed with the USACOE HEC-HMS Version 3.1.0 and HEC-RAS Version 4.0 applications. The MWRD duplicate model was run on HEC-RAS 4.0, as application of alternate versions of these programs may give different results, may not run, and/or may cause changes to the model input. The duplicate Baseline MWRD model was not truncated because of the dynamic relationship between the hydrologic and hydraulic models. It should be noted that the design baseline model does not include bridge geometry for the I-55 crossing. The baseline model water surface elevation for the 100-Yr 24-Hr storm event at I-55 crossing was 2.7 feet higher than the published FIS 100-Yr storm event water surface elevation. The duplicate Baseline MWRD Unsteady Model is included in Section 13.F of this report. MWRD Lower Des Plaines River report excerpts are provided in Section 20.A.

K. EXISTING CONDITIONS HYDRAULIC ANALYSIS

PERMIT MODEL

A new HEC-RAS plan, titled "Existing", was created to represent existing conditions at the I-55 crossing over Des Plaines River. Surveyed cross sections along with the surveyed I-55 bridge structure were input into the model "FIS TRUNC (NAVD88)". Cross sections 6 and 8 were extended using 1-foot county contour mapping to ensure flow remained within the cross section limits. Flows and starting water surface elevations for the 200-year storm event were interpolated and added to the flow data. The surveyed cross sections adjacent to the bridge were skewed using the HEC-RAS skew function in the Permit model and then copied directly into the MWRD Design model. The bridge piers and abutments are aligned with the flow. Because the bridge is on a curve, the piers and abutments were properly placed relative to the adjacent cross sections based on CAD alignment and measurements. Insertion of the bridge with piers plus six additional surveyed cross sections, results in a raise in computed water surface profiles of approximately 0.2' above the duplicate FIS model profiles upstream of the bridge for all storm events. This is reasonable due to the added detailed channel geometry. All four of the HEC-RAS Bridge Modeling Approach Low Flow Methods were computed, with the Highest Energy Answer selected for use. The High Flow Method does not apply for this bridge, as there is no orifice or weir flow for all events up to and including the 500-year event.

The modified "Existing" model is used as the basis for the Permit Waterway Information Table (WIT). The Cross Section Location Map can be found in Section 9 and presents the location of the FIS and surveyed cross sections, and the existing bridge used in the model. The high water elevation for the Waterway Information Table (WIT) was obtained from the existing conditions plan in the HEC-RAS hydraulic model. The Permit WIT and supporting calculations are provided in Section 2. Input/output for this existing plan are provided in Section 13.C.

MWRD DESIGN MODEL

A new geometry titled "DPR EXIDOT 0917" was created to reflect the existing geometry of the Des Plaines River. Upstream of the I-55 crossing, cross sections 63243.25 and 63170.51 were removed from the duplicate model geometry and were replaced with the surveyed cross section 63295.62. Additional surveyed cross sections and the I-55 bridge surveyed bridge geometry were copied from the Permit Model and added to create the existing conditions MWRD model.

The Cross Section Location Map can be found in Section 9 and presents the location of the MWRD and surveyed cross sections, and existing bridge used in the model. The high-water elevation for the Waterway Information Table (WIT) was obtained from the existing conditions plan in the HEC-RAS hydraulic model. The MWRD WIT and supporting calculations are provided in Section 2. Input/output for this existing plan are provided in Section 13.G.

EXISTING COMPARISON

Table K.1 provides a comparison between of the computed water surface elevations between the Permit model and MWRD model. On average the MWRD elevations are approximately 2.8 feet higher than the permit elevations. Peak flow rates are listed in Table H-1.

Return Event	Permit Elevation (ft)	MWRD Elevation(ft)	Difference (ft)
10-Year	596.27	599.12	2.85
50-Year	597.54	600.39	2.85
100-Year	598.25	600.82	2.57
500-Year	598.89	601.94	3.05

Table K-1 Existing Conditions Water Surface Elevation Summary for Des Plaines River at I-55 (NAVD 88)

Table K.2 provides a comparison between of the peak flows and 100-year base flood elevations (BFE) between the MWRD Baseline model and the MWRD modified Existing conditions model that includes the new site survey data. Results from the other return events are similar.

MODEL XS Baseline MWRD *Surveyed*	BASELINE DUPLICATE MWRD *(DPR BL 100 0917 rerun)*		MOD. EXISTING MWRD *(DPR EXIDOT 0917 100)*		DIFFERENCE (FT)
	100-YEAR Q (CFS)	**WSE NAVD 88 (FT)**	**100-YEAR Q (CFS)**	**WSE NAVD 88 (FT)**	
64250.75	9640.14	600.86	9658.01	600.95	0.09
64116.64	--	--	*9658.53*	*600.93*	--
64090.85	9640.29	600.83	9658.59	600.93	0.10
63887.62	9640.61	600.80	9658.59	600.90	0.10
63655.12	9640.93	600.76	9659.22	600.86	0.10
63628.88	--	--	*9658.98*	*600.85*	--
63547.57	9640.94	600.75	9659.12	600.85	0.10
63295.62	--	--	*9659.51*	*600.82*	--
63243.25	9641.74	600.76	--	--	--
63170.51	9641.87	600.74	--	--	--
63007.62	*Bridge*				
62761.95	--	--	*9659.19*	*600.69*	--
62524.89	9642.95	600.61	9659.91	600.63	0.02
62371.78	--	--	*9660.14*	*600.61*	--
62061.6*	9643.22	600.55	9660.35	600.57	0.02
61857.26	--	--	*9660.69*	*600.52*	--
61598.4*	9643.92	600.50	9661.36	600.51	0.01
61135.2*	9644.94	600.44	9661.79	600.45	0.01

Table K-2 MWRD Baseline vs. Existing Conditions Peak Flow and BFE Summary (NAVD 88)

L. NATURAL CONDITIONS HYDRAULIC ANALYSIS

PERMIT MODEL

A HEC-RAS plan, titled "Natural", was created to reflect the natural profile of the stream. The geometry information for the bridge carrying I-55 was removed from the existing geometry. The natural water surface elevations were determined for the Permit WIT. Input/output for this natural plan are provided in Section 13.D.

MWRD MODEL

A new geometry titled "DPR NATIDOT 0917" was created to reflect the natural existing geometry of the Des Plaines River. The geometry information for the bridge carrying I-55 was removed from the existing geometry. The natural water surface elevations were determined for the MWRD WIT. Input/output for this natural plan are provided in Section 13.H.

M. PROPOSED STRUCTURE ANALYSIS

The existing bridge is proposed to be widened to accommodate proposed geometrics. The bridge is planned to be widened approximately 24 feet along the stream centerline. The width of widening is planned to vary across the length of the bridge. The piers are proposed to be extended at similar lengths. Because the bridge is on a curve and superelevated at 5.7%, the low beam and low pavement elevations are proposed to be lowered by 4.5" (0.38') along the upstream face of the bridge, while the low beam and pavement overtopping elevations will be higher by 5.2" (0.43') on the upstream side. Concept plans and Stantec BCR excerpts showing the proposed changes are provided in Section 12. Bridge opening areas do not change, since the piers will be extended with no anticipated change in width. The proposed low beam elevation provides almost 13' of clearance above the MWRD design 500-year natural water surface elevation.

PERMIT MODEL

The proposed geometric changes were input to a new plan titled "Proposed". The results from this plan were used in the Permit WIT as the basis of the proposed created head. There was no increase in created head between the existing and proposed. Input/output for this proposed plan are provided in Section 13.E.

MWRD MODEL

The proposed geometric changes were inputted into a new plan titled "DPR PRIDOT 0218". The results from this plan were used in the MWRD WIT as the basis of the proposed created head.

There was no increase in created head between the existing and proposed. Input/output for this proposed plan are provided in Section 13.I.

N. SCOUR ANALYSIS

Scour analysis for the existing and proposed bridge are included in Section 14. The abutments at the subject crossing are in the overbank and do not see any flow for any of the storm events included in this study. Therefore, the abutments are not subject to scour.

Contraction and pier scour calculations have been performed using spreadsheets incorporating the formulas from the current 2012 5th Edition of HEC-18. Borings taken in 1998 nearest the piers (B-6, B-7, B-8, & B-9) show there to be primarily loam with some clay mixed in. No soil D50 was listed. Therefore, the soil D50 was conservatively assumed to be the minimum recommended value of 0.2 mm. In Phase II a correction factor can be applied to reduce the computed scour if new borings find a higher D50 or cohesive soils. Scour results are shown below in Table N-1. Supporting calculations for both proposed/existing are provided in Section 14, and have the same results.

Event	Abutment/ Contraction Scour[1]	Pier Scour	Contraction Scour	Total Pier Scour Depth[2]
Q_{100}	N/A	6.39	0.0	6.39
Q_{200}	N/A	6.46	0.0	6.46

Note 1. NCHRP Method includes both Contraction and Abutment Scour

Note 2. Includes Pier and Contraction Scour

Table N-1 Existing/Proposed Scour Depth Summary

The calculations show that the total pier scour depth for the major storm events is shallow. The existing bridge foundation consists of drilled shafts socketed into bedrock, so scour is not a concern. Scour calculations and input values from HEC-RAS are provided in Section 14.

O. COMPENSATORY STORAGE

Table 1-403c of the IDOT Drainage Manual states that under the IDNR-OWR Part 3708 Rules compensatory storage requirements for fill in the floodway must be met. There is pier construction proposed below the 100-year water surface elevation that requires compensatory storage volume. The proposed construction is shown to not impact the calculated water surface elevations. Table O-1 below provides a summary of the required compensatory storage

volumes for fill within the floodway. Compensatory storage will be provided at a 1:1 ratio based on the natural elevation. Compensatory storage is proposed to be provided in box culverts within the north east bank of the Des Plaines River. Details are provided in Section 16 and 17.

Elevation Range	Required Compensatory Storage (ac-ft)	Provided Compensatory Storage (ac-ft)
NWL-10-Year	0.08	0.09
10-100 Year	0.02	0.02

Table O-1 Compensatory storage Volumes

P. IDNR-OWR FLOODWAY CONSTRUCTION PERMIT REQUIREMENTS

The I-55 bridge over the Des Plaines River is in a Zone AE floodplain with mapped regulatory floodway. Based on the proposed scope of the project, including construction of new piers, an IDNR-OWR permit is required under the Part 3708 Rules for Floodway Construction in Northeastern Illinois.

The Des Plaines River in this reach is designated as a "Public Body of Water" by the IDNR-OWR. Based on the proposed scope of the project, including pier work within the channel, an IDNR-OWR permit is required under the Part 3704 Rules.

This reach of the Des Plaines River may be considered navigable under U.S. Coast Guard regulation. A letter outlining the preliminary proposed scope of work with documentation of the Phase I plan set will be sent to the Coast Guard for their review and permit determination. Vertical clearance is proposed to be reduced by 4.5" at the upstream bridge face.

Q. FREEBOARD/CLEARANCE

The IDOT Drainage Manual dated July 2011 states that a 50-year flood frequency should be used for design purposes. The existing crossing was analyzed for the 50-year storm event, and checked for the 10-year, 100-year, and 500-year storm events. The Design Headwater Elevation (HWE) is based on the 50-year event and is shown on the Waterway Information Table located in Section 2.

Freeboard is calculated as the distance from the Existing Design HWE to the lowest edge of pavement of the roadway within the floodplain. The IDOT freeboard policy requires a minimum freeboard distance of 3 feet for the 50-year storm event. The existing structure provides 23.0

feet of freeboard for the 50-year event as shown on the Permit WIT and 20.1 feet of freeboard as shown on the MWRD WIT, meeting the IDOT freeboard requirements. Under proposed conditions the provided freeboard is 22.6 feet for the permit WIT and 19.7 feet for the MWRD WIT, both values meeting IDOT requirements.

Clearance is calculated as the distance from the Natural Design HWE to the low beam elevation within the floodplain. The IDOT clearance policy requires that the minimum clearance must be 2 feet for the 50-year storm event, and that the all-time WSE must be at or below the low beam elevation of the bridge. The existing structure provides 17.7 feet of clearance between the Natural Design HWE and the low beam elevation as shown on the Permit WIT and 14.9 feet per the MWRD Design WIT. Under proposed conditions the provided clearance is 17.3 feet for the permit WIT and 14.5 feet for the MWRD WIT, both values meeting IDOT requirements. The all-time recorded high water elevation at the bridge is approximately 597.0 feet NGVD 29 (596.72 feet NAVD 88) recorded in July 1957, approximately 18.5 feet below the low beam elevation.

These findings demonstrate that the existing bridge exceeds the IDOT requirements for freeboard and clearance, whether considering the regulatory permit water surface elevations, or the MWRD water surface elevations, which are based on the best information currently available.

R. CONCLUSION

The Hydraulic analysis has determined that the existing I-55 five-span bridge over the Des Plaines River meets IDOT Drainage Manual criteria for freeboard and clearance. The proposed modifications also meet IDOT and IDNR-OWR permit criteria for created head and floodway compensatory storage volume.

The proposed work will include pier work within the channel. The proposed bridge opening area matches the existing area for all flood events. Vertical clearance will not be reduced. No channel modification is proposed. No scour countermeasures are required, if the new substructure foundations use the same drilled shaft construction. The proposed work is designed to meet the IDNR-OWR permit requirements for Floodway Construction in Northeastern Illinois under the Part 3708 Rules and work in a Public Body of Water under the Part 3704 Rules.

Tab 2

SECTION 2

WATERWAY INFORMATION TABLES AND SUPPORTING CALCULATIONS

TAB A

SECTION 2.A

WIT – PERMIT

Illinois Department of Transportation

Bridge Waterway Information Table (Permit)

Route:	Interstate 55 (Stevenson Expressway)	Existing SN:	016-2704
Waterway:	Des Plaines River	Proposed SN:	-
Section:	P-91-762-10	Prepared by:	EMB Date: 09/07/2018
County:	Cook	Checked by:	IAD Date: 09/12/2018

Drainage Area = 650 square miles

Existing Overtopping Elev. = 629.4' at Sta. 747+94

Proposed Overtopping Elev. = 629.83' at Sta. 747+94

Flood Event	Freq. Yr.	Discharge ft^3/s	Waterway Opening - ft^2		Natural H.W.E. - ft	Head - ft		Headwater Elevation – ft	
			Existing	Proposed		Existing	Proposed	Existing	Proposed
	10	6000	2804	2804	596.3	0.0	0.0	596.3	596.3
Design	50	7500	3413	3413	597.5	0.0	0.0	597.5	597.5
Base	100	8400	3335	3335	598.2	0.0	0.0	598.2	598.2
Scour Design Check	200	8692	3390	3390	598.4	0.0	0.0	598.4	598.4
Overtop Existing	>500	-	-	-	-	-	-	-	-
Overtop Proposed	>500	-	-	-	-	-	-	-	-
Max. Calc.	500	9300	3513	3513	598.9	0.0	0.0	598.9	598.9

Datum: NAVD 88

All-Time H.W.E. & Date: 596.72 ft. July 1957 (NAVD 88)

Surveyed Normal Water Level: 587.92 ft. June 5-7, 2017

10-Year Velocity through Existing Structure = 2.1 ft/s

10-Year Velocity through Proposed Structure = 2.1 ft/s

2-Yr. Flow Rate = 4743 ft^3/s

EXISTING STRUCTURE

Type:	5- Span Steel Bridge
Length/Width:	Length = 689' F-F Along Local Tangent, Width = 139'
# Spans/Cells:	5 @ 172.9' - 150.9' - 164.6' - 127.9' - 72.5' Brg. to Brg.
Low Chord:	615.22'
Skew:	57° (relative to road)
Clearance:	17.7'
Bridge Flow Line:	583.18' (u/s) 583.68' (d/s)
Low E.O.P:	620.5'
Freeboard:	23.0'

PROPOSED STRUCTURE

Type:	5-Span Steel Bridge
Length Of Span:	Length = 689' F-F Along Local Tangent, Width = 153'
# Spans:	5 @ 172.9' - 150.9' - 164.6' - 127.9' - 72.5' Brg. to Brg.
Low Chord:	614.84'
Skew:	57° (relative to road)
Clearance:	17.3'
Bridge Flow Line:	583.18' (u/s) 583.68' (d/s)
Low E.O.P:	620.4
Freeboard:	22.6'

NOTE: Proposed Structure Details Are Preliminary; Subject To Refinement In TSL Stage.

BACK-UP CALCULATIONS FOR WIT

Route: **I-55**
Waterway: **Des Plaines River**

Computed: EMB Rev. WBL Date: 5/9/2018
Checked: IAD Date: 9/12/2018

Calculate Created Head

Frequency	Natural H.W.E. (ft)[1]		Greatest Created Head (ft)[2] Upstream of Bridge		Existing Headwater Elevation @ Upstream Face (ft)[2]	Proposed Headwater Elevation @ Upstream Face (ft)[2]
	U/S Face of Structure (Sta. 7.55)	Approach Sect. (Sta. 7.7)	From Summary Tables Comparing Natural WSE to Existing WSE	From Summary Tables Comparing Natural WSE to Proposed WSE		
10-year	596.3	596.3	0.0	0.0	596.3	596.3
50-year	597.5	597.5	0.0	0.0	597.5	597.5
100-year	598.2	598.2	0.0	0.0	598.2	598.2
200-year	598.4	598.4	0.0	0.0	598.4	598.4
500-year	598.9	598.9	0.0	0.0	598.9	598.9

(1) The natural highwater elevation is the water surface elevation at the upstream side of the crossing as modeled in the stream natural condition, without the structure.

(2) The created head is calculated at the cross section upstream of the bridge/culvert which has the greatest difference between the natural and proposed conditions. This difference in elevation is then added to the Natural H.W.E. at the U/S face of the structure. This method of calcuating created head is only required for bridges and some major culvert crossings. Also, the preferred created head should never be negative. headwater elevations = The natural highwater elevation + the created head

CALCULATE FREEBOARD AND CLEARANCE

Low Road Elevation (ft)[3]			
Existing	Station	Proposed	Station
620.50	751+36	620.12	751+36

Low Beam Elevation (ft)			
Existing	Station	Proposed	Station
615.22	751+36	614.84	751+36

Existing Freeboard (ft)				
10-year	50-year[4]	100-year	200-year	500-year
24.25	22.99	22.30	22.10	21.65

Natural Clearance (ft)				
10-year	50-year[5]	100-year	200-year	500-year
18.97	17.71	17.00	16.80	16.37

Proposed Freeboard (ft)				
10-year	50-year[4]	100-year	200-year	500-year
23.85	22.59	21.89	21.68	21.25

Natural Clearance (ft)				
10-year	50-year[5]	100-year	200-year	500-year
18.59	17.33	16.62	16.42	15.99

(3) Low road elevation is calculated at the edge of pavement, and on the low side of the roadway.

(4) Freeboard is calculated from the 50-year design headwater elevation to the proposed low road elevation in the floodplain.

(5) Vertical clearance is calculated from the 50-year natural high-water elevation to the proposed low chord (beam) bridge elevation (2 ft minimum requirement)

CALCULATE EFFECTIVE WATERWAY OPENING AREA

Structure Length (ft)	
Existing	Proposed
689' F to F	689' F to F

Waterway Opening Area (ft^2)		
Frequency	Existing	Proposed
10-year	2804	2804
50-year	3413	3413
100-year	3335	3335
200-year	3390	3390
500-year	3513	3513

Waterway Opening Areas measured in CAD

BACK-UP CALCULATIONS FOR WIT

Route: **I-55**
Waterway: **DPR**

SUMMARY TABLE COMPARING 10-YEAR NATURAL WSE TO EXISTING WSE					
Cross Section	Natural Condition WSE	Existing Condition WSE	Proposed Conditions WSE	Existing WSE Difference	Proposed WSE Difference
9	596.84	596.86	596.86	0.02	0.02
8	596.61	596.63	596.63	0.02	0.02
7.85	596.32	596.35	596.35	0.03	0.03
7.7	596.27	596.29	596.29	0.02	0.02
7.55	596.25	596.27	596.27	0.02	0.02
7.48					
7.4	596.19	596.19	596.19	0.00	0.00
7.25	596.12	596.12	596.12	0.00	0.00
7	596.09	596.09	596.09	0.00	0.00
6.8	596.03	596.03	596.03	0.00	0.00
6	595.5	595.5	595.5	0.00	0.00

BACK-UP CALCULATIONS FOR WIT

Route: **I-55** 620.4

Waterway: **DPR**

SUMMARY TABLE COMPARING 50-YEAR NATURAL WSE TO EXISTING WSE

Cross Section	Natural Condition WSE	Existing Condition WSE	Proposed Conditions WSE	Existing WSE Difference	Proposed WSE Difference
9	598.16	598.18	598.18	0.02	0.02
8	597.91	597.94	597.94	0.03	0.03
7.85	597.59	597.62	597.62	0.03	0.03
7.7	597.53	597.56	597.56	0.03	0.03
7.55	597.51	597.54	597.54	0.03	0.03
7.48					
7.4	597.44	597.44	597.44	0.00	0.00
7.25	597.37	597.37	597.37	0.00	0.00
7	597.34	597.34	597.34	0.00	0.00
6.8	597.27	597.27	597.27	0.00	0.00
6	596.7	596.7	596.7	0.00	0.00

BACK-UP CALCULATIONS FOR WIT

Route: **I-55**

Waterway: **DPR**

SUMMARY TABLE COMPARING 100-YEAR NATURAL WSE TO EXISTING WSE					
Cross Section	Natural Condition WSE	Existing Condition WSE	Proposed Conditions WSE	Existing WSE Difference	Proposed WSE Difference
9	598.89	598.92	598.92	0.03	0.03
8	598.63	598.66	598.66	0.03	0.03
7.85	598.3	598.33	598.33	0.03	0.03
7.7	598.23	598.27	598.27	0.04	0.04
7.55	598.22	598.25	598.25	0.03	0.03
7.48			Bridge		
7.4	598.14	598.14	598.14	0.00	0.00
7.25	598.07	598.07	598.07	0.00	0.00
7	598.04	598.04	598.04	0.00	0.00
6.8	597.96	597.96	597.96	0.00	0.00
6	597.38	597.38	597.38	0.00	0.00

BACK-UP CALCULATIONS FOR WIT

Route: **I-55**

Waterway: **DPR**

SUMMARY TABLE COMPARING 200-YEAR NATURAL WSE TO EXISTING WSE

Cross Section	Natural Condition WSE	Existing Condition WSE	Proposed Conditions WSE	Existing WSE Difference	Proposed WSE Difference
9	599.11	599.13	599.14	0.02	0.03
8	598.84	598.87	598.87	0.03	0.03
7.85	598.5	598.53	598.54	0.03	0.04
7.7	598.44	598.47	598.47	0.03	0.03
7.55	598.42	598.45	598.45	0.03	0.03
7.48					
7.4	598.34	598.34	598.34	0.00	0.00
7.25	598.26	598.26	598.26	0.00	0.00
7	598.24	598.24	598.24	0.00	0.00
6.8	598.16	598.16	598.16	0.00	0.00
6	597.57	597.57	597.57	0.00	0.00

BACK-UP CALCULATIONS FOR WIT

Route: **I-55**

Waterway: **DPR**

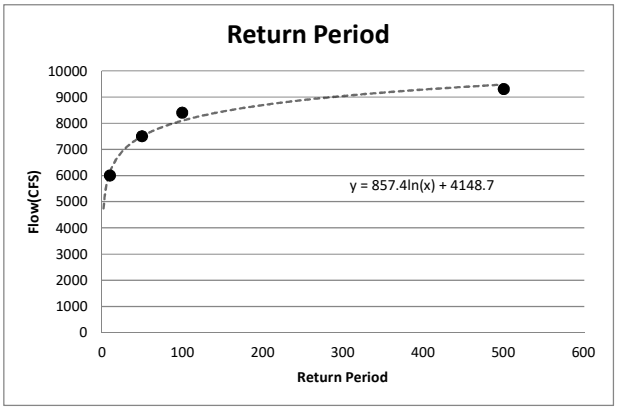
SUMMARY TABLE COMPARING 500-YEAR NATURAL WSE TO EXISTING WSE

Cross Section	Natural Condition WSE	Existing Condition WSE	Proposed Conditions WSE	Existing WSE Difference	Proposed WSE Difference
9	599.56	599.59	599.59	0.03	0.03
8	599.29	599.32	599.32	0.03	0.03
7.85	598.94	598.97	598.97	0.03	0.03
7.7	598.87	598.91	598.91	0.04	0.04
7.55	598.85	598.89	598.89	0.04	0.04
7.48					
7.4	598.78	598.78	598.78	0.00	0.00
7.25	598.69	598.69	598.69	0.00	0.00
7	598.67	598.67	598.67	0.00	0.00
6.8	598.59	598.59	598.59	0.00	0.00
6	597.99	597.99	597.99	0.00	0.00

Regression Equation - Solve for Q for 2-Yr and 200-Yr event
I-55 over Des Plaines River

Input Data	
Return Period	Actual Discharge (cfs)
10	6000
50	7500
100	8400
500	9300

Calculated Data		
Return Period	Actual Discharge (cfs)	Calculated Discharge (cfs)
2	-	4743.00
10	6000	6122.94
50	7500	7502.87
100	8400	8097.17
200	-	8691.48
500	9300	9477.10

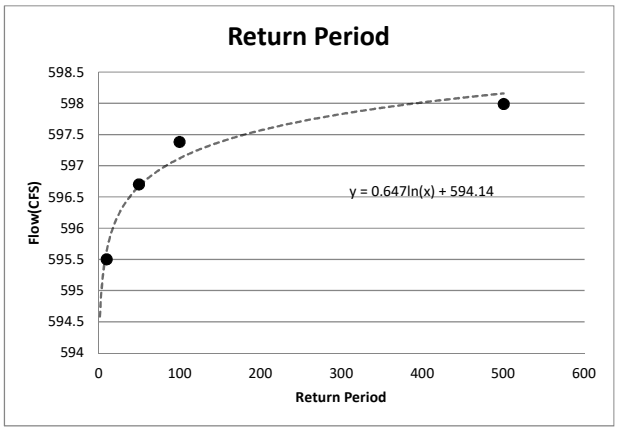


Regression Equation - Solve for Water Surafce Elevation for 2-Yr and 200-Yr event
I-55 over Des Plaines River

Input Data	
Return Period	Water Surface Elevation (ft)
10	595.5
50	596.7
100	597.38
500	597.99

Calculated Data		
Return Period	Actual Water Surface Elevation (ft)	Calculated Water Surface Elevation (ft)
2	-	594.59
10	595.5	595.63
50	596.7	596.67
100	597.38	597.12
200	-	597.57
500	597.99	598.16

620.4



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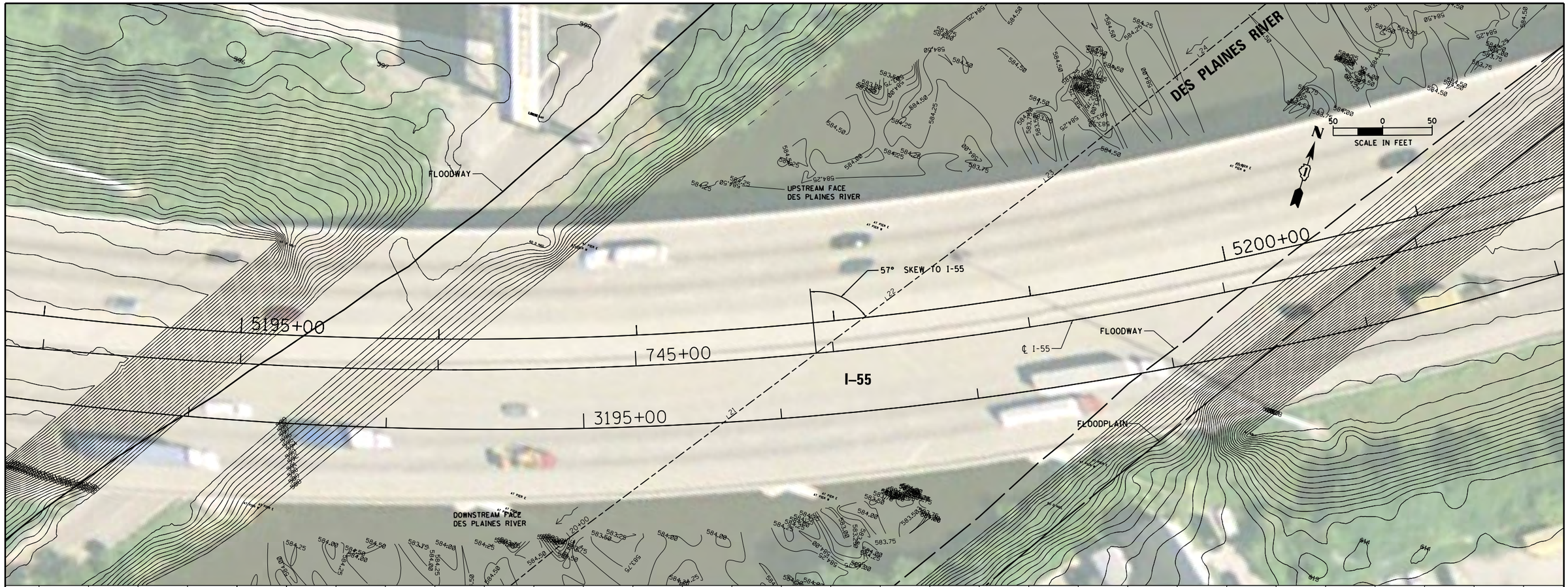
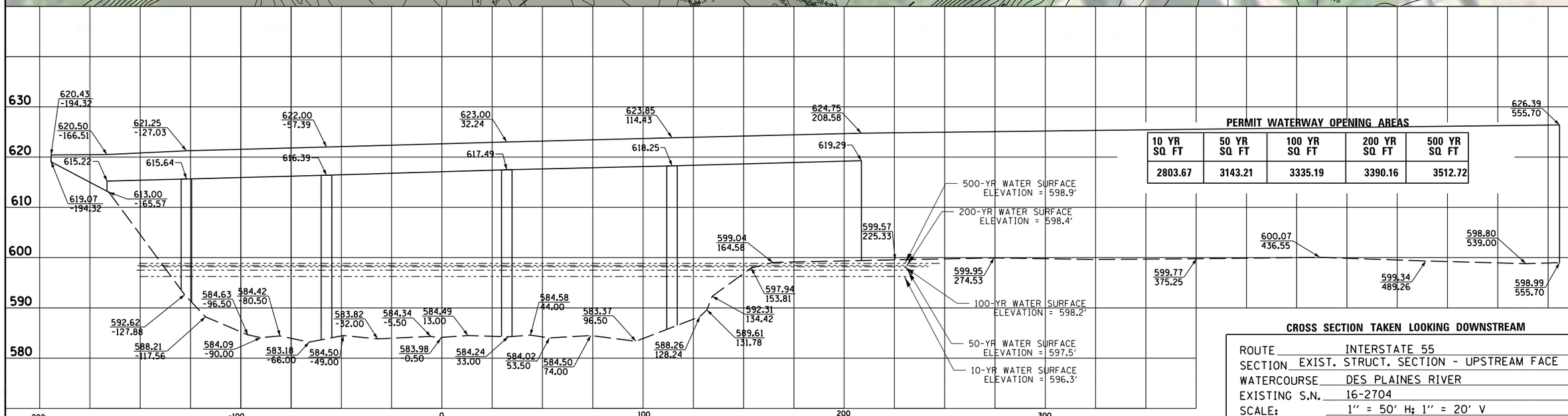




PERMIT WATERWAY OPENING AREAS

10 YR SQ FT	50 YR SQ FT	100 YR SQ FT	200 YR SQ FT	500 YR SQ FT
2803.67	3143.21	3335.19	3390.16	3512.72

CROSS SECTION TAKEN LOOKING DOWNSTREAM

ROUTE INTERSTATE 55
SECTION EXIST. STRUCT. SECTION - UPSTREAM FACE
WATERCOURSE DES PLAINES RIVER
EXISTING S.N. 16-2704
SCALE: 1" = 50' H; 1" = 20' V
PLOTTED BY: MYG DATE: 3/9/2018
CHECKED BY: IAD DATE: 3/9/2018
SURVEY DATE: 06-27-2017

FILE NAME = N:\Idot\110203\0000\CADD_Sheets\P1110203-xht-Water_Vol_I55_DesRiv_US-Permit.dgn

TAB B

SECTION 2.B

WIT – MWRD

Illinois Department of Transportation

Bridge Waterway Information Table (MWRD)

Route:	Interstate 55 (Stevenson Expressway)	Existing SN:	016-2704
Waterway:	Des Plaines River	Proposed SN:	-
Section:	P-91-762-10	Prepared by:	EMB Date: 09/12/2018
County:	Cook	Checked by:	IAD Date: 09/12/2018

Drainage Area = 650 square miles

Existing Overtopping Elev. = 629.4' at Sta. 747+94

Proposed Overtopping Elev. = 629.8' at Sta. 747+94

Flood Event	Freq. Yr.	Discharge ft^3/s	Waterway Opening - ft^2		Natural H.W.E. - ft	Head - ft		Headwater Elevation – ft	
			Existing	Proposed		Existing	Proposed	Existing	Proposed
	10	7075	3555	3555	599.1	0.1	0.1	599.2	599.2
Design	50	8949	4307	4307	600.3	0.1	0.1	600.4	600.4
Base	100	9660	4710	4710	600.8	0.1	0.1	600.9	600.9
Scour Design Check	200	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Overtop Existing	>500	-	-	-	-	-	-	-	-
Overtop Proposed	>500	-	-	-	-	-	-	-	-
Max. Calc.	500	11571	5602	5602	601.9	0.1	0.1	602.0	602.0

Datum: NAVD 88

All-Time H.W.E. & Date: 596.72 ft. July 1957 (NAVD 88)

Surveyed Normal Water Level: 587.92 ft. June 5-7, 2017

10-Year Velocity through Existing Structure = 2.0 ft/s

10-Year Velocity through Proposed Structure = 2.0 ft/s

2-Yr. Flow Rate = N/A ft^3/s

EXISTING STRUCTURE

Type:	5- Span Steel Bridge
Length/Width:	Length = 689' F-F Along Local Tangent, Width = 139'
# Spans/Cells:	5 @ 172.9' – 150.9' – 164.6' – 127.9' – 72.5' Brg. to Brg.
Low Chord:	615.22'
Skew:	57° (relative to road)
Clearance:	14.9'
Bridge Flow Line:	583.18' (u/s) 583.68' (d/s)
Low E.O.P:	620.5'
Freeboard:	20.1'

PROPOSED STRUCTURE

Type:	5-Span Steel Bridge
Length Of Span:	Length = 689' F-F Along Local Tangent, Width = 153'
# Spans:	5 @ 172.9' - 150.9' - 164.6' - 127.9' - 72.5' Brg. to Brg.
Low Chord:	614.84
Skew:	57° (relative to road)
Clearance:	14.5'
Bridge Flow Line:	583.18' (u/s) 583.68' (d/s)
Low E.O.P:	620.1'
Freeboard:	19.7'

NOTE: Proposed Structure Details Are Preliminary; Subject To Refinement In TSL Stage. MWRD model used only to quantify upstream and downstream impacts.

BACK-UP CALCULATIONS FOR MWRD WIT

Route: **I-55**
Waterway: **Des Plaines River**

Computed: EMB Rev. WBL Date: 5/9/2018
Checked: IAD Date: 9/12/2018

Calculate Created Head

Frequency	Natural H.W.E. (ft)[1]		Greatest Created Head (ft)[2] Upstream of Bridge		Existing Headwater Elevation @ Upstream Face (ft)[2]	Proposed Headwater Elevation @ Upstream Face (ft)[2]
	U/S Face of Structure (Sta. 63295.62)	Approach Sect. (Sta. 63547.57)	From Summary Tables Comparing Natural WSE to Existing WSE	From Summary Tables Comparing Natural WSE to Proposed WSE		
10-year	599.1	599.1	0.1	0.1	599.2	599.2
50-year	600.3	600.3	0.1	0.1	600.4	600.4
100-year	600.8	600.8	0.1	0.1	600.9	600.9
200-year	N/A	N/A	N/A	N/A	N/A	N/A
500-year	601.9	601.9	0.1	0.1	602.0	602.0

(1) The natural highwater elevation is the water surface elevation at the upstream side of the crossing as modeled in the stream natural condition, without the structure.

(2) The created head is calculated at the cross section upstream of the bridge/culvert which has the greatest difference between the natural and proposed conditions. This difference in elevation is then added to the Natural H.W.E. at the U/S face of the structure. This method of calcuating created head is only required for bridges and some major culvert crossings. Also, the preferred created head should never be negative. headwater elevations = The natural highwater elevation + the created head

CALCULATE FREEBOARD AND CLEARANCE

Low Road Elevation (ft)[3]			
Existing	Station	Proposed	Station
620.50	751+36	620.12	751+36

Low Beam Elevation (ft)			
Existing	Station	Proposed	Station
615.22	751+36	614.84	751+36

Existing Freeboard (ft)				
10-year	50-year[4]	100-year	200-year	500-year
21.30	20.10	19.60	N/A	18.50

Natural Clearance (ft)				
10-year	50-year[5]	100-year	200-year	500-year
16.12	14.92	14.42	N/A	13.32

Proposed Freeboard (ft)				
10-year	50-year[4]	100-year	200-year	500-year
20.92	19.72	19.22	N/A	18.12

Natural Clearance (ft)				
10-year	50-year[5]	100-year	200-year	500-year
15.74	14.54	14.04	N/A	12.94

(3) Low road elevation is calculated at the edge of pavement, and on the low side of the roadway.

(4) Freeboard is calculated from the 50-year design headwater elevation to the proposed low road elevation in the floodplain.

(5) Vertical clearance is calculated from the 50-year natural high-water elevation to the proposed low chord (beam) bridge elevation (2 ft minimum requirement)

CALCULATE EFFECTIVE WATERWAY OPENING AREA

Structure Length (ft)	
Existing	Proposed
689' F to F	689' F to F

Waterway Opening Area (ft^2)		
Frequency	Existing	Proposed
10-year	3555	3555
50-year	4307	4307
100-year	4710	4710
200-year	N/A	N/A
500-year	5602	5602

Waterway Opening Areas measured in CAD

BACK-UP CALCULATIONS FOR WIT

Route: **I-55**

Waterway: **DPR**

SUMMARY TABLE COMPARING 10-YEAR NATURAL WSE TO EXISTING WSE					
Cross Section	Natural Condition WSE	Existing Condition WSE	Proposed Condtions WSE	Existing WSE Difference	WSE Difference
64250.75	599.18	599.23	599.23	0.05	0.05
64116.64	599.17	599.21	599.21	0.04	0.04
64090.85	599.16	599.2	599.2	0.04	0.04
63887.62	599.14	599.18	599.18	0.04	0.04
63655.12	599.1	599.15	599.15	0.05	0.05
63628.88	599.1	599.14	599.14	0.04	0.04
63547.57	599.09	599.14	599.14	0.05	0.05
63295.62	599.07	599.12	599.12	0.05	0.05
63007.62	I-55 BRIDGE				
62761.95	599.01	599.01	599.01	0	0.00
62524.89	598.97	598.97	598.97	0	0.00
62371.78	598.95	598.95	598.95	0	0.00
62061.6*	598.92	598.92	598.92	0	0.00

BACK-UP CALCULATIONS FOR WIT

Route: **I-55**

Waterway: **DPR**

SUMMARY TABLE COMPARING 50-YEAR NATURAL WSE TO EXISTING WSE					
Cross Section	Natural Condition WSE	Existing Condition WSE	Proposed Condtions WSE	Existing WSE Difference	WSE Difference
64250.75	600.46	600.51	600.51	0.05	0.05
64116.64	600.44	600.49	600.49	0.05	0.05
64090.85	600.43	600.48	600.49	0.05	0.06
63887.62	600.4	600.46	600.46	0.06	0.06
63655.12	600.36	600.42	600.42	0.06	0.06
63628.88	600.36	600.41	600.42	0.05	0.06
63547.57	600.35	600.41	600.41	0.06	0.06
63295.62	600.33	600.39	600.39	0.06	0.06
63007.62	I-55 BRIDGE				
62761.95	600.25	600.26	600.26	0.01	0.01
62524.89	600.2	600.21	600.21	0.01	0.01
62371.78	600.18	600.18	600.18	0	0.00
62061.6*	600.14	600.15	600.15	0.01	0.01

BACK-UP CALCULATIONS FOR WIT

Route: **I-55**

Waterway: **DPR**

SUMMARY TABLE COMPARING 100-YEAR NATURAL WSE TO EXISTING WSE					
Cross Section	Natural Condition WSE	Existing Condition WSE	Proposed Condtions WSE	Existing WSE Difference	WSE Difference
64250.75	600.89	600.95	600.96	0.06	0.07
64116.64	600.87	600.93	600.93	0.06	0.06
64090.85	600.86	600.93	600.93	0.07	0.07
63887.62	600.83	600.9	600.9	0.07	0.07
63655.12	600.8	600.86	600.86	0.06	0.06
63628.88	600.79	600.85	600.85	0.06	0.06
63547.57	600.78	600.85	600.85	0.07	0.07
63295.62	600.76	600.82	600.83	0.06	0.07
63007.62	I-55 BRIDGE	Bridge	Bridge		
62761.95	600.68	600.69	600.69	0.01	0.01
62524.89	600.63	600.63	600.63	0	0.00
62371.78	600.6	600.61	600.61	0.01	0.01
62061.6*	600.56	600.57	600.57	0.01	0.01

BACK-UP CALCULATIONS FOR WIT

Route: **I-55**

Waterway: **DPR**

SUMMARY TABLE COMPARING 200-YEAR NATURAL WSE TO EXISTING WSE					
Cross Section	Natural Condition WSE	Existing Condition WSE	Proposed Condtions WSE	Existing WSE Difference	WSE Difference
64250.75				0	0.00
64116.64				0	0.00
64090.85				0	0.00
63887.62				0	0.00
63655.12				0	0.00
63628.88				0	0.00
63547.57				0	0.00
63295.62				0	0.00
63007.62	I-55 BRIDGE				
62761.95				0	0.00
62524.89				0	0.00
62371.78				0	0.00
62061.6*				0	0.00

BACK-UP CALCULATIONS FOR WIT

Route: **I-55**

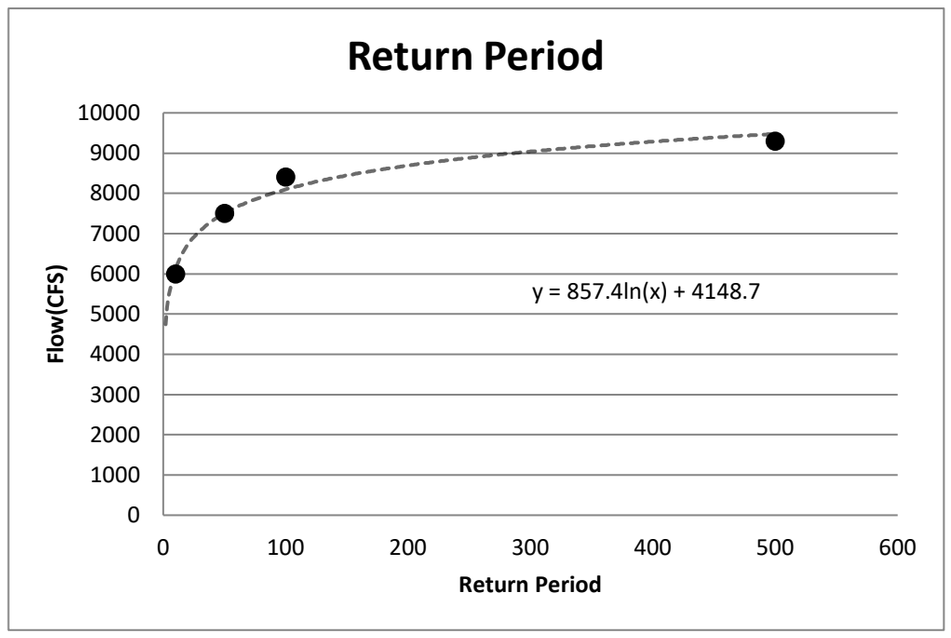
Waterway: **DPR**

SUMMARY TABLE COMPARING 500-YEAR NATURAL WSE TO EXISTING WSE					
Cross Section	Natural Condition WSE	Existing Condition WSE	Proposed Condtions WSE	Existing WSE Difference	WSE Difference
64250.75	601.99	602.07	602.07	0.08	0.08
64116.64	601.97	602.05	602.05	0.08	0.08
64090.85	601.96	602.04	602.04	0.08	0.08
63887.62	601.94	602.02	602.02	0.08	0.08
63655.12	601.89	601.97	601.97	0.08	0.08
63628.88	601.88	601.96	601.96	0.08	0.08
63547.57	601.87	601.95	601.96	0.08	0.09
63295.62	601.86	601.94	601.94	0.08	0.08
63007.62	Bridge		Bridge		
62761.95	601.78	601.78	601.78	0	0.00
62524.89	601.71	601.71	601.71	0	0.00
62371.78	601.68	601.69	601.69	0.01	0.01
62061.6*	601.64	601.65	601.65	0.01	0.01

Regression Equation - Solve for Q for 2-Yr and 200-Yr event
I-55 over CSSC

Input Data	
Return Period	Actual Discharge (cfs)
10	6000
50	7500
100	8400
500	9300

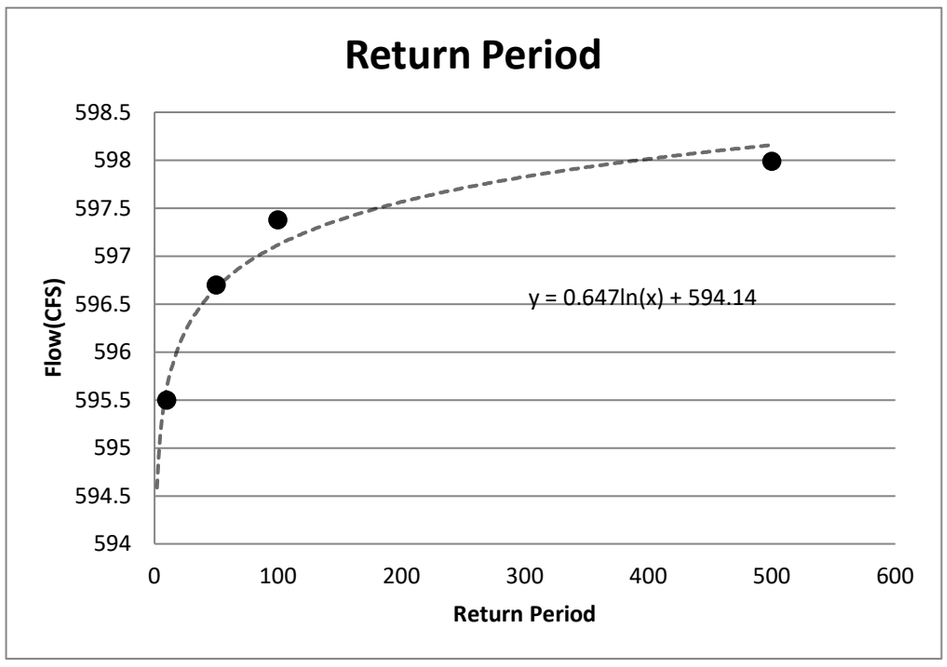
Calculated Data		
Return Period	Actual Discharge (cfs)	Calculated Discharge (cfs)
2	-	4743.00
10	6000	6122.94
50	7500	7502.87
100	8400	8097.17
200	-	8691.48
500	9300	9477.10

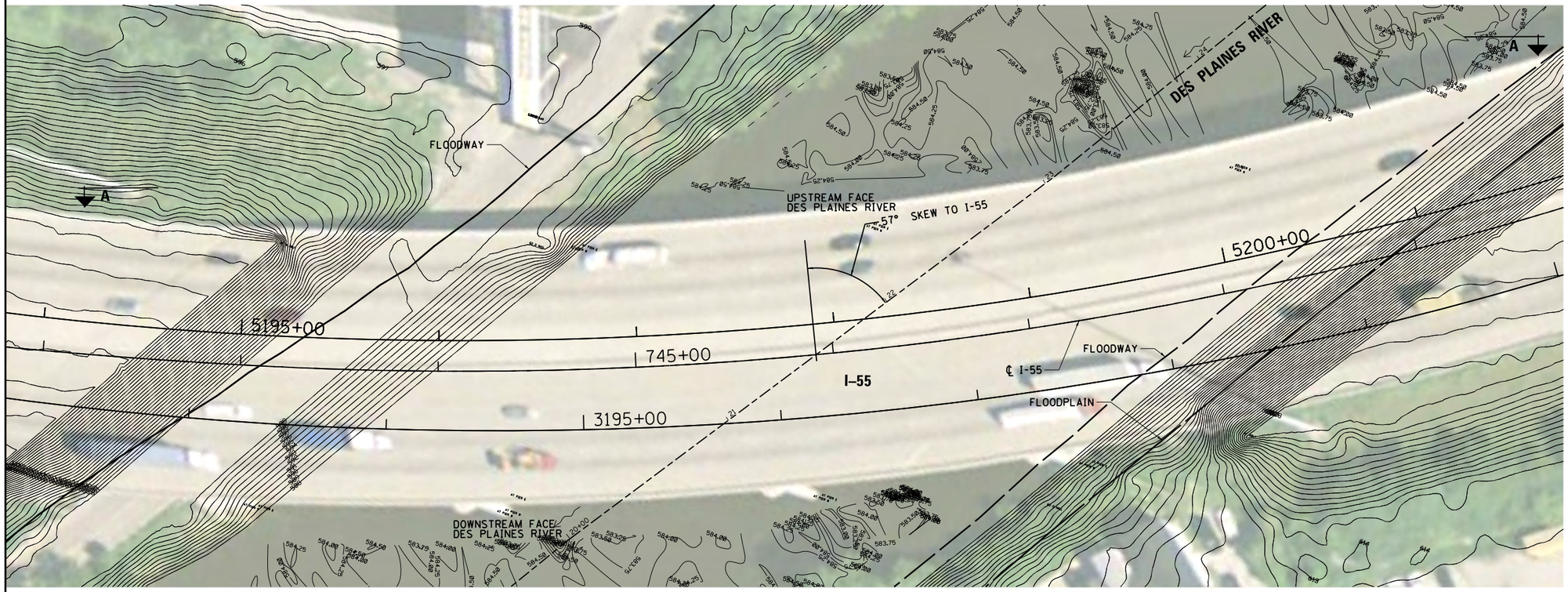


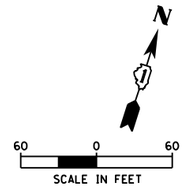
Regression Equation - Solve for Water Surafce Elevation for 2-Yr and 200-Yr event
I-55 over CSSC

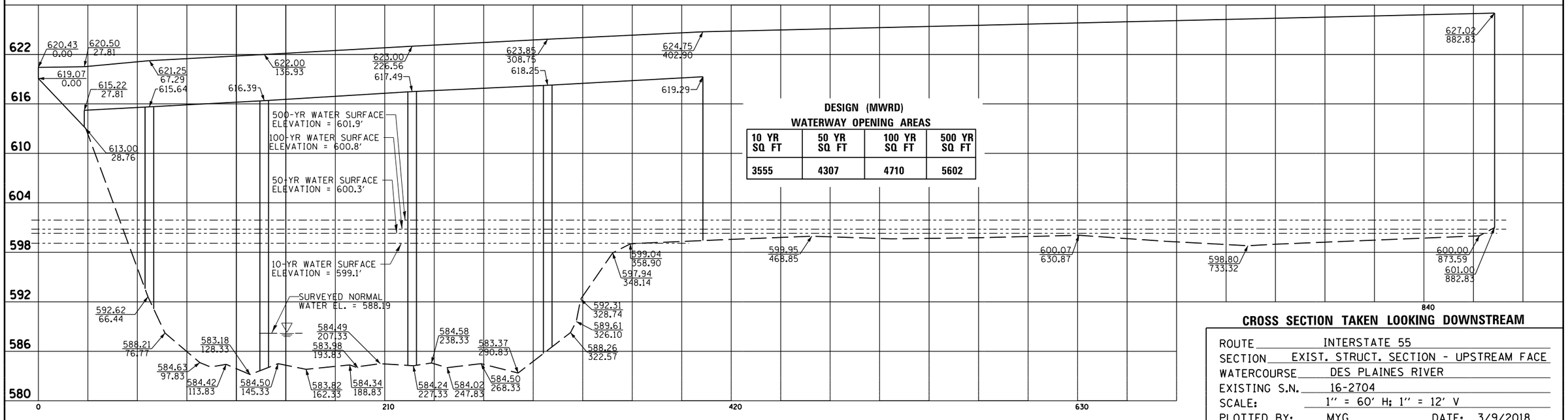
Input Data	
Return Period	Water Surface Elevation (ft)
10	595.5
50	596.7
100	597.38
500	597.99

Calculated Data		
Return Period	Actual Water Surface Elevation (ft)	Calculated Water Surface Elevation (ft)
2	-	594.59
10	595.5	595.63
50	596.7	596.67
100	597.38	597.12
200	-	597.57
500	597.99	598.16









DESIGN (MWRD)
WATERWAY OPENING AREAS

10 YR SQ FT	50 YR SQ FT	100 YR SQ FT	500 YR SQ FT
3555	4307	4710	5602

CROSS SECTION TAKEN LOOKING DOWNSTREAM

ROUTE INTERSTATE 55
SECTION EXIST. STRUCT. SECTION - UPSTREAM FACE
WATERCOURSE DES PLAINES RIVER
EXISTING S.N. 16-2704
SCALE: 1" = 60' H; 1" = 12' V
PLOTTED BY: MYG DATE: 3/9/2018
CHECKED BY: IAD DATE: 3/9/2018
SURVEY DATE: 06-27-2017

FILE NAME = N:\dot\110203.00001\CADD_Sheets\P110203-sht-Water_Vol_I55_DesRiv_US.dgn

Tab 3

SECTION 3

HYDRAULIC REPORT DATA SHEETS

Illinois Department of Transportation

Hydraulic Report Data Sheets

Route	Interstate 55	P or D #	P-91-762-10
Section	Des Plaines River	PTB #	158-002
County	Cook		
Exist SN	016-2704		
Prop SN	n/a		

General Information

1. Name of the Stream: Des Plaines River

2. Location of the Structure: SE ¼ of the SW ¼ of Section 22 Township 38N Range 12E of the 3rd P.M.

3. Hydraulic Report Prepared By: ☒ Consultant Christopher B. Burke Engineering, Ltd.
☐ District

4. Hydraulic Report Approval Authority: ☐ District – Post PDF of HR to BBS Hydraulics SharePoint Server
☒ BBS Hydraulics - Submit 2 hard copies of HR to BBS Hydraulics

Site Design Data

5. Drainage Area (sq. mi.): 640 sq. mi.

6. Highway Classification:
☐ Rural ☒ Principal Arterial
☒ Urban ☐ Minor Arterial
☐ Other ☐ Collector
☐ Local

7. Design Frequency: ☐ 30 yr ☒ 50 Yr. ☐ Other

8. Number of Waterway Information Tables (WIT): 2
If more than one, explain: One WIT is based on the FIS information as the permit model and the other is based on the unsteady MWRD model as the design model.

Hydrologic & Hydraulic Analysis

9. Hydrology Modeling (check all that apply): ☐ USGS/Stream Stats ☒ FIS ☐ Gage Data
☒ Other MWRD

10. Hydraulic Modeling (check all that apply):
a. Method: ☒ HEC-RAS ☐ WSPRO ☐ Other
b. Manning's "n" values determined as per IDOT DM CH.5? ☒ Yes ☐ No
If no, explain:
c. Source of Starting WSE: FIS, MWRD
d. Non- IDOT encroachments in Survey? ☐ Yes ☒ No
If yes, are they accounted for? ☐ Yes ☐ No
e. Does the Tailwater Control? ☐ Yes ☒ No
If yes, list:

f. Were the Expansion/Contraction cones properly addressed? ☐ Yes ☐ No ☒ N/A
If No or N/A, explain: Structure opening is greater than waterway width up to and including the 500-yr storm

g. What Expansion and Contraction Rates were used? Expansion: N/A
Contraction N/A

IDNR – OWR Floodway Permit

11. Is area experiencing urbanization or expected to urbanize within 10 years? ☒ Yes ☐ No

12. Are there any sensitive flood receptors located upstream within possible backwater influence? ☐ Yes ☒ No
If yes, list and describe critical upstream flood damageable properties and their elevations.

13. Is there any History of Flooding or Overtopping problems? ☐ Yes ☒ No
Sources of Observed Highwater:
Hydraulic Atlas Berwyn Quadrangle, HA-252. Elev. 597.00' NGVD 29 = 596.72' NAVD 88.

14. Is the structure hydraulically connected to or within the floodway of an IDNR-OWR designated Public Body of Water? ☒ Yes ☐ No

15. Required IDNR - OWR Permit type:
☒ Individual ☐ SWP #2 ☐ SWP #12 ☐ Floodway
☐ None ☐ Other

Proposed Structure Data

16. Project Scope (check all that apply): TBD
a. ☐ Complete Replacement
b. ☐ Superstructure Replacement
c: ☒ Superstructure Widening; Length of Pier Extension in the water:
U/S 11.89' D/S 10.89'
d. ☐ Bridge (Existing Bridge to remain as is.) ☐ Culvert
e. ☐ New Alignment
f. Work Planned Below Q_{100} HWE? ☒ Yes ☐ No
g. ☐ Profile Raise

17. If a bridge is proposed, supply:

Flow line elevation (ft):	583.18 Ex. U/S	Abutment type:	closed
Preliminary low beam elevation (ft):	614.84 Pr. per BCR	Skew (degrees):	57
Width of deck (ft):	153 Pr. per BCR	Number of spans:	5
Total length from face to face of abutment (ft)	689'		

18. If a culvert is proposed, supply:

Type and size:	N/A	Length (ft):	N/A
Upstream invert elevation (ft):	N/A	Entrance type:	N/A
Downstream invert elevation (ft):	N/A	Skew (degrees):	N/A

19. If a three-sided structure is proposed, supply:

Flow line elevation (ft):	N/A	Skew (degrees):	N/A
Span (ft):	N/A	Length (ft):	N/A
Height (ft):	N/A	Number of spans:	N/A

20. a. Is the IDOT Clearance Policy Met? ☒ Yes ☐ No ☐ NA Value (ft): 20.1
b. Is the IDOT Freeboard Policy Met? ☒ Yes ☐ No ☐ NA Value (ft): 19.7
Per MWRD design model.

21. Type of streambed soil: ☒ Clay ☐ Silt ☐ Sand ☒ Loam ☐ _____

22. Scour/ Migration Problems: None
Comments:

Ice Concerns: None
Comments:

Debris Concerns: None
Comments:

Countermeasures Proposed: None

Existing Structure Data

		US 12,20,45 (La Grange Road)	I-55	IHB Railroad Bridge
		U/S	Subject Structure	D/S
23.	Distance from proposed structure: (ft.)	4850	0	9820
24.	Type of structure:	30-Span Steel Bridge	5-Span Steel Bridge	5-Span RR Bridge
25.	Low beam elevation:		615.22	
26.	Flow line elevation:	583.6 Est. (FIS Profile)	583.18	583.0 Est. (FIS Profile)
27.	Maximum known high water elevation:	596.22	596.72	597.4
28.	Date of maximum high water:	July 1957	July 1957	July 1957
29.	Cause (backwater, headwater, etc.):	Unknown	Unknown	Unknown
30.	Does structure carry entire design flood flow?	Yes	Yes	Yes
	If not, state area of additional waterway opening: (ft^2)	N/A	N/A	N/A
31.	Type and size of existing overflow structures:	N/A	N/A	N/A
32.	Has adverse scour occurred under or adjacent to the structure?	No	No	No
33.	Classify type of scour and/or aggradation / degradation:	N/A	N/A	N/A

Required Additional Data

34. Deviations from the General Procedures presented in IDOT DM CH. 2, CH.6, and CH.7:
None.

35. Information regarding high water from other streams, reservoirs, flood control projects, proposed channel changes, or other controls affecting proposed waterway area:

N/A

36. Site Inspection made by: Christopher B. Burke Engineering, Ltd. Date: July 2017

Remarks:
Inspected by Francisco Martinez.

37. Prepared by: William Loftus Date May 2018

Signed (QA/QC): Date 09/12/2018

Hydraulic Report Checklist

The District or Consultant should complete the following checklist before submitting the Hydraulic Report for approval.

1. ☒ Title Page
2. ☒ Table of Contents
3. ☒ Narrative - (as outlined in Section 2-601.01 Item #3)
4. ☒ Waterway Information Table (WIT) - (as outlined in Section 2-601.01 Item #4)
5. ☒ Hydraulic Report Data Sheets
6. ☒ Location Map - should show the subject structure along with nearby location defining landmarks (cities, roads, highways, etc.)
7. ☒ USGS Hydraulic Investigation Map (District 1 only)
8. ☒ Photographs - (Minimum: U/S & D/S Structure Faces, Up & Down Channel, Up & Down Roadway Across Structure)
9. ☐ Hydrology (map and calculations)
10. ☒ Streambed Profile
11. ☒ Roadway Profile (existing and proposed)
12. ☒ Cross Section Plots - with plan layout preferably overlayed upon an aerial photo with the contours
13. ☒ Bridge Opening Plots
14. ☒ Natural Condition Analysis
15. ☒ Existing Condition Analysis
16. ☒ Proposed Condition Analysis

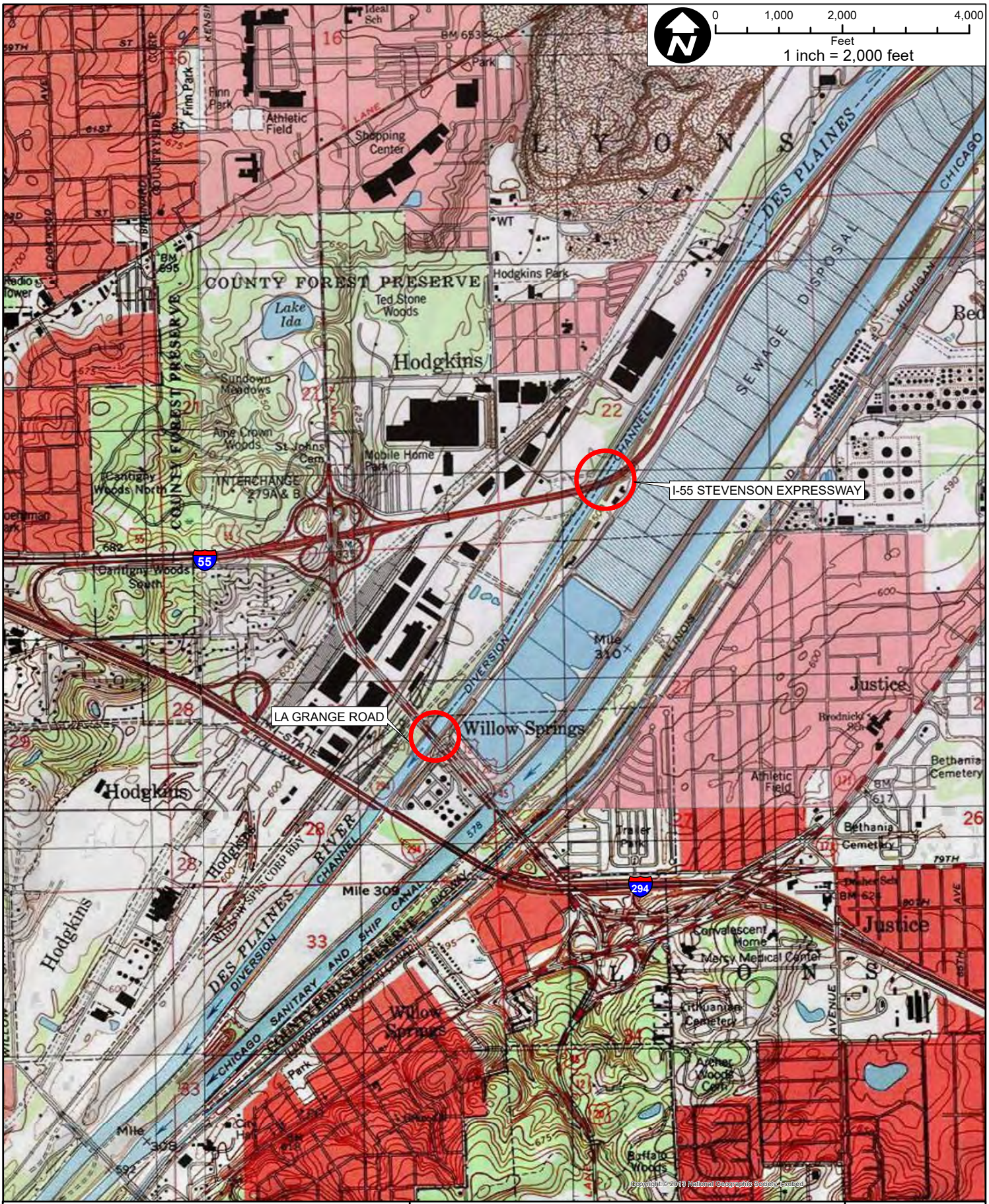
When HEC-RAS modeling is being used, ALL Plans (Natural, Existing, & Proposed) shall be included in ONE Project File.

17. ☒ Scour Analysis – Existing and Proposed Conditions
18. ☒ Compensatory Storage Calculations (if required)
19. ☒ Survey Notes (if available, No Electronic Point Files)
20. ☒ Correspondence Notes
21. ☒ CD with Project Files (Include pdf copy of the Hydraulic Report)

Tab 4

SECTION 4

LOCATION MAP
USGS HYDROLOGIC INVESTIGATIONS ATLAS
REGULATORY FLOOD MAPS



CLIENT:

ILLINOIS DEPARTMENT OF TRANSPORTATION

TITLE:

GENERAL LOCATION DRAINAGE MAP
DES PLAINES RIVER
BERWYN & PALOS PARK QUADRANGLE
BASE MAP (USGS) 1980

PROJ. NO.	110203.00001
DATE:	8/31/2017
SHEET	1 OF 1
DRAWING NO.	EXH 4.1

CHRISTOPHER B. BURKE ENGINEERING, LTD.
9575 W. Higgins Road, Suite 600 · Rosemont, Illinois 60018 · (847) 823-0500

DSGN.			SCALE:	1:12,000
DWN.			AUTHOR:	MHAYES
CHKD.			PLOT DATE:	8/31/2017
FILE:	GLDM			

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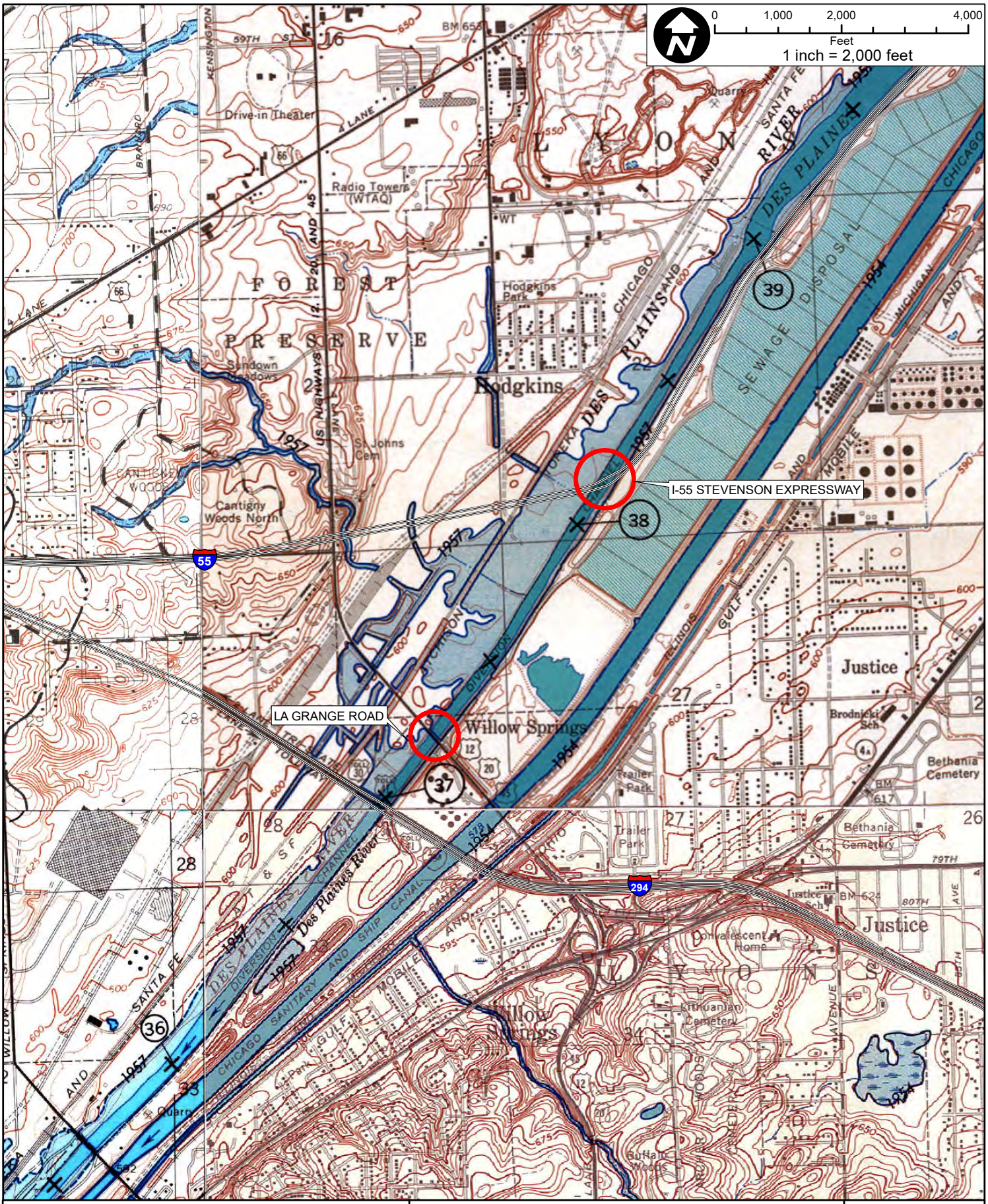

CLIENT:

ILLINOIS DEPARTMENT OF TRANSPORTATION

TITLE:

USGS HYDROLOGIC INVESTIGATIONS ATLAS FLOODS IN BERWYN (HA-252, 1967) & PALOS PARK (HA-145, 1966) QUADRANGLES DES PLAINES RIVER

PROJ. NO.	110203.00001
DATE:	8/31/2017
SHEET	1 OF 1
DRAWING NO.	EXH 4.2

CHRISTOPHER B. BURKE ENGINEERING, LTD.
9575 W. Higgins Road, Suite 600 · Rosemont, Illinois 60018 · (847) 823-0500

DSGN.			SCALE:	1:12,000
DWN.			AUTHOR:	MHAYES
CHKD.			PLOT DATE:	8/31/2017
FILE:	HADM			

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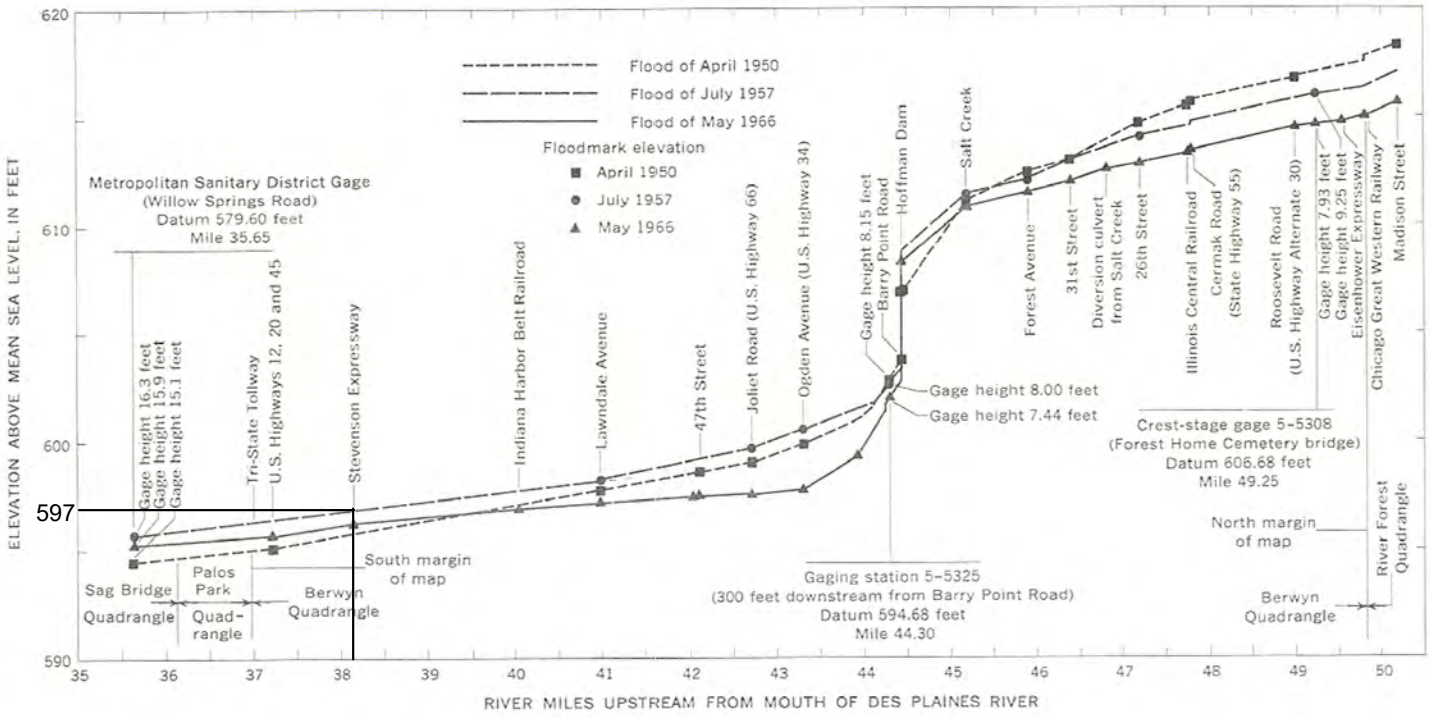

FIGURE 7.—*Profiles of floods on Des Plaines River.*

Path: N:\dot\110203.00001\GIS\Exhibits\Des Plaines River\HA 4.3.mxd

CLIENT:
ILLINOIS DEPARTMENT OF TRANSPORTATION

TITLE:
USGS HYDROLOGIC INVESTIGATIONS ATLAS
PROFILE OF FLOODS ON DES PLAINES RIVER
BERWYN (HA-252)
DES PLAINES RIVER

PROJ. NO.	110203.00001
DATE:	8/31/2017
SHEET	1 OF 1
DRAWING NO.	EXH 4.3

CHRISTOPHER B. BURKE ENGINEERING, LTD.
9575 W. Higgins Road, Suite 600 · Rosemont, Illinois 60018 · (847) 823-0500

DSGN.				SCALE:	1:12,000
DWN.				AUTHOR:	MHAYES
CHKD.				PLOT DATE:	8/31/2017
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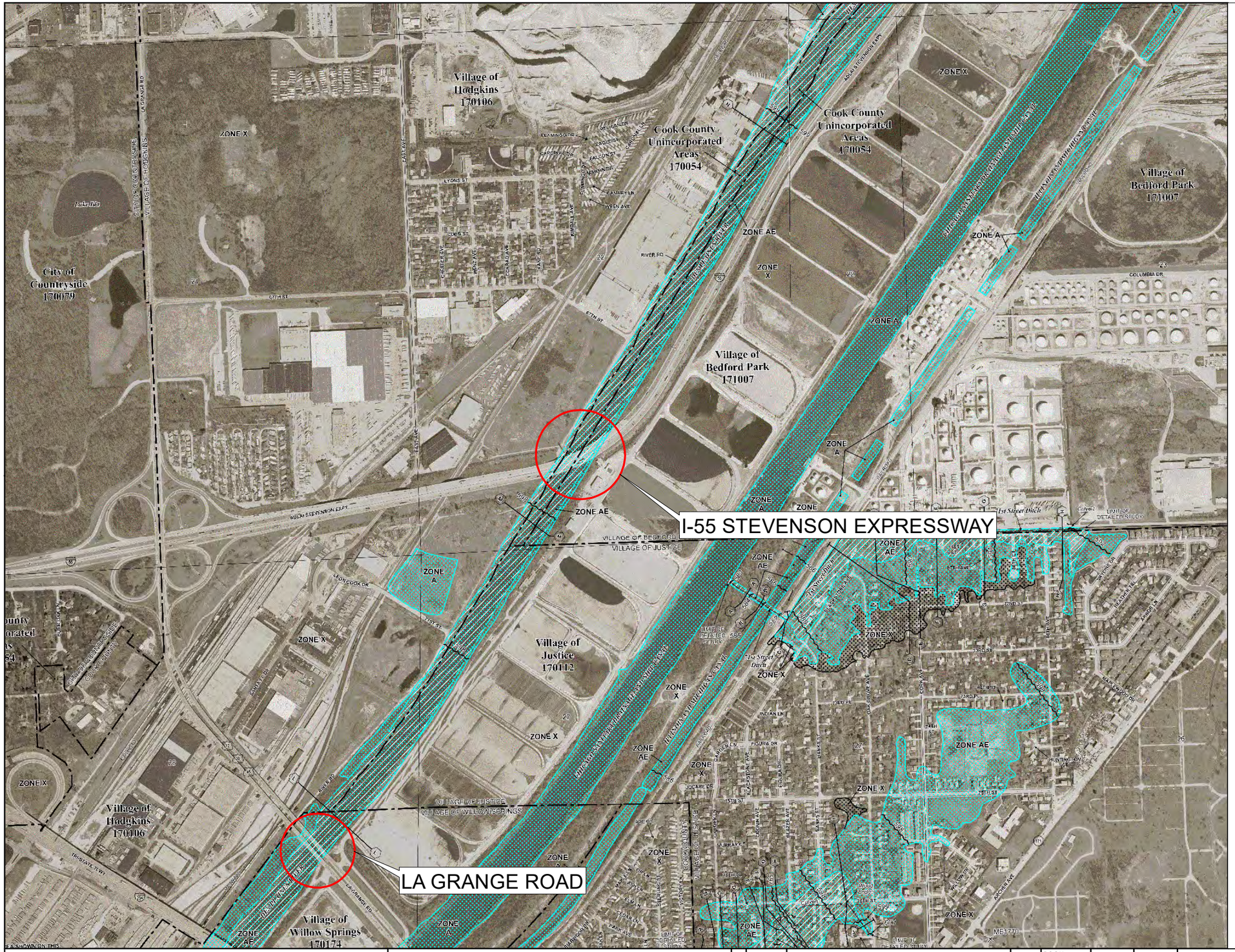


NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0487J

FIRM
FLOOD INSURANCE RATE MAP
COOK COUNTY, ILLINOIS
AND INCORPORATED AREAS

PANEL 487 OF 832

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BEDFORD PARK, VILLAGE OF	171007	0487	J
BROOKFIELD, VILLAGE OF	170056	0487	J
COOK COUNTY	170054	0487	J
HODGKINS, VILLAGE OF	170106	0487	J
LYONS, VILLAGE OF	170120	0487	J
MCCOOK, VILLAGE OF	170121	0487	J
SUMMIT, VILLAGE OF	170167	0487	J

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.

MAP NUMBER
17031C0487J
MAP REVISED
AUGUST 19, 2008

Federal Emergency Management Agency

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0486J

FIRM
FLOOD INSURANCE RATE MAP
COOK COUNTY, ILLINOIS
AND INCORPORATED AREAS

PANEL 486 OF 832

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BROOKFIELD, VILLAGE OF	170056	0486	J
COUNTRYSIDE, CITY OF	170079	0486	J
HODGKINS, VILLAGE OF	170106	0486	J
LA GRANGE, VILLAGE OF	170114	0486	J
MCCOOK, VILLAGE OF	170121	0486	J

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.

MAP NUMBER
17031C0486J
MAP REVISED
AUGUST 19, 2008

Federal Emergency Management Agency

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0488J

FIRM
FLOOD INSURANCE RATE MAP
COOK COUNTY, ILLINOIS
AND INCORPORATED AREAS

PANEL 488 OF 832

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BEDFORD PARK, VILLAGE OF	171007	0488	J
COOK COUNTY	170054	0488	J
COUNTRYSIDE, CITY OF	170079	0488	J
HODGKINS, VILLAGE OF	170106	0488	J
JUSTICE, VILLAGE OF	170112	0488	J
WILLOW SPRINGS, VILLAGE OF	170174	0488	J

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.

MAP NUMBER
17031C0488J
MAP REVISED
AUGUST 19, 2008

Federal Emergency Management Agency

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0489J

FIRM
FLOOD INSURANCE RATE MAP
COOK COUNTY, ILLINOIS
AND INCORPORATED AREAS

PANEL 489 OF 832

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BEDFORD PARK, VILLAGE OF	171007	0489	J
BRIDGEVIEW, VILLAGE OF	170055	0489	J
COOK COUNTY	170054	0489	J
HODGKINS, VILLAGE OF	170106	0489	J
JUSTICE, VILLAGE OF	170112	0489	J
SUMMIT, VILLAGE OF	170167	0489	J

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.

MAP NUMBER
17031C0489J
MAP REVISED
AUGUST 19, 2008

Federal Emergency Management Agency

CHRISTOPHER B. BURKE ENGINEERING LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500

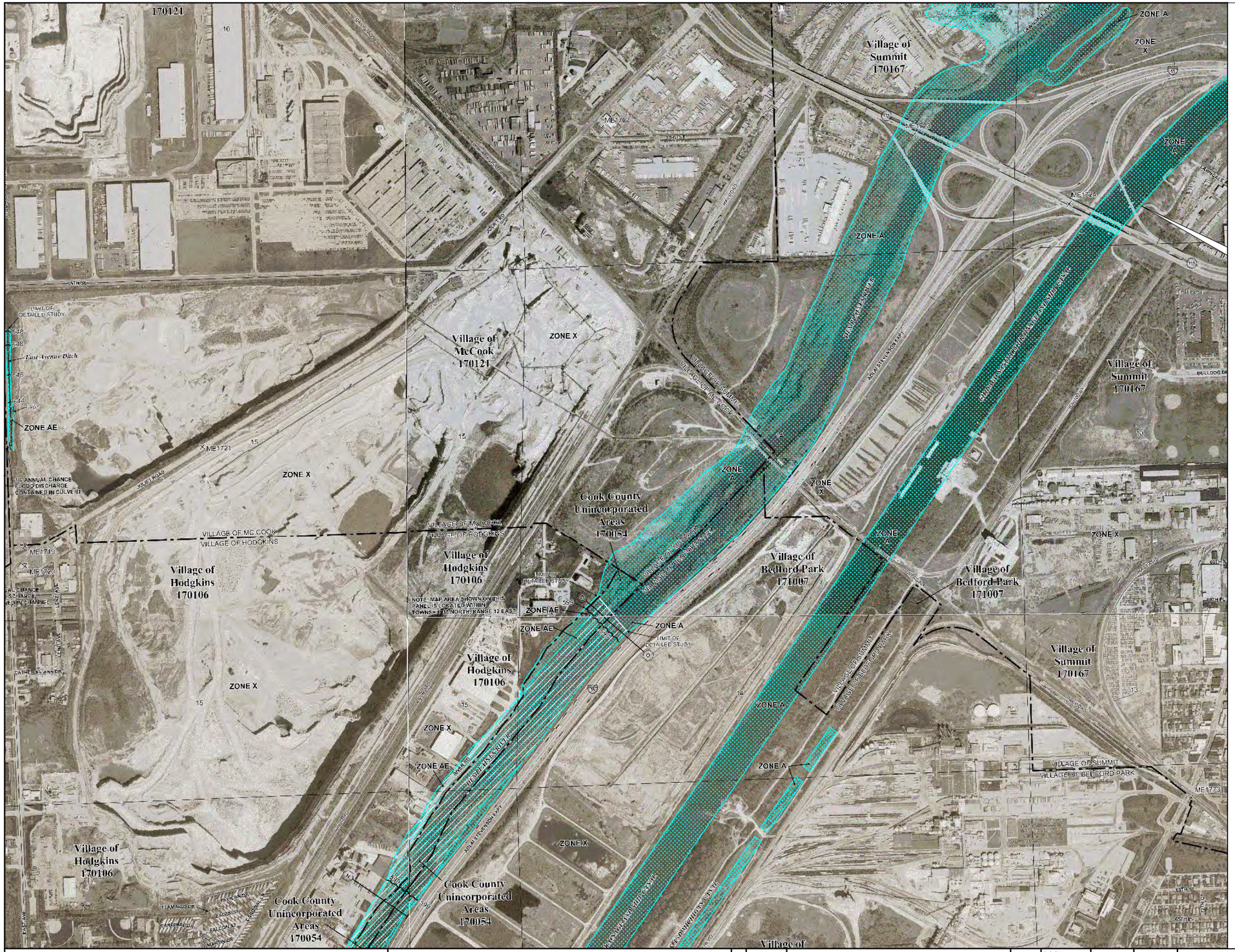
CLIENT:
ILLINOIS DEPARTMENT OF TRANSPORTATION

NO.	DATE	NATURE OF REVISION	CHKD.

DSGN.	
DWN:	MHAYES
CHKD.	
SCALE:	1:6,000
MODEL:	ArcGIS 10
PLOT DATE	9/13/2017
FILE NAME	FIRM
PATH	N:\ldot\110203.00001\GIS\Exhibits\Des Plaines River\FIRM.mxd

TITLE:
FLOOD INSURANCE RATE MAP
DES PLAINES RIVER
COOK COUNTY AND INCORPORATED AREAS
PANELS 0488, BASE MAP (FEMA), 2008

PROJ. NO.	110203.00001
DATE:	9/13/2017
SHEET	0 OF 0
DRAWING NO.	EXH 4.4a



0 500 1,000 2,000
Feet
1 inch = 1,000 feet

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0487J

FIRM
FLOOD INSURANCE RATE MAP
COOK COUNTY, ILLINOIS
AND INCORPORATED AREAS

PANEL 487 OF 832
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BEDFORD PARK, VILLAGE OF	171007	0487	J
BROOKFIELD, VILLAGE OF	170056	0487	J
COOK COUNTY	170054	0487	J
HODGKINS, VILLAGE OF	170106	0487	J
LYONS, VILLAGE OF	170120	0487	J
MCCOOK, VILLAGE OF	170121	0487	J
SUMMIT, VILLAGE OF	170167	0487	J

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.

MAP NUMBER
17031C0487J
MAP REVISED
AUGUST 19, 2008

Federal Emergency Management Agency

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0486J

FIRM
FLOOD INSURANCE RATE MAP
COOK COUNTY, ILLINOIS
AND INCORPORATED AREAS

PANEL 486 OF 832
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BROOKFIELD, VILLAGE OF	170056	0486	J
COUNTRYSIDE, CITY OF	170079	0486	J
HODGKINS, VILLAGE OF	170106	0486	J
LA GRANGE, VILLAGE OF	170114	0486	J
MCCOOK, VILLAGE OF	170121	0486	J

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.

MAP NUMBER
17031C0486J
MAP REVISED
AUGUST 19, 2008

Federal Emergency Management Agency

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0488J

FIRM
FLOOD INSURANCE RATE MAP
COOK COUNTY, ILLINOIS
AND INCORPORATED AREAS

PANEL 488 OF 832
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BEDFORD PARK, VILLAGE OF	171007	0488	J
COOK COUNTY	170054	0488	J
COUNTRYSIDE, CITY OF	170079	0488	J
HODGKINS, VILLAGE OF	170106	0488	J
JUSTICE, VILLAGE OF	170112	0488	J
WILLOW SPRINGS, VILLAGE OF	170174	0488	J

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MAP NUMBER
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MAP REVISED
AUGUST 19, 2008

Federal Emergency Management Agency

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0489J

FIRM
FLOOD INSURANCE RATE MAP
COOK COUNTY, ILLINOIS
AND INCORPORATED AREAS

PANEL 489 OF 832
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BEDFORD PARK, VILLAGE OF	171007	0489	J
BRIDGEVIEW, VILLAGE OF	170055	0489	J
COOK COUNTY	170054	0489	J
HODGKINS, VILLAGE OF	170106	0489	J
JUSTICE, VILLAGE OF	170112	0489	J
SUMMIT, VILLAGE OF	170167	0489	J

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.

MAP NUMBER
17031C0489J
MAP REVISED
AUGUST 19, 2008

Federal Emergency Management Agency

CHRISTOPHER B. BURKE ENGINEERING LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500

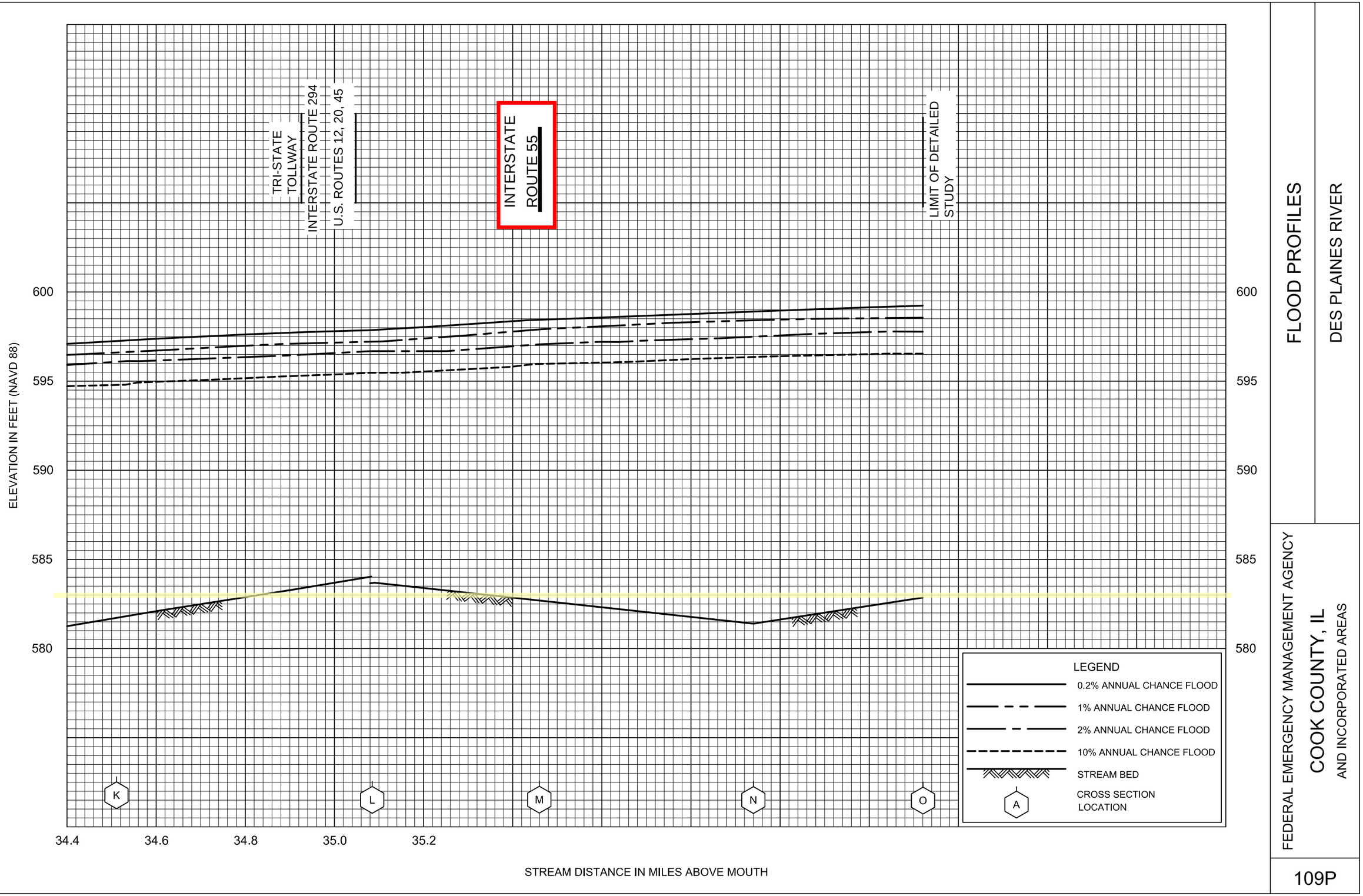
CLIENT:
ILLINOIS DEPARTMENT OF TRANSPORTATION

NO.	DATE	NATURE OF REVISION	CHKD.

DSGN.	
DWN:	MHAYES
CHKD.	
SCALE:	1:6,000
MODEL:	ArcGIS 10
PLOT DATE	9/13/2017
FILE NAME	FIRM
PATH	N:\ldot\110203.00001\GIS\Exhibits\Des Plaines River\FIRM.mxd

TITLE:
FLOOD INSURANCE RATE MAP
DES PLAINES RIVER
COOK COUNTY AND INCORPORATED AREAS
PANELS 0488, BASE MAP (FEMA), 2008

PROJ. NO.	110203.00001
DATE:	9/13/2017
SHEET	0 OF 0
DRAWING NO.	EXH 4.4b



FLOOD PROFILES

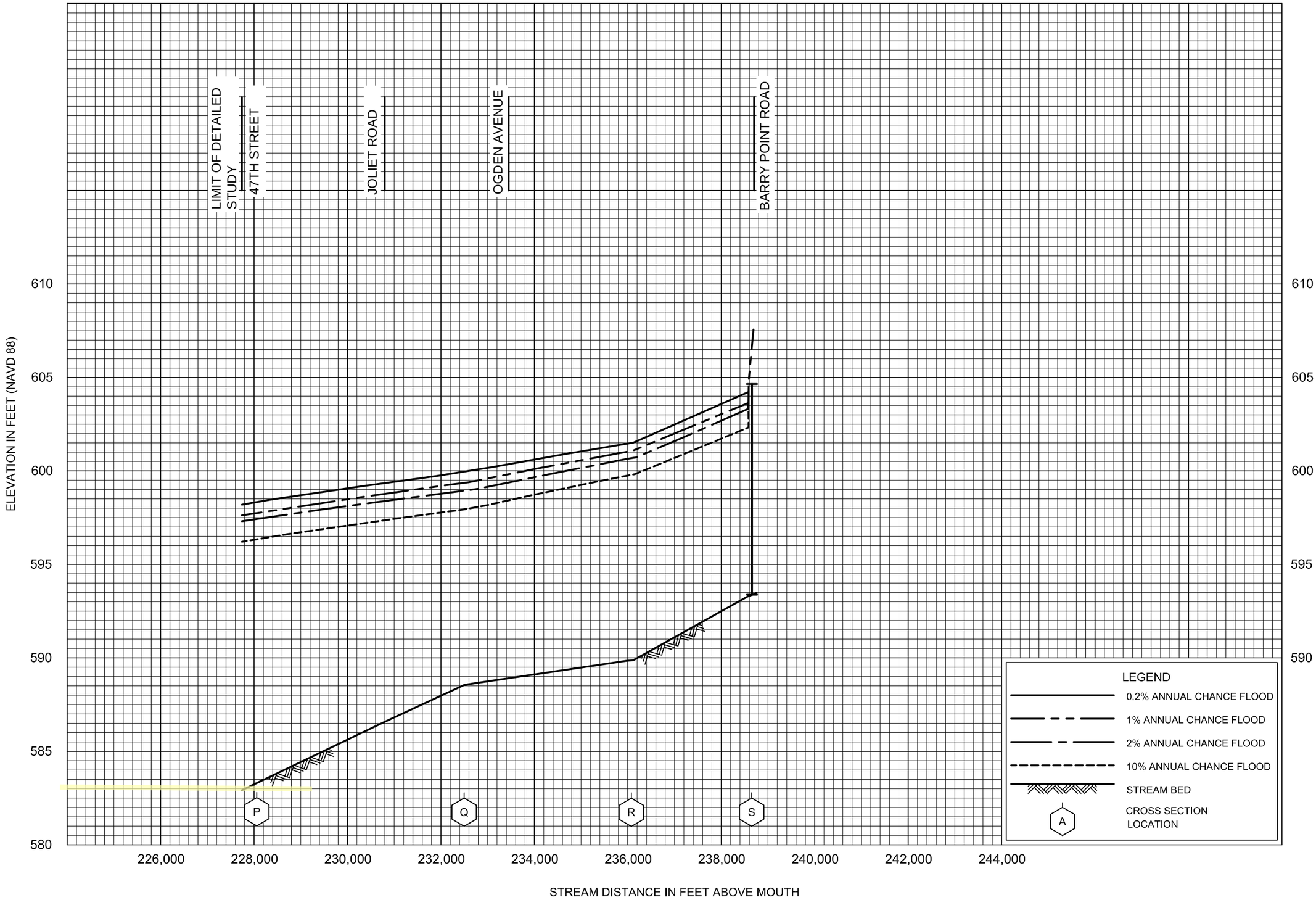
DES PLAINES RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COOK COUNTY, IL

AND INCORPORATED AREAS

109P



FLOOD PROFILES

DES PLAINES RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COOK COUNTY, IL

AND INCORPORATED AREAS

110P

Tab 5

SECTION 5

PHOTOGRAPHS

Des Plaines River, CBBEL, 7/11/2017.

Overview the Des Plaines River upstream of I-55

US-0. Looking East at upstream face of I-55 from Northwest bank

US-0 Looking Northeast from Northwest Bank

US 1000 – Looking Southeast from Northwest bank

Overview of the Des Plaines River downstream of I-55

DS-0 Looking West at downstream face of I-55 from Southeast bank

DS-1000 Looking Northwest from Southeast bank.

Tab 6

SECTION 6

HYDROLOGY

FLOOD INSURANCE STUDY

COOK COUNTY, ILLINOIS
AND INCORPORATED AREAS

Volume 1 of 5

COMMUNITY NAME	COMMUNITY NUMBER
ALSIP, VILLAGE OF	170055
ARLINGTON HEIGHTS, VILLAGE OF	170056
BARRINGTON, VILLAGE OF	170057
BARRINGTON HILLS, VILLAGE OF	170058
BARTLETT, VILLAGE OF	170059
BEDFORD PARK, VILLAGE OF	171007
BELLWOOD, VILLAGE OF	170061
BENSENVILLE, VILLAGE OF	170200
* BERKELEY, VILLAGE OF	171039
* BERWYN, CITY OF	171036
BLUE ISLAND, CITY OF	170064
BRIDGEVIEW, VILLAGE OF	170065
BROADVIEW, VILLAGE OF	170067
BROOKFIELD, VILLAGE OF	170066
BUFFALO GROVE, VILLAGE OF	170068
* BURBANK, CITY OF	170069
BURNHAM, VILLAGE OF	170070
BURR RIDGE, VILLAGE OF	170071
CALUMET CITY, CITY OF	170072
CALUMET PARK, VILLAGE OF	170073
CHICAGO CITY OF	170074
CHICAGO HEIGHTS, VILLAGE OF	170075
CHICAGO RIDGE, VILLAGE OF	170076
* CICERO, TOWN OF	170077
COOK COUNTY (UNINCORPORATED AREAS)	170054
COUNTRY CLUB HILLS, CITY OF	170078
COUNTRYSIDE, CITY OF	170079
CRESTWOOD, VILLAGE OF	170080
* DEER PARK, VILLAGE OF	171028
DEERFIELD, VILLAGE OF	170361
DES PLAINES, CITY OF	170081
DIXMOOR, VILLAGE OF	170082
DOLTON, VILLAGE OF	170083
* EAST DUNDEE, VILLAGE OF	170323
EAST HAZEL CREST, VILLAGE OF	170085
ELGIN, CITY OF	170087
ELK GROVE VILLAGE, VILLAGE OF	170088
* ELMHURST, CITY OF	170205
ELMWOOD PARK, VILLAGE OF	170089
EVANSTON, CITY OF	170090
* EVERGREEN PARK, VILLAGE OF	170733
FLOSSMOOR, VILLAGE OF	170091
FORD HEIGHTS, VILLAGE OF	170084
FOREST PARK, VILLAGE OF	170092
FOREST VIEW, VILLAGE OF	170093
* FRANKFORT, VILLAGE OF	170701
FRANKLIN PARK, VILLAGE OF	170094
GLENCOE, VILLAGE OF	170095
GLENVIEW, VILLAGE OF	170096
GLENWOOD, VILLAGE OF	170097
GOLF, VILLAGE OF	170098
HANOVER PARK, VILLAGE OF	170099
HARVEY, CITY OF	170100
* HARWOOD HEIGHTS, VILLAGE OF	170101
HAZEL CREST, VILLAGE OF	170102
HICKORY HILLS, CITY OF	170103
HILLSIDE, VILLAGE OF	170104
HINSDALE, VILLAGE OF	170105
HODGKINS, VILLAGE OF	170106
HOFFMAN ESTATES, VILLAGE OF	170107
* HOMETOWN, CITY OF	171040
HOMEWOOD, VILLAGE OF	170109
INDIAN HEAD PARK, VILLAGE OF	170110
INVERNESS, VILLAGE OF	170111
JUSTICE, VILLAGE OF	170112
KENILWORTH, VILLAGE OF	170113
LA GRANGE, VILLAGE OF	170114
LA GRANGE PARK, VILLAGE OF	170115
LANSING, VILLAGE OF	170116
LEMONT, VILLAGE OF	170117
LINCOLNWOOD, VILLAGE OF	171001
LYNWOOD, VILLAGE OF	170119
LYONS, VILLAGE OF	170120
MARKHAM, CITY OF	175169
MATTESON, VILLAGE OF	170123
MAYWOOD, VILLAGE OF	170124
MCCOOK, VILLAGE OF	170121
MELROSE PARK, VILLAGE OF	170125
MERRIONETTE PARK, VILLAGE OF	170126
MIDLOTHIAN, VILLAGE OF	170127
MORTON GROVE, VILLAGE OF	170128
MOUNT PROSPECT, VILLAGE OF	170129
NILES, VILLAGE OF	170130
* NORRIDGE, VILLAGE OF	170131
NORTH RIVERSIDE, VILLAGE OF	170135
NORTHBROOK, VILLAG EOF	170132
NORTHFIELD, VILLAGE OF	170133
NORTHLAKE, CITY OF	170134
* OAKBROOK, VILLAGE OF	170214
OAK FOREST, CITY OF	170136
OAK LAWN, VILLAGE OF	170137
* OAK PARK, VILLAGE OF	171037
OLYMPIA FIELDS, VILLAGE OF	170139
ORLAND HILLS, VILLAGE OF	170172
ORLAND PARK, VILLAGE OF	170140
PALATINE, VILLAGE OF	175170
PALOS HEIGHTS, CITY OF	170142
PALOS HILLS, CITY OF	170143
PALOS PARK, VILLAGE OF	170144
PARK FOREST, VILLAGE OF	170145
PARK RIDGE, CITY OF	170146
* PHOENIX, CITY OF	170147
POSEN, VILLAGE OF	170148
PROSPECT HEIGHTS, CITY OF	170919
RICHTON PARK, VILLAGE OF	170149
RIVER FOREST, VILLAGE OF	170151
RIVER GROVE, VILLAGE OF	170152
RIVERDALE, VILLAGE OF	170150
RIVERSIDE VILLAGE OF	170153
ROBBINS, VILLAGE OF	170154
ROLLING MEADOWS, CITY OF	170155
* ROSELLE, VILLAGE OF	170216
ROSEMONT, VILLAGE OF	170156
SAUK VILLAGE, VILLAGE OF	170157
SCHAUMBURG, VILLAGE OF	170158
SCHILLER PARK, VILLAGE OF	170159
SKOKIE, VILLAGE OF	171000
SOUTH BARRINGTON, VILLAGE OF	170161
SOUTH CHICAGO HEIGHTS, VILLAGE OF	170162
SOUTH HOLLAND, VILLAGE OF	170163
STEGER, VILLAGE OF	170713
STICKNEY, VILLAGE OF	170164
STONE PARK, VILLAGE OF	170165
STREAMWOOD, VILLAGE OF	170166
SUMMIT, VILLAGE OF	170167
THORNTON, VILLAGE OF	170168
TINLEY PARK, VILLAGE OF	170169
UNIVERSITY PARK, VILLAGE OF	170708
WESTCHESTER, VILLAGE OF	170170
WESTERN SPRINGS, VILLAGE OF	170171
WHEELING, VILLAGE OF	170173
WILLOW SPRINGS, VILLAGE OF	170174
WILMETTE, VILLAGE OF	170175
WINNETKA, VILLAGE OF	170176
WORTH, VILLAGE OF	170177

* NO SPECIAL FLOOD HAZARD AREAS IDENTIFIED WITHIN COOK COUNTY

REVISED: AUGUST 19, 2008

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
17031CV001G

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the Community Map Repository. It is advisable to contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this FIS report at any time. In addition, FEMA may revise part of this FIS by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the Community Map Repository to obtain the most current FIS components.

Initial Countywide FIS Effective Date: November 6, 2000

Revised FIS Report Dates: December 20, 2002
February 4, 2004
June 2, 2005
November 16, 2006
April 16, 2007
August 19, 2008

	September 1976. The revised analyses for the FIS report dated February 15, 1985 (Reference 51) were performed by the SCS, and reviewed and accepted by FEMA.
Hazel Crest, village of:	The hydrologic and hydraulic analyses for the FIS dated June 1980 (Reference 52) were performed by the SCS for the FIA, under Inter-Agency Agreement No. IAA-H-4-73, Project Order No. 11. The FIS was subsequently revised by Dewberry, Nealon and Davis in April 1980 due to appeals filed by community officials.
Hickory Hills, city of:	The hydrologic and hydraulic analyses for the FIS dated January 1980 (Reference 53) were performed by Harris-Toups Associates for the FIA, under Contract No. H-4564. That work was completed in December 1978.
Hinsdale, village of:	The hydrologic and hydraulic analyses for the FIS dated July 16, 1980 (Reference 54) were performed by Harza Engineering Company for the FIA, under Contract No. H-4562. This study was completed in February 1979.
Hodgkins, village of:	The hydrologic and hydraulic analyses for the FIS dated March 1979 (Reference 55) were performed by Harza Engineering Company for the FIA, under Contract No. H-3978. That work was completed in August 1977.
Hoffman Estates, village of:	The hydrologic and hydraulic analyses for the FIS dated May 19, 1984, were performed by Harza Engineering Company for the FIA, under Contract No. H-4562. That work was completed in June 1979. The revised analyses for the FIS dated November 20, 1991 (Reference 56) were performed by Harza Engineering Company, and reviewed and accepted by FEMA.
Homewood, village of:	The hydrologic and hydraulic analyses for the FIS dated January 18, 1984 (Reference 57) were performed by the SCS for FEMA, under Inter-Agency Agreement No. IAA-H-4-73, Project Order No. 11.

Table 5 – Limits of Detailed Study for Cook County (Continued)

Flooding Source	Limits of Detailed Study
Crystal Creek	From the confluence with Des Plaines River to 12,375 feet above confluence with Des Plaines River (approximately 1,000 feet above Lawrence Avenue)
Crystal Creek Tributary	From the confluence with Crystal Creek to 6,000 feet above confluence with Crystal Creek (approximately 450 feet above Manheim Road)
Deer Creek	From the mouth at Thorn Creek to 41,110 feet above the mouth at Thorn Creek (Steger Road)
Deer Creek Tributary B	From the mouth at Deer Creek to 14,600 feet above the mouth at Deer Creek approximately 1,330 feet above Cottage Grove Avenue)
Des Plaines River	From 28.4 miles above the mouth at the Illinois River to 36.32 miles above the mouth at the Illinois River (approximately 4,540 above Interstate Route 55), and 227,700 feet above the mouth at the Illinois River to 403,300 feet above mouth at the Illinois River (Lake – Cook Road, Lake/Cook County Boundary)
Des Plaines River Tributary A	From Brainard Avenue to 5,015 feet above Brainard Avenue (approximately 1,275 feet above 55th Place)
Dixie Creek	From Dixie Highway to 4,750 feet above Dixie Highway (approximately 1,250 feet above Interstate Route 294)
DuPage River West Branch	From the Cook-DuPage County Boundary 58.07 miles above the mouth of the DuPage River at the Des Plaines River (approximately .55 miles below Walnut Avenue) to 326,700 feet above mouth of the DuPage River at the Des Plaines River (approximately 490 feet above Bradford Lane)
East Avenue Ditch	From 9,500 feet above mouth at Des Plaines River to 14,225 feet above mouth at Des Plaines River (La Grange Road)

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods affecting the community.

Pre-countywide FISs

Each incorporated community within or partially within, and the unincorporated areas of, Cook County, with the exceptions for the cities of Burbank, Evanston, Hometown, and Park Ridge; and the villages of Barrington Hills, Bedford Park, Berkeley, Berwyn, Calumet Park, Deer Park, East Hazel Crest, Evergreen Park, Forest Park, Forest View, Harwood Heights, Hillside, Kenilworth, La Grange, Lincolnwood, McCook, Merrionette Park, Oak Park, Park Ridge, Phoenix, Posen, Skokie, South Chicago Heights, Steger, Stickney, Summit, Willmette, and Worth; and the town of Cicero has a previously printed FIS report. The hydrologic analyses described in those reports have been compiled and are summarized below.

For Buffalo Creek in Buffalo Grove, the SCS completed a comprehensive flood management study in conjunction with the Des Plaines River Steering Committee (Reference 140). Harza Engineering Company prepared hydrologic analyses which provided an independent review of the suitability of the SCS results.

For the Des Plaines River watershed, the discharges resulting from hydrologic analyses by the USGS for the Des Plaines River in the villages of Willow Springs and Hodgkins, together with the certified discharges computed by the ISWS at two locations in Joliet were used to plot discharge-drainage area curves along the Des Plaines River (Reference 141). With known drainage areas, discharges for the studies of the villages were obtained from these curves. In the village of Lyons, a diversion structure, which diverts floodwater from Salt Creek to the Des Plains River, is located approximately four miles downstream from the Western Springs gaging station. The discharges for Salt Creek were checked using the SCS rating curve at the diversion structure to subtract discharges diverted to the Des Plaines River. Due to spillage from the Salt Creek watershed, the 100- and 500-year discharges along Buffalo Creek Tributary A were adjusted; the spillage does not occur during the 10- and 50-year floods.

For the reach downstream of Touhy Avenue, discharges for the Chicago River, North Branch were assumed to be equal to the discharges at Touhy Avenue due to the small increase in drainage area.

In Harvey, Dixie Creek receives 500 cfs at Dixie Highway for the 1-percent-annual-chance discharge. A 60-inch pipe is used to divert the discharge of Dixie Creek into the Little Calumet River. This storm sewer pipe was not designed to pass the 1-percent-annual-chance flood discharge as an open channel flow; therefore, Dixie Creek is contributing overland flow to the floodplain. A 1-percent-annual-chance, 24-hour rainfall was obtained from TP-40 and a curve number was assumed (Reference 142). TR-55 yielded a runoff amount (Reference 143). A triangular hydrograph was developed and the base flow was subtracted as a result of the storm

Table 13 - Hydrologic Methodologies (Continued)

Stream	Community	Method(s)	Gage No(s).
Deer Creek	Glenview, Cook County Ford Heights, Sauk Village, Steger	TR-20 (l-PTIII, RE73)	near Chicago Heights (05536235)
Deer Creek Tributary B	Cook County, Sauk Village, Steger	RE73, RE75	
Des Plaines River	Willow Springs, Hodgkins	l-PTIII	Riverside (05532500)
	Lyons, Brookfield, Riverside Riverside, Lyons, North Riverside, Cook County, Forest Park, Maywood, River Forest, Melrose Park, Elmwood Park, River Grove, Chicago, Franklin Park, Schiller Park, Rosemont, Des Plaines, Park Ridge, Mount Prospect, Prospect Heights,	l-PTIII	Riverside (05532500)

Table 14 - Summary of Discharges (Continued)

Flooding Source and Location	*Drainage Area (square miles)*	*Peak Discharges (cubic feet per second)* 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Deer Creek Tributary B					
At a point approximately 1,800 feet upstream of confluence with Deer Creek	2.9	350	600	776	1,100
At Cottage Grove Avenue	2.3	300	520	675	970
Des Plaines River					
At Interstate Route 55	650.0	6,000	7,500	8,400	9,300
At the Tri-State Tollway	650.0	6,000	7,500	8,400	9,300
At 47th Street	632.0	5,930	7,370	7,900	9,000
At Ogden Avenue	630.8	5,923	7,363	7,895	8,990
At a point approximately 500 feet upstream of Hoffman Dam	629.3	5,833	7,203	7,706	8,883
At a point approximately 1,000 feet downstream of 31st Street	484.5	5,139	6,272	6,692	7,510
At a point approximately 1,800 feet downstream of Chicago Avenue	459.8	4,990	6,100	6,508	7,286
At a point approximately 3,000 feet downstream of Kennedy Expressway	419.4	4,487	5,765	6,223	7,144
At Algonquin Road	382.1	4,385	5,728	6,193	7,256
At a point approximately 1,600 feet upstream of Golf Road	362.7	4,226	5,577	6,161	7,395
At a point approximately 1,300 feet downstream of Palatine Road	357.6	4,322	5,780	6,308	7,470
At a point approximately 1,600 feet downstream of Dundee Road	326.5	3,727	5,367	6,018	7,511
Des Plaines River Tributary A					
At Brainard Avenue	1.0	120	220	290	415
Dixie Creek					
At Dixie Highway	1.2	66	100	135	250
DuPage River West Branch					
At Irving Park Road	4.5	322	594	807	1,150
East Avenue Ditch					
600 feet downstream of East Avenue Culvert	1.2	402	694	864	1,231
2,015 feet upstream of 58th Street	0.2	190	334	414	595

* Data not available

Table 16 - Hydraulic Methodologies (Continued)

Stream	Community	Method	Starting Water-Surface Elevation
Des Plaines River	Willow Springs, Hodgkins	HEC-2	slope/area method
	Lyons, Brookfield, Riverside, Lyons, North Riverside, Cook County, Forest Park, Maywood, River Forest, Melrose Park, Elmwood Park, River Grove, Chicago, Franklin Park, Schiller Park, Rosemont, Des Plaines, Park Ridge, Mount Prospect, Prospect Heights, Wheeling	WSP-2	slope/area method
		HEC-2	discharge rating curves at Hoffman Dam
Des Plaines River Tributary A	Cook County	WSP-2	discharge rating at outlet culvert
Dixie Creek	Harvey, Markham	WSP-2	stage-storage-discharge curve at Dixie Highway
DuPage River West Branch	Hanover Park	HEC-2	USACE report (Reference 174)
	Schaumburg	HEC-2	
East Avenue Ditch	Countryside McCook	WSP-2	slope/area method

Table 17 - Manning's "n" Values (Continued)

Stream	Channel "n"	Overbank "n"
Butterfield Creek Tributary No. 4	0.03-0.06	0.04-0.07
Calumet Sag Channel Tributary A	0.035-0.085	0.035-0.055
Calumet Sag Channel Tributary AA	0.055	0.045
Calumet Sag Channel Tributary B	0.050-0.075	0.045-0.055
Calumet Sag Channel Tributary C	0.032-0.080	0.030-0.055
Calumet Union Drainage Ditch	0.018-0.08	0.015-0.05
Calumet Union Drainage Ditch Southwest Branch	0.02-0.50	0.02-0.035
Calumet Union Drainage Ditch Southwest Branch Tributary N	0.04-0.06	0.030-0.055
Calumet Union Drainage Ditch Southwest Branch Tributary S	0.04-0.09	0.022-0.06
Cherry Creek	0.025-0.075	0.05-0.1
Cherry Creek East Branch	0.02-0.085	0.02-0.035
Cherry Creek East Branch Tributary	0.020-0.080	0.035-0.040
Cherry Creek West Branch	0.025-0.075	0.05-0.1
Cherry Creek West Branch East Fork	0.05-0.095	0.04-0.075
Chicago River, North Branch - Skokie River	0.035-0.10	0.035-0.056
Skokie River (upstream of Willow Road)	0.04-0.056	0.048-0.065
Chicago River, North Branch, Middle Fork	0.020-0.080	0.035-0.065
Chicago River, North Branch, West Fork	0.040-0.080	0.045-0.125
Crestwood Drainage Ditch West	0.050-0.078	0.030-0.045
Crystal Creek	0.02-0.11	0.015-0.04
Crystal Creek Tributary	0.04-0.11	0.015-0.05
Deer Creek	0.040-0.085	0.040-0.060
Deer Creek Tributary B	0.045-0.070	0.050-0.055
Des Plaines River	0.10-0.48	0.025-0.040
Des Plaines River Tributary A	0.03	0.020-0.030
Dixie Creek	0.07-0.08	0.05-0.065
DuPage River West Branch	0.070-0.100	0.035-0.05
East Avenue Ditch	0.047-0.060	0.038-0.050
East Avenue Ditch Tributary	0.047-0.060	0.037-0.040
Farmer's Creek	0.020-0.100	0.020-1.0
Elk Grove Boulevard Drainage Ditch	None	None
Farrington Ditch	0.025-0.070	0.030-0.070

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE (FEET)
Des Plaines River								
A	29.25[23]	1,154	8,581	1.0	593.8	593.8	593.9	0.1
B	29.75[23]	1,020	7,531	1.2	593.9	593.9	594.0	0.1
C	30.25[23]	1,256	7,388	1.2	594.0	594.0	594.1	0.1
D	30.75[23]	705	4,718	1.8	594.2	594.2	594.3	0.1
E	31.25[23]	696	5,468	1.5	594.3	594.3	594.4	0.1
F	32.59[23]	1,012[37]/1,005	6,524	1.3	595.0	595.0	595.1	0.1
G	32.85[23]	663[37]/959	5,162	1.6	595.2	595.2	595.3	0.1
H	33.08[23]	667	5,249	1.6	595.2	595.2	595.3	0.1
I	33.58[23]	447	4,453	1.9	595.7	595.7	595.8	0.1
J	33.99[23]	504	5,009	1.7	596.1	596.1	596.2	0.1
K	34.51[23]	376	3,985	2.1	596.6	596.6	596.7	0.1
L	35.09[23]	267	2,981	2.8	597.4	597.4	597.5	0.1
M	35.46[23]	285	3,421	2.5	598.0	598.0	598.1	0.1
N	35.84[23]	319	3,955	2.1	598.5	598.5	598.6	0.1
O	36.32[23]	413	5,291	1.6	598.8	598.8	598.9	0.1
P	228,050[4]	658	5,119	1.5	597.7	597.7	597.8	0.1
Q	232,500[4]	602	3,008	2.6	599.4	599.4	599.5	0.1
R	236,064[4]	740	3,703	2.1	601.0	601.0	601.1	0.1
S	238,630[4]	280	1,511	5.2	603.6	603.6	603.7	0.1
T	238,808[4]	405	3,109	2.9	609.9	609.9	609.9	0.0
U	241,618[4]	371	1,704	5.3	611.6	611.6	611.7	0.1
V	244,228[4]	518	3,864	2.0	613.7	613.7	613.8	0.1
W	246,754[4]	895	5,685	1.4	615.2	615.2	615.3	0.1

[4] Feet above mouth

[23] Miles above mouth

[37] Width extends beyond the county boundary. Width in county/Full floodway width

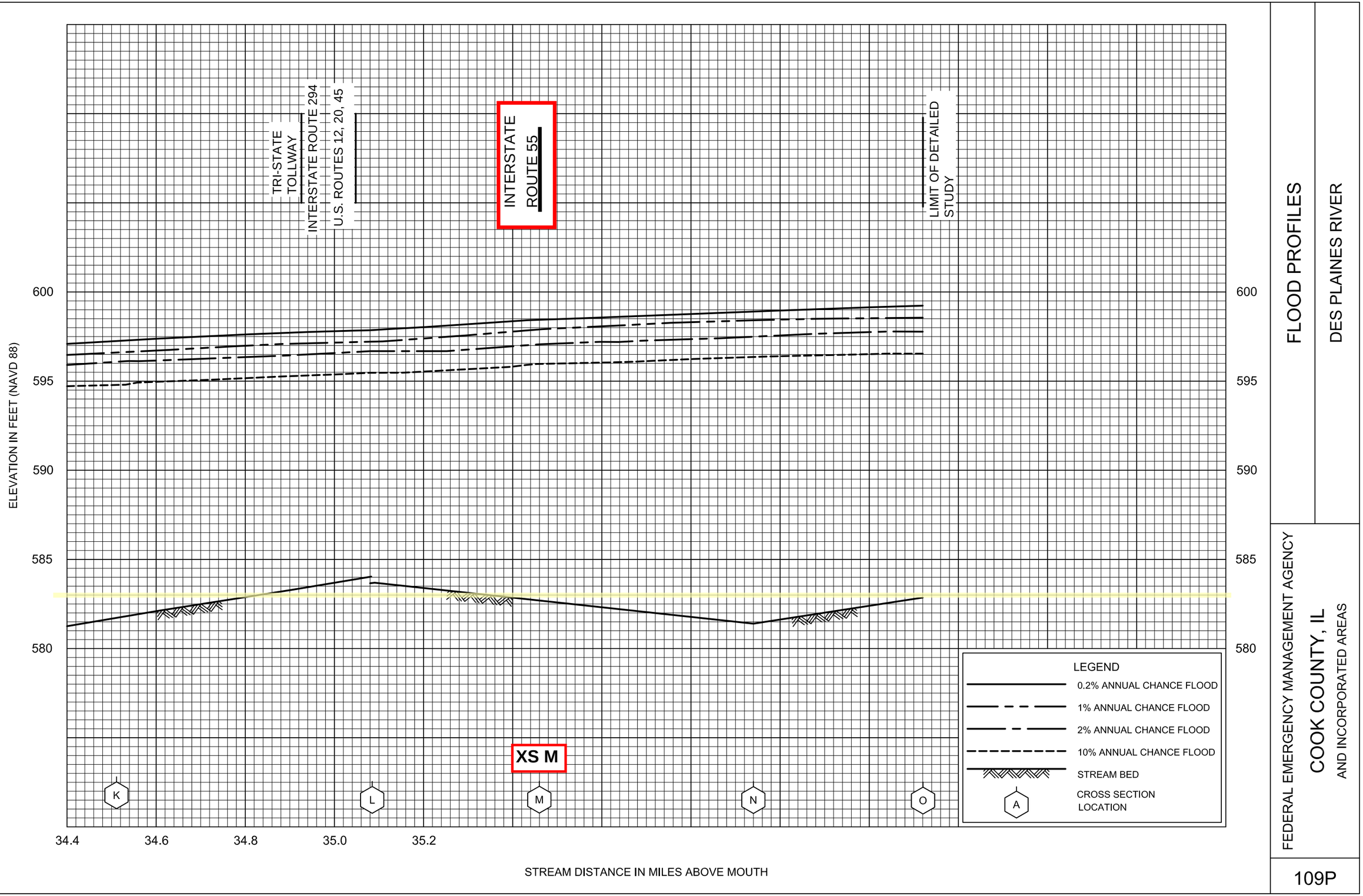
TABLE 19

FEDERAL EMERGENCY MANAGEMENT AGENCY

COOK COUNTY, IL AND INCORPORATED AREAS

FLOODWAY DATA

DES PLAINES RIVER



FLOOD PROFILES

DES PLAINES RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COOK COUNTY, IL

AND INCORPORATED AREAS

109P

Tab 7

SECTION 7

STREAMBED PROFILE

PLAN
SURVEYED
PLOTTED
NOTE BOOK
NO.
ALIGNMENT CHECKED
R.T. OF WAY CHECKED
ROAD FILE NAME
BY
DATE

PROFILE
SURVEYED
PLOTTED
NOTE BOOK
NO.
GRADES CHECKED
BAR. NOTED
STRUCTURE NOTATNS CHKD
BY
DATE

645
640
635
630
625
620
615
610
605
600
595
590
585
580
575
570
565
560

EOP EL. = 629.40
LOW BEAM EL. = 624.38
INTERSTATE 55
SN: 016-2704
LOW EOP EL. = 620.50
LOW BEAM EL. = 615.22

SURVEYED NORMAL WATER EL. (06/17) = 588.07
XS 6.8
583.31 34+37
SURVEYED NORMAL WATER EL. (06/17) = 588.19
XS 7.25
582.92 37+50
583.48 40+65
SURVEYED NORMAL WATER EL. (06/17) = 588.32
XS 7.40
583.68 44+53
583.68 45+50
583.18 48+48
SURVEYED NORMAL WATER EL. (06/17) = 588.21
XS 7.55
583.18 49+87
SURVEYED NORMAL WATER EL. (06/17) = 588.22
XS 7.7
582.89 53+21
SURVEYED NORMAL WATER EL. (06/17) = 588.00
XS 7.85
580.58 58+08

583.35 583.35 583.33 583.32 583.31 583.24 583.11 582.94 583.36 583.53 583.52 583.50 583.95 583.94 583.92 583.77 583.54 583.45 583.36 583.68 583.22 584.23 583.78 583.75 584.22 584.04 581.57 581.09 580.62 580.61 580.65

3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 4600 4700 4800 4900 5000 5100 5200 5300 5400 5500 5600 5700 5800 5900 6000

ROUTE INTERSTATE 55
SECTION P91-762-10
WATERCOURSE I55 OVER DES PLAINES RIVER
EXISTING S.N. 016-2704
SCALE: 1'' = 200' H; 1'' = 10' V
PLOTTED BY: WBL DATE: 8/21/2018
CHECKED BY: IAD DATE: 8/21/2018
SURVEY DATE: JUNE, 2017

FILE NAME = N:\ldot\110203.00001\CADD_Sheets\P1110203-sht-drnprf01_DesPlainesRiv.dgn	USER NAME = edburke	DESIGNED - FDM	REVISED -
		DRAWN - MYG	REVISED -
	PLOT SCALE = 200.0000 ' / in.	CHECKED - IAD	REVISED -
Default	PLOT DATE = 8/21/2018	DATE - 8/21/2018	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

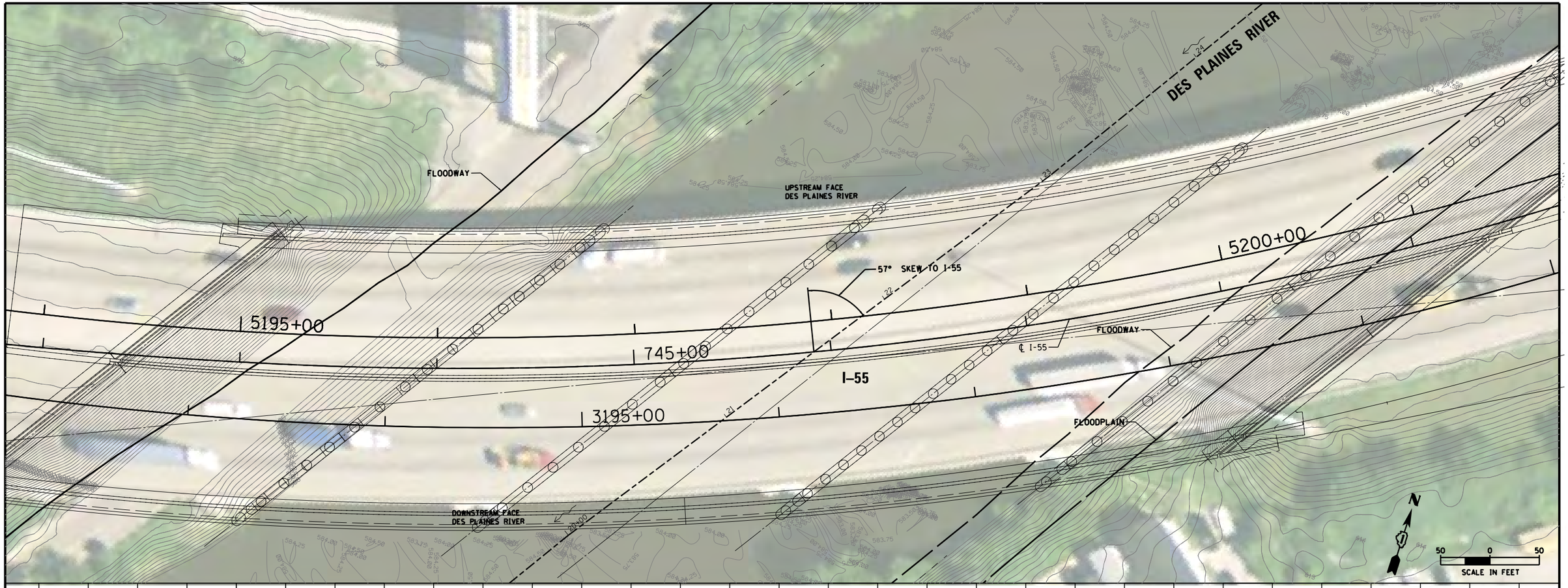
PROFILE
DES PLAINES RIVER
SCALE: | SHEET OF SHEETS | STA. TO STA.

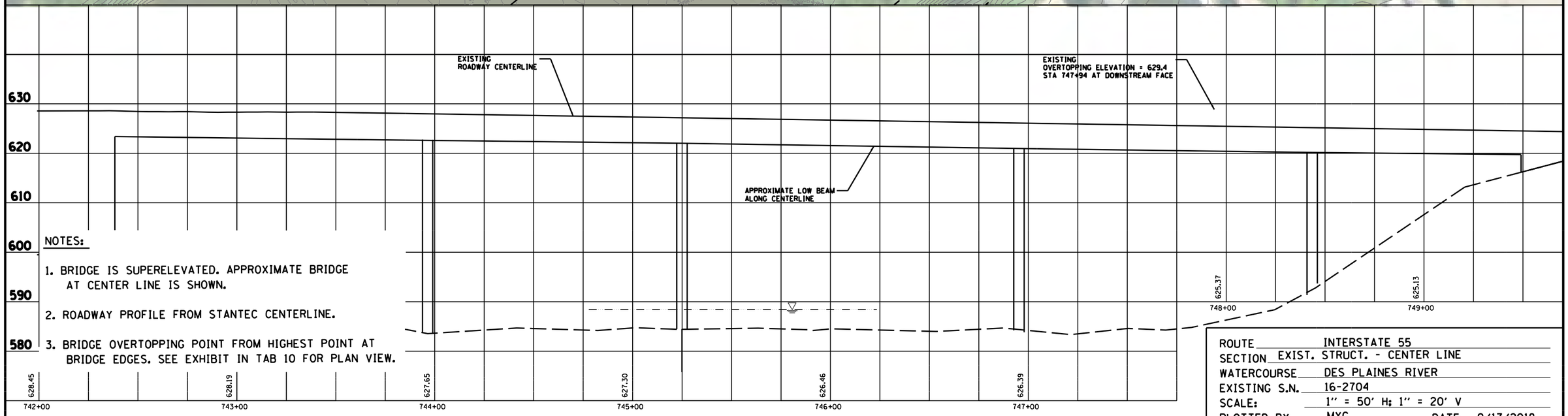
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			$TOT	
			CONTRACT NO.	
		ILLINOIS	FED. AID PROJECT	

TAB 8

SECTION 8

ROADWAY PLAN AND PROFILE



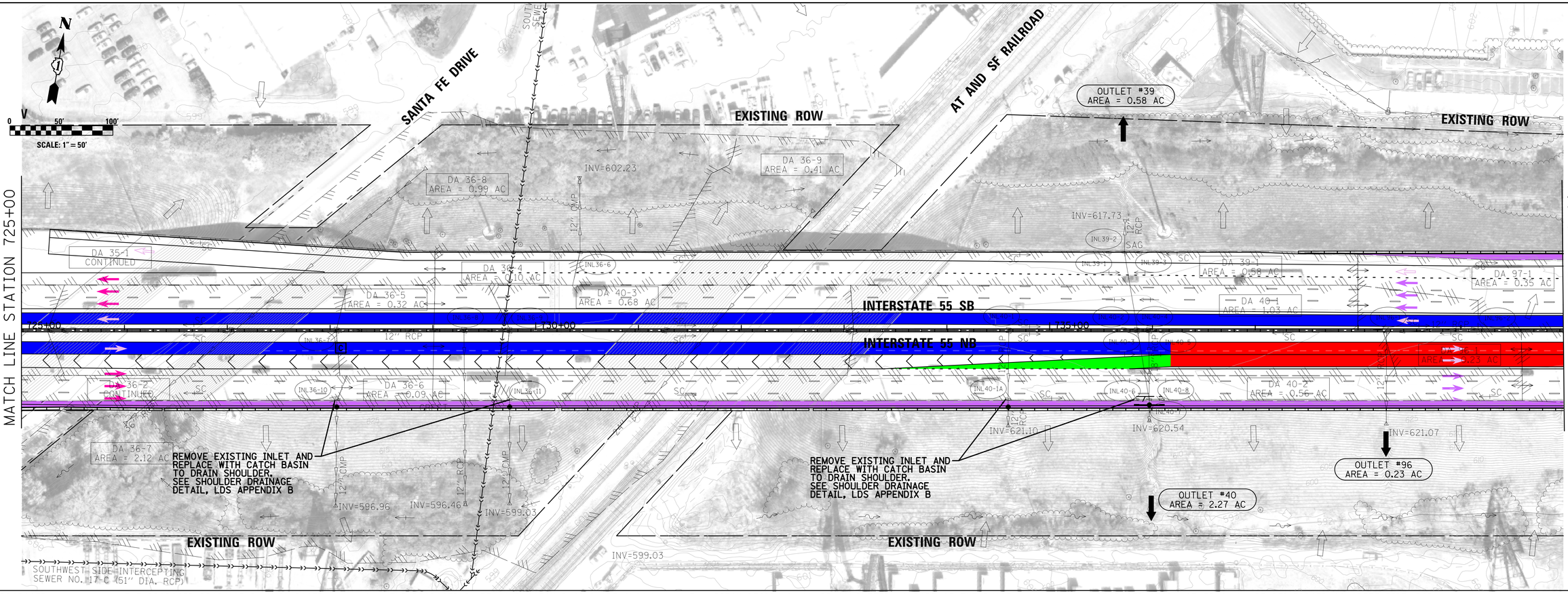


NOTES:

1. BRIDGE IS SUPERELEVATED. APPROXIMATE BRIDGE AT CENTER LINE IS SHOWN.
2. ROADWAY PROFILE FROM STANTEC CENTERLINE.
3. BRIDGE OVERTOPPING POINT FROM HIGHEST POINT AT BRIDGE EDGES. SEE EXHIBIT IN TAB 10 FOR PLAN VIEW.

ROUTE	INTERSTATE 55
SECTION	EXIST. STRUCT. - CENTER LINE
WATERCOURSE	DES PLAINES RIVER
EXISTING S.N.	16-2704
SCALE:	1" = 50' H; 1" = 20' V
PLOTTED BY:	MYG DATE: 9/17/2018
CHECKED BY:	IAD DATE: 9/17/2018
SURVEY DATE:	06-27-2017

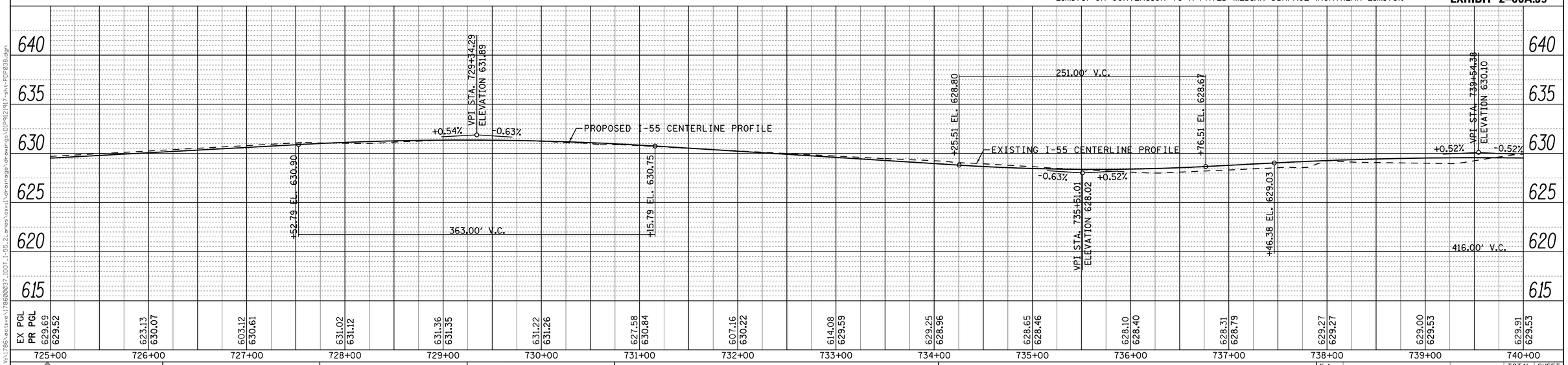
FILE NAME = N:\dot\110203.00001\CADD\Sheets\P1110203-sht-detail_I55_DesRiv_US - P&P.dgn



PROPOSED DRAINAGE NOTES:

1. THE PROPOSED DRAINAGE PLAN IS BASED ON AVAILABLE SURVEYED UTILITY DATA. ADJUST THE LOCATION AND SIZE OF IMPROVEMENTS, IF NECESSARY, DURING THE PHASE II DESIGN TO AVOID OR MINIMIZE UTILITY CONFLICTS.
2. THE PROPOSED INLETS AND CATCH BASINS ARE SHOWN AS CONCEPTUAL. ACTUAL INLET SPACING WILL BE CONDUCTED AS PART OF THE PHASE II DESIGN. INLET SPACING SHALL BE BASED ON A 10-YEAR DESIGN AND SPREAD WILL BE LIMITED TO THE SHOULDER.
3. DITCH DESIGN SHALL BE COMPLETED AS PART OF THE PHASE II DESIGN. DITCHES SHALL BE AT LEAST 3-FT DEEP AND BE SIZED FOR THE 50-YEAR DESIGN. DITCHES SHALL PROVIDE 1-FT OF FREEBOARD BETWEEN THE 50-YEAR WATER SURFACE ELEVATION AT THE EDGE OF SHOULDER.
4. ALL PROPOSED STORM SEWER SHALL BE REINFORCED CONCRETE PIPE (RCP), UNLESS OTHERWISE NOTED.
5. THE RIM ELEVATION OF EXISTING STRUCTURES LOCATED IN THE MEDIAN SHALL BE ADJUSTED TO MATCH THE REVISED SHOULDER CROSS SLOPE (SOUTHERN LIMITS) OR CONVERSION TO A PAVED MEDIAN SURFACE (NORTHERN LIMITS).

EXHIBIT 2–00A.39



I-55 MANAGED LANE PROJECT	USER NAME = dbook	DESIGNED – DJB	REVISED –	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	I-55 MANAGED LANE STUDY 2 X 2 MANAGED LANES – PROPOSED DRAINAGE PLAN
		DRAWN – STANTEC	REVISED –		
	PLOT SCALE = 50.0000 ' / in.	CHECKED – JVO	REVISED –		
	PLOT DATE = 9/14/2018	DATE – 9/14/2018	REVISED –		SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	85	39
		CONTRACT NO. #CONTRACT		
		ILLINOIS FED. AID PROJECT		

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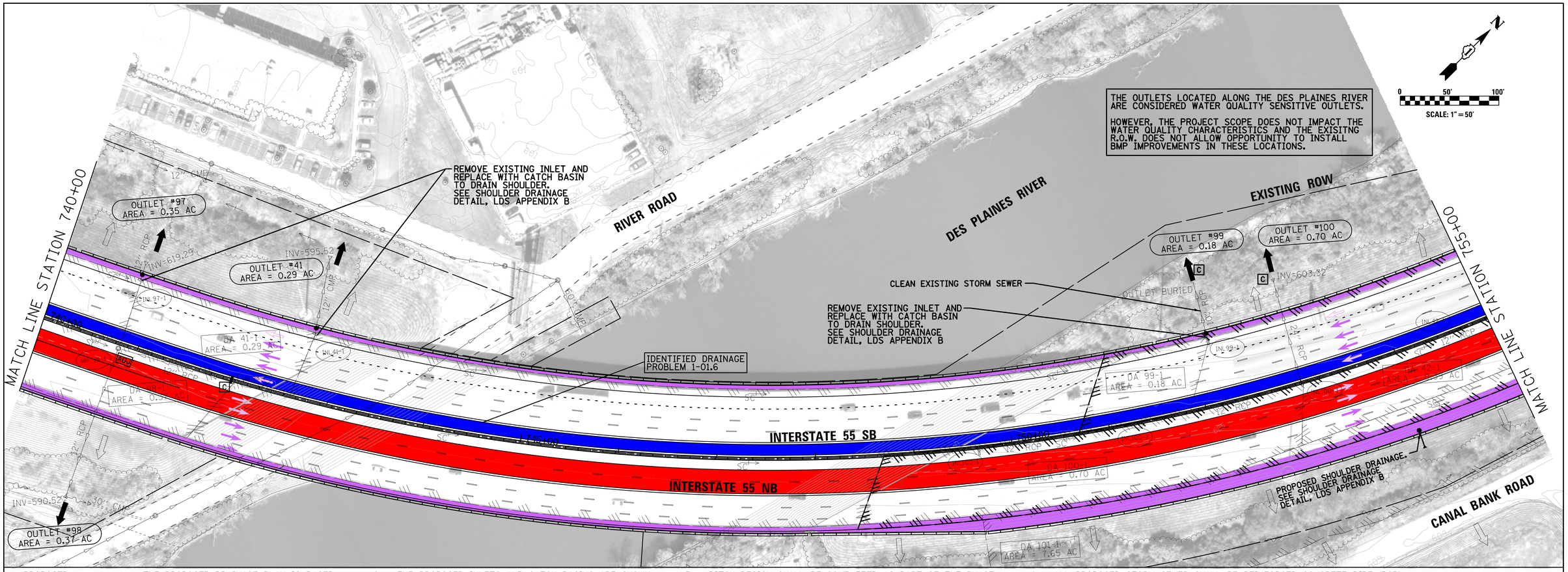
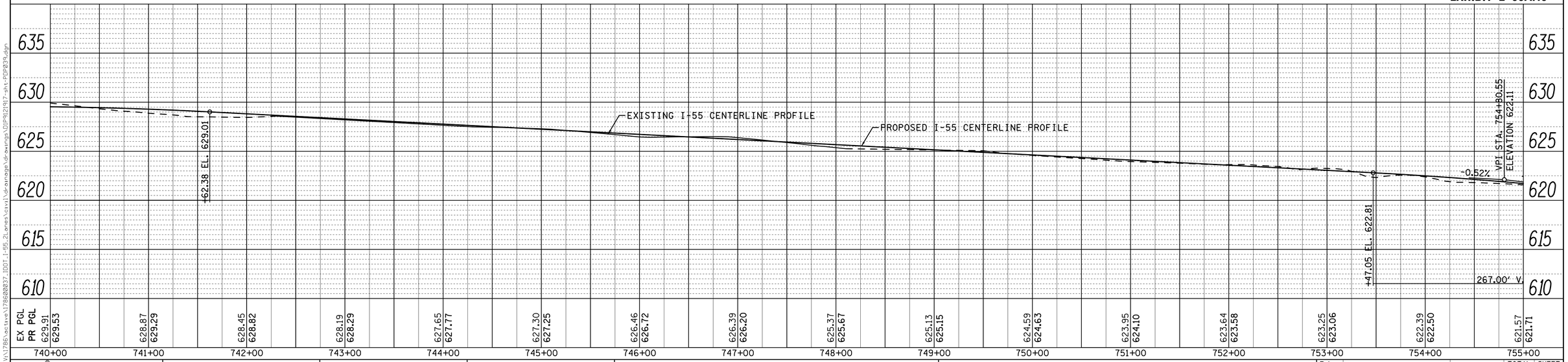


PROPOSED DRAINAGE NOTES:

1. THE PROPOSED DRAINAGE PLAN IS BASED ON AVAILABLE SURVEYED UTILITY DATA. ADJUST THE LOCATION AND SIZE OF IMPROVEMENTS, IF NECESSARY, DURING THE PHASE II DESIGN TO AVOID OR MINIMIZE UTILITY CONFLICTS.
2. THE PROPOSED INLETS AND CATCH BASINS ARE SHOWN AS CONCEPTUAL. ACTUAL INLET SPACING WILL BE CONDUCTED AS PART OF THE PHASE II DESIGN. INLET SPACING SHALL BE BASED ON A 10-YEAR DESIGN AND SPREAD WILL BE LIMITED TO THE SHOULDER.
3. DITCH DESIGN SHALL BE COMPLETED AS PART OF THE PHASE II DESIGN. DITCHES SHALL BE AT LEAST 3-FT DEEP AND BE SIZED FOR THE 50-YEAR DESIGN. DITCHES SHALL PROVIDE 1-FT OF FREEBOARD BETWEEN THE 50-YEAR WATER SURFACE ELEVATION AT THE EDGE OF SHOULDER.
4. ALL PROPOSED STORM SEWER SHALL BE REINFORCED CONCRETE PIPE (RCP), UNLESS OTHERWISE NOTED.
5. THE RIM ELEVATION OF EXISTING STRUCTURES LOCATED IN THE MEDIAN SHALL BE ADJUSTED TO MATCH THE REVISED SHOULDER CROSS SLOPE (SOUTHERN LIMITS) OR CONVERSION TO A PAVED MEDIAN SURFACE (NORTHERN LIMITS).

EXHIBIT 2–00A.40



I-55 MANAGED LANE PROJECT	USER NAME = dbook	DESIGNED - DJB	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	I-55 MANAGED LANE STUDY 2 X 2 MANAGED LANES – PROPOSED DRAINAGE PLAN
		DRAWN - STANTEC	REVISED -		
	PLOT SCALE = 50.0000 ' / in.	CHECKED - JVO	REVISED -		SCALE: SHEET OF SHEETS STA. TO STA.
	PLOT DATE = 9/14/2018	DATE - 9/14/2018	REVISED -		

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	85	40
		CONTRACT NO. *CONTRACT		
		ILLINOIS FED. AID PROJECT		

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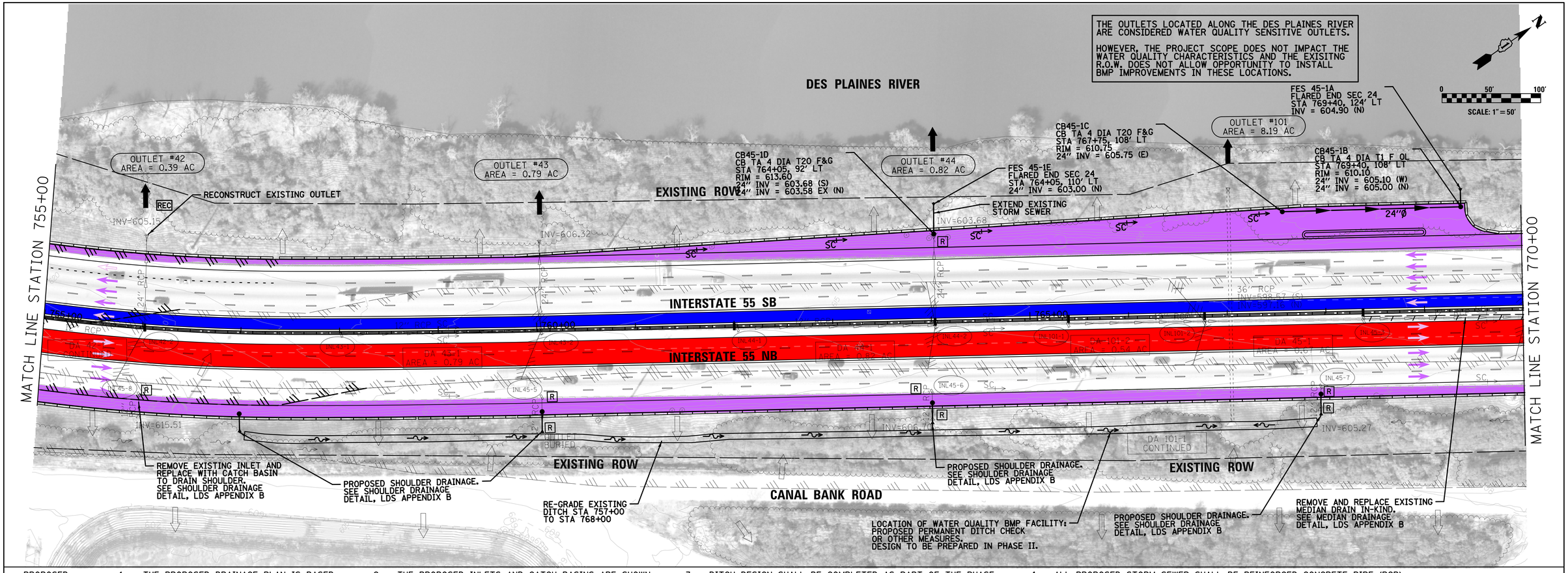
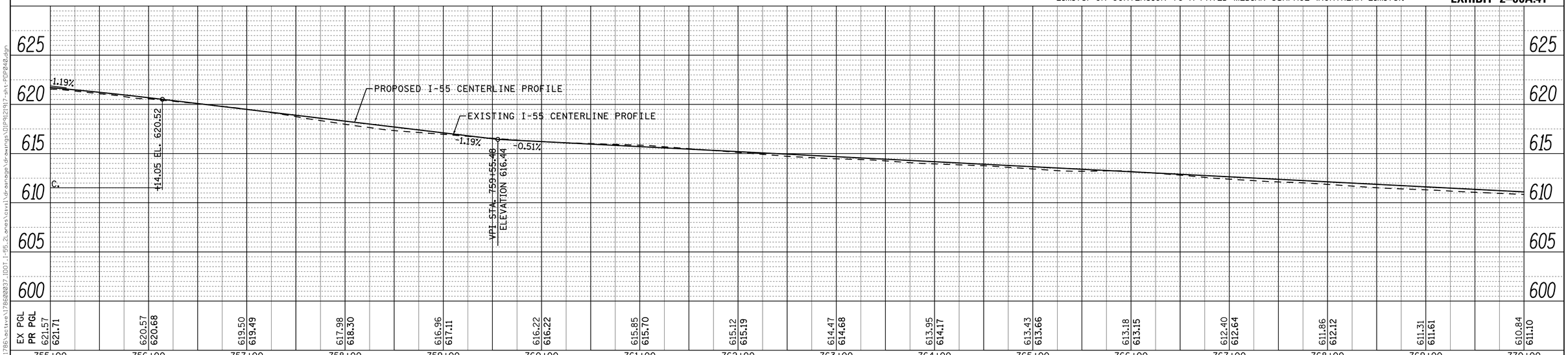


PROPOSED DRAINAGE NOTES:

1. THE PROPOSED DRAINAGE PLAN IS BASED ON AVAILABLE SURVEYED UTILITY DATA. ADJUST THE LOCATION AND SIZE OF IMPROVEMENTS, IF NECESSARY, DURING THE PHASE II DESIGN TO AVOID OR MINIMIZE UTILITY CONFLICTS.
2. THE PROPOSED INLETS AND CATCH BASINS ARE SHOWN AS CONCEPTUAL. ACTUAL INLET SPACING WILL BE CONDUCTED AS PART OF THE PHASE II DESIGN. INLET SPACING SHALL BE BASED ON A 10-YEAR DESIGN AND SPREAD WILL BE LIMITED TO THE SHOULDER.
3. DITCH DESIGN SHALL BE COMPLETED AS PART OF THE PHASE II DESIGN. DITCHES SHALL BE AT LEAST 3-FT DEEP AND BE SIZED FOR THE 50-YEAR DESIGN. DITCHES SHALL PROVIDE 1-FT OF FREEBOARD BETWEEN THE 50-YEAR WATER SURFACE ELEVATION AT THE EDGE OF SHOULDER.
4. ALL PROPOSED STORM SEWER SHALL BE REINFORCED CONCRETE PIPE (RCP), UNLESS OTHERWISE NOTED.
5. THE RIM ELEVATION OF EXISTING STRUCTURES LOCATED IN THE MEDIAN SHALL BE ADJUSTED TO MATCH THE REVISED SHOULDER CROSS SLOPE (SOUTHERN LIMITS) OR CONVERSION TO A PAVED MEDIAN SURFACE (NORTHERN LIMITS).

EXHIBIT 2–00A.41



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Default

USER NAME = dbook	DESIGNED - DJB	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION
	DRAWN - STANTEC	REVISED -	I-55 MANAGED LANE STUDY
PLOT SCALE = 50.0000 ' / in.	CHECKED - JVO	REVISED -	2 X 2 MANAGED LANES – PROPOSED DRAINAGE PLAN
PLOT DATE = 9/14/2018	DATE - 9/14/2018	REVISED -	SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55		DUPAGE/COOK	85	41
		CONTRACT NO. *CONTRACT		
		ILLINOIS FED. AID PROJECT		

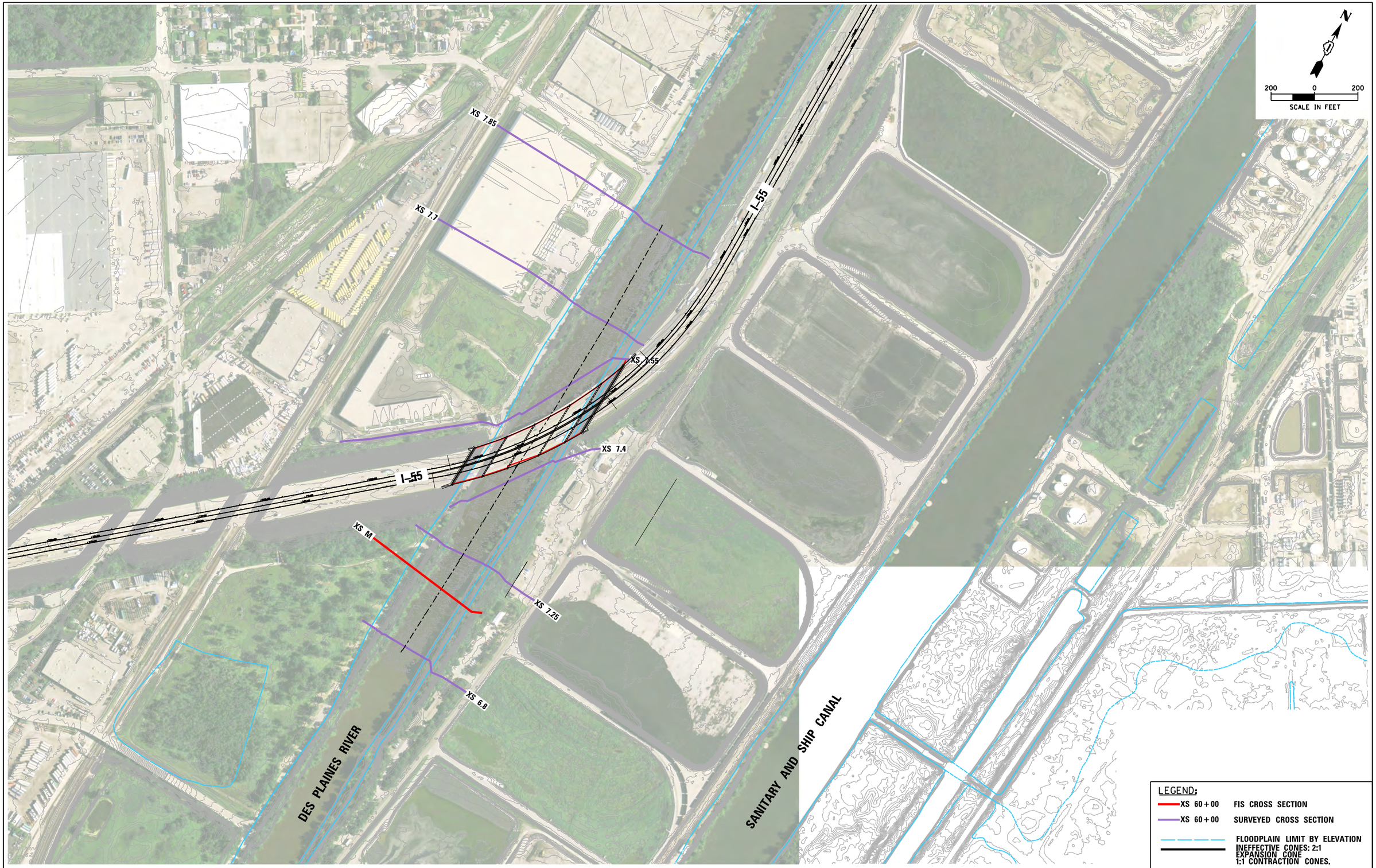
TAB 9

SECTION 9

CROSS SECTION LOCATION MAP

STREAM CROSS SECTION PLOTS

FACING DOWNSTREAM



I-55 MANAGED LANE PROJECT

USER NAME = mgoldenberg	DESIGNED - IAD	REVISED -
	DRAWN - PDR	REVISED -
PLOT SCALE =	CHECKED - IAD	REVISED -
PLOT DATE = 9/18/2018	DATE - 9/18/2018	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I–55 OVER DES PLAINES RIVER
REGULATORY CROSS SECTION LOCATION MAP

SCALE: 1" =100' | SHEET OF SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			$TOT	
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			

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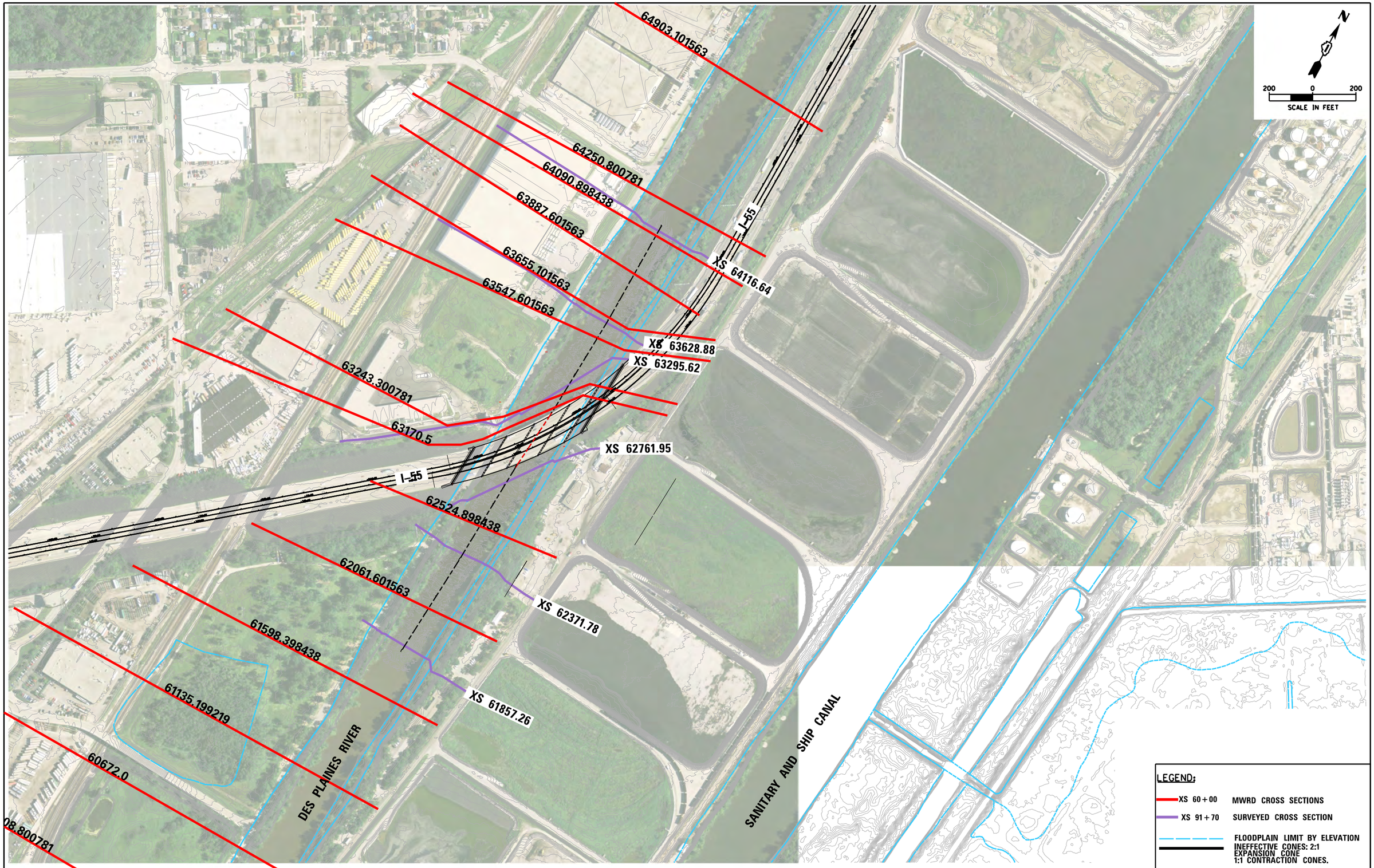

I-55 MANAGED LANE PROJECT	USER NAME = mgoldenberg	DESIGNED - IAD	REVISED -
		DRAWN - PDR	REVISED -
	PLOT SCALE =	CHECKED - IAD	REVISED -
	PLOT DATE = 9/14/2018	DATE - 9/14/2018	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 OVER DES PLAINES RIVER
MWRD CROSS SECTION LOCATION MAP

SCALE: 1" =100' | SHEET OF SHEETS | STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CONTRACT NO.		
ILLINOIS	FED. AID PROJECT			

FILE NAME = N:\dot\110203.00001\Drawn\P110203-sht-dnplr03.dgn
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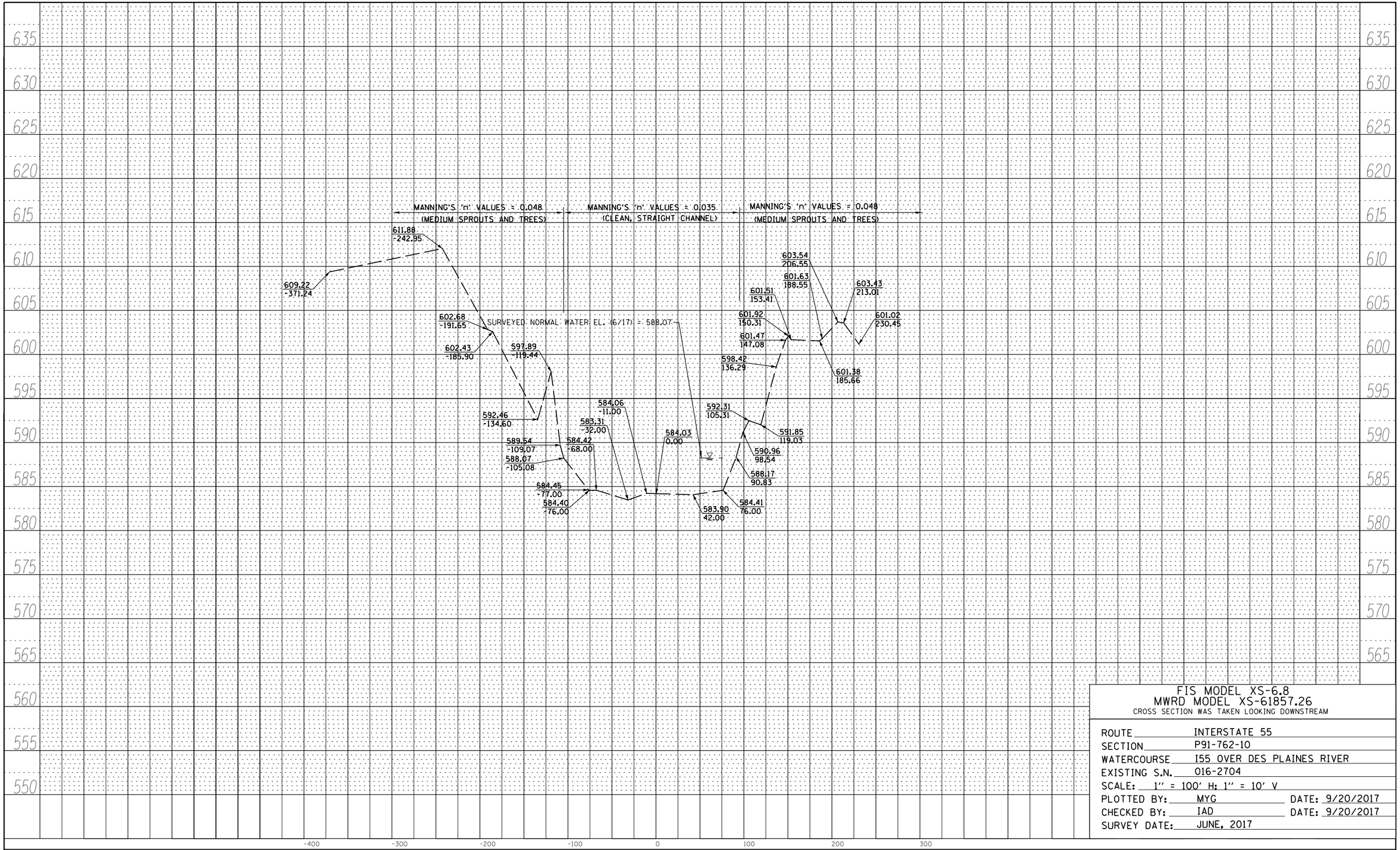
PLAN
SURVEYED
PLOTTED
ALIGNMENT CHECKED
RT. OF WAY CHECKED
CADD FILE NAME
NOTE BOOK
NO.
BY
DATE

PROFILE
SURVEYED
PLOTTED
POINTS CHECKED
BM. NOTED
STRUCTURE NOTATNS CHKD
NOTE BOOK
NO.
BY
DATE



FIS MODEL XS-6.8
MWRD MODEL XS-61857.26
CROSS SECTION WAS TAKEN LOOKING DOWNSTREAM

ROUTE INTERSTATE 55
SECTION P91-762-10
WATERCOURSE I55 OVER DES PLAINES RIVER
EXISTING S.N. 016-2704
SCALE: 1'' = 100' H; 1'' = 10' V
PLOTTED BY: MYG DATE: 9/20/2017
CHECKED BY: IAD DATE: 9/20/2017
SURVEY DATE: JUNE, 2017

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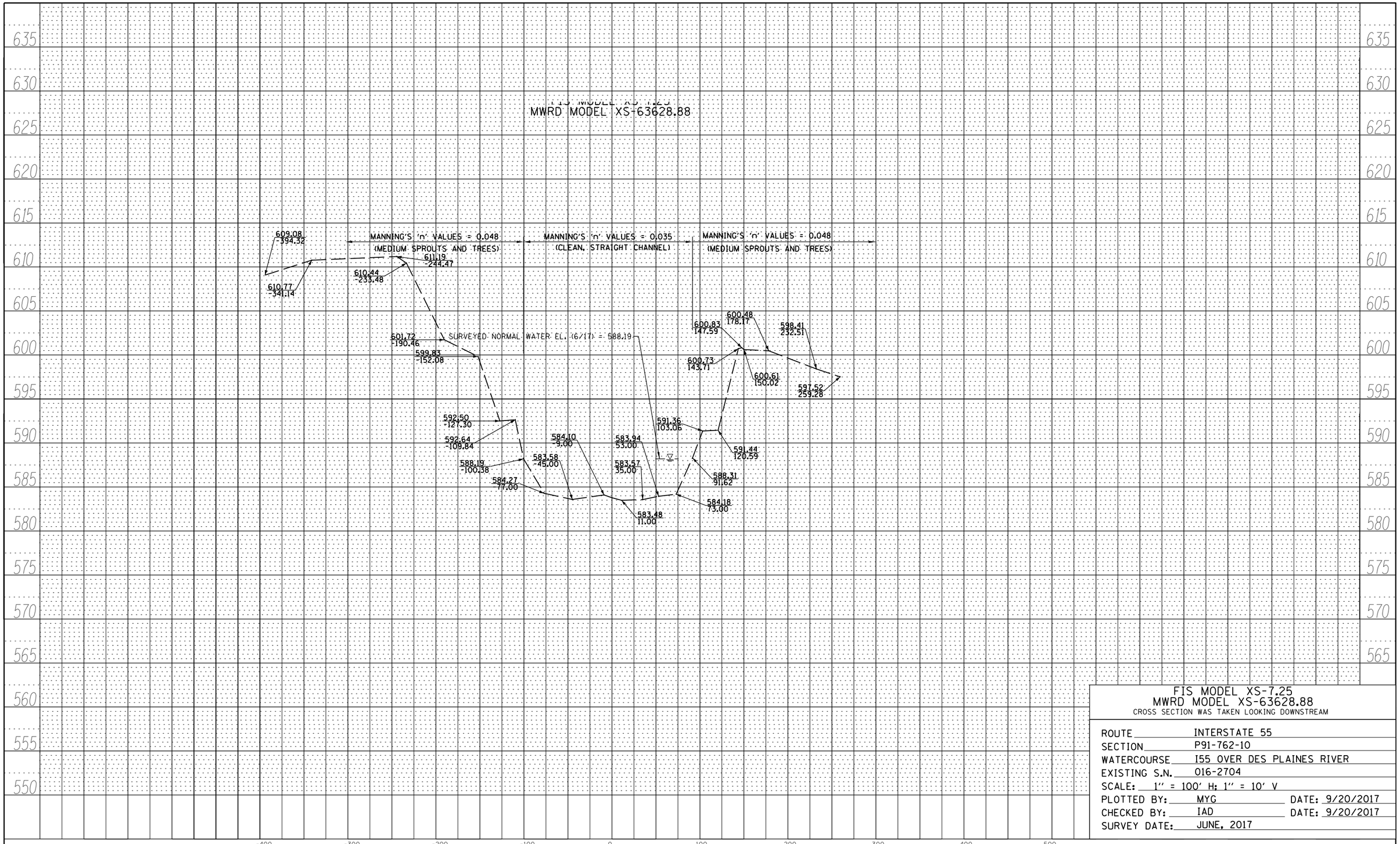
Default	PLOT DATE = 9/20/2017	DATE - 9/20/2017	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS
DES PLAINES RIVER

SCALE: | SHEET 1 OF 8 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			



PLAN
SURVEYED
PLOTTED
CHECKED
ALIGNMENT CHECKED
RT. OF WAY CHECKED
CADD FILE NAME
NOTE BOOK
NO.
DATE
BY

PROFILE
SURVEYED
PLOTTED
CHECKED
BM. NOTED
STRUCTURE NOTATNS CHKD
NOTE BOOK
NO.
DATE
BY

FIS MODEL XS-7.25
MWRD MODEL XS-63628.88
CROSS SECTION WAS TAKEN LOOKING DOWNSTREAM

ROUTE INTERSTATE 55
SECTION P91-762-10
WATERCOURSE I55 OVER DES PLAINES RIVER
EXISTING S.N. 016-2704
SCALE: 1'' = 100' H; 1'' = 10' V
PLOTTED BY: MYG DATE: 9/20/2017
CHECKED BY: IAD DATE: 9/20/2017
SURVEY DATE: JUNE, 2017

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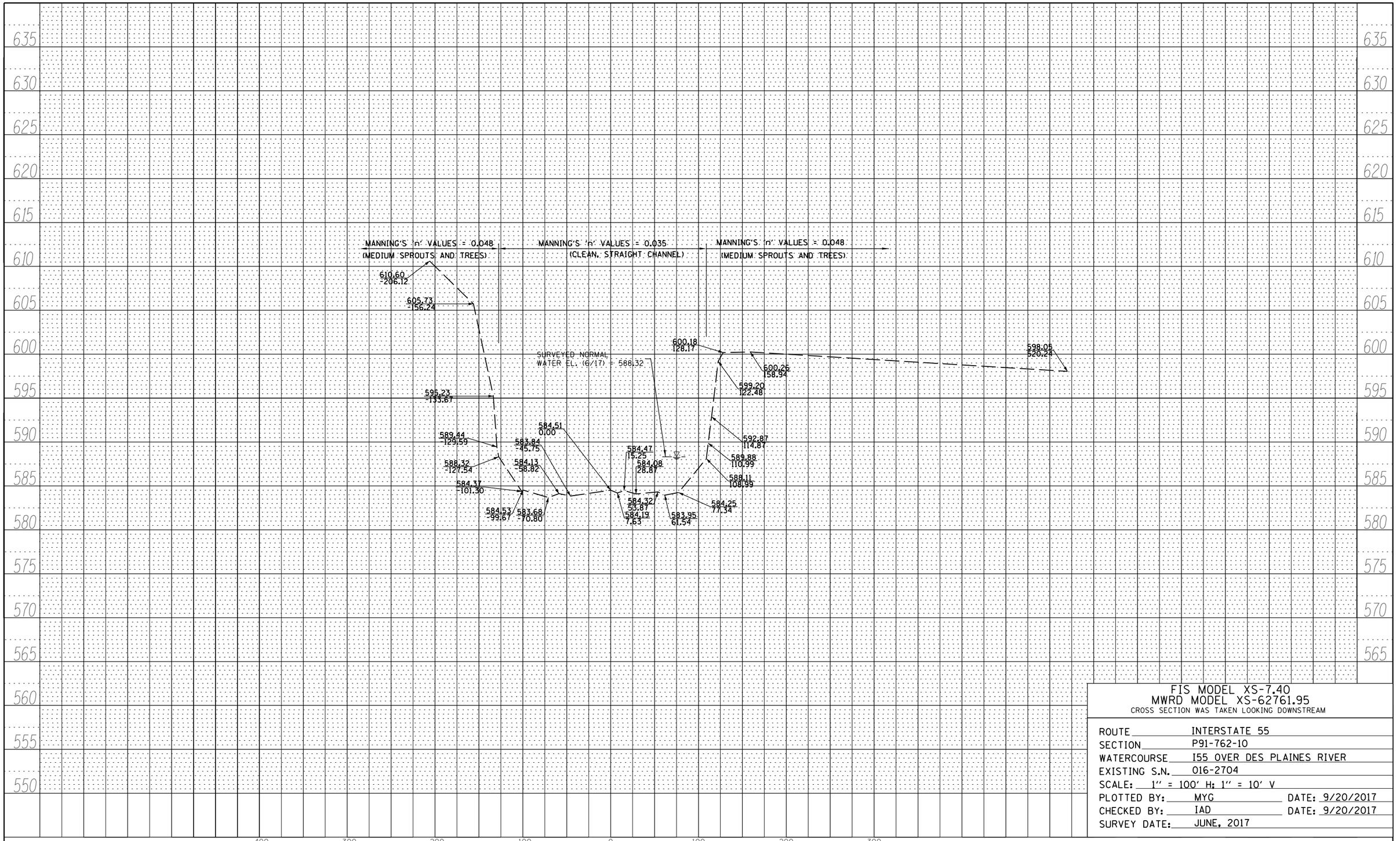
Default	PLOT DATE = 9/20/2017	DATE - 9/20/2017	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS
DES PLAINES RIVER

SCALE: | SHEET 2 OF 8 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			



PLAN

DATE	BY	
		SURVEYED
		PLOTTED
		ALIGNMENT CHECKED
		RT. OF WAY CHECKED
		CADD FILE NAME
		NOTE BOOK
		NO.

PROFILE

DATE	BY	
		SURVEYED
		PLOTTED
		GRADES CHECKED
		BM. NOTED
		STRUCTURE NOTATNS CHKD
		NOTE BOOK
		NO.

FIS MODEL XS-7.40
MWRD MODEL XS-62761.95
CROSS SECTION WAS TAKEN LOOKING DOWNSTREAM

ROUTE INTERSTATE 55
SECTION P91-762-10
WATERCOURSE I55 OVER DES PLAINES RIVER
EXISTING S.N. 016-2704
SCALE: 1'' = 100' H; 1'' = 10' V
PLOTTED BY: MYG DATE: 9/20/2017
CHECKED BY: IAD DATE: 9/20/2017
SURVEY DATE: JUNE, 2017

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		DRAWN - MYG	REVISED -
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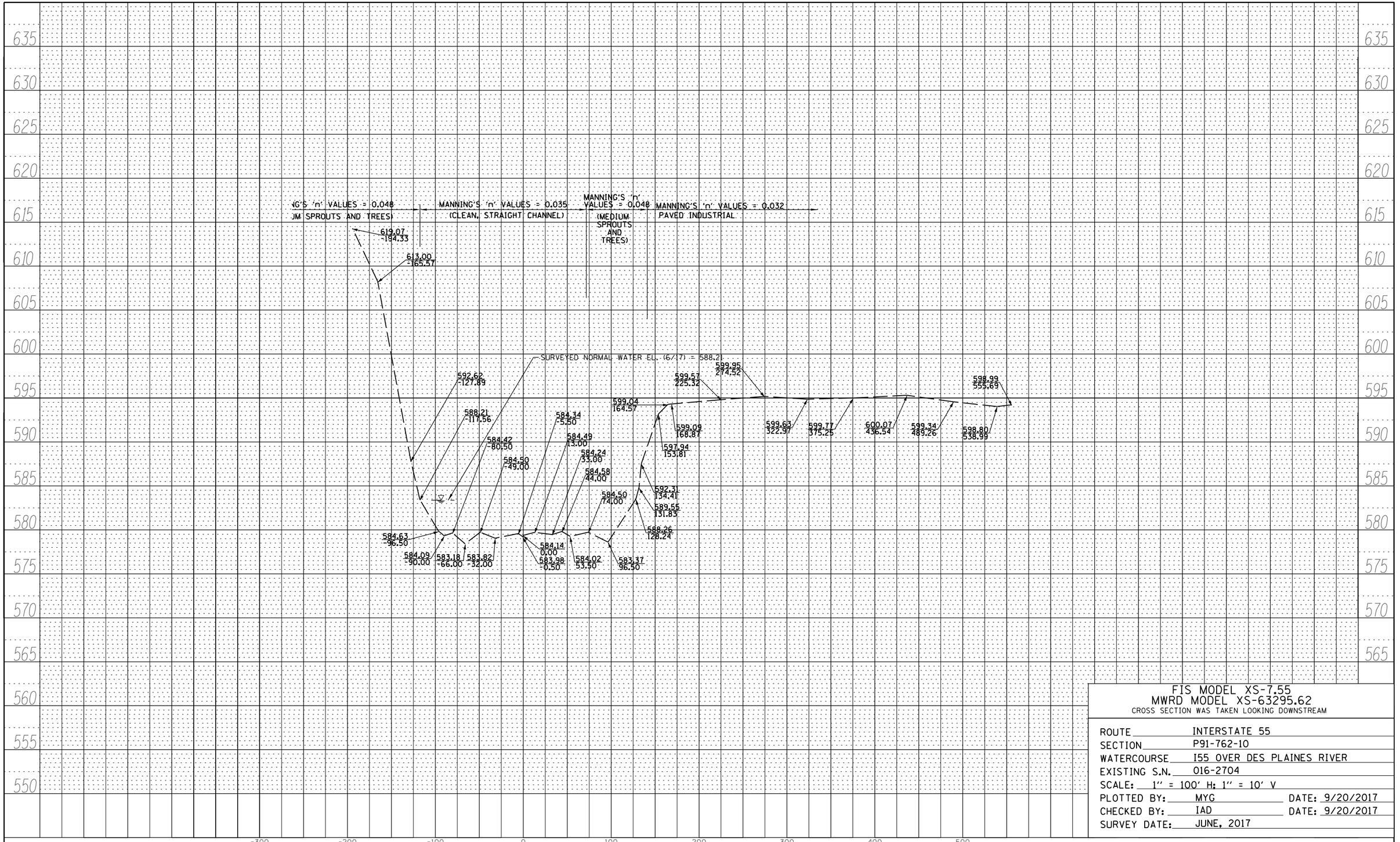
Default	PLOT DATE = 9/20/2017	DATE - 9/20/2017	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS
DES PLAINES RIVER

SCALE: | SHEET 3 OF 8 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			



PLAN

SURVEYED	BY	DATE
PLOTTED		
ALIGNMENT CHECKED		
RT. OF WAY CHECKED		
CADD FILE NAME		
NOTE BOOK		
NO.		

PROFILE

SURVEYED	BY	DATE
PLOTTED		
GRADES CHECKED		
BLM. NOTED		
STRUCTURE NOTATNS CHKD		
NOTE BOOK		
NO.		

FIS MODEL XS-7.55
MWRD MODEL XS-63295.62
CROSS SECTION WAS TAKEN LOOKING DOWNSTREAM

ROUTE INTERSTATE 55
SECTION P91-762-10
WATERCOURSE I55 OVER DES PLAINES RIVER
EXISTING S.N. 016-2704
SCALE: 1'' = 100' H; 1'' = 10' V
PLOTTED BY: MYG DATE: 9/20/2017
CHECKED BY: IAD DATE: 9/20/2017
SURVEY DATE: JUNE, 2017

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		DRAWN - MYG	REVISED -
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Default	PLOT DATE = 9/20/2017	DATE - 9/20/2017	REVISED -

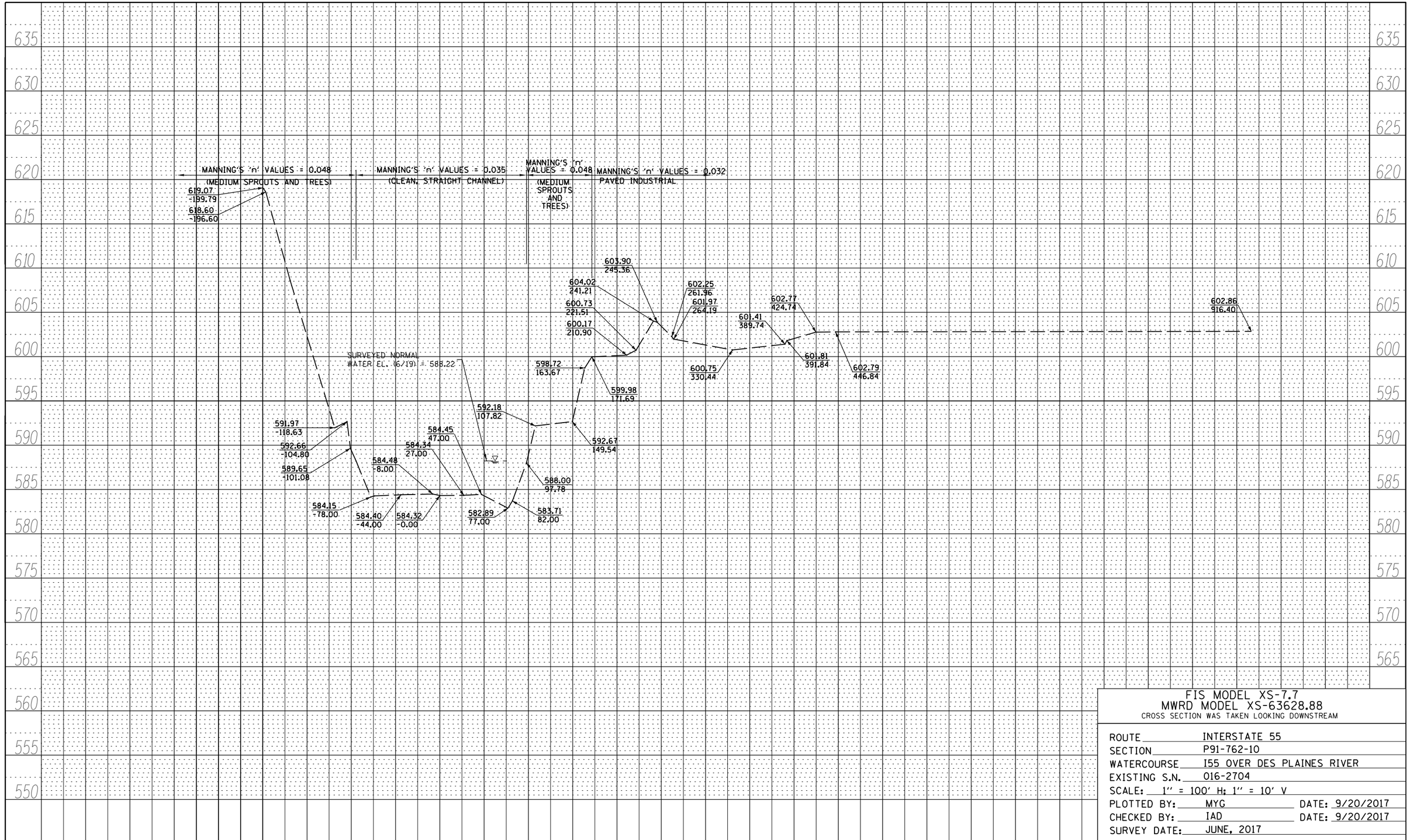
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS
DES PLAINES RIVER

SCALE: | SHEET 4 OF 8 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.

CONTRACT NO.
ILLINOIS | FED. AID PROJECT



PLAN
SURVEYED
PLOTTED
ALIGNMENT CHECKED
RT. OF WAY CHECKED
CADD FILE NAME
NOTE BOOK
NO.
BY
DATE

PROFILE
SURVEYED
PLOTTED
GRADES CHECKED
BM. NOTED
STRUCTURE NOTATNS CHKD
NOTE BOOK
NO.
BY
DATE

FIS MODEL XS-7.7
MWRD MODEL XS-63628.88
CROSS SECTION WAS TAKEN LOOKING DOWNSTREAM

ROUTE INTERSTATE 55
SECTION P91-762-10
WATERCOURSE I55 OVER DES PLAINES RIVER
EXISTING S.N. 016-2704
SCALE: 1" = 100' H; 1" = 10' V
PLOTTED BY: MYG DATE: 9/20/2017
CHECKED BY: IAD DATE: 9/20/2017
SURVEY DATE: JUNE, 2017

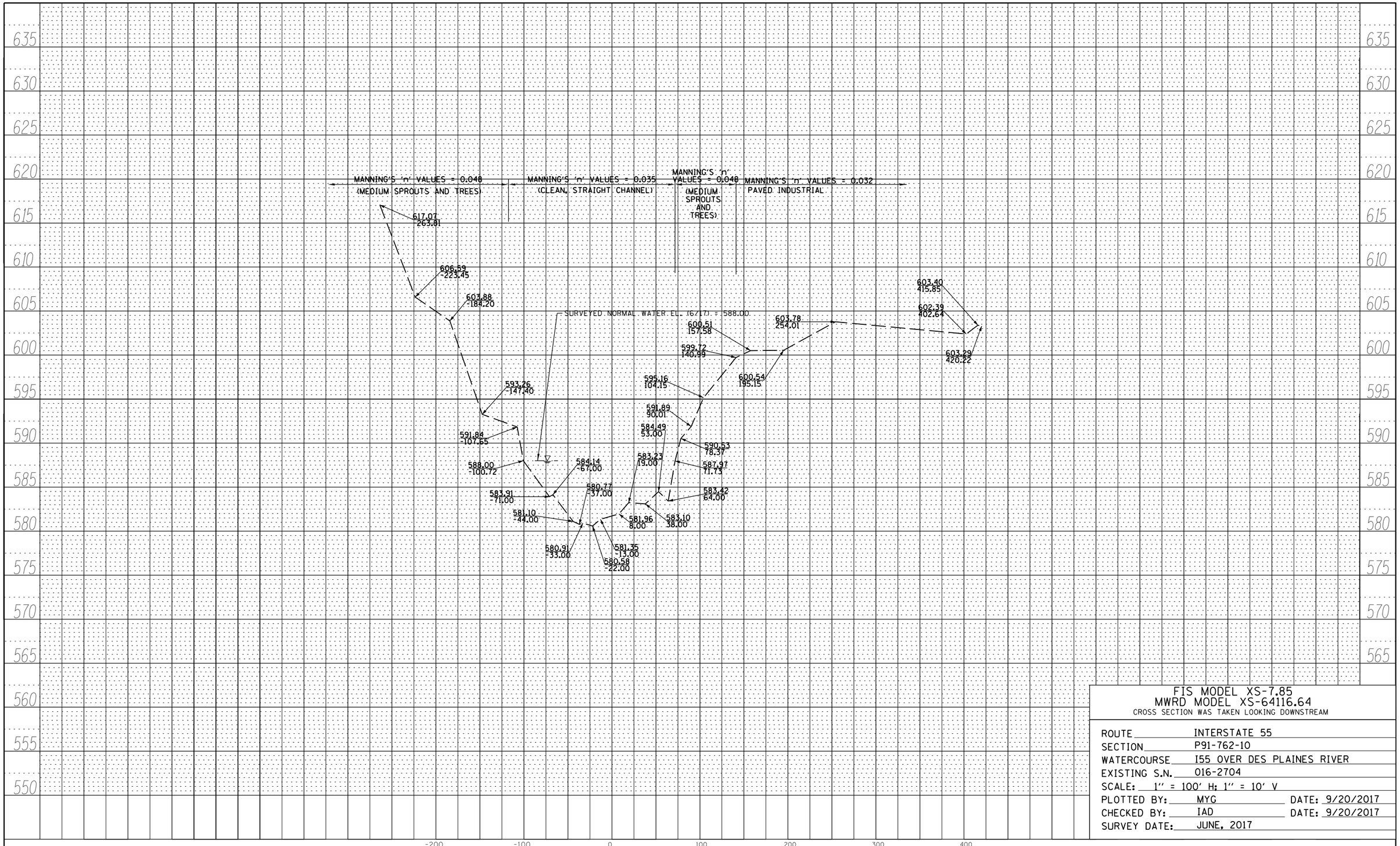
FILE NAME = N:\Idot\110203.0000I\CADD_Sheets\P1110203-sht-xssht3.dgn	USER NAME = mgoldenberg	DESIGNED - FDM	REVISED -
		DRAWN - MYG	REVISED -
	PLOT SCALE = $SCALE$	CHECKED - IAD	REVISED -
Default	PLOT DATE = 9/20/2017	DATE - 9/20/2017	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS
DES PLAINES RIVER

SCALE: | SHEET 5 OF 8 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			



PLAN
SURVEYED
PLOTTED
ALIGNMENT CHECKED
RT. OF WAY CHECKED
CADD FILE NAME
NOTE BOOK
NO.
BY
DATE

PROFILE
SURVEYED
PLOTTED
GRADES CHECKED
B.M. NOTED
STRUCTURE NOTATNS CHKD
NOTE BOOK
NO.
BY
DATE

FIS MODEL XS-7.85
MWRD MODEL XS-64116.64
CROSS SECTION WAS TAKEN LOOKING DOWNSTREAM

ROUTE INTERSTATE 55
SECTION P91-762-10
WATERCOURSE I55 OVER DES PLAINES RIVER
EXISTING S.N. 016-2704
SCALE: 1'' = 100' H; 1'' = 10' V
PLOTTED BY: MYG DATE: 9/20/2017
CHECKED BY: IAD DATE: 9/20/2017
SURVEY DATE: JUNE, 2017

FILE NAME = N:\Idot\110203.0000\CADD_Sheets\P1110203-sht-xssht3.dgn	USER NAME = mgoldenberg	DESIGNED - FDM	REVISED -
		DRAWN - MYG	REVISED -
	PLOT SCALE = $SCALE$	CHECKED - IAD	REVISED -
Default	PLOT DATE = 9/20/2017	DATE - 9/20/2017	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS
DES PLAINES RIVER

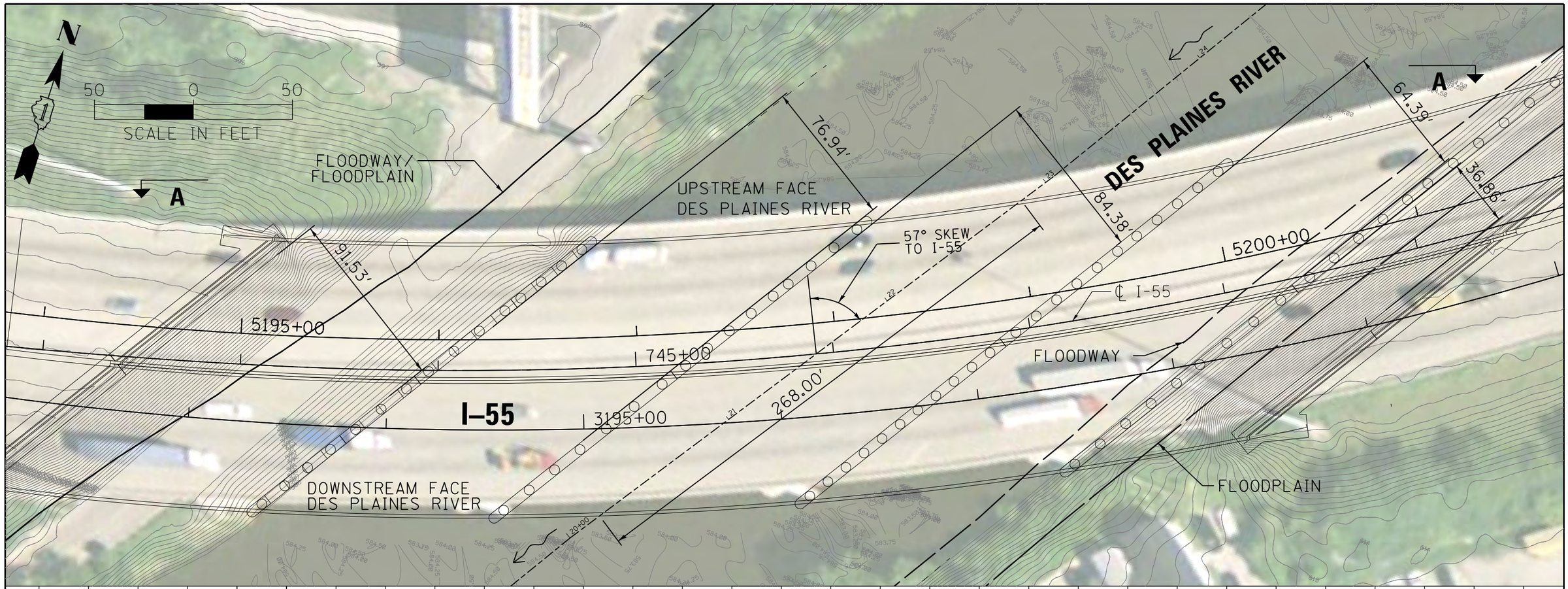
SCALE: | SHEET 6 OF 8 SHEETS | STA. | TO STA.

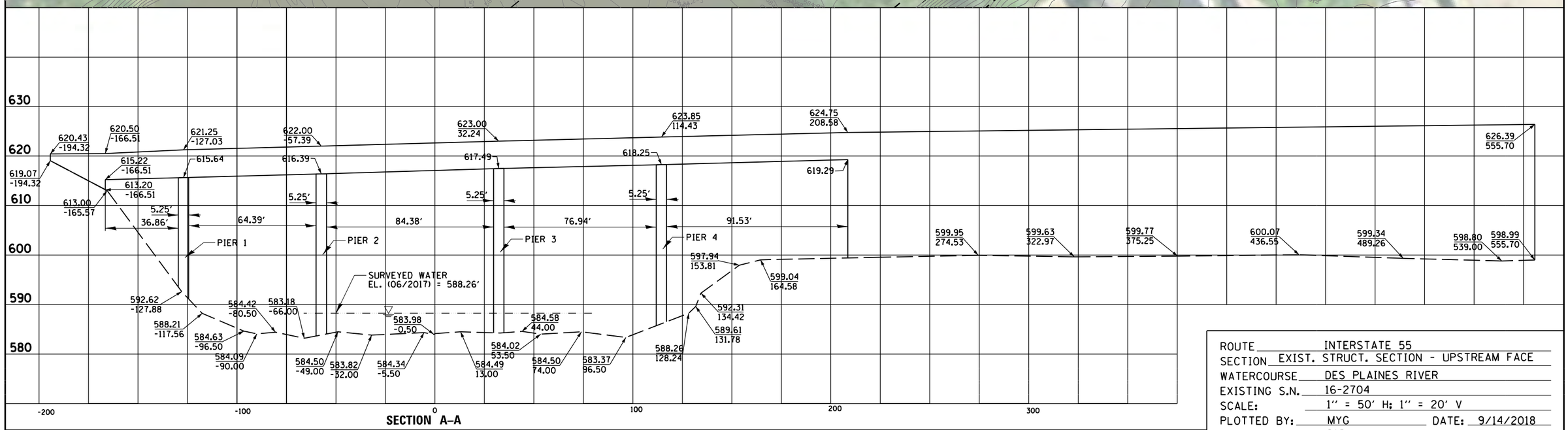
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			CONTRACT NO.	
		ILLINOIS	FED. AID PROJECT	

TAB 10

SECTION 10

BRIDGE LAYOUT / PLAN DRAWING PLOTS





SECTION A–A

(PLOTTED PERPENDICULAR TO THE STREAM, FACING DOWNSTREAM)

ROUTE	INTERSTATE 55
SECTION	EXIST. STRUCT. SECTION - UPSTREAM FACE
WATERCOURSE	DES PLAINES RIVER
EXISTING S.N.	16-2704
SCALE:	1'' = 50' H; 1'' = 20' V
PLOTTED BY:	MYG DATE: 9/14/2018
CHECKED BY:	IAD DATE: 9/14/2018
SURVEY DATE:	06-27-2017

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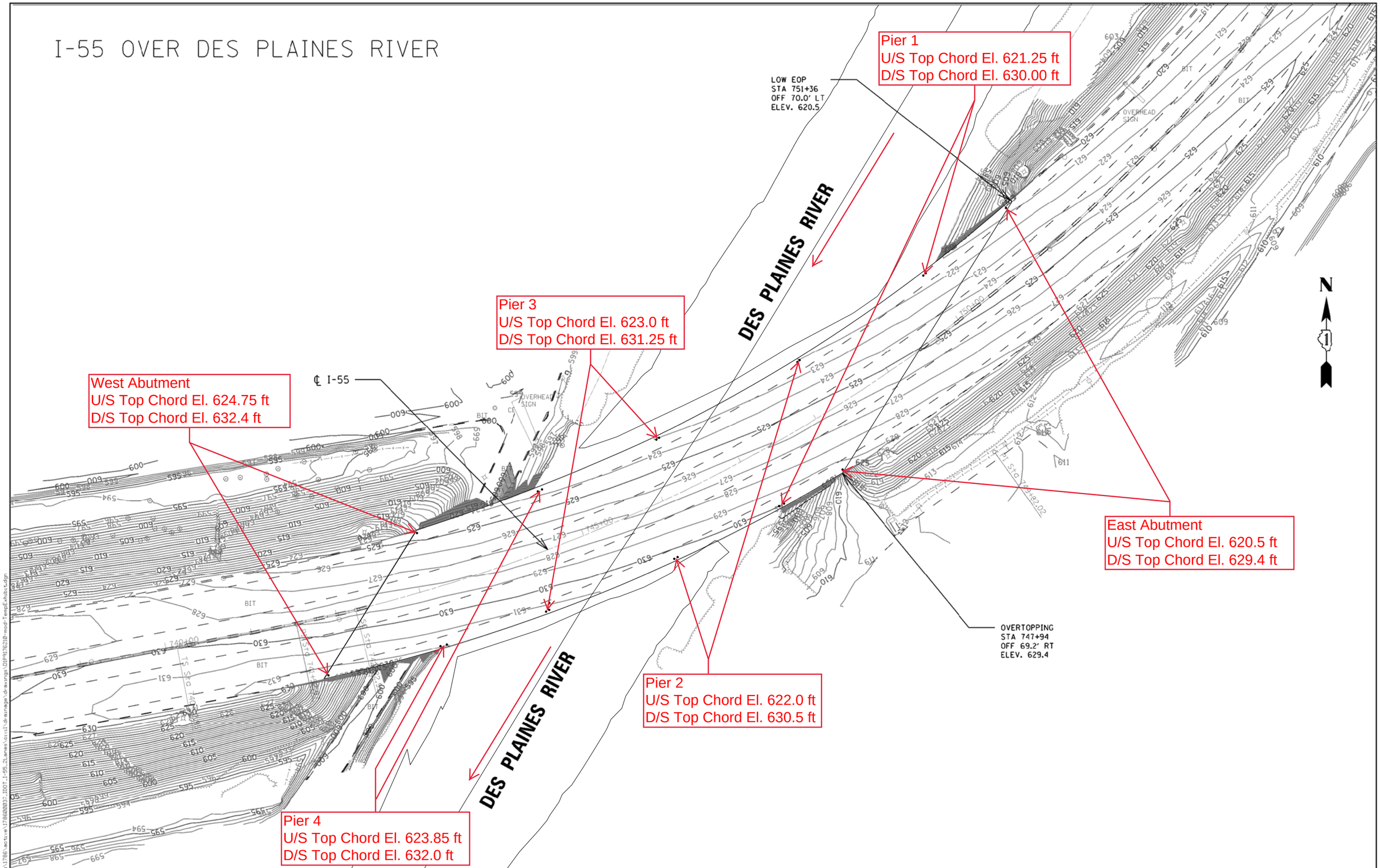
I-55 OVER DES PLAINES RIVER



I-55 MANAGED LANE PROJECT	USER NAME = EEOM	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 99.5899 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 8/11/2017	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
DRAINAGE SUPPLEMENT

SCALE: | SHEET OF SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			#TOTAL	#SHT
		CONTRACT NO.#CONTRACT		
	ILLINOIS	FED. AID PROJECT		

FILE NAME = V:\1786\active\178620037_IDOT_I-55_2Lanes\civil\drainage\drawings\DIP\178210-mod-TempExhibit.dgn

TAB A

SECTION 10.A

HISTORIC IDOT PLAN EXCERPTS

ROUTE No.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I 55	*	COOK	368	1
F.H.W.A. REGION		ILLINOIS	PROJECT	

* 0404-640R & 0404 (ETC; 676B) R-1

D-91-168-93 & D-91-295-92

FOR INDEX OF SHEETS, SEE SHEET NO. 2

PROJECT LOCATED IN:
VILLAGE OF HODGKINS
VILLAGE OF WILLOW SPRINGS

TRAFFIC DATA
US 12/20/45 (LAGRANGE ROAD):
1990 ADT: 14,700 – 36,000 VEHICLES
2010 ADT: 15,000 – 38,000 VEHICLES
INTERSTATE 55:
1990 ADT: 57,400 – 58,700 VEHICLES
2010 ADT: 74,000 – 77,000 VEHICLES

POSTED SPEED LIMIT
US 12/20/45: 45 MPH
INTERSTATE 55 : 55 MPH

DESIGN DESIGNATION
6900 (10) MAJOR 12.85 (COMPOSITE – 20)

SCALES				
	PLAN	1m = 500m	
	PROFILE	1m = 500m	HORIZ.
	PROFILE	1m = 100m	VERT.
	CROSS SECTIONS	1m = 100m	HORIZ.
		1m = 50m	VERT.

METRIC RATIOS

1 m 0 2 m
1 : 50

0 5 m 10 m
1 : 100

10 m 0 20 m
1 : 250

5 m 0 20 m
1 : 500

0 50 m 100 m
1 : 1000

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

CONTRACT NO. 82979 (EB)

DISTRICT ONE DESIGN ENGINEER: RICK YOUNG (847) 705-4232

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLANS FOR PROPOSED FEDERAL AID HIGHWAY

016-2904

F.A.I. 55 (STEVENSON EXPRESSWAY)

SECTION: 0404–640R & 0404 (ETC; 676B) R–1

NOTE: WHEREVER IN THESE PLANS THE SECTION IS REFERENCED IT SHALL MEAN 0404-640R & 0404 (ETC; 676B) R-1

US ROUTE 45 (LAGRANGE ROAD) TO EAST OF DESPLAINES RIVER EASTBOUND WIDENING, RESURFACING & BRIDGE REHABILITATION

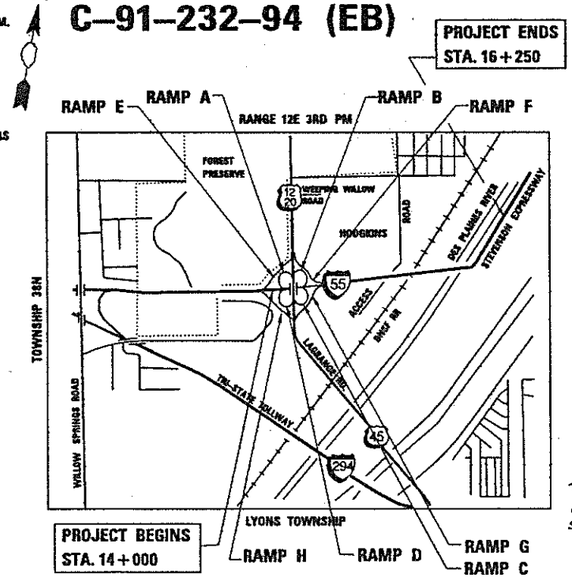
PROJECT: IM–55–7 (208) 278
COOK COUNTY
C–91–232–94 (EB)

ROADWAY:

EASTBOUND

- SCARIFY AND RESURFACE BITUMINOUS CONCRETE ALONG I-55 MAINLINE AND OUTSIDE SHOULDERS.
- CONSTRUCT CLOSED MEDIAN INCLUDING BITUMINOUS SHOULDERS, CONCRETE BARRIER AND DRAINAGE SYSTEM.
- REMOVE AND REPLACE EXISTING OUTSIDE STABILIZED SHOULDERS ALONG I-55 MAINLINE WITH TIED P.C.C. SHOULDERS INCLUDING SINGLE FACE CONCRETE BARRIERS EAST OF LAGRANGE ROAD INTERCHANGE.
- SCARIFY, PATCH AND RESURFACE RAMP D
- REMOVE AND REPLACE EXISTING STABILIZED SHOULDERS ALONG RAMP D WITH BITUMINOUS SHOULDERS.

SET 1 – STA 14+000 TO 15+110
SET 2 – STA 15+110 TO STA 16+250



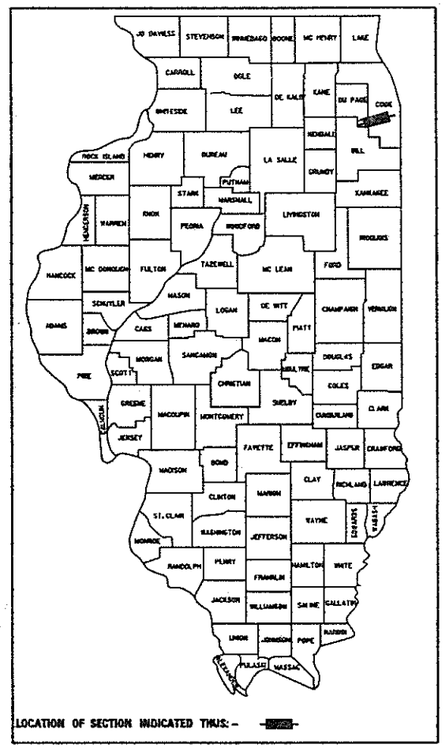
BRIDGES:

1. STRUCTURE NOS. 016-0004 ~~AND 016-0005~~ (4 SPAN CONTINUOUS NON-COMPOSITE PLATE GIRDER BRIDGES)
2. STRUCTURE NOS. 016-0006 ~~AND 016-0007~~ (3 SPAN CONTINUOUS NON-COMPOSITE PLATE GIRDER BRIDGES)
3. STRUCTURE NOS. 016-0008 ~~AND 016-0009~~ (3 SPAN CONTINUOUS NON-COMPOSITE PLATE GIRDER BRIDGES)

STRUCTURE NOS. 016-0010 AND 016-0011 (5 SPAN; 4 SPAN CONTINUOUS AND 1 SIMPLE SPAN, NON-COMPOSITE CURVED PLATE GIRDER BRIDGES).

EASTBOUND

- REMOVE EXISTING DECK, BARRIERS, AND LIGHTING.
- REPAIR SUBSTRUCTURES AND REPLACE SLOPEWALLS.
- REMOVE AND REPLACE EXISTING ABUTMENT BACKWALLS.
- CONSTRUCT COMPOSITE DECK AND BARRIERS INCLUDING MEDIAN WIDENING TO CL I-55.
- REPLACE BRIDGE OVER DESPLAINES RIVER.



LOCATION OF SECTION INDICATED THUS: –

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED July 6 19 98
DISTRICT ENGINEER
19
ENGINEER OF PROJECT DEVELOPMENT AND IMPLEMENTATION
August 14 19 98
ENGINEER OF DESIGN AND ENVIRONMENT
August 14 19 98
DIRECTOR, DIVISION OF HIGHWAYS

M. MICHAEL OKRENT 082-36705 REGISTERED PROFESSIONAL ENGINEER ILLINOIS
EXP 11/30/99
SET 1

ROBERT RASKIN 17899 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS
expires 11-30-99
SET 2

PRINTED BY THE AUTHORITY OF THE STATE OF ILLINOIS

REVISED PLAN SHEETS
1 Rev. 11-2-98

alfred benesch & company
CONSULTING ENGINEERS
205 NORTH MICHIGAN AVENUE, CHICAGO, ILLINOIS 60601
JOB NO. 2975

MAP SCALE
0 500m 1000m 1500m
1cm: 200m

GROSS AND NET LENGTH OF PROJECT = 2250.000 METERS = 2.250 KM

Bench Mark: Brass plug located at the south east corner of westbound DesPlaines River Bridge median-Elev. 189.093

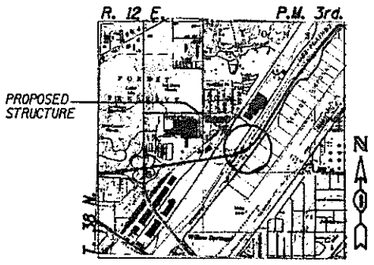
Existing Structures: S.N. 016-0010 (E.B.) & 016-0011 (W.B.) are twin deck five span structures having one simple span and four continuous spans with two curved welded plate girders, transverse plate girder floor beams, and rolled steel beam stringers. The out to out width of each deck is 18.123m. The structure is approximately 217.0m back to back of abutments, and the skew of piers and abutments to a tangent line to I-55 at Station 15+281.981 is 42°-48'-30". The bridge was constructed in 1964 at Sta. 15+455.08 and the deck was patched, waterproofed and resurfaced in 1978.

The existing structure will be removed and replaced with concrete deck on five span continuous multiple curved steel plate girders. The bridges will be widened to the center line of I-55. Pier #3 will be multiple columns with crash wall in between and a cap beam with spread footings. Other Piers will have cap beam supported on drilled shaft columns. New abutments will be supported on the existing steel piles with additional piles added.

Two stage construction will be used to keep the traffic open. One deck will be replaced in each stage.

No salvage.

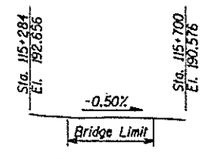
Note: All dimensions are in millimeters(mm) except as noted.



LOCATION SKETCH

SHEET NO. 1 OF 36 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
155	0404-6768	COOK	368	313
STA.		TO STA.		
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT		



PROFILE GRADE
(Along P.G.L. East Bound)

CURVE DATA
℄ F.A.I. ROUTE 55

P.I. Sta. 15+583.901 — θ_s = 3°-08'-42.577"
T.S. Sta. 15+281.98 — Δ_s = 43°-22'-44.486"
S.C. Sta. 15+345.98 — L_c = 441.353m
C.S. Sta. 15+787.333 — X = 63.981m
S.T. Sta. 15+851.333 — Y = 1.171m
Δ = 49°-40'-9.64" — K = 31.998m
D_c = 2°-59'-44.78" — P = 0.293m
R_c = 582.948m — Es = 59.725m
T_s = 301.921m
L_s = 64.0m

SEISMIC DATA

Seismic Performance Category (SPC) = A
Bedrock Acceleration Coefficient (A) = 0.04g
Site Coefficient (S) = 1.0

DESIGN SPECIFICATIONS

AASHTO 1996 and 1997 Interim
1993 AASHTO Guide Specifications for Horizontally Curved Highway Bridges

LOADING MS18 & ALT.

Allow 1.2 kN/m2 for future wearing surface

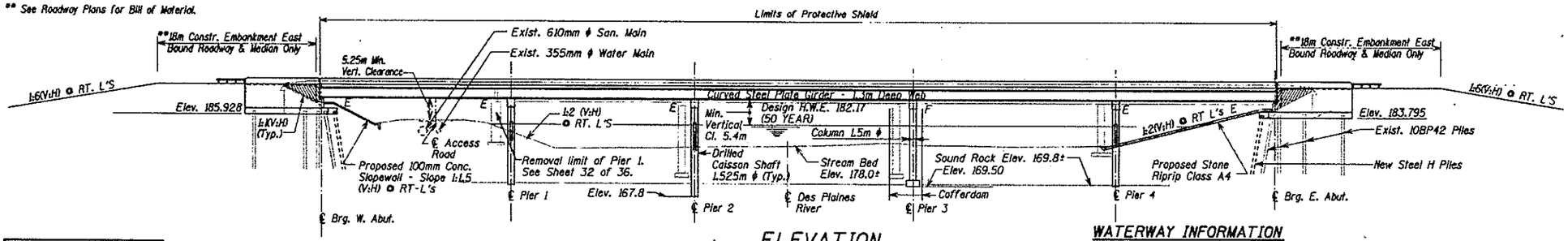
DESIGN STRESSES

FIELD UNITS
f'c = 24 MPa
fy = 400 MPa (Reinf.)
fy = 345 MPa Structural Steel (M-270M Grade 345)

CAISSON SHAFTS
f'c = 27.5 MPa
fy = 400 MPa

NOTES:
1. This contract includes eastbound bridge structure only.
2. Hatched portion of Embankment Backfill by Bridge Contractor after Abutment is in place.

** See Roadway Plans for Bill of Material.



ELEVATION

Note:
Existing concrete slope wall at East abutment to be replaced with riprap. Existing concrete Slopewall at West abutment to be replaced with new concrete slopewall.

WATERWAY INFORMATION

Drainage Area = 1683.5 km² Low Grade Elev. 189.58 m ● Sta. 215+603

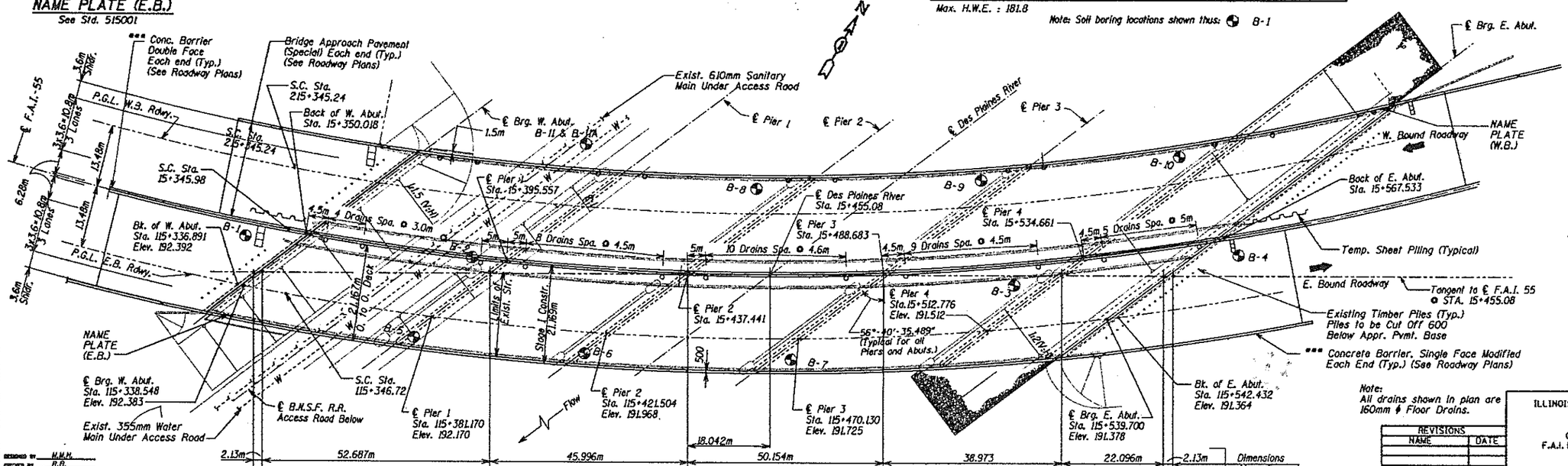
Flood	Freq. Yr.	Q cms	Opening Sq. m Exist.	Opening Sq. m Prop.	Mat. H.W.E. m	Head - m Exist.	Head - m Prop.	Headwater Elev. - m Exist.	Headwater Elev. - m Prop.
Design	50	212.0	248.0	318.0	182.17	0.00	0.00	182.17	182.17
Base	100	238.0	263.0	337.0	182.35	0.00	0.00	182.35	182.35
Overtopping	10	170.0	216.0	277.0	181.77	0.00	0.00	181.77	181.77
Max. Calc.	500	263.0	281.0	360.0	182.56	0.00	0.00	182.56	182.56

Max. H.W.E. = 181.8

Note: Soft boring locations shown thus: ⊕ B-1

STATION 115+455.08
BUILT 199 BY
STATE OF ILLINOIS
F.A.I. RTE. 55 SEC. 0404-6768
F.A. PROJ. IM-55-7 (208) 278
LOADING MS18 & ALT.
STR. NO. 016-2704

NAME PLATE (E.B.)
See Std. 515001



PLAN

*** Barrier width on the bridge will be matched with a transition. See Roadway Plans.

Note:
All drains shown in plan are 160mm ϕ Floor Drains.

6-10-98
date

STATE OF ILLINOIS
ROBERT BASKIN
No. 3031
STRUCTURAL ENGINEER
Signature

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION

GENERAL PLAN AND ELEVATION
F.A.I. ROUTE 55 OVER DES PLAINES RIVER
COOK COUNTY

F.A.I. RTE. 55 — SECTION 0404-6768
STA. 15+455.08 — STRUCTURE NO. 016-2704(E.B.)

SCALE: VERT. HORIZ.
DATE 06/10/98

DESIGNED BY M.M.H.
CHECKED BY R.B.
DRAWN BY W.R.A.
CHECKED BY M.M.H.

NELSON OSTROM BASKIN BERMAN & ASSOC., INC.
CONSULTING ENGINEERS PARK RIDGE, ILLINOIS

J:\96\e01.dgn 6/12/98

⚠ Rev. 11-2-98

ROUTE No.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I 55	*	COOK	594	1
F.H.W.A. REGION		ILLINOIS	PROJECT	

D-91-233-94 & D-91-168-93

IM -55-7(219)277

* 0102-631RS-2, ETC, 0404-676B-R-1

PROJECT LOCATED IN:
VILLAGE OF HODGKINS
VILLAGE OF WILLOW SPRINGS

TRAFFIC DATA
US 12/20/45 (LAGRANGE ROAD):
1990 ADT: 14,700 – 36,000 VEHICLES
2010 ADT: 15,000 – 38,000 VEHICLES
INTERSTATE 55:
1990 ADT: 57,400 – 58,700 VEHICLES
2010 ADT: 74,000 – 77,000 VEHICLES

POSTED SPEED LIMIT
US 12/20/45: 45 MPH
INTERSTATE 55 : 55 MPH

DESIGN DESIGNATION
6900 (10) MAJOR 12.85 (COMPOSITE – 20)

SCALES				
PLAN	1m	= 500m		
PROFILE	1m	= 500m	HORIZ.	
PROFILE	1m	= 100m	VERT.	
CROSS SECTIONS	1m	= 100m	HORIZ.	
	1m	= 50m	VERT.	

METRIC RATIOS

1 m 0 2 m
1 : 50

0 5 m 10 m
1 : 100

10 m 0 20 m
1 : 250

5 m 0 20 m
1 : 500

0 50 m 100 m
1 : 1000

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

CONTRACT NO. 82969

DISTRICT ONE DESIGN ENGINEER: RICK YOUNG (847) 705-4247

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLANS FOR PROPOSED FEDERAL AID HIGHWAY

F.A.I. 55 (STEVENSON EXPRESSWAY)
SECTION: 0102-631RS-2, ETC, 0404-676B-R-1

SET 1 OF 2

WILLOW SPRINGS ROAD TO EAST OF DESPLAINES RIVER WESTBOUND WIDENING, RESURFACING & BRIDGE REHABILITATION

NOTE: WHEREVER IN THESE PLANS PROJ. NO. IMD-55-7(219)277 IS REFERENCED IT SHALL MEAN PROJ. NO. IM-55-7(219)277.

NOTE: WHEREEVER IN THESE PLANS THE SECTION IS REFERENCED IT SHALL MEAN 0102-631RS-2, ETC, 0404-676B-R-1

ROADWAY:

- SCARIFY AND RESURFACE BITUMINOUS CONCRETE ALONG I-55 MAINLINE AND OUTSIDE SHOULDERS (WB).
- CONSTRUCT CLOSED MEDIAN INCLUDING BITUMINOUS SHOULDERS, CONCRETE BARRIER AND DRAINAGE SYSTEM (WB & EB).
- REMOVE AND REPLACE EXISTING OUTSIDE STABILIZED SHOULDERS ALONG I-55 MAINLINE WITH TIED P.C.C. SHOULDERS INCLUDING SINGLE FACE CONCRETE BARRIERS EAST OF LAGRANGE ROAD INTERCHANGE (WB).
- SCARIFY, PATCH AND RESURFACE RAMP H
- REMOVE AND REPLACE EXISTING STABILIZED SHOULDERS ALONG RAMP H WITH BITUMINOUS SHOULDERS.
- CONSTRUCT COLLECTOR-DISTRIBUTOR ROAD FOR LA GRANGE ROAD INTERCHANGE (WB)
- CONSTRUCT AUXILIARY LANES WEST OF LA GRANGE ROAD (EB & WB).
- RECONSTRUCT RAMPS A, B, E & F

SET 1 – STA 12+760.520 TO STA 15+110 & (WB)
STA 12+770.910 TO STA 14+000 (EB)

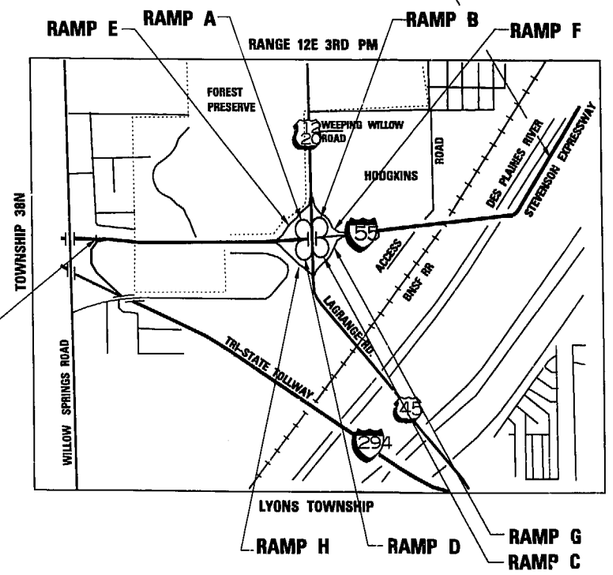
SET 2 – STA 15+110 TO STA 16+250

N

PROJECT: IM -55-7(219)277
COOK COUNTY
C-91-233-94

PROJECT BEGINS STA. 12+760.520

PROJECT ENDS STA. 16+250



BRIDGES:

1. STRUCTURE ~~NO6.016-0004 AND~~ 016-0005 (4 SPAN CONTINUOUS NON-COMPOSITE PLATE GIRDER BRIDGES)
2. STRUCTURE ~~NO6.016-0006 AND~~ 016-0007 (3 SPAN CONTINUOUS NON-COMPOSITE PLATE GIRDER BRIDGES)
3. STRUCTURE ~~NO6.016-0008 AND~~ 016-0009 (3 SPAN CONTINUOUS NON-COMPOSITE PLATE GIRDER BRIDGES)

STRUCTURE ~~NO6.016-0010 AND~~ 016-0011 (5 SPAN: 4 SPAN CONTINUOUS AND 1 SIMPLE SPAN, NON-COMPOSITE CURVED PLATE GIRDER BRIDGES).

WESTBOUND

- REMOVE EXISTING DECK, BARRIERS, AND LIGHTING.
- REPAIR SUBSTRUCTURES AND REPLACE SLOPEWALLS.
- REMOVE AND REPLACE EXISTING ABUTMENT BACKWALLS.
- CONSTRUCT COMPOSITE DECK AND BARRIERS INCLUDING MEDIAN WIDENING TO CL I-55.
- REPLACE BRIDGE OVER DESPLAINES RIVER.

LOCATION OF SECTION INDICATED THUS:- ▬

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED June 16 19 99
John P. Kos
DISTRICT ENGINEER

19
ENGINEER OF PROJECT DEVELOPMENT AND IMPLEMENTATION

August 13, 19 99
Bill Sunderlee
ENGINEER OF DESIGN AND ENVIRONMENT

August 13, 19 99
James C. Sligh
DIRECTOR, DIVISION OF HIGHWAYS

M. Michael Obrien
EXP 11/30/99
SET 1

17899 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS
Robert Baskin
EXPIRES: 11-30-99
SET 2

PRINTED BY THE AUTHORITY OF THE STATE OF ILLINOIS

alfred benesch & company
CONSULTING ENGINEERS
205 NORTH MICHIGAN AVENUE, CHICAGO, ILLINOIS 60601
JOB NO. 2975

GROSS AND NET LENGTH OF PROJECT = 3,489.48 METERS = 3.489 KM

Bench Mark: Brass plug located at the south east corner of westbound DesPlaines River Bridge median-Elev. 189.093

Existing Structures: S.N. 016-0010 (E.B.) & 016-0011 (W.B.) are twin deck five span structures having one simple span and four continuous spans with two curved welded plate girders, transverse plate girder floor beams, and rolled steel beam stringers. The out to out width of each deck is 18.123m. The structure is approximately 217.0m back to back of abutments, and the skew of piers and abutments to a tangent line to I-55 at Station 15+281.981 is 42°-48'-30". The bridge was constructed in 1964 at Sta. 15+455.08 and the deck was patched, waterproofed and resurfaced in 1978.

The existing structure will be removed and replaced with concrete deck on five span continuous multiple curved steel plate girders. The bridges will be widened to the center line of I-55. Pier #3 will be multiple columns with crash wall in between and a cap beam with spread footings. Other Piers will have cap beam Supported on drilled shaft columns. New abutments will be supported on the existing steel piles with additional piles added.

Two stage construction will be used to keep the traffic open. One deck will be replaced in each stage.

No salvage.

SHEET NO. 1 OF	36 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
155	*	COOK	594	539
STA.	TO STA.			
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT		

*0102-631RS-2,ETC,0404-676B-R-1

CURVE DATA
℄ F.A.I. ROUTE 55

P.I. Sta. 15+583.901
T.S. Sta. 15+281.98
S.C. Sta. 15+345.98
C.S. Sta. 15+787.333
S.T. Sta. 15+851.333
Δ = 49°-40'-9.64"
R_c = 582.948m
T_s = 301.921m
L_s = 64.0m
θ_s = 3°-08'-42.577"
Δ_s = 43°-22'-44.486"
L_c = 441.353m
X = 63.981m
Y = 1.171m
K = 31.998m
P = 0.293m
E_s = 59.725m

SEISMIC DATA

Seismic Performance Category (SPC) = A
Bedrock Acceleration Coefficient (A) = 0.04g
Site Coefficient (S) = 1.0

DESIGN SPECIFICATIONS

1996 AASHTO
1993 AASHTO Guide Specifications for Horizontally Curved Highway Bridges

LOADING MS18 & ALT.

Allow 1.2 kN/m2 for future wearing surface

DESIGN STRESSES

FIELD UNITS
f'c = 24 MPa
fy = 400 MPa (Reinf.)
fy = 345 MPa Structural Steel (M-270M Grade 345W)

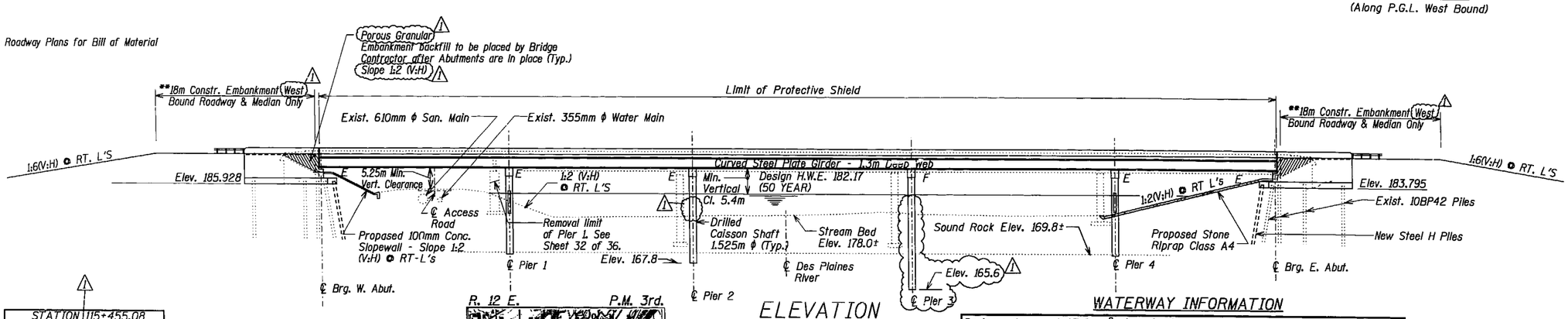
CAISSON SHAFTS
f'c = 27.5 MPa
fy = 400 MPa

NOTES:
1. This contract includes westbound bridge structure only.
2. All dimensions are in millimeters (mm) except as noted.

Sta. 215+322.5 El. 190.978 — -0.524% — Sta. 215+622.5 El. 189.406 — Bridge Limit

PROFILE GRADE
(Along P.G.L. West Bound)

**See Roadway Plans for Bill of Material



ELEVATION

Note:
Existing concrete slope wall at East abutment to be replaced with riprap. Existing concrete Slopewall at West abutment to be replaced with new concrete slopewall.

WATERWAY INFORMATION

Drainage Area = 1683.5 km^2 Low Grade Elev. 189.58 m ⊙ Sta. 215+603

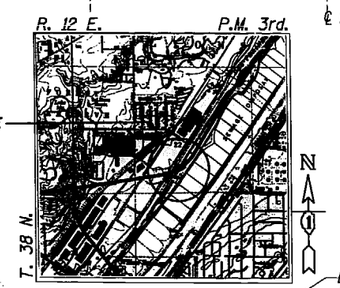
Flood	Freq. Yr.	Q cms	Opening Sq. m Exist.	Opening Sq. m Prop.	Nat. H.W.E. m	Head - m Exist.	Head - m Prop.	Headwater Elev. - m Exist.	Headwater Elev. - m Prop.
Design	50	212.0	248.0	318.0	182.17	0.00	0.00	182.17	182.17
Base	100	238.0	263.0	337.0	182.35	0.00	0.00	182.35	182.35
Overtopping	10	170.0	216.0	277.0	181.77	0.00	0.00	181.77	181.77
Max. Calc.	500	263.0	281.0	360.0	182.56	0.00	0.00	182.56	182.56

Max. H.W.E. : 181.8

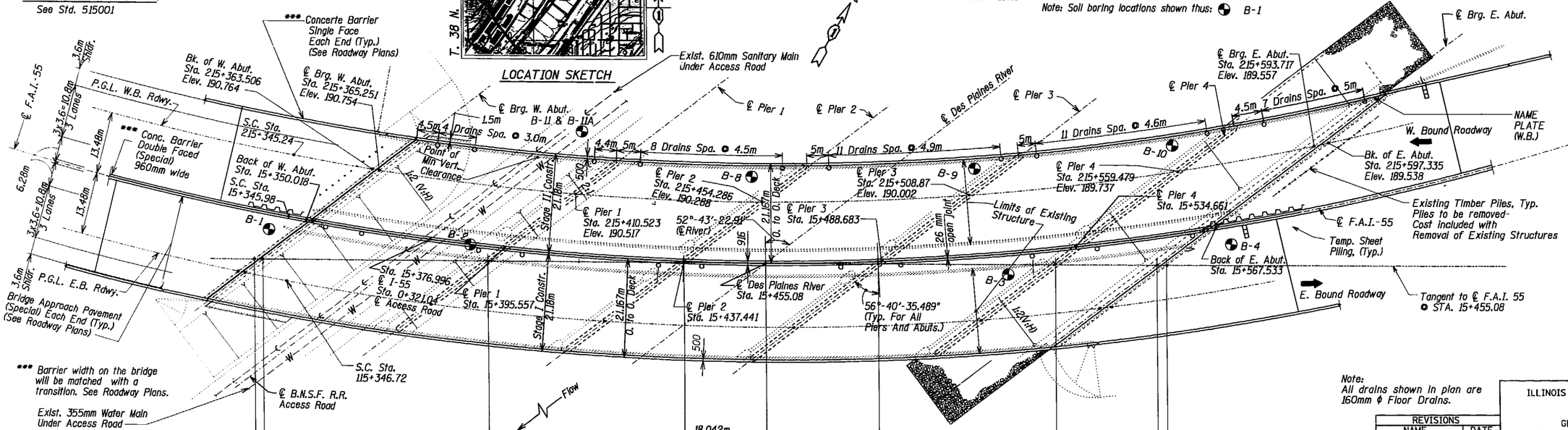
Note: Soil boring locations shown thus: ⊕ B-1

STATION 115+455.08
BUILT (200) BY
STATE OF ILLINOIS
F.A.I. RTE. 55 SEC. 0404-676B
F.A. PROJ.
LOADING MS18 & ALT.
STR. NO. 016-2704

NAME PLATE (W.B.)
See Std. 515001



LOCATION SKETCH



*** Barrier width on the bridge will be matched with a transition. See Roadway Plans.

Dimensions Along Tangent ⊙ Sta. 15+455.08

PLAN

Note:
All drains shown in plan are 160mm ϕ Floor Drains.

11-05-99
Date

STATE OF ILLINOIS
ROBERT BASKIN
No. 2091
STRUCTURAL ENGINEER
expires: 11-30-2000
Signature

APPROVED
FOR STRUCTURAL ADEQUACY ONLY
Ralph E. Anderson
ENGINEER OF BRIDGES AND STRUCTURES

REVISIONS	
NAME	DATE
⚠M. HUSAIN	11/5/99

ILLINOIS DEPARTMENT OF TRANSPORTATION

GENERAL PLAN AND ELEVATION
F.A.I. ROUTE 55 OVER DES PLAINES RIVER
COOK COUNTY

F.A.I. RTE. 55 SECTION 0404-676B
STA. 15+455.08 STRUCTURE NO. 016-2704(W.B.)

SCALE: VERT. HORIZ.
DATE 6/29/99

DESIGNED BY M.M.H.
CHECKED BY R.B.
DRAWN BY W.R.A./J.S.S.
CHECKED BY M.M.H.

NELSON OSTROM BASKIN BERMAN & ASSOC., INC.
CONSULTING ENGINEERS PARK RIDGE, ILLINOIS

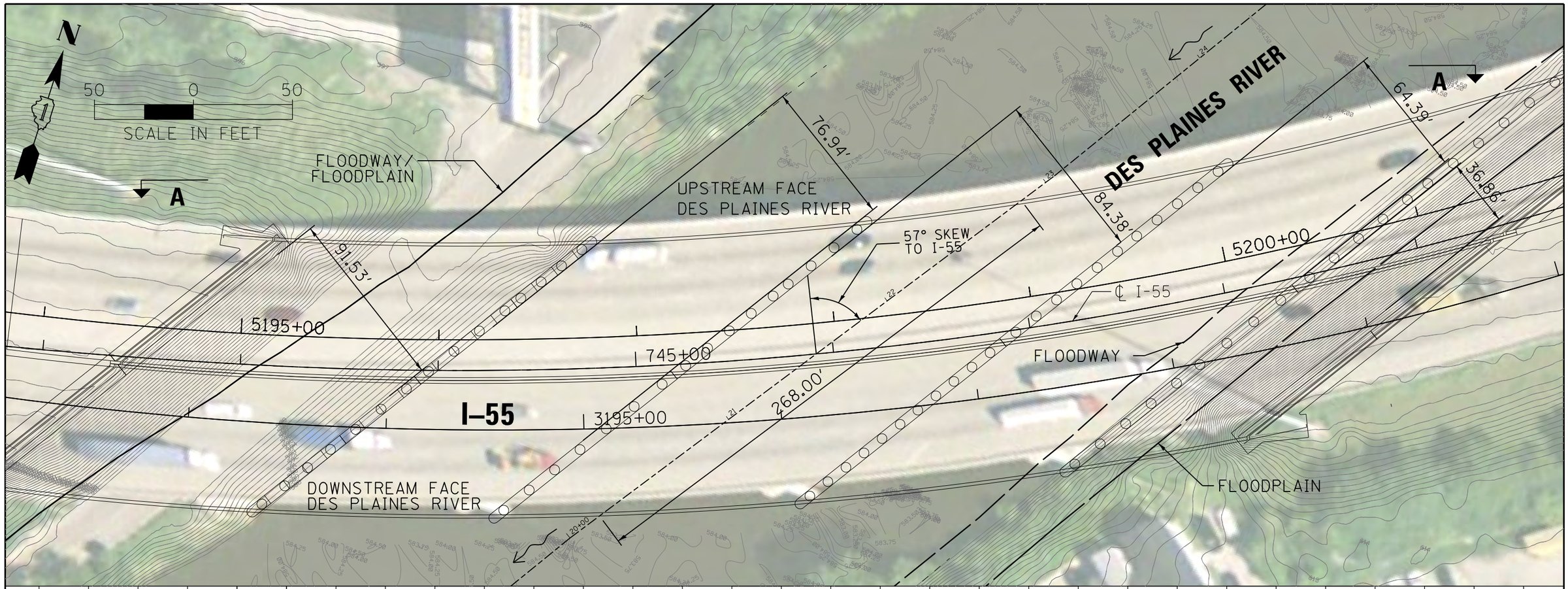
1896w101.dgn

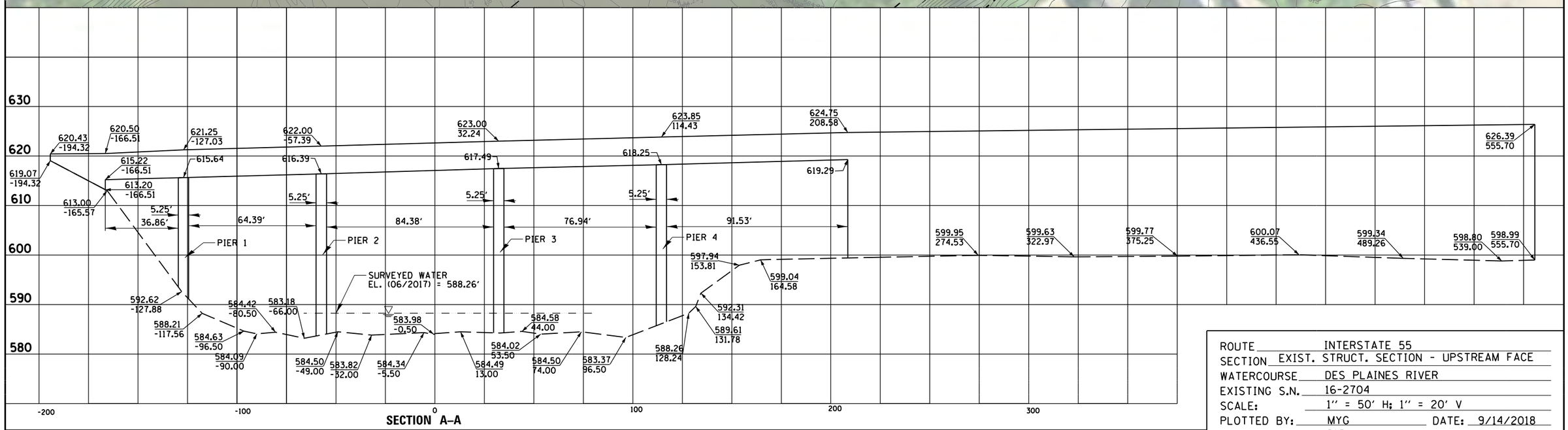
D C B A 0 A B C D

TAB 11

SECTION 11

BRIDGE CROSS SECTION PLOTS – EXISTING CONDITIONS





SECTION A–A

(PLOTTED PERPENDICULAR TO THE STREAM, FACING DOWNSTREAM)

ROUTE	INTERSTATE 55
SECTION	EXIST. STRUCT. SECTION - UPSTREAM FACE
WATERCOURSE	DES PLAINES RIVER
EXISTING S.N.	16-2704
SCALE:	1'' = 50' H; 1'' = 20' V
PLOTTED BY:	MYG DATE: 9/14/2018
CHECKED BY:	IAD DATE: 9/14/2018
SURVEY DATE:	06-27-2017

FILE NAME = N:\Idot\110203\00001\CADD\Sheets\P1110203-sht-detail55_DesPlv_US.dgn

N

50 0 50

SCALE IN FEET

FLOODWAY/
FLOODPLAIN

UPSTREAM FACE
DES PLAINES RIVER

DES PLAINES RIVER

76.94'

84.38'

64.39'

36.86'

91.53'

57° SKEW
TO I-55

5200+00

℄ I-55

5195+00

745+00

3195+00

I-55

268.00

FLOODWAY

FLOODPLAIN

B

B

DOWNSTREAM FACE
DES PLAINES RIVER

120.00

630
620
610
600
590
580

629.40 -166.51
630.00 -127.03
630.50 -57.39
631.25 32.24
632.00 114.43
632.40 208.58
630.97 520.24

628.73 -206.12
624.66
625.23
626.04
626.65
627.43
624.38

5.25'
5.25'
5.25'
5.25'

610.60 -206.12
605.73 -156.23

36.86'
64.39'
84.38'
76.94'
91.53'

PIER 1
PIER 2
PIER 3
PIER 4

594.58 116.93
599.96 208.58
598.05 520.24

SURVEYED WATER
EL. (06/2017) = 588.19'

595.23 -133.66
589.44 -129.59
584.37 -101.30
588.32 -127.54
583.84 -45.75
583.68 -70.80
584.13 -58.82
584.51 0.00
584.19 7.63
584.09 29.74
584.47 15.25
584.15 34.74
588.11 108.99
584.37 53.92
590.61 111.93
584.25 77.34
600.18 128.18
599.20 122.48

-200 -100 0 100 200 300

SECTION B–B

(PLOTTED PERPENDICULAR TO THE STREAM, FACING DOWNSTREAM)

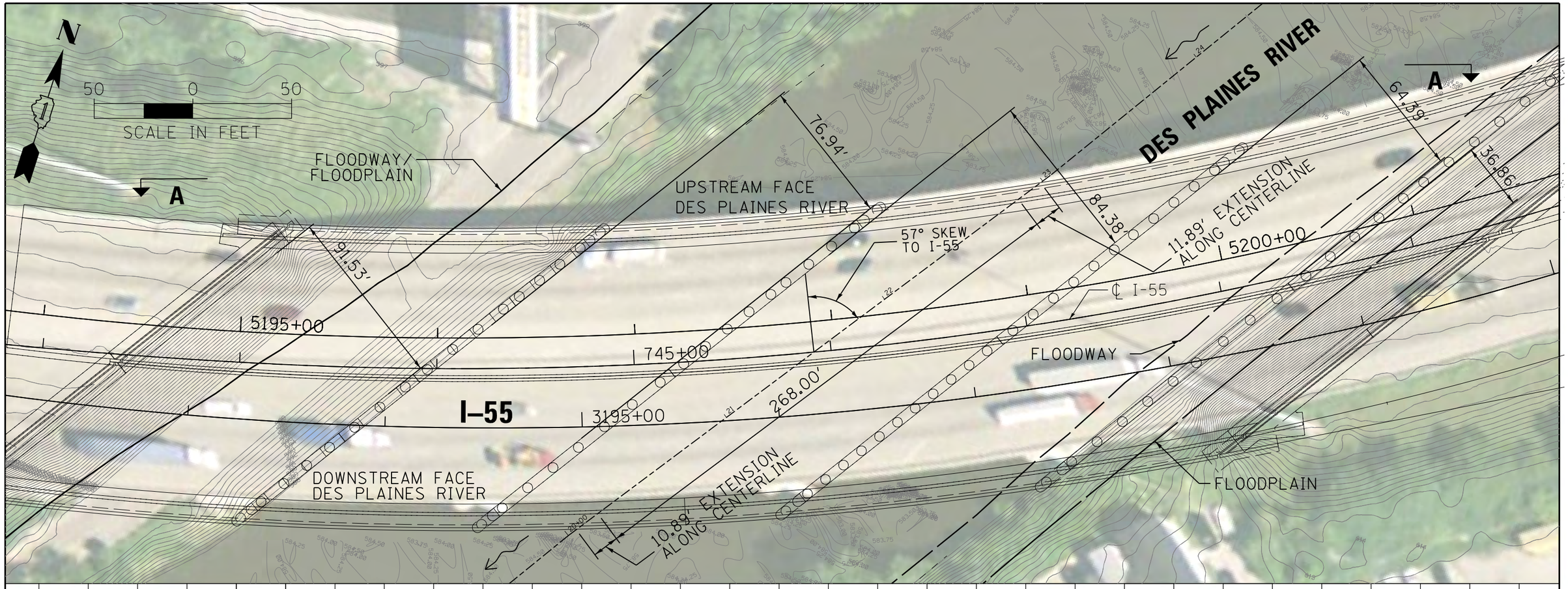
ROUTE	INTERSTATE 55
SECTION	EXIST. STRUCT. SECTION - DOWNSTREAM FACE
WATERCOURSE	DES PLAINES RIVER
EXISTING S.N.	16-2704
SCALE:	1'' = 50' H; 1'' = 20' V
PLOTTED BY:	MYG DATE: 9/14/2018
CHECKED BY:	IAD DATE: 9/14/2018
SURVEY DATE:	06-27-2017

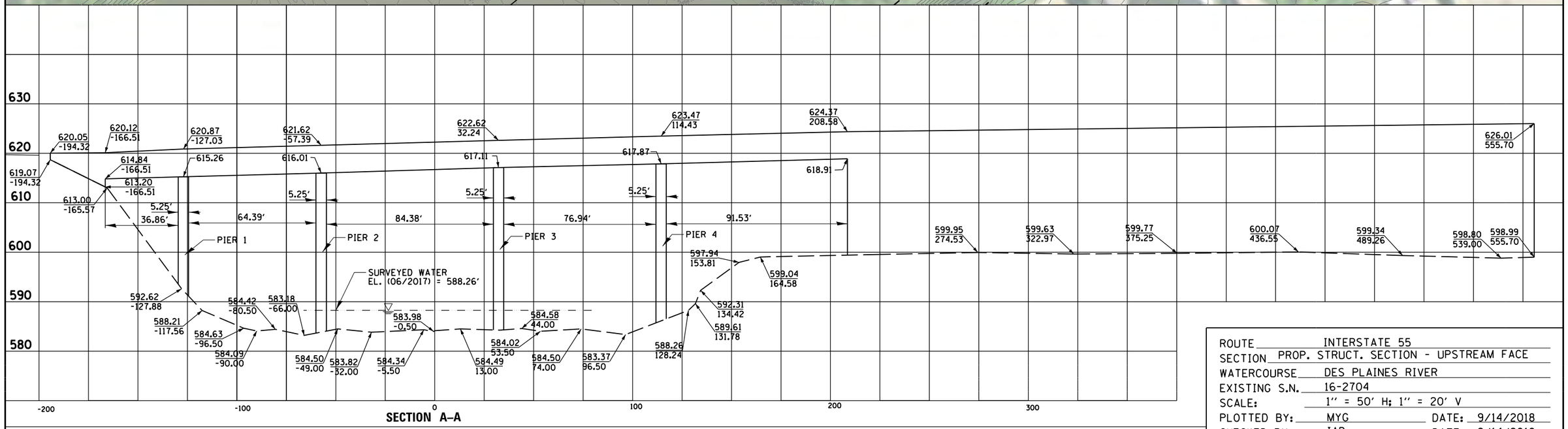
FILE NAME = N:\dot\110203.00001\CADD\Sheets\P1102203-sht-detail-I55_DesPlv_DS.dgn

TAB 12

SECTION 12

BRIDGE CROSS SECTION PLOTS – PROPOSED CONDITIONS





SECTION A–A

(PLOTTED PERPENDICULAR TO THE STREAM, FACING DOWNSTREAM)

ROUTE	INTERSTATE 55
SECTION	PROP. STRUCT. SECTION - UPSTREAM FACE
WATERCOURSE	DES PLAINES RIVER
EXISTING S.N.	16-2704
SCALE:	1'' = 50' H; 1'' = 20' V
PLOTTED BY:	MYG DATE: 9/14/2018
CHECKED BY:	IAD DATE: 9/14/2018
SURVEY DATE:	06-27-2017

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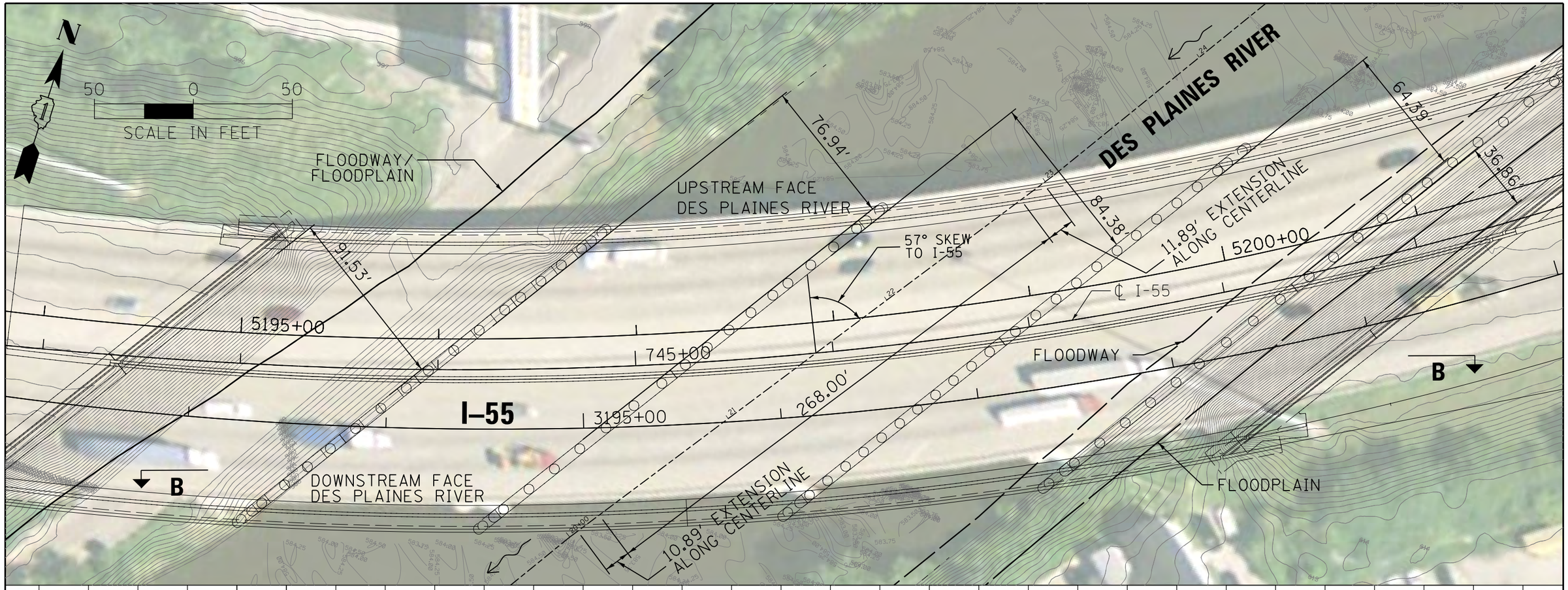
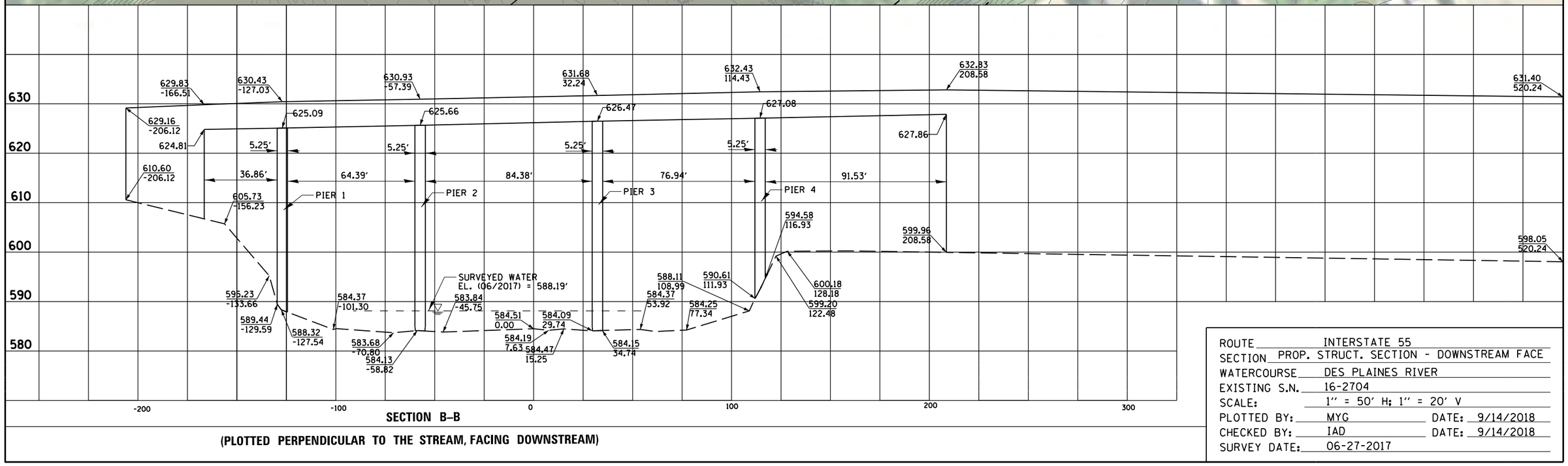




SECTION B–B

(PLOTTED PERPENDICULAR TO THE STREAM, FACING DOWNSTREAM)

ROUTE	INTERSTATE 55
SECTION	PROP. STRUCT. SECTION - DOWNSTREAM FACE
WATERCOURSE	DES PLAINES RIVER
EXISTING S.N.	16-2704
SCALE:	1'' = 50' H; 1'' = 20' V
PLOTTED BY:	MYG DATE: 9/14/2018
CHECKED BY:	IAD DATE: 9/14/2018
SURVEY DATE:	06-27-2017

FILE NAME = N:\dot\110203.00001\CADD_Sheets\P1102203-sht-detail_I55_DesRv.DS - Pro.dgn

PROP. CURVE I55NBALIGNJ-3
PI STA. = 3190+40.12
Δ = 1° 03′ 00″ (LT)
D = 0° 44′ 47″
R = 7,677.20′
T = 70.34′
L = 140.68′
E = 0.32′
e = -----
T.R. = -----
S.E. RUN = -----
P.C. STA. = 3189+69.77
P.T. STA. = 3191+10.46

PROP. CURVE I55NBALIGNJ-4
PI STA. = 3199+68.34
Δ = 47° 33′ 02″ (LT)
D = 2° 56′ 32″
R = 1,947.36′
T = 857.89′
L = 1,616.14′
E = 180.59′
e = -----
T.R. = -----
S.E. RUN = -----
P.C. STA. = 3191+10.46
P.T. STA. = 3207+26.60

PROP. CURVE I55CLALIGNJ-3
PI STA. = 740+34.89
Δ = 1° 03′ 00″ (LT)
D = 0° 45′ 00″
R = 7,639.70′
T = 70.00′
L = 140.00′
E = 0.32′
e = -----
T.R. = -----
S.E. RUN = -----
P.C. STA. = 739+64.89
P.T. STA. = 741+04.89

PROP. CURVE I55CLALIGNJ-4
PI STA. = 749+46.26
Δ = 47° 33′ 02″ (LT)
D = 3° 00′ 00″
R = 1,909.86′
T = 841.37′
L = 1,585.02′
E = 177.11′
e = -----
T.R. = -----
S.E. RUN = -----
P.C. STA. = 741+04.89
P.T. STA. = 756+89.91

PROP. CURVE I55SBALIGNJ-3
PI STA. = 5190+29.89
Δ = 1° 03′ 00″ (LT)
D = 0° 45′ 10″
R = 7,612.20′
T = 69.75′
L = 139.49′
E = 0.32′
e = -----
T.R. = -----
S.E. RUN = -----
P.C. STA. = 5189+60.14
P.T. STA. = 5190+99.63

PROP. CURVE I55SBALIGNJ-4
PI STA. = 5199+28.88
Δ = 47° 33′ 02″ (LT)
D = 3° 02′ 38″
R = 1,882.36′
T = 829.25′
L = 1,562.20′
E = 174.56′
e = -----
T.R. = -----
S.E. RUN = -----
P.C. STA. = 5190+99.63
P.T. STA. = 5206+61.83

Sheeting
FILE NAME = W:\1786\active\178600037_IDOT_I-55_2Lanes\civil\drawing\sht\plan set\current\D1P92917_sht_007.dgn

I-55 MANAGED LANE PROJECT

USER NAME = cteodoro	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
PLOT DATE = 6/29/2017	DATE -	REVISED -

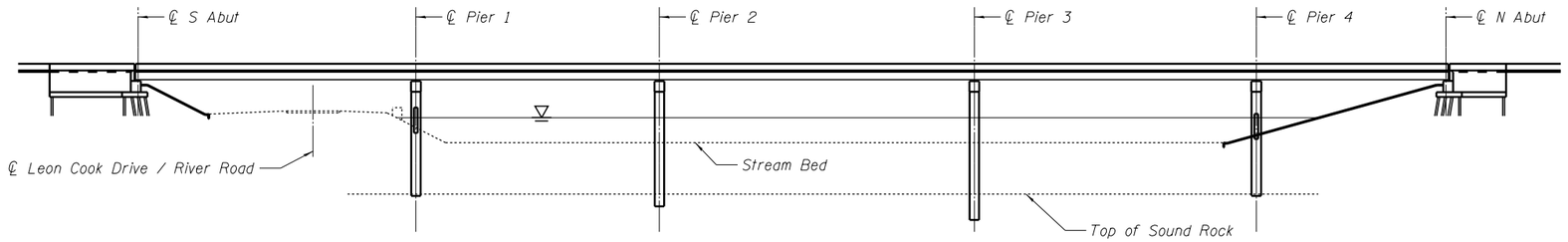
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 MANAGED LANE STUDY
PROPOSED ROADWAY PLANS

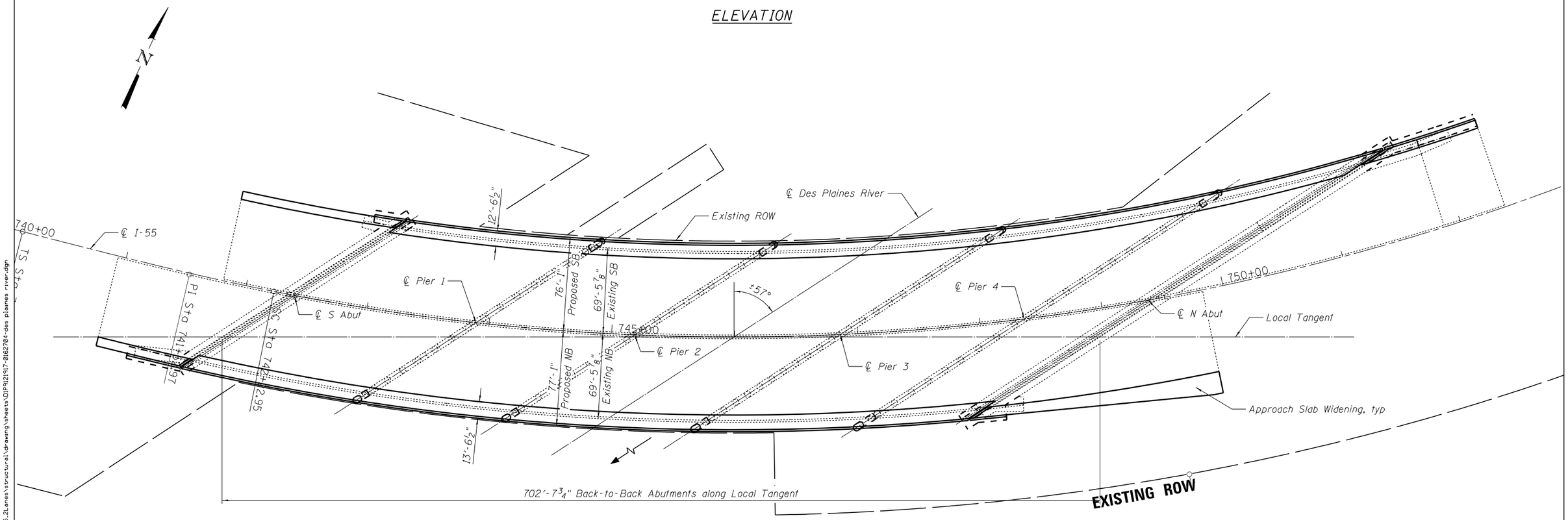
SCALE: | SHEET OF SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			52	7
		CONTRACT NO. P92917		
	ILLINOIS FED. AID PROJECT			

NOTES: Superstructure type, girder spacing, and rail type to be determined during the TSL phase.



ELEVATION



PLAN
PROPOSED STRUCTURE

FILE NAME = V:\1786\active\178600037_IDOT_I-55_2Lanes\structural\drawing\sheets\DIP\121917-8162784-des plaines river.dgn

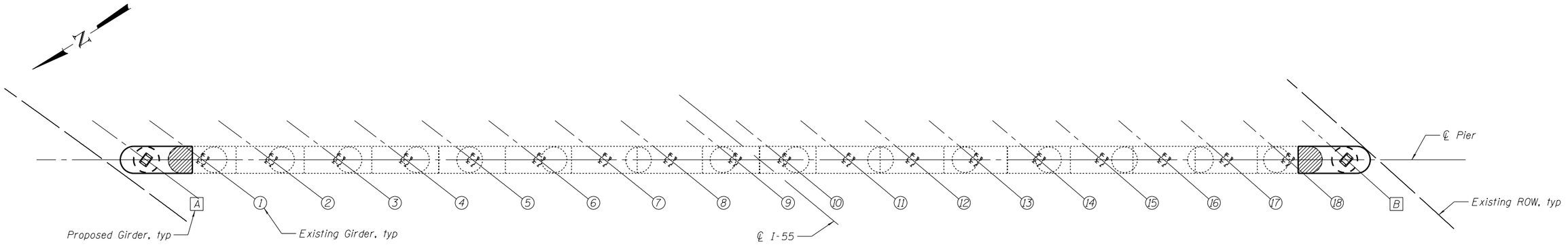
USER NAME = bsayers	DESIGNED -	REVISED -	
	CHECKED -	REVISED -	
PLOT SCALE = N/A	DRAWN -	REVISED -	
PLOT DATE = 8/18/2017	CHECKED -	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ATTACHMENT G – PROPOSED STRUCTURE DRAWING
SN 016–2704: I–55 OVER DES PLAINES RIVER
SHEET NO. G1 OF 3 SHEETS

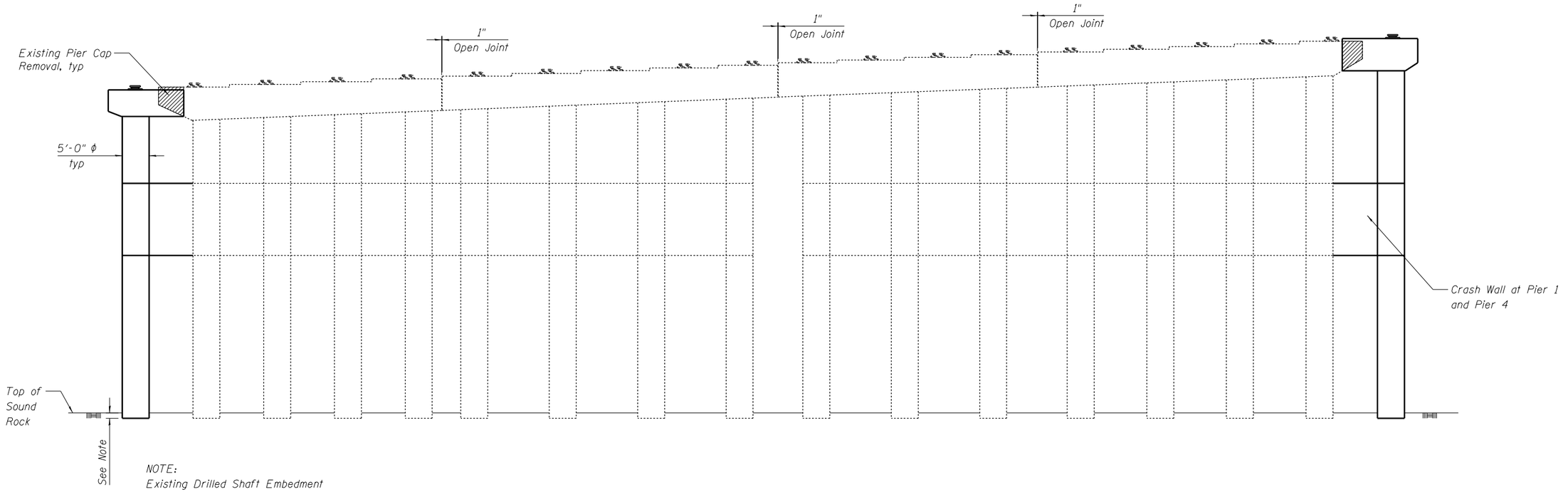
F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
055		COOK		
		JOB NO. P-91-219-17		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		

NOTES: Pier type, column spacing, and foundation type to be determined during the TSL phase.



PIER CAP

Pier 1 shown. Pier 2 through Pier 4 widening similar.



NOTE:
Existing Drilled Shaft Embedment into Sound Rock:
- Pier 1 = 1'-0"
- Pier 2 = 6'-6"
- Pier 3 = 13'-9"
- Pier 4 = 1'-0"

PIER ELEVATION

Pier 1 shown. Looking East. Pier 2 through Pier 4 widening similar.

FILE NAME = V:\1786\active\178600037_IDOT_I-55_2Lanes\structural\drawing\sheets\DIP91219170162704-des plaines river.dgn

Stantec

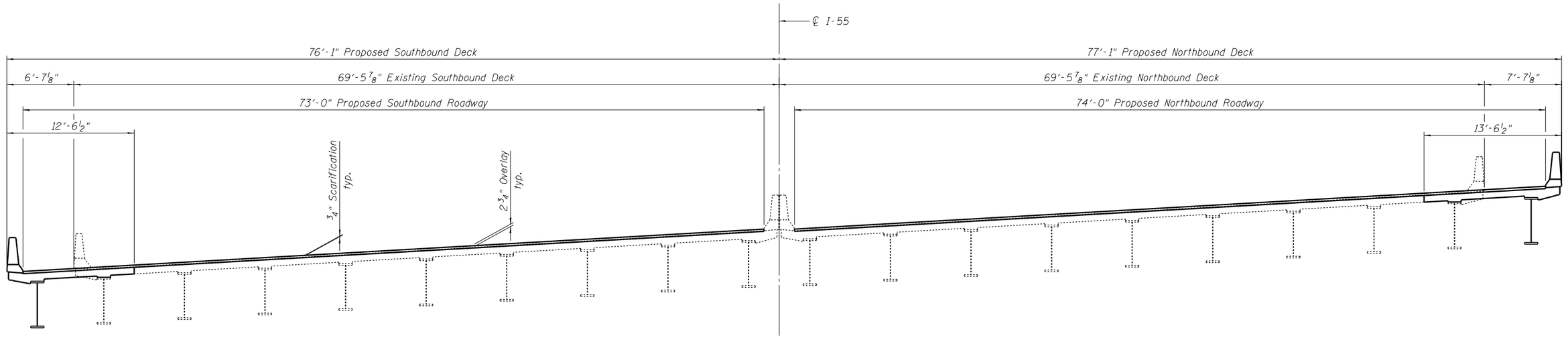
USER NAME = bsayers	DESIGNED -	REVISED -	
	CHECKED -	REVISED -	
PLOT SCALE = N/A	DRAWN -	REVISED -	
PLOT DATE = 8/18/2017	CHECKED -	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ATTACHMENT G – PROPOSED STRUCTURE DRAWING
SN 016-2704: I-55 OVER DES PLAINES RIVER
SHEET NO. G2 OF 3 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
055		COOK		
		JOB NO. P-91-219-17		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		

NOTES: Superstructure type, girder spacing, and rail type to be determined during the TSL phase.



PROPOSED STRUCTURE WIDTH

(Looking North)

FILE NAME = K:\1786\active\178600037.IDOT.I-55.2Lanes\structural\drawing\sheets\DIP912917-0162704-des plaines river.dgn

Stantec	USER NAME = bsayers	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	ATTACHMENT G – PROPOSED STRUCTURE DRAWING SN 016–2704: I–55 OVER DES PLAINES RIVER SHEET NO. G3 OF 3 SHEETS
		CHECKED -	REVISED -		
	PLOT SCALE = N/A	DRAWN -	REVISED -		
	PLOT DATE = 8/24/2017	CHECKED -	REVISED -		

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
055		COOK		
		JOB NO. P-91-219-17		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		

TAB 13

SECTION 13

HYDRAULIC ANALYSIS

TAB A

SECTION 13.A

BASELINE (FEMA) HEC-2 MODEL
HARDCOPY (NGVD29)

FEMA Engineering Library
Digitized Data Index

CID:170174

Community:WILLOW SPRINGS, CITY OF

County:COOK COUNTY

State:ILLINOIS

0242725

Box:

Doc:

Case Number/ Study ID:170174-19790716

Effective Date:7/16/1979

Description:1d. Type 15 Study

Contents:06. Engineering Analysis: Hydraulics (riverine, stillwater, LDS)

Revision Status:

Flooding Source(s):Des Plaines River

Notes:170174-19790716_DES_PLAINES; Matches (H)-(L) in current effective text; poor quality hardcopy

Scanned by: TK

Scan Date: 1/19/2011

QC Staff:

QC Date:

```
**********************************************
HEC2 VERSION UPDATED AUG 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09,10
MODIFICATIONS 52,53,54,55,56,57,58,59
**********************************************
```

Rerun of Des Plaines River in Willow Springs and Hodgkins

IGNOR FLOODWAY RUN

Sections 5 and 7 were revised based on data received from the Santa Fe RR

JAB 1 Feb 78

```
T1  DES PLAINES RIVER IN WILLOW SPRINGS AND HODGKINS
T2  HARZA ENGINEERING CO.
T3  500 YEAR FLOOD

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         NSEL      PO
        =1.       2.        =0.       =0.    .000120      =.00      =.0       =0.      =.000     =.000

J2  NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLOC     IBW       CHNIM     ITRACE
      1.000     =.000     =1.000      =.000     =.000     =.000    =1.000     =.000     =.000     =.000

J3      1.000    34.000     2.000     4.000    27.000    28.000     9.000     =.000     =.000     =.000
NC       .075      .075      .035      .100      .300     =.000     =.000     =.000     =.000     =.000
QT      5.000  9300.000  8400.000  8400.000  7500.000  6000.000     =.000     =.000     =.000     =.000
ET      =.000     =.000     =.000     1.400     =.000     =.000     =.000     =.000     =.000     =.000

X1      1.000    25.000   200.000   445.000     =.000     =.000     =.000     =.000     =.000     =.000
GR    597.500      .000   596.200   100.000   594.100   166.000   589.100   190.000   589.600   200.000
GR    586.500   210.000   586.100   211.000   583.800   236.000   582.600   290.000   581.900   335.000
GR    582.200   360.000   582.900   385.000   586.100   405.000   586.600   430.000   589.000   445.000
GR    589.200   500.000   588.200   600.000   588.000   700.000   591.900   775.000   591.400   800.000
GR    593.300   900.000   594.900  1000.000   595.700  1100.000   595.600  1145.000   596.500  1200.000

X1      2.000     =.000     =.000     =.000  2000.000  2000.000  8000.000     =.000      .240     =.000

X1      3.000    13.000   100.000   300.000  4800.000  4800.000  4800.000     =.000     =.000     =.000
GR    600.000      .000   595.000    20.000   590.000    50.000   586.000   100.000   584.500   120.000
GR    581.000   170.000   580.900   220.000   581.400   270.000   586.000   300.000   590.000   360.000
GR    591.000   500.000   595.000   520.000   600.000   530.000     =.000     =.000     =.000     =.000
NC       .070      .045      .035      .100      .300     =.000     =.000     =.000     =.000     =.000

X1      4.000    21.000   350.000   780.000  4140.000  4140.000  4140.000     =.000     =.000     =.000
GR    600.300   190.000   592.800   221.000   593.700   278.000   589.900   300.000   591.300   356.000
GR    586.000   373.000   586.400   374.000   583.200   410.000   580.600   434.000   579.800   467.000
GR    579.300   474.000   580.200   602.000   583.100   500.000   586.400   578.000   586.800   581.000
GR    588.000   614.000   588.600   700.000   590.900   780.000   590.800   800.000   595.100   806.000
GR    597.000   820.000     =.000     =.000     =.000     =.000     =.000     =.000     =.000     =.000

X1      5.000    10.000    50.000   270.000  5200.000  5300.000  5200.000     =.000     =.000     =.000
GR    600.000      .000   590.000    20.000   586.500    90.000   582.600    90.000   592.000   110.000
GR    582.200   190.000   586.500   270.000   590.000   300.000   595.000   420.000   600.000   430.000
NC       .070      .045      .035      .100      .300     =.000     =.000     =.000     =.000     =.000
```

HARZA

X1	6.000	14.000	700.000	885.000	5900.000	5900.000	5900.000	*.000	*.000	*.000
GR	608.000	900.000	607.800	500.000	605.600	690.000	586.700	700.000	585.800	701.000
GR	584.600	740.000	584.300	790.000	584.700	830.000	585.800	884.000	586.700	803.000
GR	595.700	945.000	596.700	985.000	597.700	1085.000	598.200	1145.000	*.000	*.000
X1	7.000	13.000	80.000	250.000	3750.000	3750.000	3750.000	*.000	*.000	*.000
GR	600.000	.000	595.000	30.000	590.600	70.000	586.600	80.000	584.300	120.000
GR	587.200	170.000	584.300	200.000	585.200	250.000	586.600	280.000	591.200	315.000
GR	599.500	355.000	600.700	450.000	600.900	560.000	*.000	*.000	*.000	*.000
NC	.045	.032	.035	.100	.300	*.000	*.000	*.000	*.000	*.000
X1	8.000	19.000	35.000	179.000	4800.000	4800.000	4800.000	*.000	*.000	*.000
GR	599.100	.000	583.500	15.000	587.100	35.000	586.700	36.000	586.300	37.000
GR	582.700	65.000	581.900	90.000	583.200	125.000	584.700	150.000	585.300	177.000
GR	586.300	178.000	587.100	179.000	588.200	200.000	587.800	250.000	589.800	300.000
GR	591.800	330.000	599.300	345.000	599.800	400.000	600.900	500.000	*.000	*.000
NC	.045	.049	.035	.100	.300	*.000	*.000	*.000	*.000	*.000
X1	9.000	18.000	190.000	324.000	3800.000	3800.000	3800.000	*.000	*.000	*.000
GR	600.000	.000	589.100	10.000	587.700	100.000	586.900	101.000	586.300	102.000
GR	583.800	135.000	583.300	195.000	583.000	225.000	583.900	270.000	586.000	315.000
GR	586.300	320.000	587.600	324.300	589.100	390.000	590.300	400.000	594.800	425.000
GR	600.100	448.000	600.800	500.000	601.000	524.000	*.000	*.000	*.000	*.000
EJ	*.000	*.000	*.000	*.000	*.000	*.000	*.000	*.000	*.000	*.000

```
**********************************************
HEC2 VERSION UPDATED AUG 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09,10
MODIFICATIONS 52,53,54,55,56,57,58,59
**********************************************



T1  DES PLAINES RIVER IN WILLOW SPRINGS AND HODGKINS
T2  HARZA ENGINEERING CO.
T3  100 YEAR FLOOD

J1  ICHECK      INQ         NINV        IDIR        STRT        METRIC      HVINS       Q           WSEL        FQ

        =1.         3.          =0.         =0.     .000120     =.00        =.0         =0.         =.000       =.000

J2  NPROF       IPLOT       PRFVS       XSECV       XSECH       FN          ALLOC       IBW         CHNIM       ITRACE

        2.000       =.000       =1.000      =.000       =.000       =.000       =1.000      =.000       =.000       =.000
```

```
**********************************************
HEC2 VERSION UPDATED AUG 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09,10
MODIFICATIONS 52,53,54,55,56,57,58,59
**********************************************



T1  DES PLAINES RIVER IN WILLOW SPRINGS AND HODGKINS
T2  HARZA ENGINEERING CO.
T3  100 YEAR FLOODWAY

J1  ICHECK      INQ         NINV        IDIR        STRT        METRIC      HVINS       Q           WSEL        FQ
        =1.         0.          =0.         =0.     .000120     =.00        =.0         =0.         =.000       =.000
J2  NPROF       IPLOT       PRFVS       XSECV       XSECH       FN          ALLOC       ITW         CHNIM       ITRACE
        3.000       =.000       =1.000      =.000       =.000       =.000       =1.000      =.000       =.000       =.000
```

HARZA

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**********************************************
HEC2 VERSION UPDATED AUG 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09,10
MODIFICATIONS 52,53,54,55,56,57,58,59
**********************************************


T1  DES PLAINES RIVER IN WILLOW SPRINGS AND HODGKINS
T2  HARZA ENGINEERING CO.
T3   50 YEAR FLOOD

J1  ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ

       =1.         3.        =0.        =0.    .000120       =.00       =.0        =0.     =.000      =.000

J2  NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE

      4.000      =.000     =1.000      =.000      =.000      =.000     =1.000      =.000      =.000      =.000
```

```
**********************************************
HEC2 VERSION UPDATED AUG 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09,10
MODIFICATIONS 52,53,54,55,56,57,58,59
**********************************************



T1  DES PLAINES RIVER IN WILLOW SPRINGS AND HODGKINS
T2  HARZA ENGINEERING CO.
T3   10 YEAR FLOOD

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINQ     0         NSEL      FQ

      =1.        5.        =0.       =0.    .000120      =.00      =.0       =0.     =.000     =.000

J2  NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     15.000     =.000     =1.000     =.000     =.000     =.000     =1.000     =.000     =.000     =.000
```

SUMMARY PRINTOUT FOR MULTIPLE PROFILES

YEAR FLOOD

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TO	CRIWS	TOPWID	STENCL	STENCR	ASELK
1.00	.00	.00	.00	581.90	9300.00	595.85	8500.40	587.31	1049.13	.00	.00	.00
1.00	.00	.00	.00	581.90	8400.00	595.28	7672.01	587.08	936.65	.00	.00	.00
1.00	.00	.00	.00	581.90	8400.00	30290.95	*********	595.95	714.30	191.76	905.56	595.85
1.00	.00	.00	.00	581.90	7500.00	594.64	6793.66	586.78	863.66	.00	.00	.00
1.00	.00	.00	.00	581.90	6000.00	593.97	5467.89	586.23	753.69	.00	.00	.00
2.00	2000.00	.00	.00	582.14	9300.00	596.09	8499.47	587.56	1049.07	.00	.00	.00
2.00	2000.00	.00	.00	582.14	8400.00	595.52	7671.62	587.29	936.62	.00	.00	.00
2.00	2000.00	.00	.00	582.14	8400.00	30290.95	*********	596.19	714.21	191.27	905.48	596.09
2.00	2000.00	.00	.00	582.14	7500.00	594.89	6798.39	587.03	863.97	.00	.00	.00
2.00	2000.00	.00	.00	582.14	6000.00	593.81	5468.71	586.01	753.71	.00	.00	.00
3.00	4800.00	.00	.00	580.50	9300.00	596.63	8713.86	586.23	509.78	.00	.00	.00
3.00	4800.00	.00	.00	580.50	8400.00	596.06	8647.03	585.96	506.35	.00	.00	.00
3.00	4800.00	.00	.00	580.50	8400.00	30290.95	*********	596.73	489.32	49.27	497.59	596.63
3.00	4800.00	.00	.00	580.50	7500.00	595.42	7329.45	585.65	502.50	.00	.00	.00
3.00	4800.00	.00	.00	580.50	6000.00	594.32	6175.08	585.07	492.45	.00	.00	.00
4.00	4140.00	.00	.00	579.80	9300.00	597.06	10762.30	586.27	616.38	.00	.00	.00
4.00	4140.00	.00	.00	579.80	8400.00	596.47	9788.10	585.95	610.24	.00	.00	.00
4.00	4140.00	.00	.00	579.80	8400.00	30290.95	*********	597.16	527.13	232.87	780.00	597.06
4.00	4140.00	.00	.00	579.80	7500.00	595.82	8753.99	585.62	602.73	.00	.00	.00
4.00	4140.00	.00	.00	579.80	6000.00	594.69	7588.60	585.01	586.18	.00	.00	.00
5.00	5200.00	.00	.00	582.00	9300.00	597.09	8952.90	587.18	419.96	.00	.00	.00
5.00	5200.00	.00	.00	582.00	8400.00	596.90	8230.20	586.93	417.58	.00	.00	.00
5.00	5200.00	.00	.00	582.00	8400.00	30290.95	*********	597.59	373.63	19.85	393.47	597.09
5.00	5200.00	.00	.00	582.00	7500.00	596.20	7073.90	586.66	414.95	.00	.00	.00
5.00	5200.00	.00	.00	582.00	6000.00	595.09	6232.24	586.17	410.34	.00	.00	.00
6.00	5900.00	.00	.00	584.30	9300.00	598.27	6810.05	589.16	503.15	.00	.00	.00
6.00	5900.00	.00	.00	584.30	8400.00	597.66	6205.51	588.88	435.47	.00	.00	.00
6.00	5900.00	.00	.00	584.30	8400.00	30290.95	*********	598.37	300.66	472.27	976.93	598.27
6.00	5900.00	.00	.00	584.30	7500.00	596.98	5392.73	588.99	360.31	.00	.00	.00
6.00	5900.00	.00	.00	584.30	6000.00	595.78	4606.33	588.07	293.52	.00	.00	.00
7.00	3750.00	.00	.00	583.20	9300.00	598.99	8142.92	588.74	345.41	.00	.00	.00
7.00	3750.00	.00	.00	583.20	8400.00	598.26	7287.10	588.48	338.58	.00	.00	.00
7.00	3750.00	.00	.00	583.20	8400.00	30290.95	*********	598.99	291.14	33.04	324.20	598.89
7.00	3750.00	.00	.00	583.20	7500.00	597.97	6798.23	588.21	331.09	.00	.00	.00
7.00	3750.00	.00	.00	583.20	6000.00	596.33	5406.29	587.69	317.67	.00	.00	.00
8.00	4930.00	.00	.00	581.90	9300.00	599.02	10170.36	589.12	358.65	.00	.00	.00
8.00	4800.00	.00	.00	581.90	8400.00	598.77	9340.32	588.80	343.48	.00	.00	.00
8.00	4800.00	.00	.00	581.90	8400.00	30290.95	*********	599.52	320.78	13.39	334.31	599.42
8.00	4800.00	.00	.00	581.90	7500.00	598.06	8470.84	588.44	341.08	.00	.00	.00
8.00	4800.00	.00	.00	581.90	6000.00	596.79	7009.00	587.85	336.70	.00	.00	.00

HARZA
ENGINEERING COMPANY

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	CRIWS	TOPWID	STENCL	STENCR	WSELK
9.00	3800.00	.00	.00	585.30	9300.00	599.71	12537.83	587.99	446.05	.00	.00	.00
9.00	3800.00	.00	.00	583.30	8400.00	599.05	11548.57	587.71	442.56	.00	.00	.00
9.00	3800.00	.00	.00	583.30	8400.00	50290.95	********	599.81	417.16	5.23	422.38	599.71
9.00	3800.00	.00	.00	585.30	7500.00	598.33	10311.82	587.44	438.77	.00	.00	.00
9.00	3800.00	.00	.00	583.30	6000.00	597.03	8757.23	586.98	431.94	.00	.00	.00

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
1.000	9300.000	595.448	.000	.000	.000	1049.127	-.000	.000
1.000	8400.000	595.285	-.163	.000	.000	936.652	112.474	.000
1.000	8400.000	50290.950	49695.664	.000	.000	714.298	334.828	.000
1.000	7500.000	594.644	-49696.306	.000	.000	863.058	186.068	.000
1.000	6000.000	593.570	-1.074	.000	.000	753.652	295.475	.000
2.000	9300.000	596.088	.000	.239	.000	1049.070	-.000	2000.000
2.000	8400.000	595.525	-.563	.240	.000	936.620	112.450	2000.000
2.000	8400.000	50290.949	49695.424	-.001	49694.861	714.215	334.855	2000.000
2.000	7500.000	594.887	-49696.061	.244	.000	863.469	185.601	2000.000
2.000	6000.000	593.811	-1.077	.241	.000	753.719	295.355	2000.000
3.000	9300.000	596.631	.000	.544	.000	509.782	-.000	4800.000
3.000	8400.000	596.060	-.572	.535	.000	506.350	3.431	4800.000
3.000	8400.000	50290.949	49694.889	-.000	49694.318	449.316	60.466	4800.000
3.000	7500.000	595.818	-49695.130	.531	.000	502.502	7.279	4800.000
3.000	6000.000	594.715	-1.103	.505	.000	492.450	17.332	4800.000
4.000	9300.000	597.058	.000	.426	.000	616.585	-.000	4140.000
4.000	8400.000	596.471	-.587	.412	.000	610.238	6.347	4140.000
4.000	8400.000	50290.949	49694.478	-.000	49693.891	527.133	89.452	4140.000
4.000	7500.000	595.818	-49695.130	.400	.000	602.727	13.857	4140.000
4.000	6000.000	594.686	-1.132	.371	.000	586.176	30.409	4140.000
5.000	9300.000	597.492	.000	.434	.000	419.961	-.000	5200.000
5.000	8400.000	596.897	-.595	.426	.000	417.580	2.381	5200.000
5.000	8400.000	50290.940	49694.052	-.000	49693.457	373.627	46.334	5200.000
5.000	7500.000	596.239	-49694.710	.421	.000	414.988	5.018	5200.000
5.000	6000.000	595.089	-1.150	.403	.000	410.340	9.616	5200.000
6.000	9300.000	598.274	.000	.782	.000	503.150	-.000	5900.000
6.000	8400.000	597.698	-.616	.761	.000	435.469	67.681	5900.000
6.000	8400.000	50290.949	49693.291	-.000	49692.675	304.661	198.889	5900.000
6.000	7500.000	596.981	-49693.967	.742	.000	364.313	138.837	5900.000
6.000	6000.000	595.782	-1.199	.693	.000	293.817	209.334	5900.000
7.000	9300.000	598.891	.000	.617	.000	345.408	-.000	3750.000
7.000	8400.000	598.260	-.631	.602	.000	338.581	6.828	3750.000
7.000	8400.000	50290.949	49692.689	-.000	49692.059	291.160	54.248	3750.000
7.000	7500.000	597.367	-49693.382	.586	.000	331.086	14.322	3750.000
7.000	6000.000	596.128	-1.240	.585	.000	317.675	27.733	3750.000
8.000	9300.000	599.424	.000	.533	.000	358.646	-.000	4800.000
8.000	8400.000	598.773	-.651	.514	.000	343.484	15.162	4800.000
8.000	8400.000	50290.949	49692.175	-.000	49691.525	320.721	37.925	4800.000
8.000	7500.000	597.062	-49692.886	.495	.000	341.056	17.590	4800.000
8.000	6000.000	596.786	-1.277	.458	.000	338.696	21.950	4800.000

HARZA

9.000	8000.000	599.049	-.643	.275	.000	448.585	3.484	3800.000
9.000	8000.000	50890.949	49691.900	-.000	49691.259	417.157	26.892	3800.000
9.000	7500.000	598.327	-49692.622	.264	.000	458.768	7.281	3800.000
9.000	6000.000	597.028	-1.298	.242	.000	431.943	14.106	3800.000

DATA FOR LAST CROSS SECTION

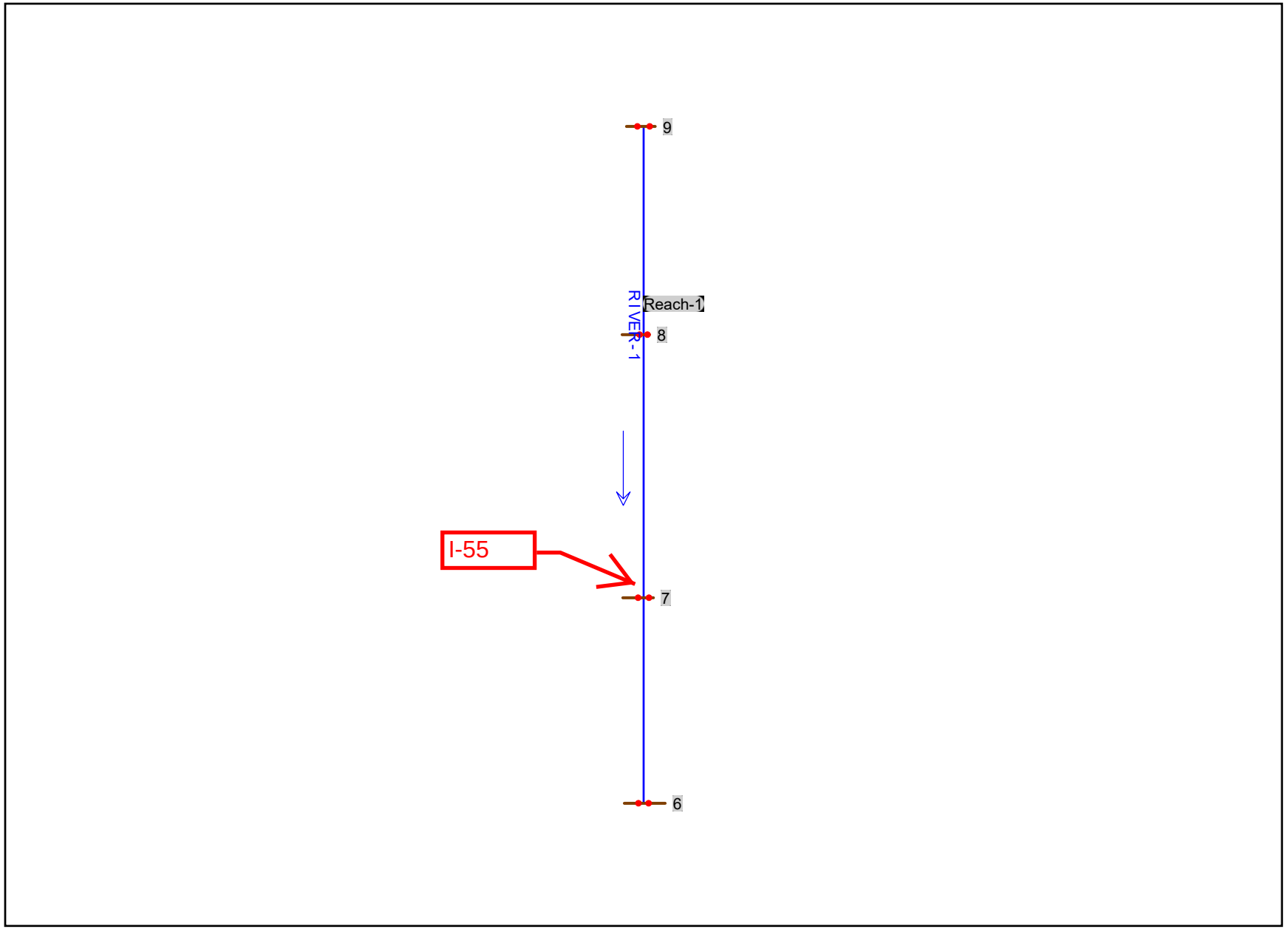
PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	.000	.000	422.381	.000
2	.000	.000	399.870	-22.511
3	.000	.012	334.546	-87.835
4	.000	.000	381.913	-40.468
5	.000	.000	357.567	-64.814

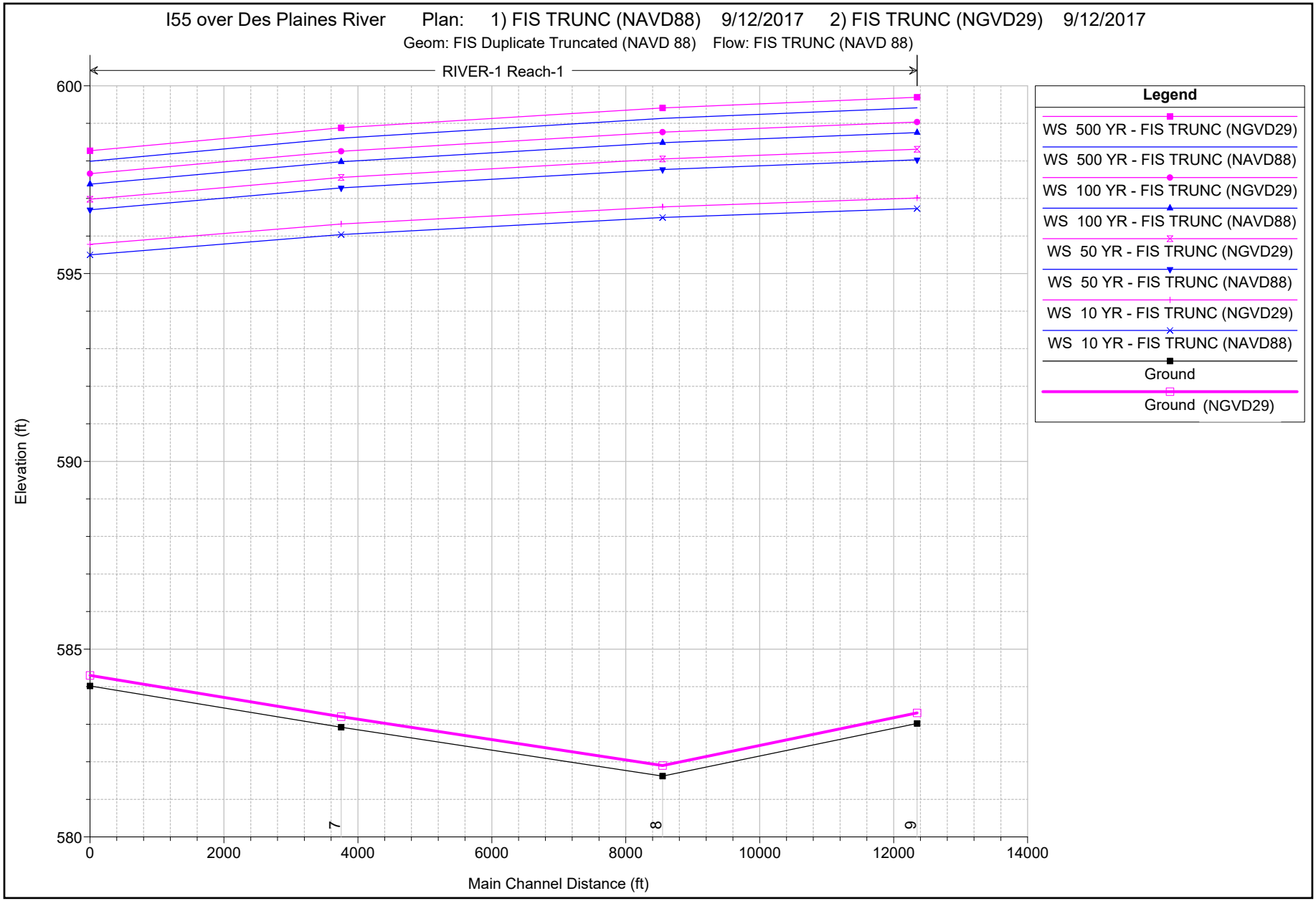
TAB B

SECTION 13.B

FIS DUPLICATE MODEL
(NGVD29 and NAVD88)

Duplicate Conditions
HEC-RAS Geometry




I55 over Des Plaines River Plan: 1) FIS TRUNC (NAVD88) 9/12/2017 2) FIS TRUNC (NGVD29) 9/12/2017
Geom: FIS Duplicate Truncated (NAVD 88) Flow: FIS TRUNC (NAVD 88)
RIVER-1 Reach-1
Elevation (ft)
600
595
590
585
580
0
2000
4000
6000
8000
10000
12000
14000
Main Channel Distance (ft)
7
8
9
Legend
WS 500 YR - FIS TRUNC (NGVD29)
WS 500 YR - FIS TRUNC (NAVD88)
WS 100 YR - FIS TRUNC (NGVD29)
WS 100 YR - FIS TRUNC (NAVD88)
WS 50 YR - FIS TRUNC (NGVD29)
WS 50 YR - FIS TRUNC (NAVD88)
WS 10 YR - FIS TRUNC (NGVD29)
WS 10 YR - FIS TRUNC (NAVD88)
Ground
Ground (NGVD29)

HEC-RAS HEC-RAS 5.0.3 September 2016
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: I55 over Des Plaines River
Project File : I55overDesPlaine.prj
Run Date and Time: 9/12/2017 11:58:03 AM

Project in English units

PLAN DATA

Plan Title: FIS TRUNC (NGVD29)
Plan File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.p04

Geometry Title: FIS Duplicate Truncated (NGVD 29)
Geometry File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.g04

Flow Title : FIS TRUNC (NGVD 29)
Flow File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.f03

Plan Description:
NGVD29. Truncated from hardcopy FIS HEC-2 "Des Plaines River in Willow Springs and Hodgkins, Harza Engineering Company". Hand-annotated "Ignore Floodway Run", 1 Feb 78".

Plan Summary Information:

Number of:	Cross Sections	= 4	Multiple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	0

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculation tolerance	= 0.01
Maximum number of iterations	= 20
Maximum difference tolerance	= 0.3
Flow tolerance factor	= 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: Between every coordinate point (HEC2 Style)
Friction Slope Method: Program Selects Appropriate method
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: FIS TRUNC (NGVD 29)
Flow File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.f03

Flow Data (cfs)

River	Reach	RS	500 YR	100 YR	50 YR	10 YR
RIVER-1	Reach-1	9	9300	8400	7500	6000

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	500 YR	Known WS = 598.27	
RIVER-1	Reach-1	100 YR	Known WS = 597.66	
RIVER-1	Reach-1	50 YR	Known WS = 596.98	
RIVER-1	Reach-1	10 YR	Known WS = 595.78	

GEOMETRY DATA

Geometry Title: FIS Duplicate Truncated (NGVD 29)
Geometry File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.g04

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 9

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	600	1	589.1	100	587.7	101	586.8	102	586.3
135	583.8	195	583.3	225	583.4	270	583.9	315	586
320	586.8	324	587.6	390	589.1	400	590.3	425	594.8
448	600.1	500	600.8	524	601				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	100	.035	324	.042

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	324	3800	3800	3800	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 8

INPUT
Description: FIS XS N (old Hodgkins XS C)
38.15 I-55 STEVENSON EXPRESSWAY
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	599.1	15	588.5	35	587.1	36	586.7	37	586.3
65	582.7	90	581.9	125	583.2	150	584.7	177	585.3
178	586.3	179	587.1	200	588.2	250	587.8	300	589.8
330	591.8	345	599.3	400	599.8	500	600.9		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	35	.035	179	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35	179	4800	4800	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 7

INPUT
Description: FIS XS M (old Hodgkins XS B)
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	600	30	595	70	590	80	586.6	120	584.3
170	583.2	200	584.3	250	585.2	280	586.6	315	591.2
355	599.5	450	600.7	560	600.9				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.048	80	.035	280	.048

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
80	280	3750	3750	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 6

INPUT
Description: FIS XS L ((old Hodgkins XS A)
36.98 I-294 TOLLWAY
37.24 US 12,
US 20 AND US 45
IN DIVERSION
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
400	608	500	607.8	600	606.6	700	586.7	701	585.8
740	584.6	790	584.3	830	584.7	884	585.8	885	586.7
945	595.7	985	596.7	1085	597.7	1145	598.2		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
400	.048	700	.035	885	.048

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
700	885	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3
Reach-1	9	.045	.035	.042
Reach-1	8	.045	.035	.032
Reach-1	7	.048	.035	.048
Reach-1	6	.048	.035	.048

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	9	3800	3800	3800
Reach-1	8	4800	4800	4800
Reach-1	7	3750	3750	3750
Reach-1	6	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	9	.1	.3
Reach-1	8	.1	.3
Reach-1	7	.1	.3
Reach-1	6	.1	.3

HEC-RAS Plan: FIS TRUNC (NGVD29) River: RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9	500 YR	9300.00	583.30	599.69		599.74	0.000053	1.92	5672.11	446.21	0.09
Reach-1	9	100 YR	8400.00	583.30	599.04		599.08	0.000051	1.83	5379.10	443.29	0.08
Reach-1	9	50 YR	7500.00	583.30	598.31		598.35	0.000049	1.74	5059.21	440.08	0.08
Reach-1	9	10 YR	6000.00	583.30	597.01		597.04	0.000045	1.56	4491.52	434.33	0.08
Reach-1	8	500 YR	9300.00	581.90	599.41		599.49	0.000084	2.43	4244.57	357.33	0.11
Reach-1	8	100 YR	8400.00	581.90	598.77		598.84	0.000081	2.32	4021.14	343.46	0.11
Reach-1	8	50 YR	7500.00	581.90	598.05		598.12	0.000079	2.21	3777.02	341.02	0.10
Reach-1	8	10 YR	6000.00	581.90	596.78		596.83	0.000074	2.01	3344.26	336.66	0.10
Reach-1	7	500 YR	9300.00	583.20	598.88		599.00	0.000131	2.85	3742.21	345.33	0.13
Reach-1	7	100 YR	8400.00	583.20	598.26		598.36	0.000126	2.71	3528.00	338.55	0.13
Reach-1	7	50 YR	7500.00	583.20	597.56		597.66	0.000122	2.58	3295.07	331.02	0.13
Reach-1	7	10 YR	6000.00	583.20	596.32		596.40	0.000113	2.32	2892.71	317.60	0.12
Reach-1	6	500 YR	9300.00	584.30	598.27	589.18	598.42	0.000186	3.26	3448.20	503.14	0.16
Reach-1	6	100 YR	8400.00	584.30	597.66	588.90	597.80	0.000183	3.13	3159.68	436.07	0.15
Reach-1	6	50 YR	7500.00	584.30	596.98	588.60	597.11	0.000180	2.99	2887.44	364.66	0.15
Reach-1	6	10 YR	6000.00	584.30	595.78	588.07	595.89	0.000169	2.71	2500.09	293.83	0.14

HEC-RAS HEC-RAS 5.0.3 September 2016
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
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PROJECT DATA
Project Title: I55 over Des Plaines River
Project File : I55overDesPlaine.prj
Run Date and Time: 9/12/2017 11:58:08 AM

Project in English units

PLAN DATA

Plan Title: FIS TRUNC (NAVD88)
Plan File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.p03

Geometry Title: FIS Duplicate Truncated (NAVD 88)
Geometry File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.g06

Flow Title : FIS TRUNC (NAVD 88)
Flow File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.f04

Plan Description:
NAVD88. Truncated from hardcopy FIS HEC-2 "Des Plaines River in Willow Springs and Hodgkins, Harza Engineering Company". Hand-annotated "Ignore Floodway Run", 1 Feb 78".

Plan Summary Information:
Number of: Cross Sections = 4 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 0 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: Between every coordinate point (HEC2 Style)
Friction Slope Method: Program Selects Appropriate method
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: FIS TRUNC (NAVD 88)
Flow File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.f04

Flow Data (cfs)

River	Reach	RS	500 YR	100 YR	50 YR	10 YR
RIVER-1	Reach-1	9	9300	8400	7500	6000

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	500 YR		Known WS = 597.99
RIVER-1	Reach-1	100 YR		Known WS = 597.38
RIVER-1	Reach-1	50 YR		Known WS = 596.7
RIVER-1	Reach-1	10 YR		Known WS = 595.5

GEOMETRY DATA

Geometry Title: FIS Duplicate Truncated (NAVD 88)
Geometry File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.g06

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 9

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	599.72	1	588.82	100	587.42	101	586.52	102	586.02
135	583.52	195	583.02	225	583.12	270	583.62	315	585.72
320	586.52	324	587.32	390	588.82	400	590.02	425	594.52
448	599.82	500	600.52	524	600.72				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	100	.035	324	.042

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	324	3800	3800	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 8

INPUT
Description: FIS XS N (old Hodgkins XS C)
38.15 I-55 STEVENSON EXPRESSWAY
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	598.82	15	588.22	35	586.82	36	586.42	37	586.02
65	582.42	90	581.62	125	582.92	150	584.42	177	585.02
178	586.02	179	586.82	200	587.92	250	587.52	300	589.52
330	591.52	345	599.02	400	599.52	500	600.62		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	35	.035	179	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35	179	4800	4800	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 7

INPUT
Description: FIS XS M (old Hodgkins XS B)
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	599.72	30	594.72	70	589.72	80	586.32	120	584.02
170	582.92	200	584.02	250	584.92	280	586.32	315	590.92
355	599.22	450	600.42	560	600.62				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.048	80	.035	280	.048

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
80	280	3750	3750	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 6

INPUT
Description: FIS XS L ((old Hodgkins XS A)
36.98 I-294 TOLLWAY
37.24 US 12,
US 20 AND US 45
IN DIVERSION
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
400	607.72	500	607.52	600	606.32	700	586.42	701	585.52
740	584.32	790	584.02	830	584.42	884	585.52	885	586.42
945	595.42	985	596.42	1085	597.42	1145	597.92		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
400	.048	700	.035	885	.048

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
700	885	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3
Reach-1	9	.045	.035	.042
Reach-1	8	.045	.035	.032
Reach-1	7	.048	.035	.048
Reach-1	6	.048	.035	.048

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	9	3800	3800	3800
Reach-1	8	4800	4800	4800
Reach-1	7	3750	3750	3750
Reach-1	6	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	9	.1	.3
Reach-1	8	.1	.3
Reach-1	7	.1	.3
Reach-1	6	.1	.3

HEC-RAS Plan: FIS TRUNC (NAVD88) River: RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	6	500 YR	9300.00	584.02	597.99	588.90	598.14	0.000186	3.26	3448.19	503.14	0.16
Reach-1	6	100 YR	8400.00	584.02	597.38	588.62	597.52	0.000183	3.13	3159.70	436.08	0.15
Reach-1	6	50 YR	7500.00	584.02	596.70	588.31	596.83	0.000180	2.99	2887.45	364.66	0.15
Reach-1	6	10 YR	6000.00	584.02	595.50	587.79	595.61	0.000169	2.71	2500.08	293.83	0.14
Reach-1	7	500 YR	9300.00	582.92	598.60		598.72	0.000131	2.85	3742.20	345.33	0.13
Reach-1	7	100 YR	8400.00	582.92	597.98		598.08	0.000126	2.71	3528.01	338.55	0.13
Reach-1	7	50 YR	7500.00	582.92	597.28		597.38	0.000122	2.58	3295.09	331.02	0.13
Reach-1	7	10 YR	6000.00	582.92	596.04		596.12	0.000113	2.32	2892.71	317.60	0.12
Reach-1	8	500 YR	9300.00	581.62	599.13		599.21	0.000084	2.43	4244.56	357.33	0.11
Reach-1	8	100 YR	8400.00	581.62	598.49		598.56	0.000081	2.32	4021.15	343.46	0.11
Reach-1	8	50 YR	7500.00	581.62	597.77		597.84	0.000079	2.21	3777.01	341.02	0.10
Reach-1	8	10 YR	6000.00	581.62	596.49		596.55	0.000074	2.01	3344.25	336.66	0.10
Reach-1	9	500 YR	9300.00	583.02	599.41		599.46	0.000053	1.92	5672.09	446.21	0.09
Reach-1	9	100 YR	8400.00	583.02	598.76		598.80	0.000051	1.83	5379.11	443.29	0.08
Reach-1	9	50 YR	7500.00	583.02	598.03		598.07	0.000049	1.74	5059.20	440.08	0.08
Reach-1	9	10 YR	6000.00	583.02	596.73		596.76	0.000045	1.56	4491.50	434.33	0.08

Errors Warnings and Notes for Plan : FIS TRUNC (NAVD88)

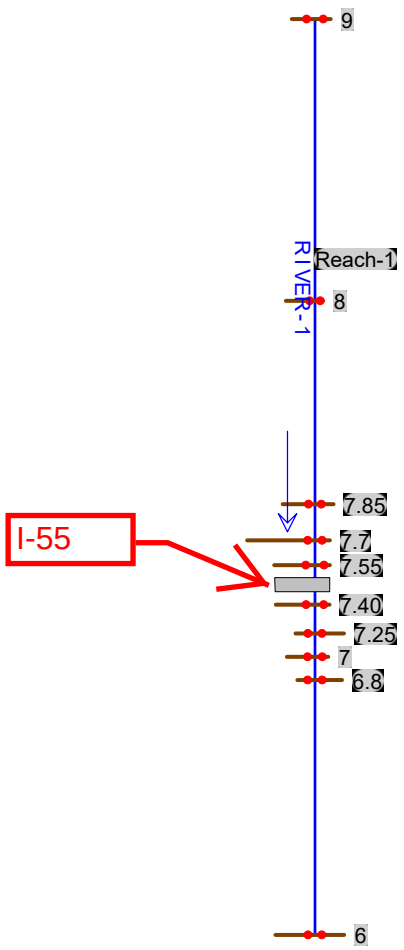
Location:	River: RIVER-1 Reach: Reach-1 RS: 8 Profile: 500 YR
Warning:	The cross-section end points had to be extended vertically for the computed water surface.

TAB C

SECTION 13.C

EXISTING CONDITIONS
PERMIT MODEL

Existing Conditions
HEC-RAS Geometry



HEC-RAS HEC-RAS 5.0.3 September 2016
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
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PROJECT DATA
Project Title: I55 over Des Plaines River
Project File : I55overDesPlaine.prj
Run Date and Time: 2/14/2018 11:19:03 AM

Project in English units

PLAN DATA

Plan Title: Existing
Plan File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.p05

Geometry Title: Existing
Geometry File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.g05

Flow Title : FIS FLOWS W/200 (NAVD 88)
Flow File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.f05

Plan Description:
NAVD88. Added 200 YR Storm Event to Flow Data and surveyed cross sections and bridge geometry to geometry data to the truncated FIS HEC-2 "Des Plaines River in Willow Springs and Hodgkins, Harza Engineering Company". Extended Cross Section 6 and 8 using county countour map.

Plan Summary Information:
Number of: Cross Sections = 10 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 1 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: Between every coordinate point (HEC2 Style)
Friction Slope Method: Program Selects Appropriate method
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: FIS FLOWS W/200 (NAVD 88)
Flow File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.f05

Flow Data (cfs)

River	Reach	RS	500 YR	200 YR	100 YR	50 YR	10 YR
RIVER-1	Reach-1	9	9300	8692	8400	7500	6000

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	500 YR		Known WS = 597.99
RIVER-1	Reach-1	200 YR		Known WS = 597.57
RIVER-1	Reach-1	100 YR		Known WS = 597.38
RIVER-1	Reach-1	50 YR		Known WS = 596.7
RIVER-1	Reach-1	10 YR		Known WS = 595.5

GEOMETRY DATA

Geometry Title: Existing
Geometry File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.g05

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 9

INPUT
Description: FIS XS O ((old Hodgkins XS D)
Adjusted stations by -212
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-212	599.72	-211	588.82	-112	587.42	-111	586.52	-110	586.02
-77	583.52	-17	583.02	13	583.12	58	583.62	103	585.72
108	586.52	112	587.32	178	588.82	188	590.02	213	594.52
236	599.82	288	600.52	312	600.72				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-212	.045	-112	.035	112	.042

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-112	112	3800	3800	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 8

INPUT
Description: FIS XS N (old Hodgkins XS C)
Adjusted stations by -107
Extended
using county countours
added station -110
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-110	600	-107	598.82	-92	588.22	-72	586.82	-71	586.42
-70	586.02	-42	582.42	-17	581.62	18	582.92	43	584.42
70	585.02	71	586.02	72	586.82	93	587.92	143	587.52
193	589.52	223	591.52	238	599.02	293	599.52	393	600.62

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-110	.045	-72	.035	72	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-72	72	2742	2742	2742	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 7.85

INPUT
Description: Surveyed X-Section
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-263.81	617.07	-223.45	606.59	-184.2	603.88	-147.4	593.26	-107.65	591.84
-100.72	588	-71	583.91	-67	584.14	-44	581.1	-37	580.77
-33	580.91	-22	580.58	-13	581.35	0	581.8	8	581.96
19	583.23	38	583.1	53	584.49	64	583.42	71.73	587.97
78.37	590.53	90.01	591.89	104.15	595.16	140.99	599.72	157.58	600.51
195.15	600.54	254.01	603.78	402.64	602.39	415.85	603.4	420.28	603.35

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-263.81	.048	-100.72	.035	71.73	.048	140.99	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-100.72	71.73	487	487	487	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 7.7

INPUT
Description: Surveyed X-Section
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-199.79	619.07	-196.6	618.6	-169	608.58	-118.63	591.97	-104.8	592.66
-101.08	589.65	-94.68	588.22	-78	584.15	-74	584.27	-44	584.4
-8	584.48	0	584.32	27	584.34	47	584.45	77	582.89
82	583.71	97.78	588	107.82	592.18	149.54	592.67	163.67	598.72
171.69	599.98	210.9	600.17	221.51	600.73	241.21	604.02	245.36	603.9
261.96	602.25	264.19	601.97	330.44	600.75	389.74	601.41	391.84	601.81
424.74	602.77	446.84	602.79	916.4	602.857				

```
Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
 -199.79    .048  -94.68    .035   97.78    .048  171.69    .032

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -94.68   97.78              334     334     334             .1       .3

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 7.55

INPUT
Description: Surveyed X-Section
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
-194.325  619.07 -165.57     613-127.885  592.62 -117.56  588.21   -96.5  584.63
     -90  584.09   -80.5  584.42     -66  583.18     -49   584.5     -32  583.82
    -5.5  584.34     -.5  583.98       0  584.14      13  584.49      33  584.24
      44  584.58    53.5  584.02      74   584.5    96.5  583.37  128.24  588.26
 131.775  589.61 134.415  592.31  153.81  597.94 164.575  599.04  168.87  599.09
 225.325  599.57 274.525  599.95  322.97 599.632  375.25  599.77 436.545  600.07
  489.26  599.34 538.995   598.8 555.695  598.99

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
-194.325    .048 -117.56    .035  128.24    .048  168.87    .032

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -117.56  128.24              534     534     534             .1       .3
Skew Angle = 60

BRIDGE


RIVER: RIVER-1
REACH: Reach-1            RS: 7.48

INPUT
Description:
Distance from Upstream XS =     169
Deck/Roadway Width        =     268
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      10
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 -353.44     620         -166.51   620.5         -166.51   620.5  615.22
 -127.03  621.25  615.64  -57.39     622  616.39   32.24     623  617.49
  114.43  623.85  618.25  208.58  624.75  619.29  208.58  624.75
 1111.36  629.01

Upstream Bridge Cross Section Data
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
-194.325  619.07 -165.57     613-127.885  592.62 -117.56  588.21   -96.5  584.63
     -90  584.09   -80.5  584.42     -66  583.18     -49   584.5     -32  583.82
    -5.5  584.34     -.5  583.98       0  584.14      13  584.49      33  584.24
      44  584.58    53.5  584.02      74   584.5    96.5  583.37  128.24  588.26
 131.775  589.61 134.415  592.31  153.81  597.94 164.575  599.04  168.87  599.09
 225.325  599.57 274.525  599.95  322.97 599.632  375.25  599.77 436.545  600.07
  489.26  599.34 538.995   598.8 555.695  598.99

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
-194.325    .048 -117.56    .035  128.24    .048  168.87    .032
```

```
Bank Sta: Left   Right    Coeff Contr.   Expan.
       -117.56  128.24             .1       .3
Skew Angle = 60

Downstream  Deck/Roadway Coordinates
    num=      10
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 -378.46   625.8         -166.51   629.4         -166.51   629.4  624.38
 -127.03     630  624.66  -57.39   630.5  625.23   32.24  631.25  626.04
  114.43     632  626.65  208.58   632.4  627.43  208.58   632.4
   955.2  628.98

Downstream Bridge Cross Section Data
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
-206.124   610.6-156.235  605.73-133.665  595.23-129.586  589.44-127.544  588.32
-101.303  584.37 -99.669  584.53 -70.803  583.68 -58.821  584.13  -45.75  583.84
       0  584.51   7.625  584.19   15.25  584.47  28.866  584.08  53.919  584.37
  61.544  583.95  77.339  584.25 108.988  588.11 110.987  589.88 114.875  592.87
 122.484   599.2 128.175  600.18 158.937  600.26 520.239 598.048

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
-206.124    .048-127.544    .035 108.988    .048

Bank Sta: Left   Right    Coeff Contr.   Expan.
      -127.544 108.988             .1       .3
Skew Angle = 57

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  4

Pier Data
Pier Station     Upstream= -127.03    Downstream= -127.03
Upstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.72    5.25  615.64
Downstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.75    5.25  624.66

Pier Data
Pier Station     Upstream=  -57.39    Downstream=  -57.39
Upstream     num=       2
    Width   Elev    Width   Elev
    5.25  584.78    5.25  616.39
Downstream     num=       2
    Width   Elev    Width   Elev
    5.25  584.78    5.25  625.23

Pier Data
Pier Station     Upstream=   32.24    Downstream=   32.24
Upstream     num=       2
    Width   Elev    Width   Elev
    5.25  584.78    5.25  617.49
Downstream     num=       2
    Width   Elev    Width   Elev
    5.25  584.78    5.25  626.04
```

```
Pier Data
Pier Station     Upstream=  114.43    Downstream=  114.43
Upstream     num=       2
    Width   Elev    Width   Elev
    5.25  584.78    5.25  618.25
Downstream     num=       2
    Width   Elev    Width   Elev
    5.25  584.78    5.25  626.65

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum               Cd   =    1.33
       Yarnell                KVal =    1.05
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 7.40

INPUT
Description: Surveyed X-Section
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
-206.124   610.6-156.235  605.73-133.665  595.23-129.586  589.44-127.544  588.32
-101.303  584.37 -99.669  584.53 -70.803  583.68 -58.821  584.13  -45.75  583.84
       0  584.51   7.625  584.19   15.25  584.47  28.866  584.08  53.919  584.37
  61.544  583.95  77.339  584.25 108.988  588.11 110.987  589.88 114.875  592.87
 122.484   599.2 128.175  600.18 158.937  600.26 520.239 598.048

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
-206.124    .048-127.544    .035 108.988    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      -127.544 108.988              388     388     388             .1       .3
Skew Angle = 57

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 7.25

INPUT
Description: Surveyed X-Section
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -394.32  609.08 -341.14  610.77 -244.47  611.19 -233.48  610.44 -190.46  601.72
 -152.08  599.83  -127.3   592.5 -109.84  592.64 -100.38  588.19     -77  584.27
     -45  583.58      -9   584.1       0  583.78      11  583.48      35  583.57
      53  583.94      73  584.18   91.62  588.31  103.06  591.36  120.59  591.44
```

```
  143.71  600.73  147.59  600.83  150.02  600.61  178.17  600.48  232.51  598.41
  259.28  597.52

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -394.32    .048 -100.38    .035   91.62    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -100.38   91.62              315     315     315             .1       .3

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 7

INPUT
Description: FIS XS M (old Hodgkins XS B)
Adjusted stations by -180
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -180  599.72    -150  594.72    -110  589.72    -100  586.32     -60  584.02
     -10  582.92      20  584.02      70  584.92     100  586.32     135  590.92
     175  599.22     270  600.42     380  600.62

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -180    .048    -100    .035     100    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -100     100              313     313     313             .1       .3

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 6.8

INPUT
Description: Surveyed X-Section
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -371.24  609.22 -242.95  611.88 -191.65  602.68  -185.9  602.43  -134.6  592.46
 -119.44  597.89 -109.07  589.54 -105.08  588.07     -77  584.45     -76   584.4
     -68  584.42     -32  583.31     -11  584.06       0  584.03      42   583.9
      76  584.41   90.83  588.17   98.54  590.96  105.31  592.31  119.03  591.85
  136.29  598.42  147.08  601.47  150.31  601.92  153.41  601.51  185.66  601.38
  188.55  601.63  206.55  603.54  213.01 603.427  230.45 601.016

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -371.24    .048 -105.08    .035   90.83    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -105.08   90.83             3437    3437    3437             .1       .3

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 6

INPUT
Description: FIS XS L ((old Hodgkins XS A)
Adjusted stations by
             -792.5
```

Extended XS Using county maps
Added Station 533.5
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-392.5	607.72	-292.5	607.52	-192.5	606.32	-92.5	586.42	-91.5	585.52
-52.5	584.32	-2.5	584.02	37.5	584.42	91.5	585.52	92.5	586.42
152.5	595.42	192.5	596.42	292.5	597.42	352.5	597.92	533.5	600

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-392.5	.048	-92.5	.035	92.5	.048

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-92.5	92.5	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3	n4
Reach-1	9	.045	.035	.042	
Reach-1	8	.045	.035	.032	
Reach-1	7.85	.048	.035	.048	.032
Reach-1	7.7	.048	.035	.048	.032
Reach-1	7.55	.048	.035	.048	.032
Reach-1	7.48	Bridge			
Reach-1	7.40	.048	.035	.048	
Reach-1	7.25	.048	.035	.048	
Reach-1	7	.048	.035	.048	
Reach-1	6.8	.048	.035	.048	
Reach-1	6	.048	.035	.048	

SUMMARY OF REACH LENGTHS

River: RIVER-1

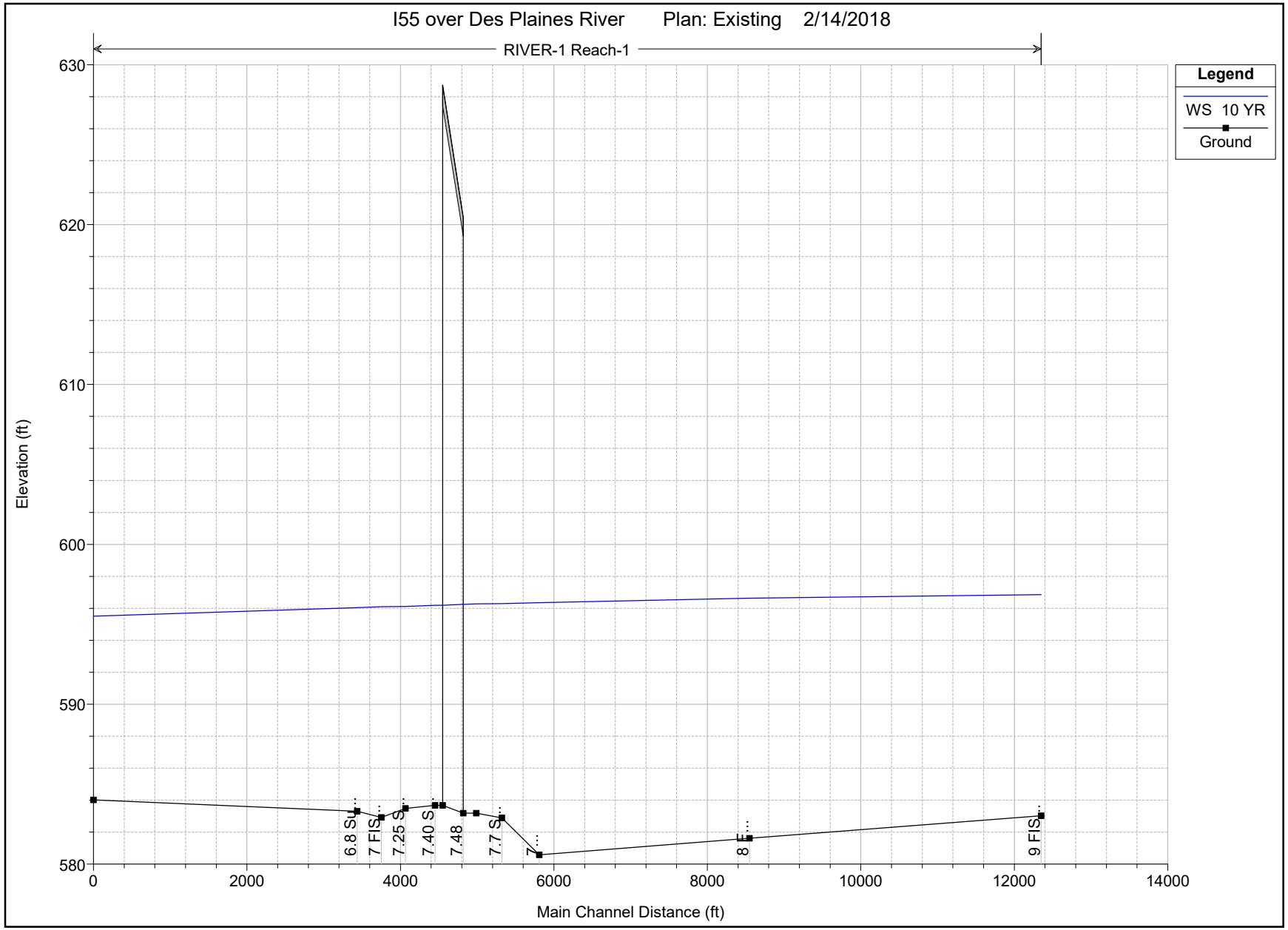
Reach	River Sta.	Left	Channel	Right
Reach-1	9	3800	3800	3800
Reach-1	8	2742	2742	2742
Reach-1	7.85	487	487	487
Reach-1	7.7	334	334	334
Reach-1	7.55	534	534	534
Reach-1	7.48	Bridge		
Reach-1	7.40	388	388	388
Reach-1	7.25	315	315	315
Reach-1	7	313	313	313
Reach-1	6.8	3437	3437	3437
Reach-1	6	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	9	.1	.3

Reach-1	8		.1	.3
Reach-1	7.85		.1	.3
Reach-1	7.7		.1	.3
Reach-1	7.55		.1	.3
Reach-1	7.48	Bridge		
Reach-1	7.40		.1	.3
Reach-1	7.25		.1	.3
Reach-1	7		.1	.3
Reach-1	6.8		.1	.3
Reach-1	6		.1	.3

10-Year Existing


I55 over Des Plaines River Plan: Existing 2/14/2018
RIVER-1 Reach-1
Legend
WS 10 YR
Ground
Elevation (ft)
630
620
610
600
590
580
0
2000
4000
6000
8000
10000
12000
14000
Main Channel Distance (ft)
6.8 Su...
7 FIS...
7.25 S...
7.40 S...
7.48
7.7 S...
7...
8 F...
9 FIS...

HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1 Profile: 10 YR

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9	10 YR	6000.00	583.02	596.86		596.89	0.000044	1.54	4547.13	434.89	0.08
Reach-1	8	10 YR	6000.00	581.62	596.63		596.68	0.000071	1.98	3390.46	337.13	0.10
Reach-1	7.85	10 YR	6000.00	580.58	596.35		596.44	0.000114	2.50	2635.10	271.85	0.12
Reach-1	7.7	10 YR	6000.00	582.89	596.29		596.38	0.000129	2.49	2654.69	289.73	0.13
Reach-1	7.55	10 YR	6000.00	583.18	596.27	587.12	596.34	0.000088	2.05	3020.64	282.71	0.11
Reach-1	7.48		Bridge									
Reach-1	7.40	10 YR	6000.00	583.68	596.19		596.26	0.000102	2.18	2795.96	254.59	0.11
Reach-1	7.25	10 YR	6000.00	583.48	596.12		596.22	0.000132	2.52	2580.66	271.78	0.13
Reach-1	7	10 YR	6000.00	582.92	596.09		596.17	0.000111	2.31	2910.05	318.19	0.12
Reach-1	6.8	10 YR	6000.00	583.31	596.03		596.13	0.000139	2.55	2526.02	275.51	0.13
Reach-1	6	10 YR	6000.00	584.02	595.50	587.79	595.61	0.000169	2.71	2500.08	293.83	0.14

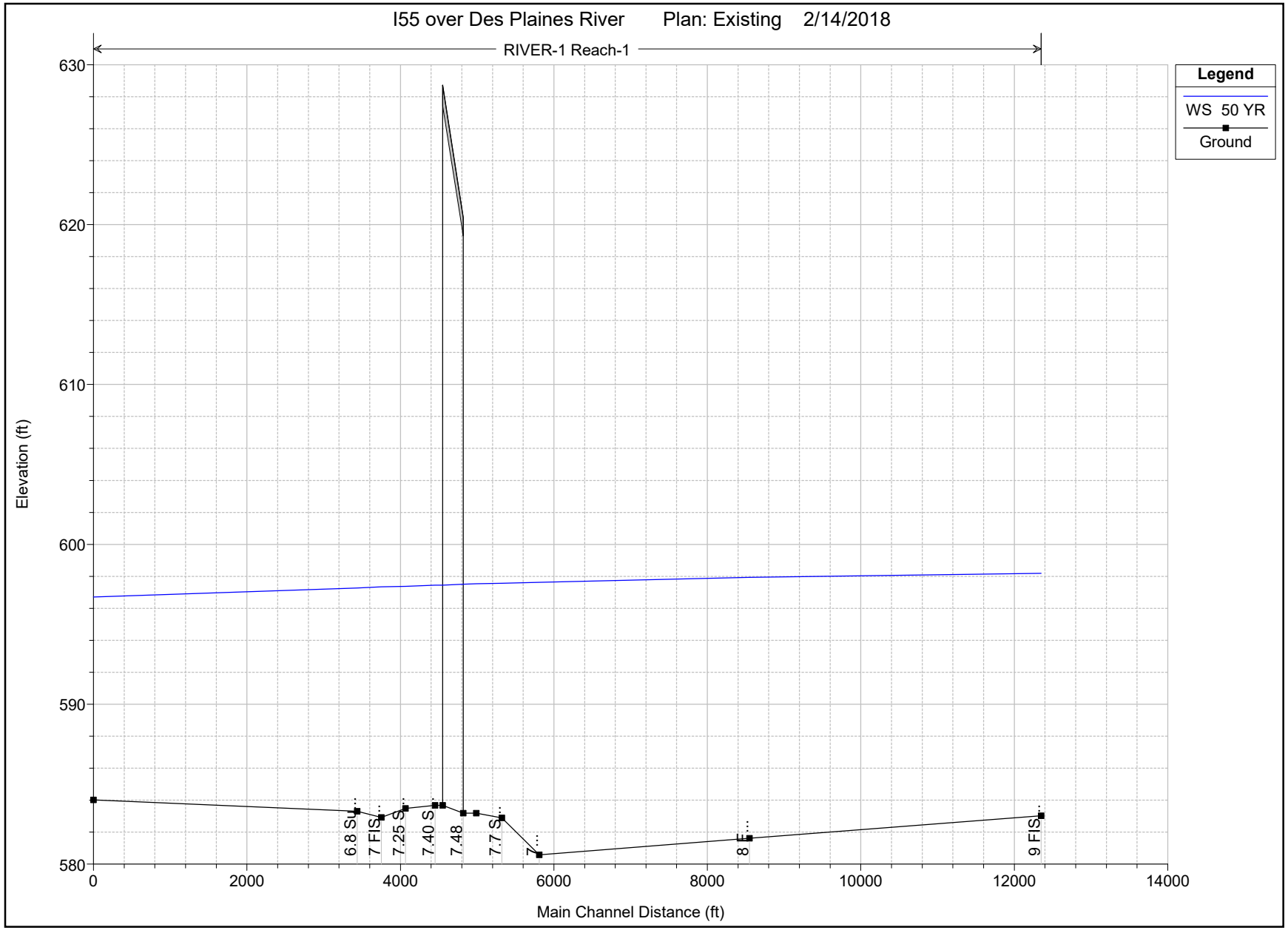
HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1 Profile: 10 YR

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Reach-1	9	10 YR	596.89	596.86	0.03	0.21	0.00	802.61	4476.39	721.01	434.89
Reach-1	8	10 YR	596.68	596.63	0.05	0.24	0.00	251.75	3772.32	1975.94	337.13
Reach-1	7.85	10 YR	596.44	596.35	0.09	0.06	0.00	174.77	5684.72	140.51	271.85
Reach-1	7.7	10 YR	596.38	596.29	0.09	0.04	0.01	143.19	5639.34	217.48	289.73
Reach-1	7.55	10 YR	596.34	596.27	0.06	0.02	0.00	58.77	5892.31	48.92	282.71
Reach-1	7.48		Bridge								
Reach-1	7.40	10 YR	596.26	596.19	0.07	0.04	0.00	24.62	5944.87	30.52	254.59
Reach-1	7.25	10 YR	596.22	596.12	0.09	0.04	0.01	120.14	5695.49	184.37	271.78
Reach-1	7	10 YR	596.17	596.09	0.08	0.04	0.00	227.99	5408.08	363.92	318.19
Reach-1	6.8	10 YR	596.13	596.03	0.10	0.52	0.00	81.95	5766.27	151.78	275.51
Reach-1	6	10 YR	595.61	595.50	0.11			225.93	5470.93	303.14	293.83

Errors Warnings and Notes for Plan : Existing

Location:	River: RIVER-1 Reach: Reach-1 RS: 7.48 Profile: 10 YR
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream
	energy. The program defaulted to the next valid (user selected) method. If the Yarnell method
	was the only one selected, the program will default to an energy based solution.
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Location:	River: RIVER-1 Reach: Reach-1 RS: 6.8 Profile: 10 YR
Warning:	Divided flow computed for this cross-section.

50-Year Existing


I55 over Des Plaines River Plan: Existing 2/14/2018
RIVER-1 Reach-1
Legend
WS 50 YR
Ground
Elevation (ft)
630
620
610
600
590
580
0
2000
4000
6000
8000
10000
12000
14000
Main Channel Distance (ft)
6.8 Su...
7 FIS...
7.25 S...
7.40 S...
7.48
7.7 S...
7...
8 F...
9 FIS...

HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1 Profile: 50 YR

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9	50 YR	7500.00	583.02	598.18		598.22	0.000047	1.71	5126.45	440.76	0.08
Reach-1	8	50 YR	7500.00	581.62	597.94		598.00	0.000075	2.18	3832.75	341.58	0.10
Reach-1	7.85	50 YR	7500.00	580.58	597.62		597.74	0.000126	2.80	2990.20	286.53	0.13
Reach-1	7.7	50 YR	7500.00	582.89	597.56		597.67	0.000139	2.76	3026.42	296.54	0.13
Reach-1	7.55	50 YR	7500.00	583.18	597.54	587.57	597.62	0.000096	2.30	3383.16	289.42	0.11
Reach-1	7.48		Bridge									
Reach-1	7.40	50 YR	7500.00	583.68	597.44		597.53	0.000112	2.45	3117.76	258.79	0.12
Reach-1	7.25	50 YR	7500.00	583.48	597.37		597.48	0.000144	2.81	2924.07	279.10	0.14
Reach-1	7	50 YR	7500.00	582.92	597.34		597.44	0.000120	2.56	3315.31	331.68	0.13
Reach-1	6.8	50 YR	7500.00	583.31	597.27		597.39	0.000150	2.84	2876.03	290.13	0.14
Reach-1	6	50 YR	7500.00	584.02	596.70	588.31	596.83	0.000180	2.99	2887.45	364.66	0.15

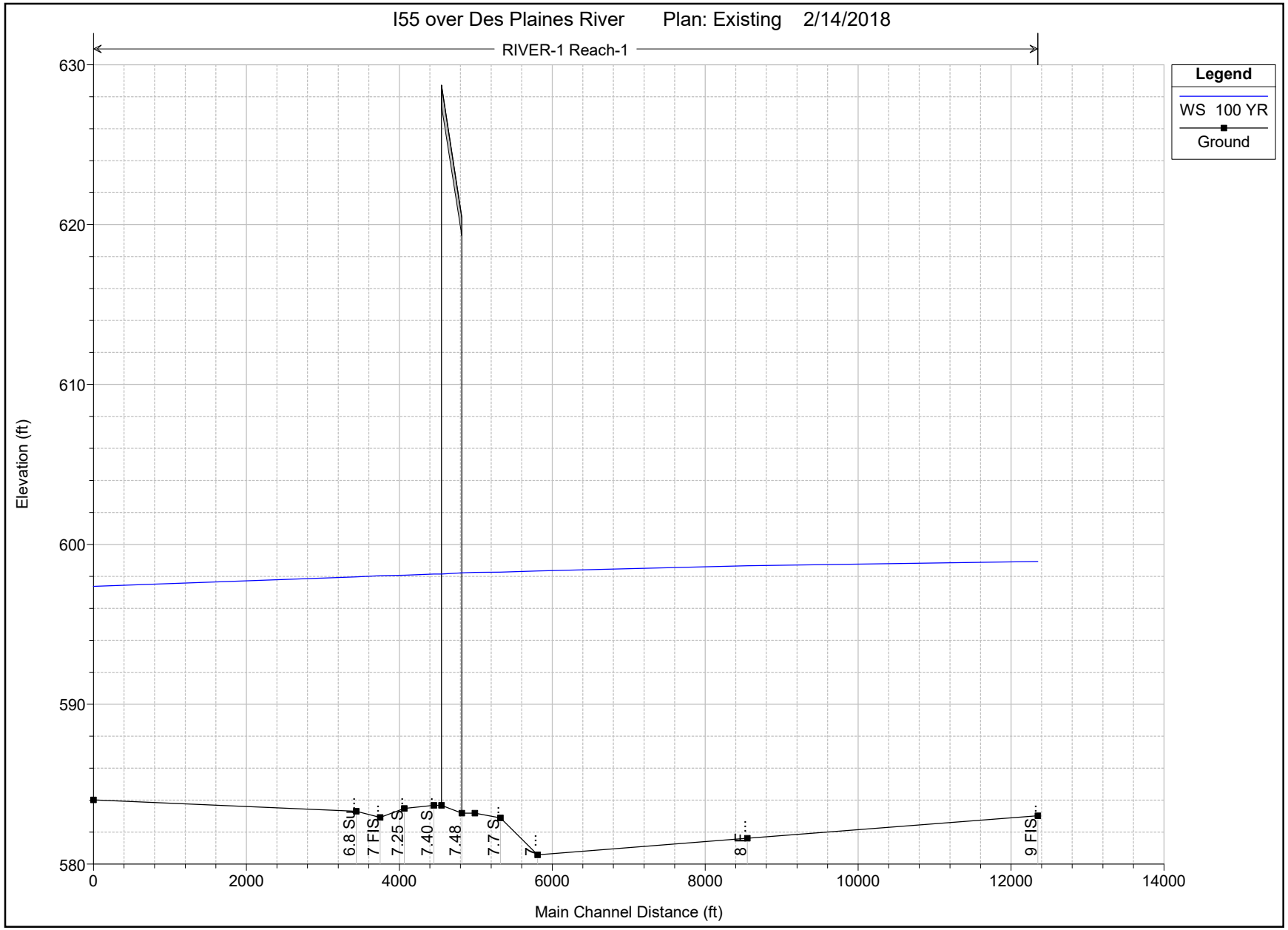
HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1 Profile: 50 YR

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Reach-1	9	50 YR	598.22	598.18	0.04	0.22	0.00	1054.61	5469.38	976.01	440.76
Reach-1	8	50 YR	598.00	597.94	0.06	0.26	0.01	331.75	4553.30	2614.96	341.58
Reach-1	7.85	50 YR	597.74	597.62	0.11	0.06	0.00	291.50	6983.06	225.44	286.53
Reach-1	7.7	50 YR	597.67	597.56	0.11	0.04	0.01	221.48	6929.55	348.97	296.54
Reach-1	7.55	50 YR	597.62	597.54	0.08	0.02	0.00	89.67	7332.17	78.16	289.42
Reach-1	7.48		Bridge								
Reach-1	7.40	50 YR	597.53	597.44	0.09	0.05	0.00	37.75	7415.25	47.00	258.79
Reach-1	7.25	50 YR	597.48	597.37	0.12	0.04	0.01	197.75	7022.58	279.67	279.10
Reach-1	7	50 YR	597.44	597.34	0.09	0.04	0.00	348.48	6643.37	508.15	331.68
Reach-1	6.8	50 YR	597.39	597.27	0.12	0.56	0.00	141.70	7120.24	238.06	290.13
Reach-1	6	50 YR	596.83	596.70	0.13			323.96	6704.55	471.50	364.66

Errors Warnings and Notes for Plan : Existing

Location:	River: RIVER-1 Reach: Reach-1 RS: 7.48 Profile: 50 YR
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream
	energy. The program defaulted to the next valid (user selected) method. If the Yarnell method
	was the only one selected, the program will default to an energy based solution.
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Location:	River: RIVER-1 Reach: Reach-1 RS: 6.8 Profile: 50 YR
Warning:	Divided flow computed for this cross-section.

100-Year Existing


I55 over Des Plaines River Plan: Existing 2/14/2018
RIVER-1 Reach-1
Legend
WS 100 YR
Ground
Elevation (ft)
630
620
610
600
590
580
0
2000
4000
6000
8000
10000
12000
14000
Main Channel Distance (ft)
6.8 Su...
7 FIS...
7.25 S...
7.40 S...
7.48
7.7 S...
7...
8 E...
9 FIS...

HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1 Profile: 100 YR

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9	100 YR	8400.00	583.02	598.92		598.96	0.000049	1.80	5452.52	444.02	0.08
Reach-1	8	100 YR	8400.00	581.62	598.66		598.73	0.000077	2.28	4081.92	344.06	0.10
Reach-1	7.85	100 YR	8400.00	580.58	598.33		598.46	0.000132	2.96	3196.79	294.74	0.13
Reach-1	7.7	100 YR	8400.00	582.89	598.27		598.39	0.000143	2.91	3238.04	300.34	0.14
Reach-1	7.55	100 YR	8400.00	583.18	598.25	587.83	598.34	0.000101	2.43	3589.92	295.13	0.12
Reach-1	7.48		Bridge									
Reach-1	7.40	100 YR	8400.00	583.68	598.14		598.25	0.000118	2.60	3300.76	276.69	0.13
Reach-1	7.25	100 YR	8400.00	583.48	598.07		598.19	0.000149	2.96	3124.76	299.60	0.14
Reach-1	7	100 YR	8400.00	582.92	598.04		598.14	0.000124	2.70	3549.65	339.24	0.13
Reach-1	6.8	100 YR	8400.00	583.31	597.96		598.10	0.000156	3.00	3080.01	298.01	0.14
Reach-1	6	100 YR	8400.00	584.02	597.38	588.60	597.52	0.000183	3.13	3159.70	436.08	0.15

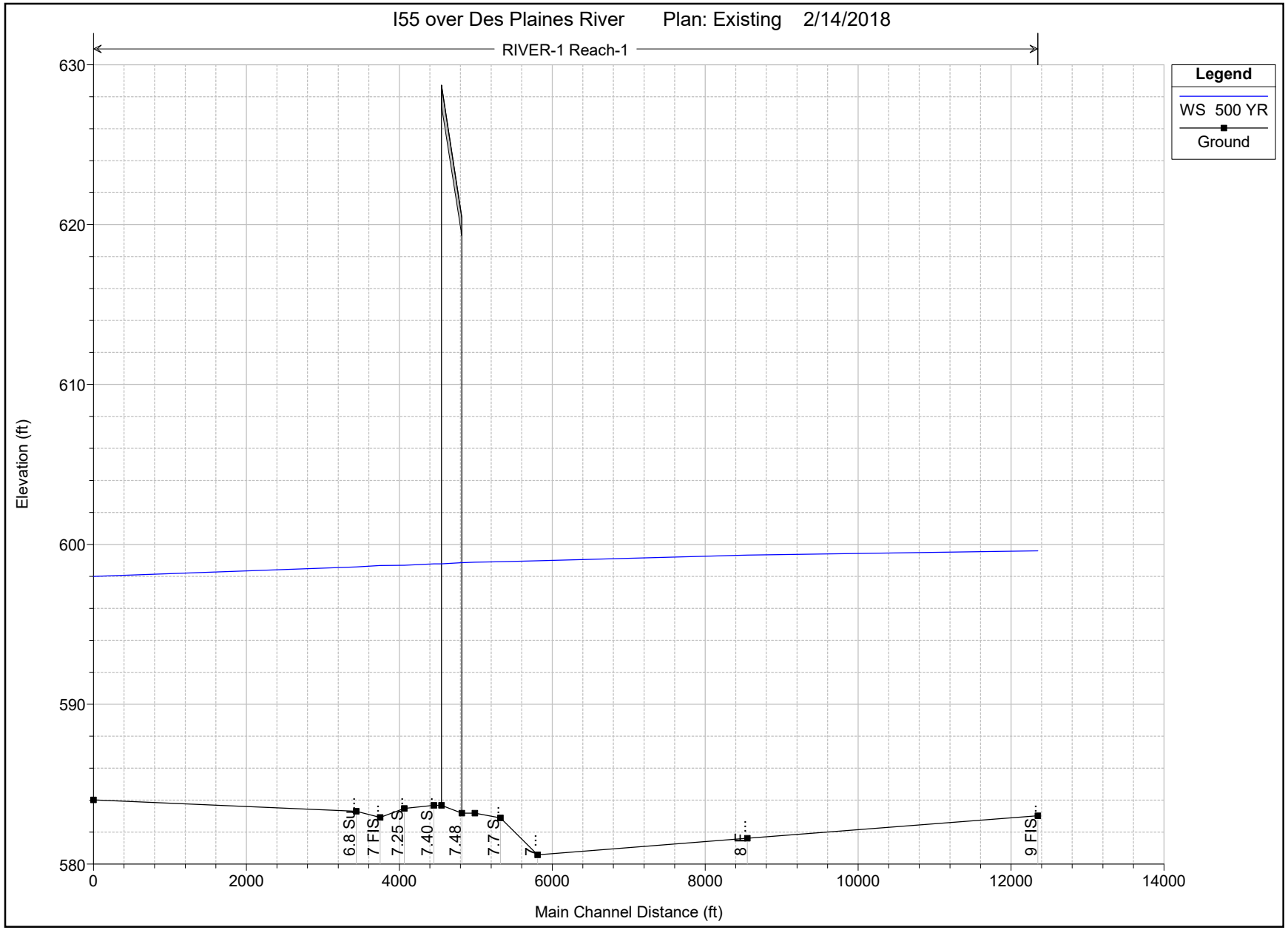
HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1 Profile: 100 YR

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Reach-1	9	100 YR	598.96	598.92	0.04	0.23	0.00	1208.04	6056.57	1135.39	444.02
Reach-1	8	100 YR	598.73	598.66	0.07	0.27	0.01	381.23	5012.45	3006.33	344.06
Reach-1	7.85	100 YR	598.46	598.33	0.13	0.07	0.00	370.35	7744.62	285.03	294.74
Reach-1	7.7	100 YR	598.39	598.27	0.12	0.04	0.01	273.59	7690.82	435.59	300.34
Reach-1	7.55	100 YR	598.34	598.25	0.09	0.02	0.00	110.39	8189.43	100.18	295.13
Reach-1	7.48		Bridge								
Reach-1	7.40	100 YR	598.25	598.14	0.10	0.05	0.00	47.14	8294.63	58.24	276.69
Reach-1	7.25	100 YR	598.19	598.07	0.13	0.04	0.01	250.50	7806.78	342.73	299.60
Reach-1	7	100 YR	598.14	598.04	0.10	0.04	0.00	428.74	7370.70	600.55	339.24
Reach-1	6.8	100 YR	598.10	597.96	0.13	0.58	0.00	186.73	7918.03	295.24	298.01
Reach-1	6	100 YR	597.52	597.38	0.14			387.77	7410.14	602.09	436.08

Errors Warnings and Notes for Plan : Existing

Location:	River: RIVER-1 Reach: Reach-1 RS: 7.48 Profile: 100 YR
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream
	energy. The program defaulted to the next valid (user selected) method. If the Yarnell method
	was the only one selected, the program will default to an energy based solution.
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Location:	River: RIVER-1 Reach: Reach-1 RS: 7.40 Profile: 100 YR
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: RIVER-1 Reach: Reach-1 RS: 7.25 Profile: 100 YR
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.

500-Year Existing


I55 over Des Plaines River Plan: Existing 2/14/2018
RIVER-1 Reach-1
Legend
WS 500 YR
Ground
Elevation (ft)
630
620
610
600
590
580
0
2000
4000
6000
8000
10000
12000
14000
Main Channel Distance (ft)
6.8 Su...
7 FIS...
7.25 S...
7.40 S...
7.48
7.7 S...
7...
8 E...
9 FIS...

HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1 Profile: 500 YR

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9	500 YR	9300.00	583.02	599.59		599.64	0.000051	1.89	5751.22	446.99	0.08
Reach-1	8	500 YR	9300.00	581.62	599.32		599.40	0.000080	2.39	4314.57	379.45	0.11
Reach-1	7.85	500 YR	9300.00	580.58	598.97		599.11	0.000138	3.12	3388.43	302.15	0.14
Reach-1	7.7	500 YR	9300.00	582.89	598.91		599.04	0.000149	3.05	3431.47	304.54	0.14
Reach-1	7.55	500 YR	9300.00	583.18	598.89	588.07	598.99	0.000105	2.57	3781.79	318.60	0.12
Reach-1	7.48		Bridge									
Reach-1	7.40	500 YR	9300.00	583.68	598.78		598.89	0.000123	2.75	3508.86	382.01	0.13
Reach-1	7.25	500 YR	9300.00	583.48	598.69		598.83	0.000155	3.12	3319.94	321.10	0.15
Reach-1	7	500 YR	9300.00	582.92	598.67		598.78	0.000129	2.83	3765.07	346.04	0.13
Reach-1	6.8	500 YR	9300.00	583.31	598.59		598.73	0.000162	3.15	3267.36	303.01	0.15
Reach-1	6	500 YR	9300.00	584.02	597.99	588.90	598.14	0.000186	3.26	3448.41	509.23	0.16

HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1 Profile: 500 YR

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Reach-1	9	500 YR	599.64	599.59	0.05	0.24	0.00	1361.64	6641.30	1297.07	446.99
Reach-1	8	500 YR	599.40	599.32	0.08	0.28	0.01	433.06	5467.37	3399.58	379.45
Reach-1	7.85	500 YR	599.11	598.97	0.14	0.07	0.00	452.44	8498.64	348.92	302.15
Reach-1	7.7	500 YR	599.04	598.91	0.13	0.04	0.01	327.65	8447.11	525.24	304.54
Reach-1	7.55	500 YR	598.99	598.89	0.10	0.02	0.00	132.03	9042.12	125.85	318.60
Reach-1	7.48		Bridge								
Reach-1	7.40	500 YR	598.89	598.78	0.12	0.05	0.00	57.32	9165.21	77.46	382.01
Reach-1	7.25	500 YR	598.83	598.69	0.14	0.04	0.01	305.47	8582.60	411.93	321.10
Reach-1	7	500 YR	598.78	598.67	0.11	0.04	0.00	512.07	8092.89	695.04	346.04
Reach-1	6.8	500 YR	598.73	598.59	0.15	0.60	0.00	239.75	8705.41	354.85	303.01
Reach-1	6	500 YR	598.14	597.99	0.15			452.25	8084.19	763.56	509.23

Errors Warnings and Notes for Plan : Existing

Location:	River: RIVER-1 Reach: Reach-1 RS: 7.55 Profile: 500 YR
Warning:	Divided flow computed for this cross-section.
Location:	River: RIVER-1 Reach: Reach-1 RS: 7.48 Profile: 500 YR
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream
	energy. The program defaulted to the next valid (user selected) method. If the Yarnell method
	was the only one selected, the program will default to an energy based solution.
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Location:	River: RIVER-1 Reach: Reach-1 RS: 7.40 Profile: 500 YR
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: RIVER-1 Reach: Reach-1 RS: 7.25 Profile: 500 YR
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.

Structure Tables

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

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Reach-1	7.7	500 YR	599.04	598.91		0.04	0.01	304.54	327.65	8447.11	525.24	3.05
Reach-1	7.7	100 YR	598.39	598.27		0.04	0.01	300.34	273.59	7690.82	435.59	2.91
Reach-1	7.7	50 YR	597.67	597.56		0.04	0.01	296.54	221.48	6929.55	348.97	2.76
Reach-1	7.7	10 YR	596.38	596.29		0.04	0.01	289.73	143.19	5639.34	217.48	2.49
Reach-1	7.55	500 YR	598.99	598.89	588.07	0.02	0.00	318.60	132.03	9042.12	125.85	2.57
Reach-1	7.55	100 YR	598.34	598.25	587.83	0.02	0.00	295.13	110.39	8189.43	100.18	2.43
Reach-1	7.55	50 YR	597.62	597.54	587.57	0.02	0.00	289.42	89.67	7332.17	78.16	2.30
Reach-1	7.55	10 YR	596.34	596.27	587.12	0.02	0.00	282.71	58.77	5892.31	48.92	2.05
Reach-1	7.48 BR U	500 YR	598.96	598.85	588.25	0.05	0.00	281.12	82.65	9053.17	164.18	2.75
Reach-1	7.48 BR U	100 YR	598.32	598.21	587.98	0.05	0.00	273.71	70.25	8200.07	129.68	2.61
Reach-1	7.48 BR U	50 YR	597.60	597.51	587.71	0.05	0.00	268.24	58.50	7341.11	100.39	2.46
Reach-1	7.48 BR U	10 YR	596.32	596.24	587.23	0.04	0.00	261.56	41.03	5897.21	61.76	2.19
Reach-1	7.48 BR D	500 YR	598.91	598.78	588.43	0.02	0.01	242.27	23.46	9237.28	39.26	2.93
Reach-1	7.48 BR D	100 YR	598.27	598.15	588.18	0.01	0.00	240.16	17.48	8349.49	33.03	2.77
Reach-1	7.48 BR D	50 YR	597.55	597.45	587.92	0.01	0.00	237.81	12.48	7460.29	27.24	2.62
Reach-1	7.48 BR D	10 YR	596.28	596.19	587.43	0.01	0.00	233.61	6.59	5974.54	18.88	2.32
Reach-1	7.40	500 YR	598.89	598.78		0.05	0.00	382.01	57.32	9165.21	77.46	2.75
Reach-1	7.40	100 YR	598.25	598.14		0.05	0.00	276.69	47.14	8294.63	58.24	2.60
Reach-1	7.40	50 YR	597.53	597.44		0.05	0.00	258.79	37.75	7415.25	47.00	2.45
Reach-1	7.40	10 YR	596.26	596.19		0.04	0.00	254.59	24.62	5944.87	30.52	2.18
Reach-1	7.25	500 YR	598.83	598.69		0.04	0.01	321.10	305.47	8582.60	411.93	3.12
Reach-1	7.25	100 YR	598.19	598.07		0.04	0.01	299.60	250.50	7806.78	342.73	2.96
Reach-1	7.25	50 YR	597.48	597.37		0.04	0.01	279.10	197.75	7022.58	279.67	2.81
Reach-1	7.25	10 YR	596.22	596.12		0.04	0.01	271.78	120.14	5695.49	184.37	2.52

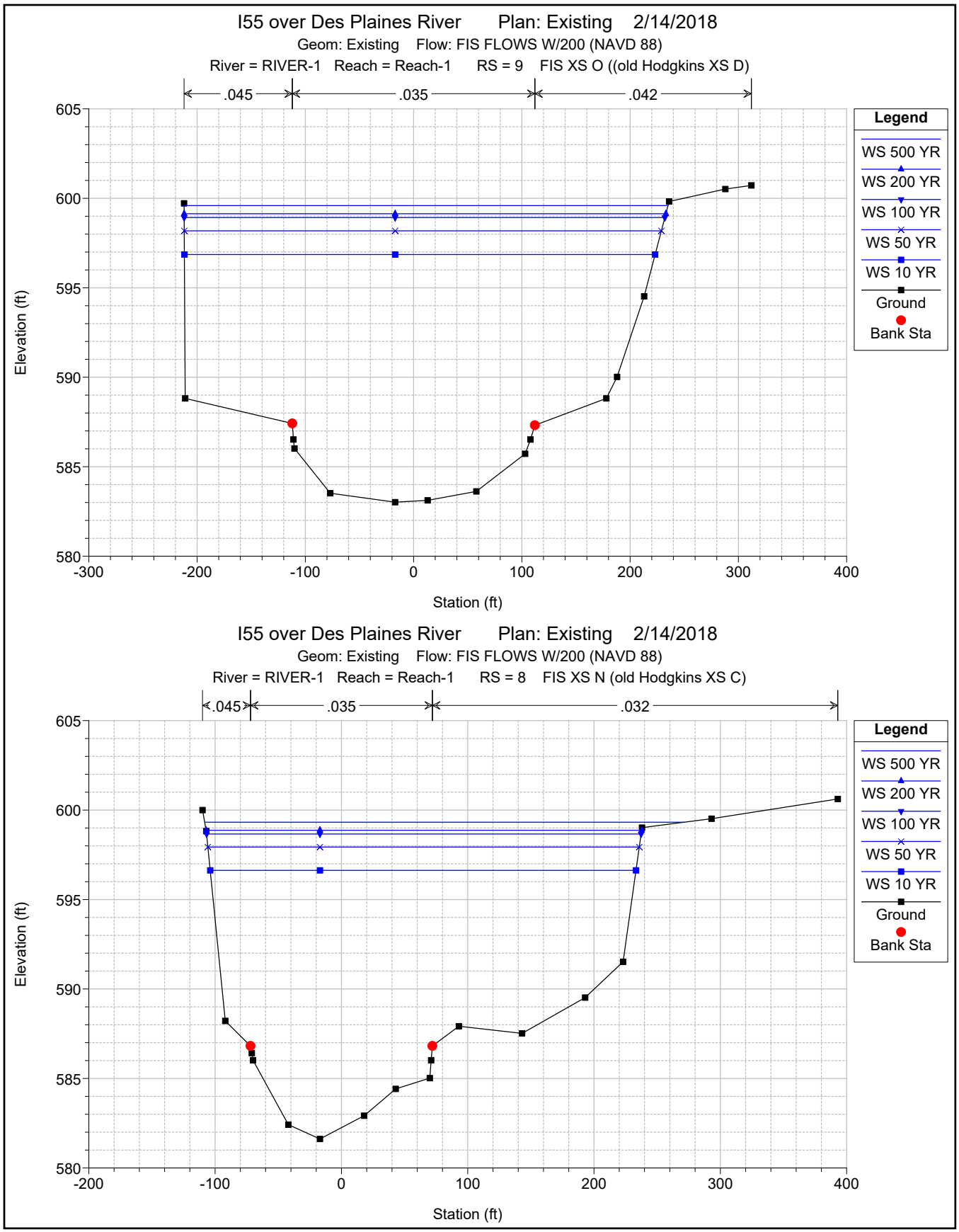
HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1

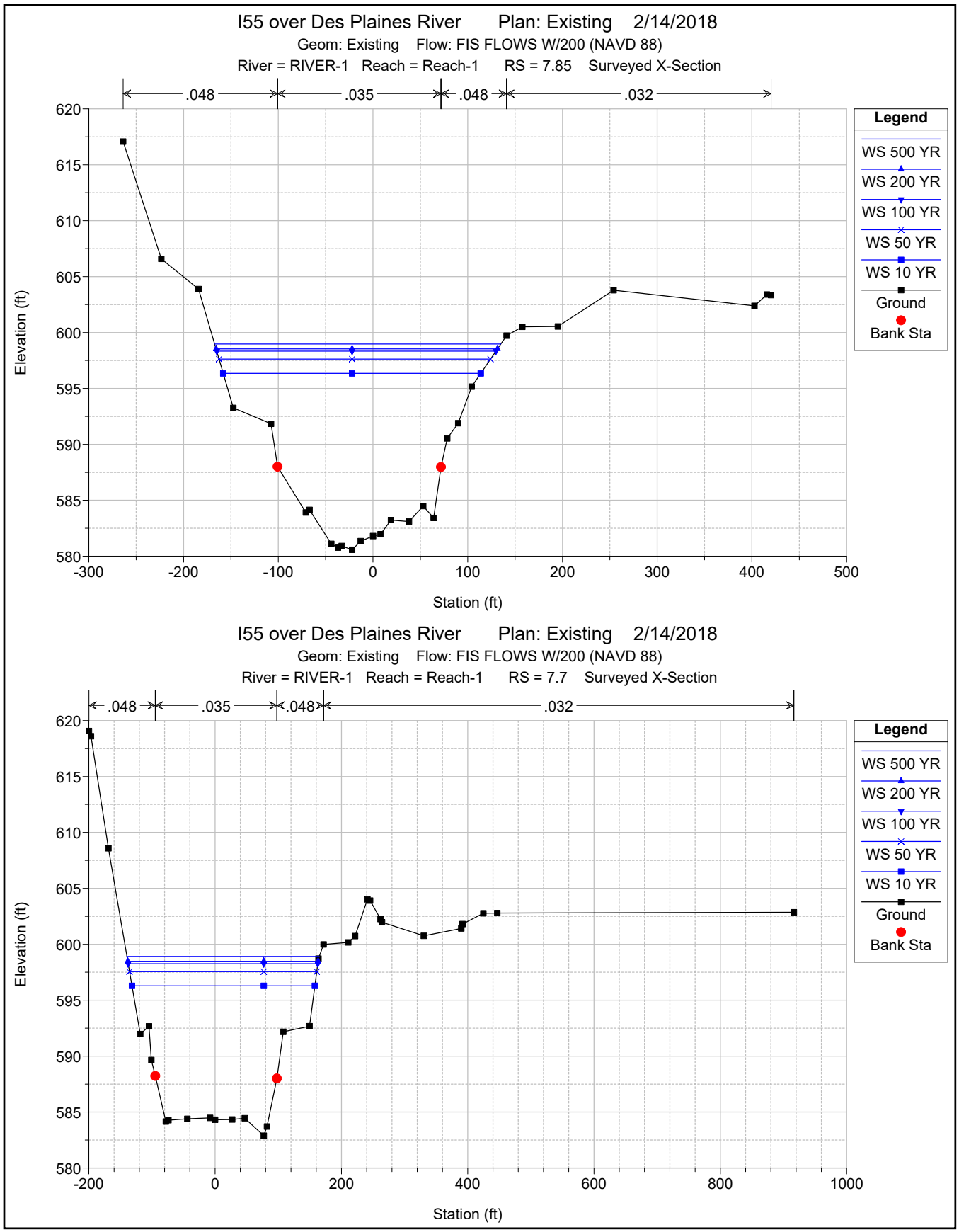
Reach	River Sta	Profile	E.G. US.	W.S. US.	BR Sel Method	Energy EG	Momen. EG	Yarnell EG	WSPRO EG	Prs O EG	Prs/Wr EG	Energy/Wr EG
			(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Reach-1	7.48	500 YR	598.99	598.89	Energy only	598.99						
Reach-1	7.48	100 YR	598.34	598.25	Energy only	598.34						
Reach-1	7.48	50 YR	597.62	597.54	Energy only	597.62						
Reach-1	7.48	10 YR	596.34	596.27	Energy only	596.34						

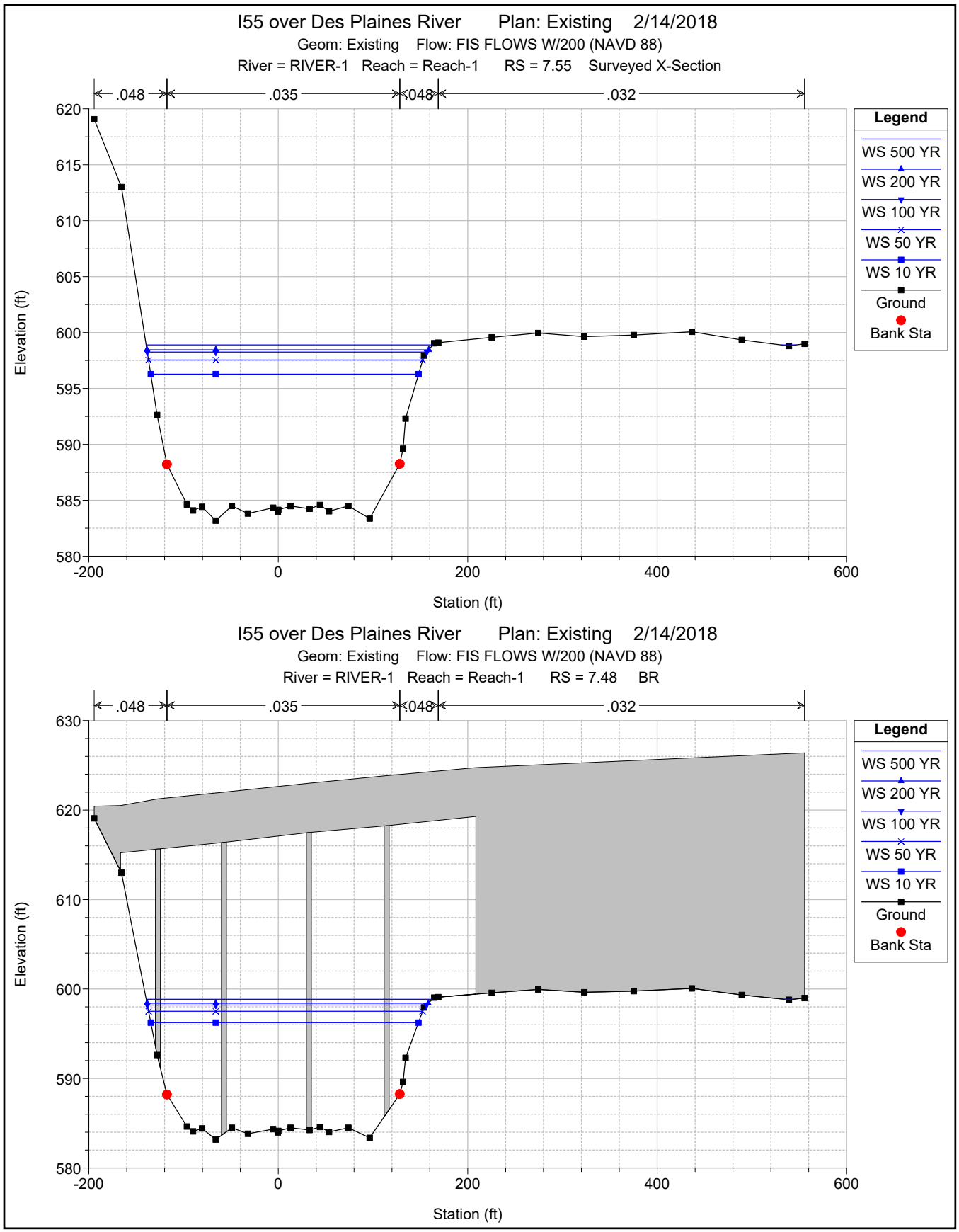
HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1

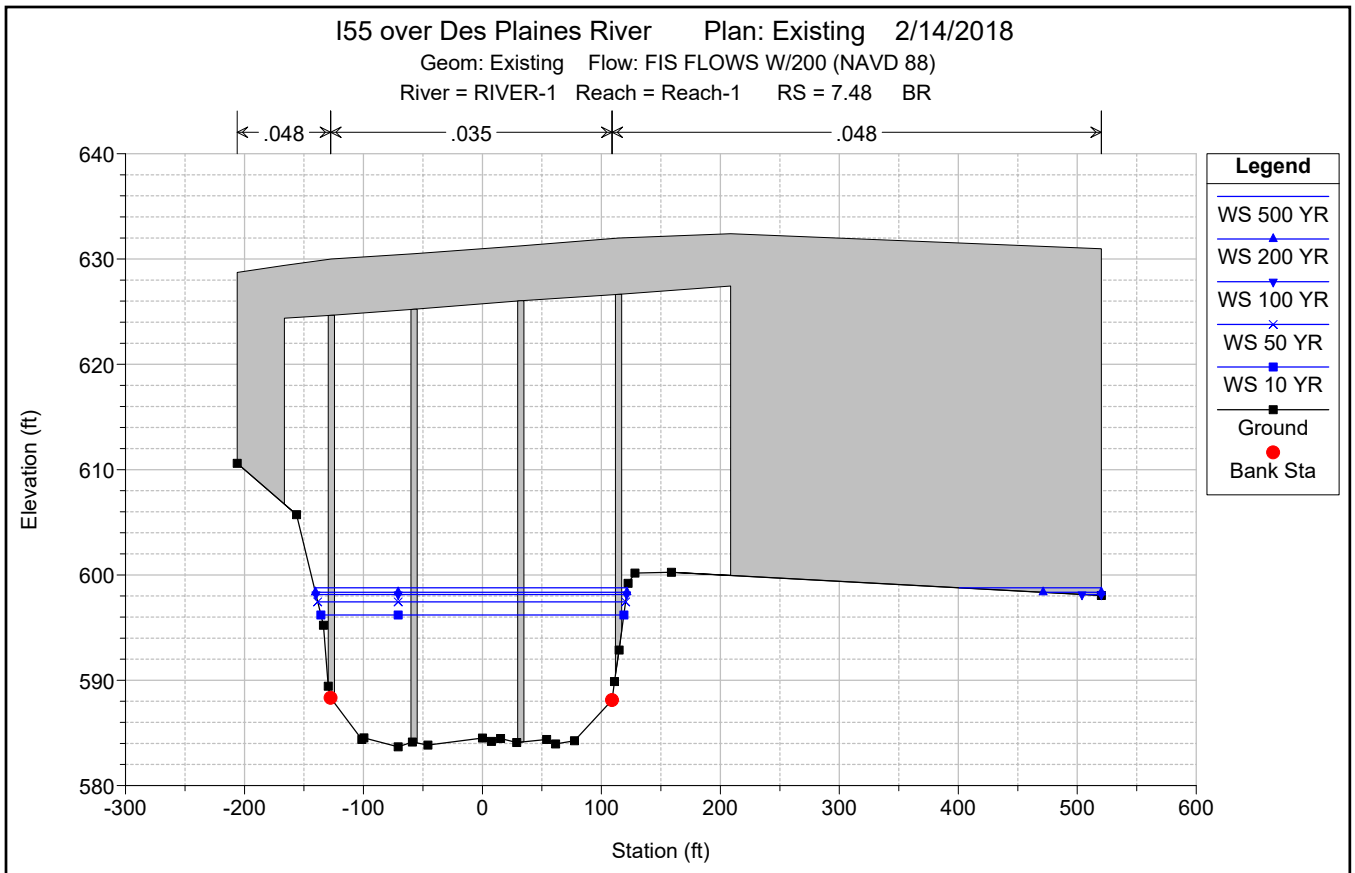
Reach	River Sta	Profile	E.G. US.	Min El Prs	BR Open Area	Prs O WS	Q Total	Min El Weir Flow	Q Weir	Delta EG	BR Sluice Coef
			(ft)	(ft)	(sq ft)	(ft)	(cfs)	(ft)	(cfs)	(ft)	
Reach-1	7.48	500 YR	598.99	619.29	9827.16		9300.00	628.74		0.10	
Reach-1	7.48	100 YR	598.34	619.29	9827.16		8400.00	628.74		0.09	
Reach-1	7.48	50 YR	597.62	619.29	9827.16		7500.00	628.74		0.09	
Reach-1	7.48	10 YR	596.34	619.29	9827.16		6000.00	628.74		0.08	

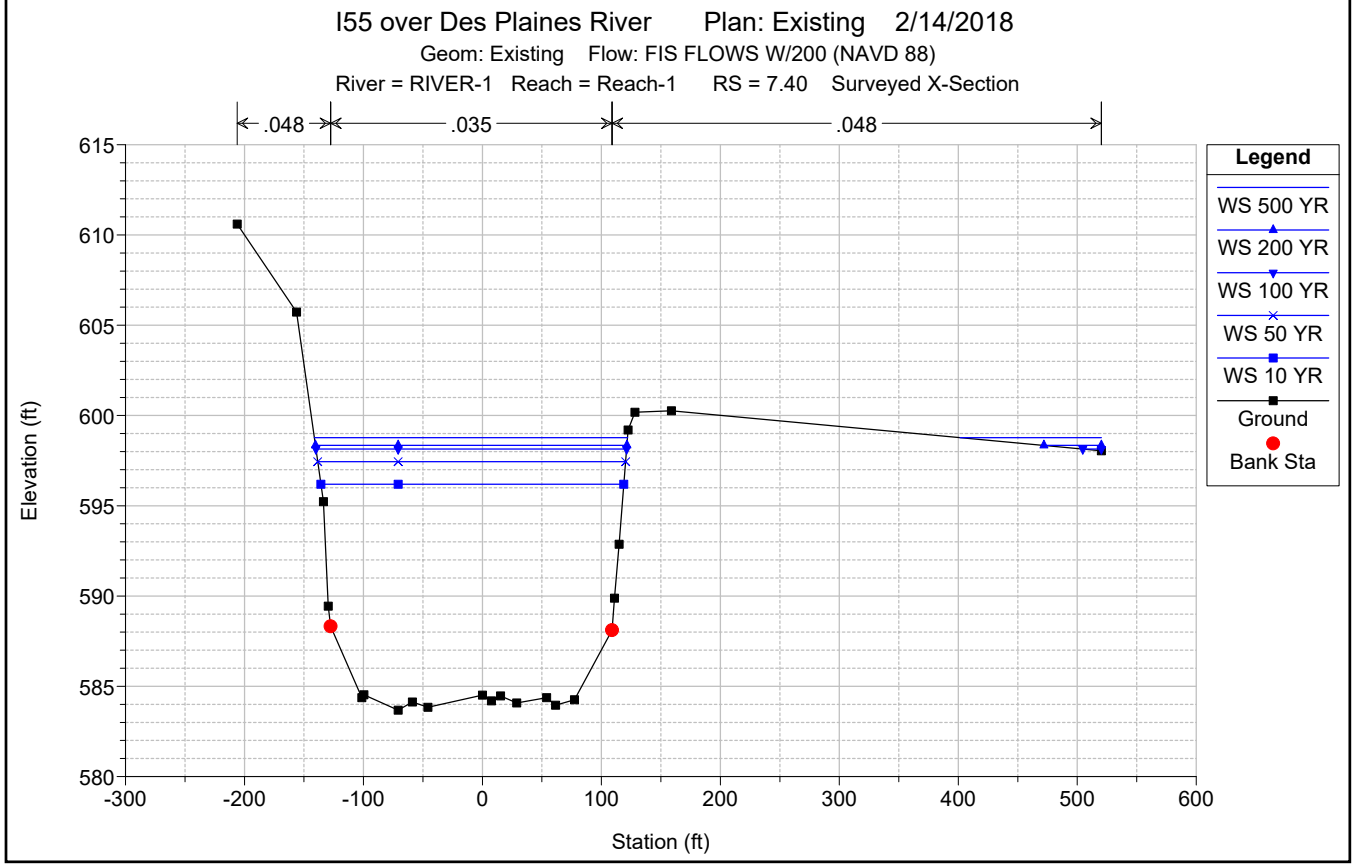
HEC-RAS Plotted Cross Sections

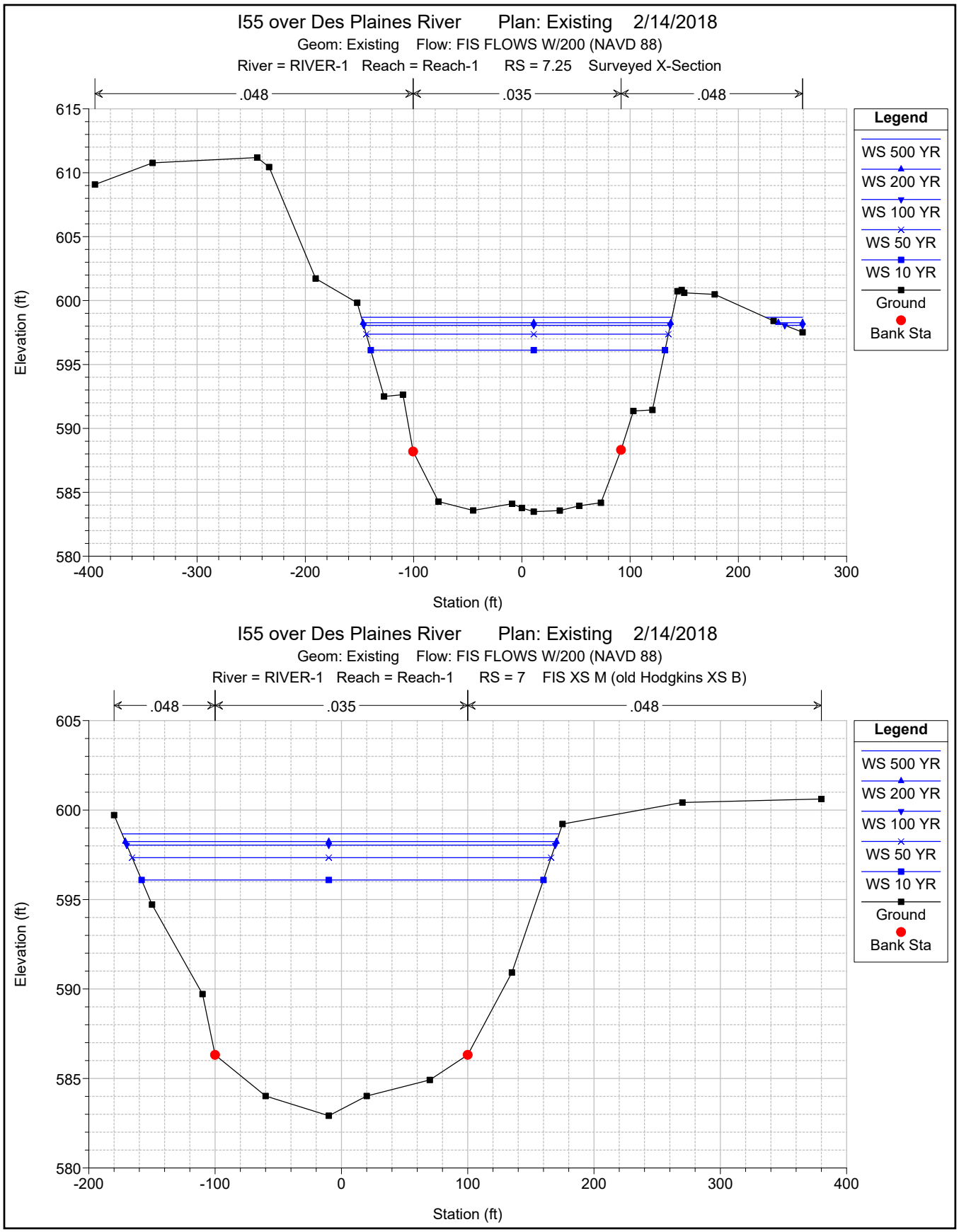

I55 over Des Plaines River Plan: Existing 2/14/2018
Geom: Existing Flow: FIS FLOWS W/200 (NAVD 88)
River = RIVER-1 Reach = Reach-1 RS = 9 FIS XS O ((old Hodgkins XS D)
.045
.035
.042
Legend
WS 500 YR
WS 200 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
I55 over Des Plaines River Plan: Existing 2/14/2018
Geom: Existing Flow: FIS FLOWS W/200 (NAVD 88)
River = RIVER-1 Reach = Reach-1 RS = 8 FIS XS N (old Hodgkins XS C)
.045
.035
.032
Legend
WS 500 YR
WS 200 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
Elevation (ft)
Station (ft)

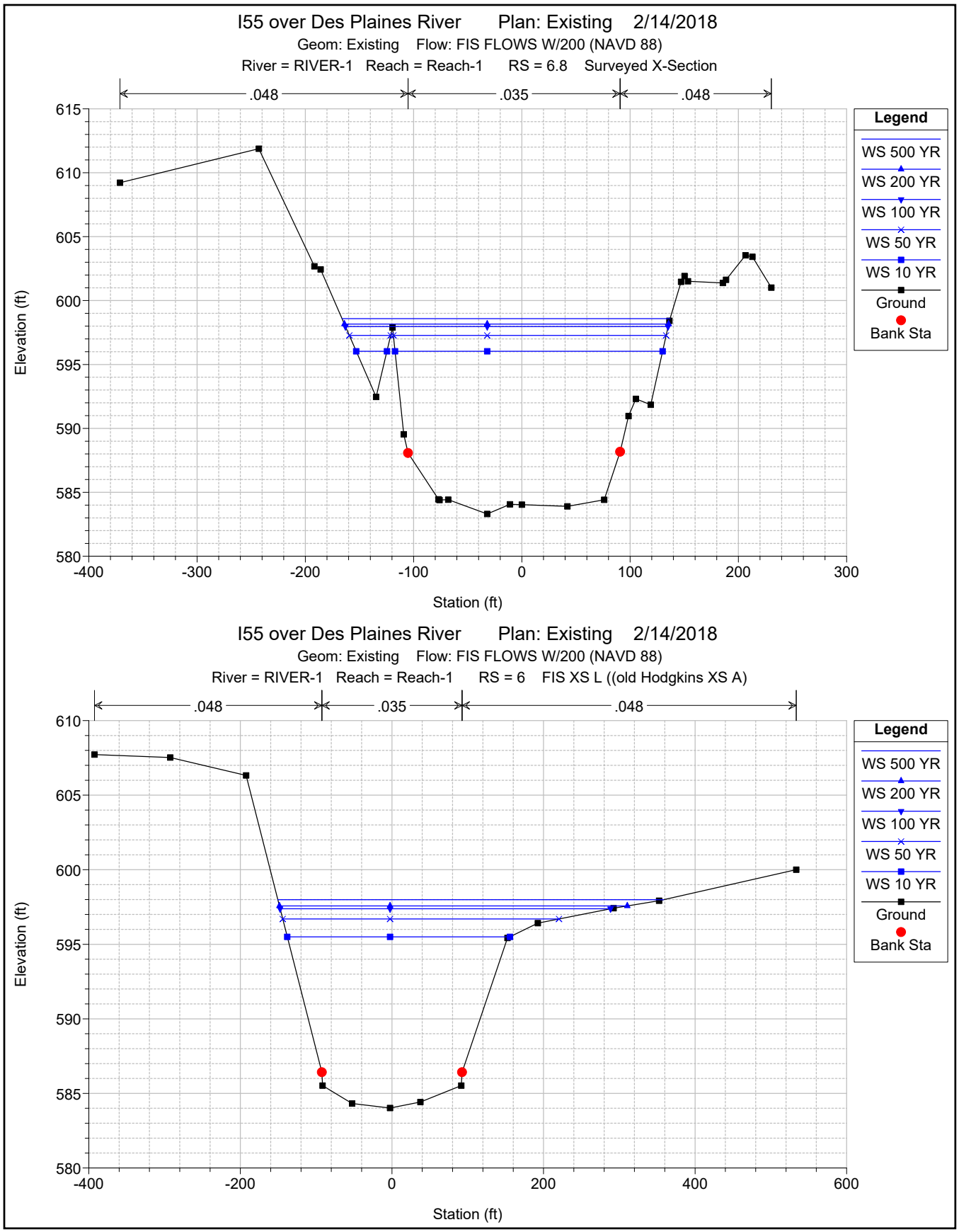

I55 over Des Plaines River Plan: Existing 2/14/2018
Geom: Existing Flow: FIS FLOWS W/200 (NAVD 88)
River = RIVER-1 Reach = Reach-1 RS = 7.85 Surveyed X-Section
.048
.035
.048
.032
Elevation (ft)
620
615
610
605
600
595
590
585
580
-300
-200
-100
0
100
200
300
400
500
Station (ft)
Legend
WS 500 YR
WS 200 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
I55 over Des Plaines River Plan: Existing 2/14/2018
Geom: Existing Flow: FIS FLOWS W/200 (NAVD 88)
River = RIVER-1 Reach = Reach-1 RS = 7.7 Surveyed X-Section
.048
.035
.048
.032
Elevation (ft)
620
615
610
605
600
595
590
585
580
-200
0
200
400
600
800
1000
Station (ft)
Legend
WS 500 YR
WS 200 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta


I55 over Des Plaines River Plan: Existing 2/14/2018
Geom: Existing Flow: FIS FLOWS W/200 (NAVD 88)
River = RIVER-1 Reach = Reach-1 RS = 7.55 Surveyed X-Section
.048
.035
.048
.032
Legend
WS 500 YR
WS 200 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
Elevation (ft)
620
615
610
605
600
595
590
585
580
-200
0
200
400
600
Station (ft)
I55 over Des Plaines River Plan: Existing 2/14/2018
Geom: Existing Flow: FIS FLOWS W/200 (NAVD 88)
River = RIVER-1 Reach = Reach-1 RS = 7.48 BR
.048
.035
.048
.032
Legend
WS 500 YR
WS 200 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
Elevation (ft)
630
620
610
600
590
580
-200
0
200
400
600
Station (ft)


I55 over Des Plaines River Plan: Existing 2/14/2018
Geom: Existing Flow: FIS FLOWS W/200 (NAVD 88)
River = RIVER-1 Reach = Reach-1 RS = 7.48 BR
.048
.035
.048
Legend
WS 500 YR
WS 200 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
Elevation (ft)
Station (ft)


I55 over Des Plaines River Plan: Existing 2/14/2018
Geom: Existing Flow: FIS FLOWS W/200 (NAVD 88)
River = RIVER-1 Reach = Reach-1 RS = 7.40 Surveyed X-Section
.048
.035
.048
Legend
WS 500 YR
WS 200 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
Elevation (ft)
Station (ft)


I55 over Des Plaines River Plan: Existing 2/14/2018
Geom: Existing Flow: FIS FLOWS W/200 (NAVD 88)
River = RIVER-1 Reach = Reach-1 RS = 7.25 Surveyed X-Section
.048
.035
.048
Legend
WS 500 YR
WS 200 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
I55 over Des Plaines River Plan: Existing 2/14/2018
Geom: Existing Flow: FIS FLOWS W/200 (NAVD 88)
River = RIVER-1 Reach = Reach-1 RS = 7 FIS XS M (old Hodgkins XS B)
.048
.035
.048
Legend
WS 500 YR
WS 200 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
Elevation (ft)
Station (ft)

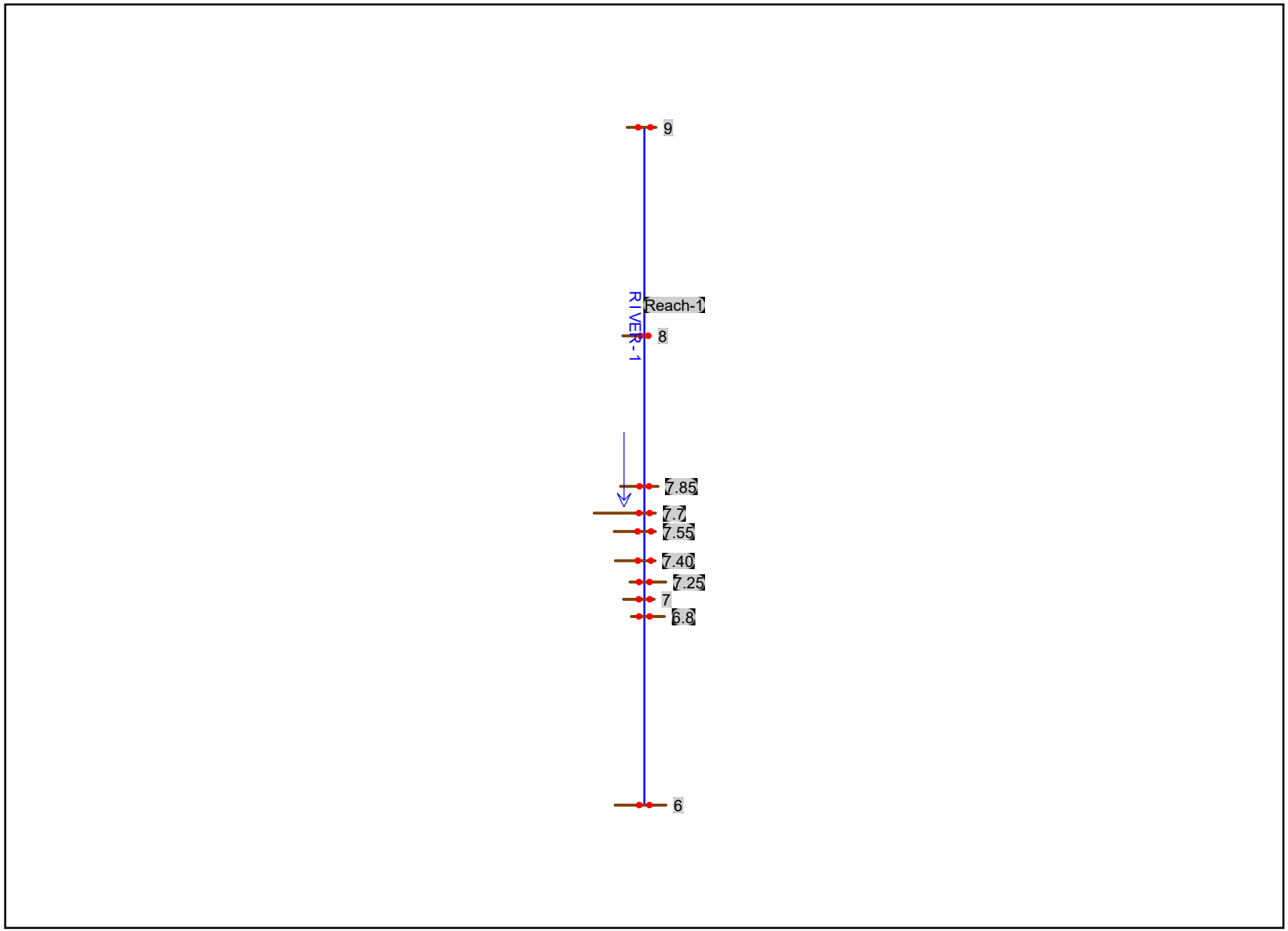

I55 over Des Plaines River Plan: Existing 2/14/2018
Geom: Existing Flow: FIS FLOWS W/200 (NAVD 88)
River = RIVER-1 Reach = Reach-1 RS = 6.8 Surveyed X-Section
.048
.035
.048
Elevation (ft)
615
610
605
600
595
590
585
580
-400
-300
-200
-100
0
100
200
300
Station (ft)
Legend
WS 500 YR
WS 200 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
I55 over Des Plaines River Plan: Existing 2/14/2018
Geom: Existing Flow: FIS FLOWS W/200 (NAVD 88)
River = RIVER-1 Reach = Reach-1 RS = 6 FIS XS L ((old Hodgkins XS A)
.048
.035
.048
Elevation (ft)
610
605
600
595
590
585
580
-400
-200
0
200
400
600
Station (ft)
Legend
WS 500 YR
WS 200 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta

TAB D

SECTION 13.D

NATURAL CONDITIONS
PERMIT MODEL

Natural Conditions
HEC-RAS Geometry



HEC-RAS HEC-RAS 5.0.3 September 2016
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: I55 over Des Plaines River
Project File : I55overDesPlaine.prj
Run Date and Time: 9/12/2017 11:58:08 AM

Project in English units

PLAN DATA

Plan Title: Natural
Plan File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.p06

Geometry Title: Natural
Geometry File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.g07

Flow Title : FIS FLOWS W/200 (NAVD 88)
Flow File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.f05

Plan Description:
NAVD88. Added 200 YR Storm Event to Flow Data and surveyed cross sections to geometry data to the truncated FIS HEC-2 "Des Plaines River in Willow Springs and Hodgkins, Harza Engineering Company". Extended Cross Section 6 and 8 using county countour map.

Plan Summary Information:
Number of: Cross Sections = 10 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 0 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: Between every coordinate point (HEC2 Style)
Friction Slope Method: Program Selects Appropriate method
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: FIS FLOWS W/200 (NAVD 88)
Flow File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.f05

Flow Data (cfs)

River	Reach	RS	500 YR	200 YR	100 YR	50 YR	10 YR
RIVER-1	Reach-1	9	9300	8692	8400	7500	6000

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	500 YR		Known WS = 597.99
RIVER-1	Reach-1	200 YR		Known WS = 597.57
RIVER-1	Reach-1	100 YR		Known WS = 597.38
RIVER-1	Reach-1	50 YR		Known WS = 596.7
RIVER-1	Reach-1	10 YR		Known WS = 595.5

GEOMETRY DATA

Geometry Title: Natural
Geometry File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.g07

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 9

INPUT
Description: FIS XS O ((old Hodgkins XS D)
Adjusted stations by -212
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-212	599.72	-211	588.82	-112	587.42	-111	586.52	-110	586.02
-77	583.52	-17	583.02	13	583.12	58	583.62	103	585.72
108	586.52	112	587.32	178	588.82	188	590.02	213	594.52
236	599.82	288	600.52	312	600.72				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-212	.045	-112	.035	112	.042

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-112	112	3800	3800	3800	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 8

INPUT
Description: FIS XS N (old Hodgkins XS C)
Adjusted stations by -107
38.15
I-55 STEVENSON EXPRESSWAY
added station -110
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-110	600	-107	598.82	-92	588.22	-72	586.82	-71	586.42
-70	586.02	-42	582.42	-17	581.62	18	582.92	43	584.42
70	585.02	71	586.02	72	586.82	93	587.92	143	587.52
193	589.52	223	591.52	238	599.02	293	599.52	393	600.62

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-110	.045	-72	.035	72	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-72	72	2742	2742	2742	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 7.85

INPUT
Description: Surveyed X-Section
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-263.81	617.07	-223.45	606.59	-184.2	603.88	-147.4	593.26	-107.65	591.84
-100.72	588	-71	583.91	-67	584.14	-44	581.1	-37	580.77
-33	580.91	-22	580.58	-13	581.35	0	581.8	8	581.96
19	583.23	38	583.1	53	584.49	64	583.42	71.73	587.97
78.37	590.53	90.01	591.89	104.15	595.16	140.99	599.72	157.58	600.51
195.15	600.54	254.01	603.78	402.64	602.39	415.85	603.4	420.28	603.35

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-263.81	.048	-100.72	.035	71.73	.048	140.99	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-100.72	71.73	487	487	487	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 7.7

INPUT
Description: Surveyed X-Section
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-199.79	619.07	-196.6	618.6	-169	608.58	-118.63	591.97	-104.8	592.66
-101.08	589.65	-94.68	588.22	-78	584.15	-74	584.27	-44	584.4
-8	584.48	0	584.32	27	584.34	47	584.45	77	582.89
82	583.71	97.78	588	107.82	592.18	149.54	592.67	163.67	598.72
171.69	599.98	210.9	600.17	221.51	600.73	241.21	604.02	245.36	603.9
261.96	602.25	264.19	601.97	330.44	600.75	389.74	601.41	391.84	601.81
424.74	602.77	446.84	602.79	916.4	602.857				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-199.79	.048	-94.68	.035	97.78	.048	171.69	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-94.68	97.78	334	334	334	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 7.55

INPUT
Description: Surveyed X-Section
Station Elevation Data num= 33

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
-194.325  619.07 -165.57     613-127.885  592.62 -117.56  588.21   -96.5  584.63
     -90  584.09   -80.5  584.42     -66  583.18     -49   584.5     -32  583.82
    -5.5  584.34     -.5  583.98       0  584.14      13  584.49      33  584.24
      44  584.58    53.5  584.02      74   584.5    96.5  583.37  128.24  588.26
 131.775  589.61 134.415  592.31  153.81  597.94 164.575  599.04  168.87  599.09
 225.325  599.57 274.525  599.95  322.97 599.632  375.25  599.77 436.545  600.07
  489.26  599.34 538.995   598.8 555.695  598.99

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
-194.325    .048 -117.56    .035  128.24    .048  168.87    .032

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -117.56  128.24              534     534     534             .1       .3
Skew Angle = 60

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 7.40

INPUT
Description: Surveyed X-Section
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
-206.124   610.6-156.235  605.73-133.665  595.23-129.586  589.44-127.544  588.32
-101.303  584.37 -99.669  584.53 -70.803  583.68 -58.821  584.13  -45.75  583.84
       0  584.51   7.625  584.19   15.25  584.47  28.866  584.08  53.919  584.37
  61.544  583.95  77.339  584.25 108.988  588.11 110.987  589.88 114.875  592.87
 122.484   599.2 128.175  600.18 158.937  600.26 520.239 598.048

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
-206.124    .048-127.544    .035 108.988    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      -127.544 108.988              388     388     388             .1       .3
Skew Angle = 57

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 7.25

INPUT
Description: Surveyed X-Section
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -394.32  609.08 -341.14  610.77 -244.47  611.19 -233.48  610.44 -190.46  601.72
 -152.08  599.83  -127.3   592.5 -109.84  592.64 -100.38  588.19     -77  584.27
     -45  583.58      -9   584.1       0  583.78      11  583.48      35  583.57
      53  583.94      73  584.18   91.62  588.31  103.06  591.36  120.59  591.44
  143.71  600.73  147.59  600.83  150.02  600.61  178.17  600.48  232.51  598.41
  259.28  597.52

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -394.32    .048 -100.38    .035   91.62    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -100.38   91.62              315     315     315             .1       .3

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 7
```

```
INPUT
Description: FIS XS M (old Hodgkins XS B)
Adjusted stations by -180
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -180  599.72    -150  594.72    -110  589.72    -100  586.32     -60  584.02
     -10  582.92      20  584.02      70  584.92     100  586.32     135  590.92
     175  599.22     270  600.42     380  600.62

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -180    .048    -100    .035     100    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -100     100              313     313     313             .1       .3

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 6.8

INPUT
Description: Surveyed X-Section
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -371.24  609.22 -242.95  611.88 -191.65  602.68  -185.9  602.43  -134.6  592.46
 -119.44  597.89 -109.07  589.54 -105.08  588.07     -77  584.45     -76   584.4
     -68  584.42     -32  583.31     -11  584.06       0  584.03      42   583.9
      76  584.41   90.83  588.17   98.54  590.96  105.31  592.31  119.03  591.85
  136.29  598.42  147.08  601.47  150.31  601.92  153.41  601.51  185.66  601.38
  188.55  601.63  206.55  603.54  213.01 603.427  230.45 601.016

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -371.24    .048 -105.08    .035   90.83    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -105.08   90.83             3437    3437    3437             .1       .3

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 6

INPUT
Description: FIS XS L ((old Hodgkins XS A)
Adjusted stations by -792.5
36.98
             I-294 TOLLWAY
37.24  US 12, US 20 AND US 45
IN
             DIVERSION
Extended XS Using county maps
Added Station 533.5
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -392.5  607.72  -292.5  607.52  -192.5  606.32   -92.5  586.42   -91.5  585.52
   -52.5  584.32    -2.5  584.02    37.5  584.42    91.5  585.52    92.5  586.42
   152.5  595.42   192.5  596.42   292.5  597.42   352.5  597.92   533.5     600

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -392.5    .048   -92.5    .035    92.5    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -92.5    92.5                0       0       0             .1       .3
```

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3	n4
Reach-1	9	.045	.035	.042	
Reach-1	8	.045	.035	.032	
Reach-1	7.85	.048	.035	.048	.032
Reach-1	7.7	.048	.035	.048	.032
Reach-1	7.55	.048	.035	.048	.032
Reach-1	7.40	.048	.035	.048	
Reach-1	7.25	.048	.035	.048	
Reach-1	7	.048	.035	.048	
Reach-1	6.8	.048	.035	.048	
Reach-1	6	.048	.035	.048	

SUMMARY OF REACH LENGTHS

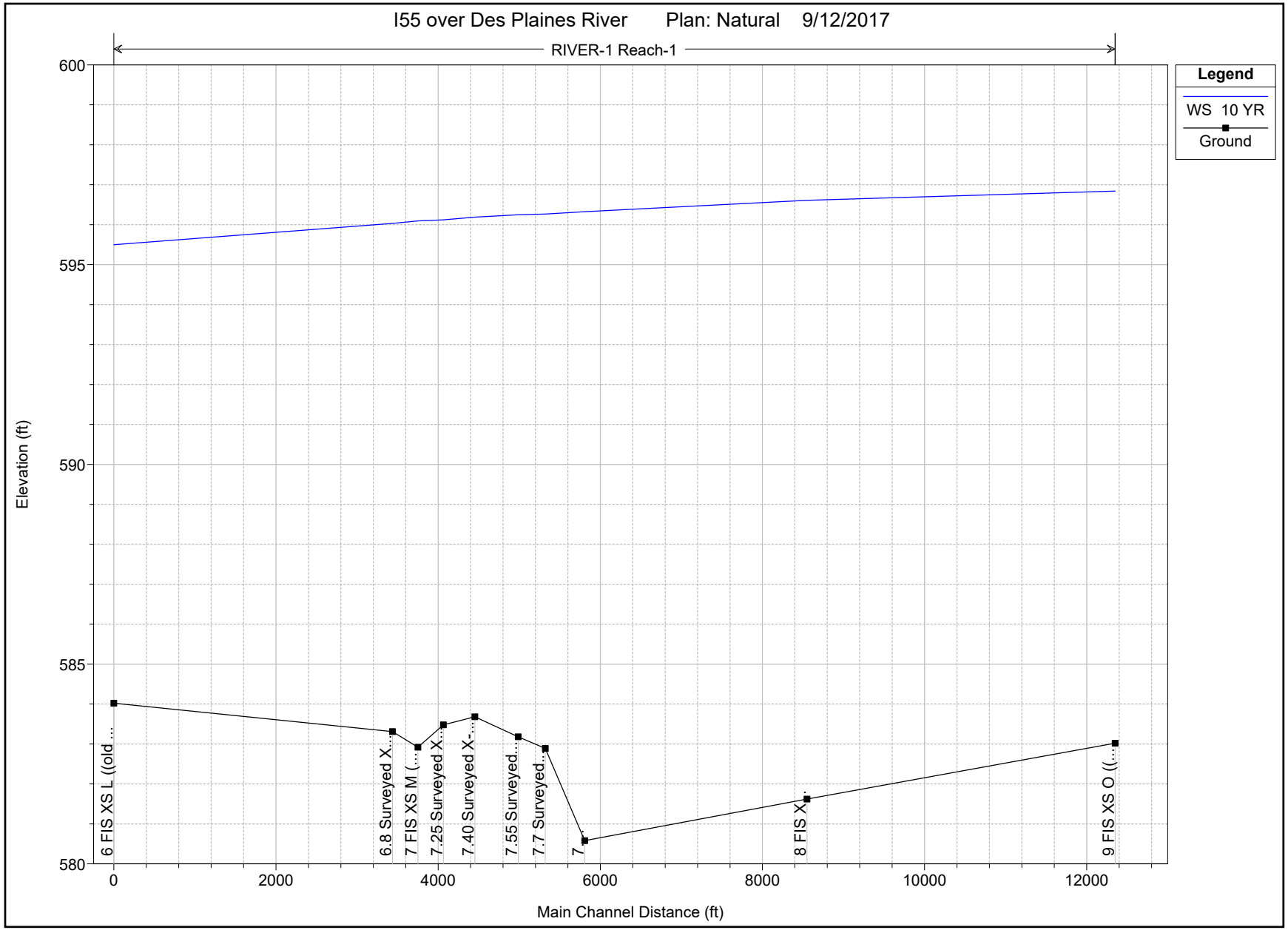
River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	9	3800	3800	3800
Reach-1	8	2742	2742	2742
Reach-1	7.85	487	487	487
Reach-1	7.7	334	334	334
Reach-1	7.55	534	534	534
Reach-1	7.40	388	388	388
Reach-1	7.25	315	315	315
Reach-1	7	313	313	313
Reach-1	6.8	3437	3437	3437
Reach-1	6	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	9	.1	.3
Reach-1	8	.1	.3
Reach-1	7.85	.1	.3
Reach-1	7.7	.1	.3
Reach-1	7.55	.1	.3
Reach-1	7.40	.1	.3
Reach-1	7.25	.1	.3
Reach-1	7	.1	.3
Reach-1	6.8	.1	.3
Reach-1	6	.1	.3

10-Year Natural


I55 over Des Plaines River Plan: Natural 9/12/2017
RIVER-1 Reach-1
Legend
WS 10 YR
Ground
Elevation (ft)
600
595
590
585
580
0
2000
4000
6000
8000
10000
12000
Main Channel Distance (ft)
6 FIS XS L ((old ...
6.8 Surveyed X...
7 FIS XS M (...
7.25 Surveyed X...
7.40 Surveyed X...
7.55 Surveyed...
7.7 Surveyed...
7...
8 FIS X...
9 FIS XS O ((...

HEC-RAS Plan: Natural River: RIVER-1 Reach: Reach-1 Profile: 10 YR

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9	10 YR	6000.00	583.02	596.84		596.87	0.000044	1.55	4538.19	434.80	0.08
Reach-1	8	10 YR	6000.00	581.62	596.61		596.66	0.000071	1.99	3383.03	337.05	0.10
Reach-1	7.85	10 YR	6000.00	580.58	596.32		596.42	0.000114	2.51	2628.62	271.58	0.12
Reach-1	7.7	10 YR	6000.00	582.89	596.27		596.36	0.000130	2.49	2647.64	289.60	0.13
Reach-1	7.55	10 YR	6000.00	583.18	596.25		596.31	0.000088	2.05	3013.72	282.58	0.11
Reach-1	7.40	10 YR	6000.00	583.68	596.19		596.26	0.000102	2.18	2795.96	254.59	0.11
Reach-1	7.25	10 YR	6000.00	583.48	596.12		596.22	0.000132	2.52	2580.66	271.78	0.13
Reach-1	7	10 YR	6000.00	582.92	596.09		596.17	0.000111	2.31	2910.05	318.19	0.12
Reach-1	6.8	10 YR	6000.00	583.31	596.03		596.13	0.000139	2.55	2526.02	275.51	0.13
Reach-1	6	10 YR	6000.00	584.02	595.50	587.79	595.61	0.000169	2.71	2500.08	293.83	0.14

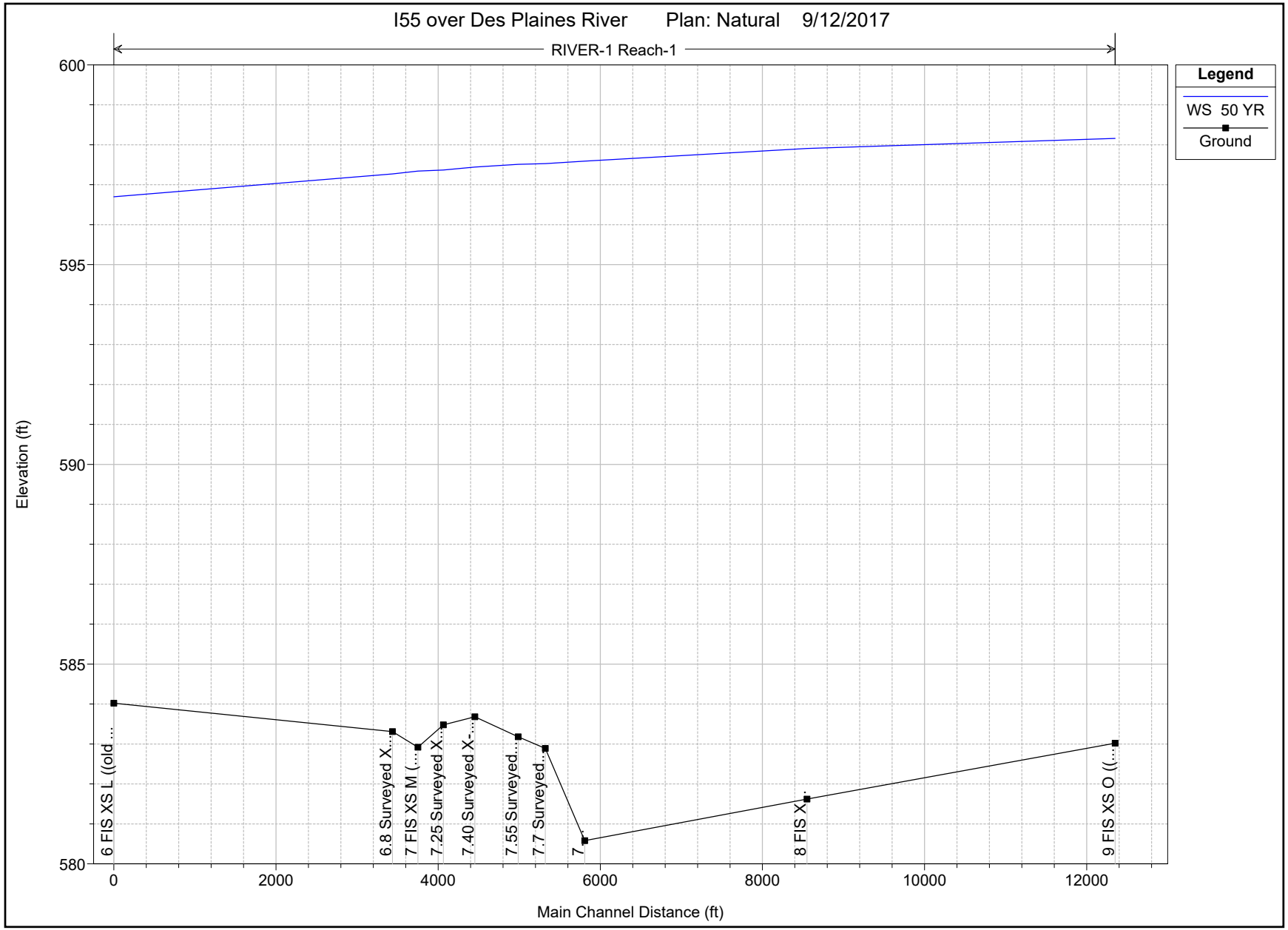
HEC-RAS Plan: Natural River: RIVER-1 Reach: Reach-1 Profile: 10 YR

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Reach-1	9	10 YR	596.87	596.84	0.03	0.21	0.00	801.89	4478.10	720.01	434.80
Reach-1	8	10 YR	596.66	596.61	0.05	0.24	0.00	251.50	3774.74	1973.76	337.05
Reach-1	7.85	10 YR	596.42	596.32	0.09	0.06	0.00	173.65	5686.56	139.79	271.58
Reach-1	7.7	10 YR	596.36	596.27	0.09	0.04	0.01	142.52	5641.25	216.24	289.60
Reach-1	7.55	10 YR	596.31	596.25	0.06	0.05	0.00	58.52	5892.81	48.67	282.58
Reach-1	7.40	10 YR	596.26	596.19	0.07	0.04	0.00	24.62	5944.87	30.52	254.59
Reach-1	7.25	10 YR	596.22	596.12	0.09	0.04	0.01	120.14	5695.49	184.37	271.78
Reach-1	7	10 YR	596.17	596.09	0.08	0.04	0.00	227.99	5408.08	363.92	318.19
Reach-1	6.8	10 YR	596.13	596.03	0.10	0.52	0.00	81.95	5766.27	151.78	275.51
Reach-1	6	10 YR	595.61	595.50	0.11			225.93	5470.93	303.14	293.83

Errors Warnings and Notes for Plan : Natural

Location:	River: RIVER-1 Reach: Reach-1 RS: 6.8 Profile: 10 YR
Warning:	Divided flow computed for this cross-section.

50-Year Natural


I55 over Des Plaines River Plan: Natural 9/12/2017
RIVER-1 Reach-1
Legend
WS 50 YR
Ground
Elevation (ft)
600
595
590
585
580
0
2000
4000
6000
8000
10000
12000
Main Channel Distance (ft)
6 FIS XS L ((old ...
6.8 Surveyed X...
7 FIS XS M (...
7.25 Surveyed X...
7.40 Surveyed X...
7.55 Surveyed...
7.7 Surveyed...
7...
8 FIS X...
9 FIS XS O ((...

HEC-RAS Plan: Natural River: RIVER-1 Reach: Reach-1 Profile: 50 YR

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9	50 YR	7500.00	583.02	598.16		598.20	0.000048	1.72	5115.34	440.65	0.08
Reach-1	8	50 YR	7500.00	581.62	597.91		597.97	0.000076	2.18	3823.54	341.49	0.10
Reach-1	7.85	50 YR	7500.00	580.58	597.59		597.71	0.000127	2.81	2981.82	286.20	0.13
Reach-1	7.7	50 YR	7500.00	582.89	597.53		597.64	0.000140	2.77	3017.59	296.38	0.14
Reach-1	7.55	50 YR	7500.00	583.18	597.51		597.59	0.000097	2.30	3374.53	289.26	0.11
Reach-1	7.40	50 YR	7500.00	583.68	597.44		597.53	0.000112	2.45	3117.76	258.79	0.12
Reach-1	7.25	50 YR	7500.00	583.48	597.37		597.48	0.000144	2.81	2924.07	279.10	0.14
Reach-1	7	50 YR	7500.00	582.92	597.34		597.44	0.000120	2.56	3315.31	331.68	0.13
Reach-1	6.8	50 YR	7500.00	583.31	597.27		597.39	0.000150	2.84	2876.03	290.13	0.14
Reach-1	6	50 YR	7500.00	584.02	596.70	588.31	596.83	0.000180	2.99	2887.45	364.66	0.15

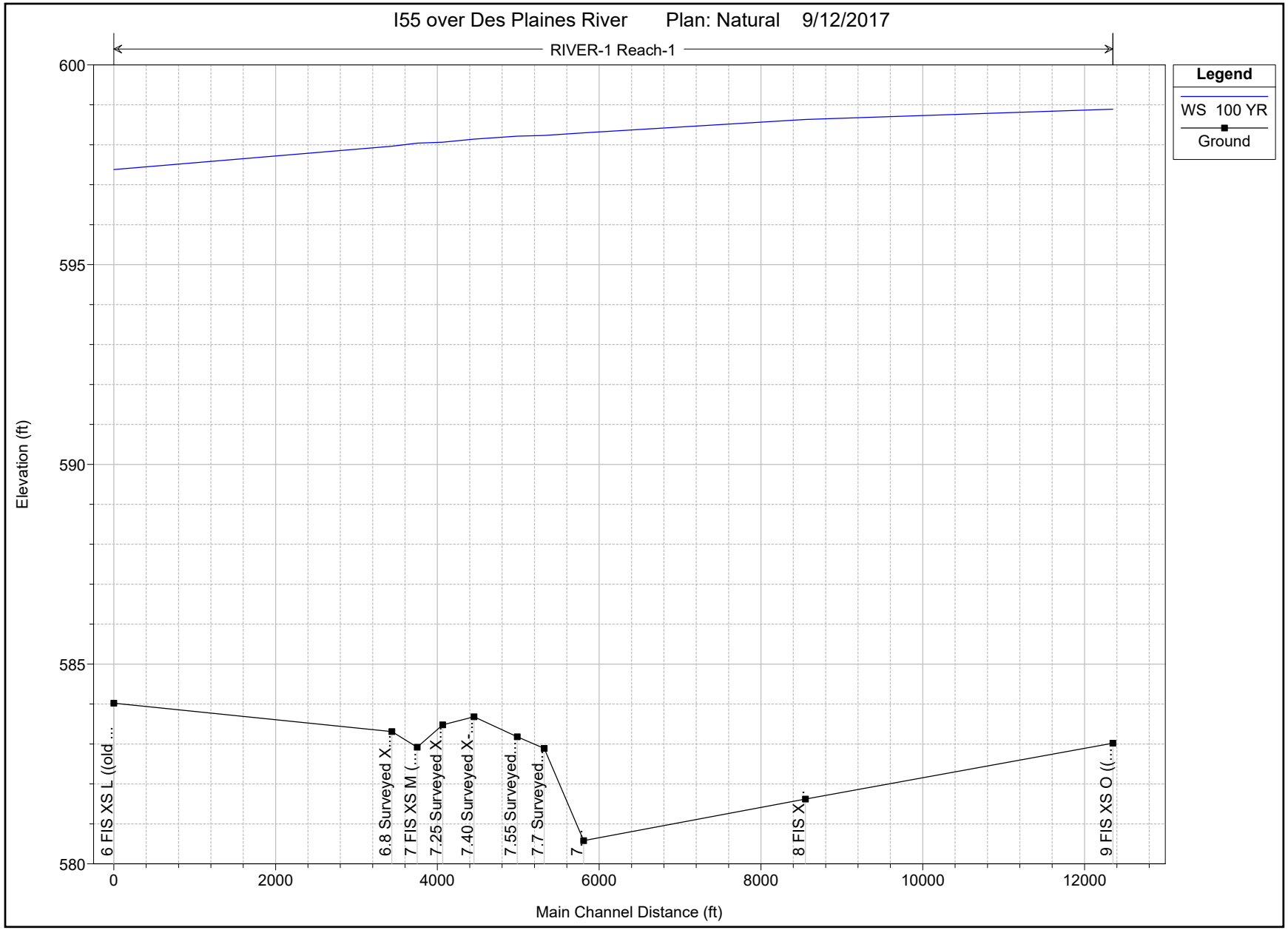
HEC-RAS Plan: Natural River: RIVER-1 Reach: Reach-1 Profile: 50 YR

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Reach-1	9	50 YR	598.20	598.16	0.04	0.22	0.00	1053.74	5471.59	974.68	440.65
Reach-1	8	50 YR	597.97	597.91	0.06	0.26	0.01	331.41	4556.34	2612.24	341.49
Reach-1	7.85	50 YR	597.71	597.59	0.12	0.06	0.00	289.86	6985.88	224.26	286.20
Reach-1	7.7	50 YR	597.64	597.53	0.11	0.04	0.01	220.51	6932.25	347.24	296.38
Reach-1	7.55	50 YR	597.59	597.51	0.08	0.06	0.00	89.29	7332.96	77.74	289.26
Reach-1	7.40	50 YR	597.53	597.44	0.09	0.05	0.00	37.75	7415.25	47.00	258.79
Reach-1	7.25	50 YR	597.48	597.37	0.12	0.04	0.01	197.75	7022.58	279.67	279.10
Reach-1	7	50 YR	597.44	597.34	0.09	0.04	0.00	348.48	6643.37	508.15	331.68
Reach-1	6.8	50 YR	597.39	597.27	0.12	0.56	0.00	141.70	7120.24	238.06	290.13
Reach-1	6	50 YR	596.83	596.70	0.13			323.96	6704.55	471.50	364.66

Errors Warnings and Notes for Plan : Existing

Location:	River: RIVER-1 Reach: Reach-1 RS: 7.48 Profile: 50 YR
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy. The program defaulted to the next valid (user selected) method.
	If the Yarnell method was the only one selected, the program will default to an energy based solution.
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum
	answer has been disregarded.
Location:	River: RIVER-1 Reach: Reach-1 RS: 6.8 Profile: 50 YR
Warning:	Divided flow computed for this cross-section.

100-Year Natural


I55 over Des Plaines River Plan: Natural 9/12/2017
RIVER-1 Reach-1
Legend
WS 100 YR
Ground
Elevation (ft)
600
595
590
585
580
0
2000
4000
6000
8000
10000
12000
Main Channel Distance (ft)
6 FIS XS L ((old ...
6.8 Surveyed X...
7 FIS XS M (...
7.25 Surveyed X...
7.40 Surveyed X-...
7.55 Surveyed...
7.7 Surveyed...
7 ...
8 FIS X...
9 FIS XS O (...

HEC-RAS Plan: Natural River: RIVER-1 Reach: Reach-1 Profile: 100 YR

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9	100 YR	8400.00	583.02	598.89		598.93	0.000049	1.81	5440.14	443.90	0.08
Reach-1	8	100 YR	8400.00	581.62	598.63		598.70	0.000078	2.29	4071.67	343.96	0.10
Reach-1	7.85	100 YR	8400.00	580.58	598.30		598.43	0.000133	2.97	3187.28	294.37	0.13
Reach-1	7.7	100 YR	8400.00	582.89	598.23		598.36	0.000145	2.91	3228.17	300.17	0.14
Reach-1	7.55	100 YR	8400.00	583.18	598.22		598.31	0.000102	2.44	3580.18	294.75	0.12
Reach-1	7.40	100 YR	8400.00	583.68	598.14		598.25	0.000118	2.60	3300.76	276.69	0.13
Reach-1	7.25	100 YR	8400.00	583.48	598.07		598.19	0.000149	2.96	3124.76	299.60	0.14
Reach-1	7	100 YR	8400.00	582.92	598.04		598.14	0.000124	2.70	3549.65	339.24	0.13
Reach-1	6.8	100 YR	8400.00	583.31	597.96		598.10	0.000156	3.00	3080.01	298.01	0.14
Reach-1	6	100 YR	8400.00	584.02	597.38	588.60	597.52	0.000183	3.13	3159.70	436.08	0.15

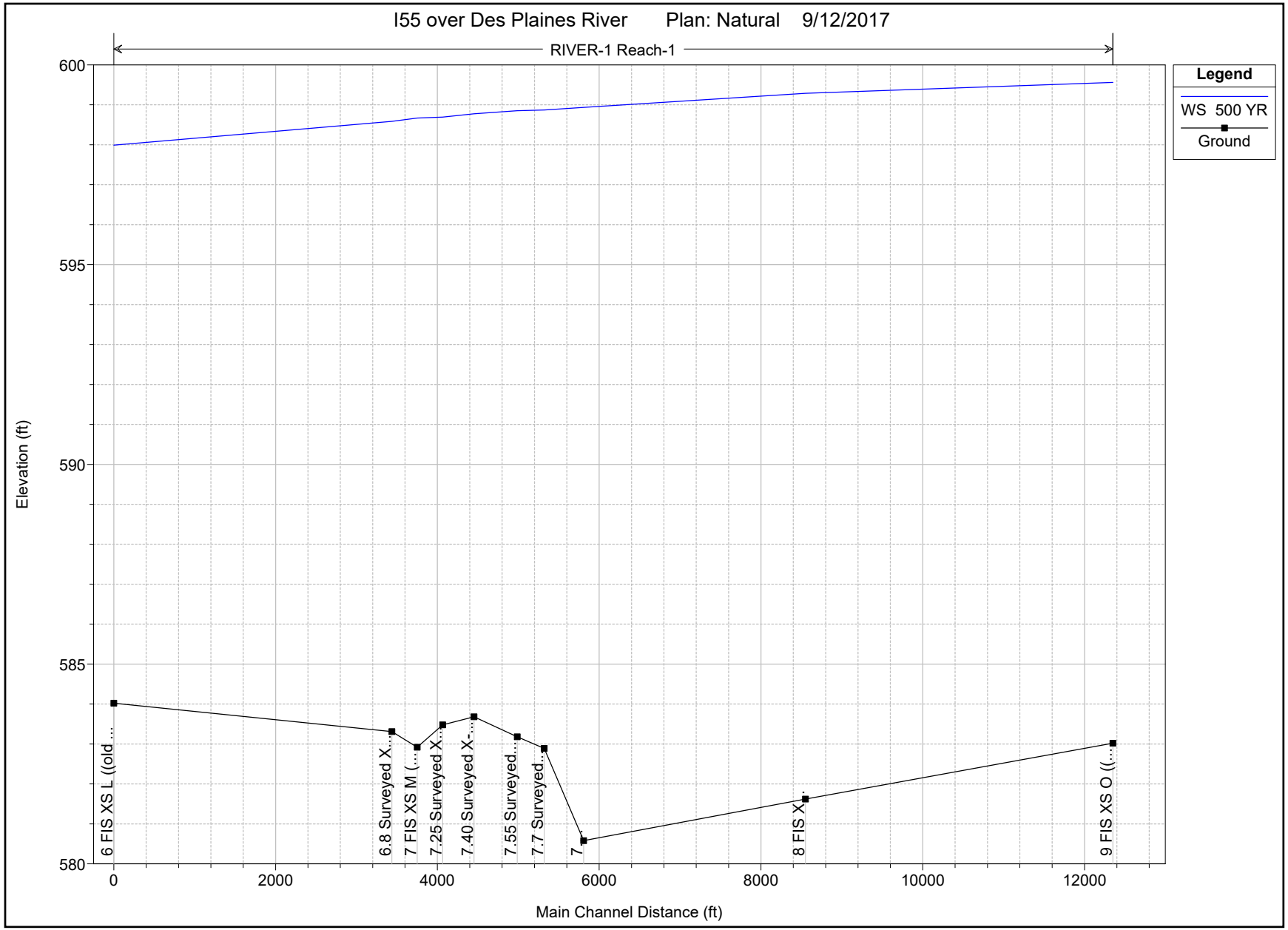
HEC-RAS Plan: Natural River: RIVER-1 Reach: Reach-1 Profile: 100 YR

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Reach-1	9	100 YR	598.93	598.89	0.04	0.23	0.00	1207.08	6059.08	1133.84	443.90
Reach-1	8	100 YR	598.70	598.63	0.07	0.27	0.01	380.84	5015.85	3003.31	343.96
Reach-1	7.85	100 YR	598.43	598.30	0.13	0.07	0.00	368.39	7748.08	283.53	294.37
Reach-1	7.7	100 YR	598.36	598.23	0.12	0.04	0.01	272.42	7694.01	433.57	300.17
Reach-1	7.55	100 YR	598.31	598.22	0.09	0.06	0.00	109.93	8190.56	99.50	294.75
Reach-1	7.40	100 YR	598.25	598.14	0.10	0.05	0.00	47.14	8294.63	58.24	276.69
Reach-1	7.25	100 YR	598.19	598.07	0.13	0.04	0.01	250.50	7806.78	342.73	299.60
Reach-1	7	100 YR	598.14	598.04	0.10	0.04	0.00	428.74	7370.70	600.55	339.24
Reach-1	6.8	100 YR	598.10	597.96	0.13	0.58	0.00	186.73	7918.03	295.24	298.01
Reach-1	6	100 YR	597.52	597.38	0.14			387.77	7410.14	602.09	436.08

Errors Warnings and Notes for Plan : Existing

Location:	River: RIVER-1 Reach: Reach-1 RS: 7.48 Profile: 100 YR
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy. The program defaulted to the next valid (user selected) method.
	If the Yarnell method was the only one selected, the program will default to an energy based solution.
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum
	answer has been disregarded.
Location:	River: RIVER-1 Reach: Reach-1 RS: 7.40 Profile: 100 YR
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: RIVER-1 Reach: Reach-1 RS: 7.25 Profile: 100 YR
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.

500-Year Natural


I55 over Des Plaines River Plan: Natural 9/12/2017
RIVER-1 Reach-1
Legend
WS 500 YR
Ground
Elevation (ft)
600
595
590
585
580
0
2000
4000
6000
8000
10000
12000
Main Channel Distance (ft)
6 FIS XS L ((old ...
6.8 Surveyed X...
7 FIS XS M (...
7.25 Surveyed X...
7.40 Surveyed X-...
7.55 Surveyed...
7.7 Surveyed...
7 ...
8 FIS X...
9 FIS XS O (...

HEC-RAS Plan: Natural River: RIVER-1 Reach: Reach-1 Profile: 500 YR

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9	500 YR	9300.00	583.02	599.56		599.61	0.000051	1.90	5737.53	446.86	0.08
Reach-1	8	500 YR	9300.00	581.62	599.29		599.37	0.000081	2.39	4302.20	375.76	0.11
Reach-1	7.85	500 YR	9300.00	580.58	598.94		599.08	0.000140	3.13	3377.69	301.74	0.14
Reach-1	7.7	500 YR	9300.00	582.89	598.87		599.01	0.000150	3.06	3420.46	304.20	0.14
Reach-1	7.55	500 YR	9300.00	583.18	598.85		598.95	0.000106	2.57	3770.35	311.64	0.12
Reach-1	7.40	500 YR	9300.00	583.68	598.78		598.89	0.000123	2.75	3508.86	382.01	0.13
Reach-1	7.25	500 YR	9300.00	583.48	598.69		598.83	0.000155	3.12	3319.94	321.10	0.15
Reach-1	7	500 YR	9300.00	582.92	598.67		598.78	0.000129	2.83	3765.07	346.04	0.13
Reach-1	6.8	500 YR	9300.00	583.31	598.59		598.73	0.000162	3.15	3267.36	303.01	0.15
Reach-1	6	500 YR	9300.00	584.02	597.99	588.90	598.14	0.000186	3.26	3448.41	509.23	0.16

HEC-RAS Plan: Natural River: RIVER-1 Reach: Reach-1 Profile: 500 YR

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Reach-1	9	500 YR	599.61	599.56	0.05	0.24	0.00	1360.59	6644.13	1295.29	446.86
Reach-1	8	500 YR	599.37	599.29	0.08	0.28	0.01	432.50	5471.42	3396.07	375.76
Reach-1	7.85	500 YR	599.08	598.94	0.14	0.07	0.00	450.13	8502.82	347.05	301.74
Reach-1	7.7	500 YR	599.01	598.87	0.13	0.04	0.01	326.27	8450.95	522.78	304.20
Reach-1	7.55	500 YR	598.95	598.85	0.10	0.06	0.00	131.47	9043.58	124.94	311.64
Reach-1	7.40	500 YR	598.89	598.78	0.12	0.05	0.00	57.32	9165.21	77.46	382.01
Reach-1	7.25	500 YR	598.83	598.69	0.14	0.04	0.01	305.47	8582.60	411.93	321.10
Reach-1	7	500 YR	598.78	598.67	0.11	0.04	0.00	512.07	8092.89	695.04	346.04
Reach-1	6.8	500 YR	598.73	598.59	0.15	0.60	0.00	239.75	8705.41	354.85	303.01
Reach-1	6	500 YR	598.14	597.99	0.15			452.25	8084.19	763.56	509.23

Errors Warnings and Notes for Plan : Natural

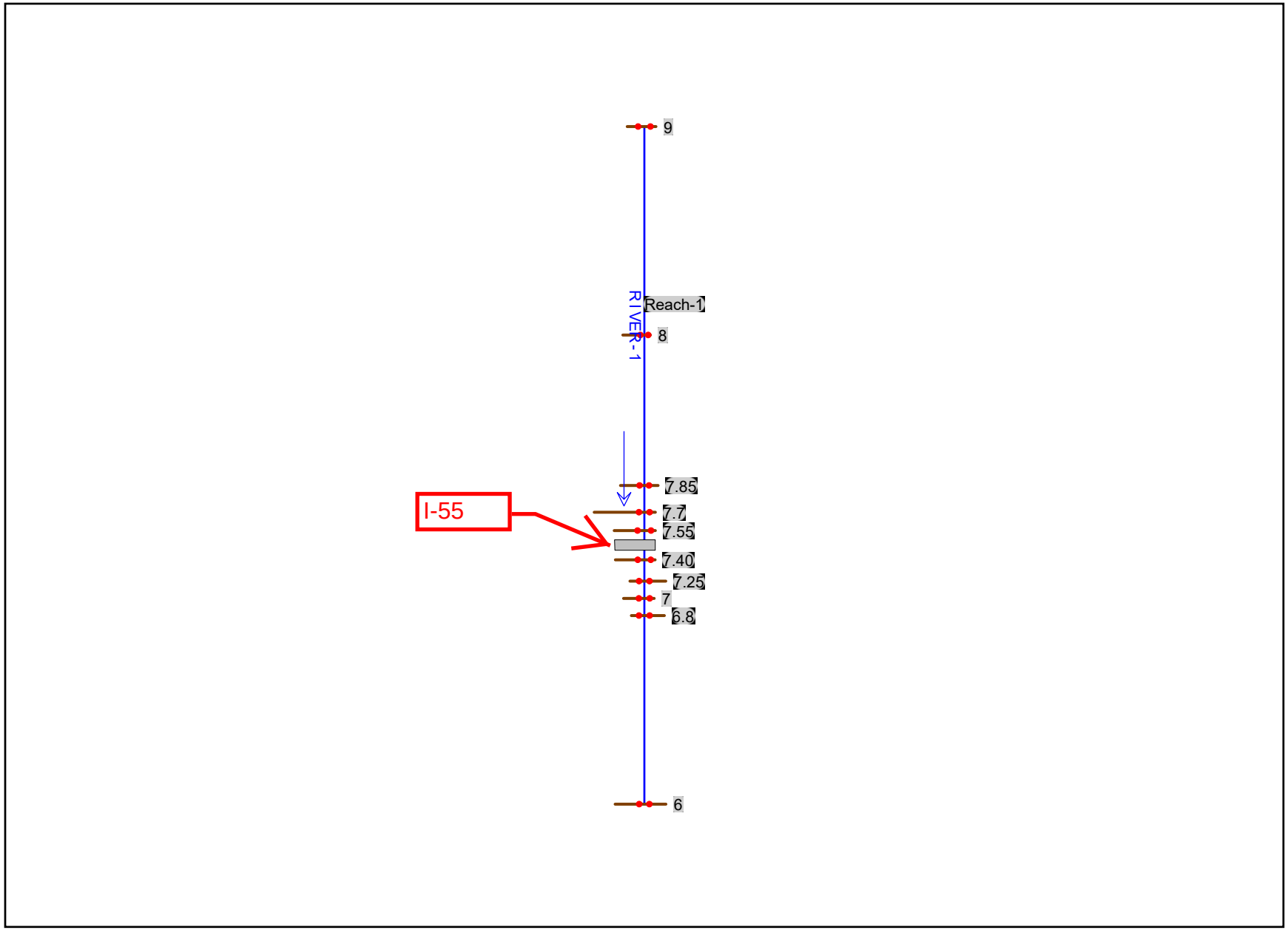
Location:	River: RIVER-1 Reach: Reach-1 RS: 7.55 Profile: 500 YR
Warning:	Divided flow computed for this cross-section.
Location:	River: RIVER-1 Reach: Reach-1 RS: 7.40 Profile: 500 YR
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: RIVER-1 Reach: Reach-1 RS: 7.25 Profile: 500 YR
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.

TAB E

SECTION 13.E

PROPOSED CONDITIONS
PERMIT MODEL

Proposed Conditions
HEC-RAS Geometry



HEC-RAS HEC-RAS 5.0.3 September 2016
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: I55 over Des Plaines River
Project File : I55overDesPlaine.prj
Run Date and Time: 9/12/2018 2:37:41 PM

Project in English units

PLAN DATA

Plan Title: Proposed
Plan File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.p01

Geometry Title: Proposed
Geometry File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.g01

Flow Title : FIS FLOWS W/200 (NAVD 88)
Flow File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.f05

Plan Description:
NAVD88. Added 200 YR Storm Event to Flow Data and surveyed cross sections and bridge geometry to geometry data to the truncated FIS HEC-2 "Des Plaines River in Willow Springs and Hodgkins, Harza Engineering Company". Extended Cross Section 6 and 8 using county countour map. Proposed geometry from Stantec BCR.

Plan Summary Information:

Number of:	Cross Sections	= 10	Multiple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 1	Lateral Structures	=	0

Computational Information
- Water surface calculation tolerance = 0.01
- Critical depth calculation tolerance = 0.01
- Maximum number of iterations = 20
- Maximum difference tolerance = 0.3
- Flow tolerance factor = 0.001

Computation Options
- Critical depth computed only where necessary
- Conveyance Calculation Method: Between every coordinate point (HEC2 Style)
- Friction Slope Method: Program Selects Appropriate method
- Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: FIS FLOWS W/200 (NAVD 88)
Flow File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.f05

Flow Data (cfs)

River	Reach	RS	500 YR	200 YR	100 YR	50 YR	10 YR
RIVER-1	Reach-1	9	9300	8692	8400	7500	6000

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	500 YR		Known WS = 597.99
RIVER-1	Reach-1	200 YR		Known WS = 597.57
RIVER-1	Reach-1	100 YR		Known WS = 597.38
RIVER-1	Reach-1	50 YR		Known WS = 596.7
RIVER-1	Reach-1	10 YR		Known WS = 595.5

GEOMETRY DATA

Geometry Title: Proposed
Geometry File : n:\Idot\110203.00001\Drain\Model\I55 over Des Plaines River\I55overDesPlaine.g01

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 9

INPUT
Description: FIS XS O ((old Hodgkins XS D)
Adjusted stations by -212
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-212	599.72	-211	588.82	-112	587.42	-111	586.52	-110	586.02
-77	583.52	-17	583.02	13	583.12	58	583.62	103	585.72
108	586.52	112	587.32	178	588.82	188	590.02	213	594.52
236	599.82	288	600.52	312	600.72				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-212	.045	-112	.035	112	.042

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
-112 112 3800 3800 3800 .1 .3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 8

INPUT
Description: FIS XS N (old Hodgkins XS C)
Adjusted stations by -107
Extended
using county countours
added station -110
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-110	600	-107	598.82	-92	588.22	-72	586.82	-71	586.42
-70	586.02	-42	582.42	-17	581.62	18	582.92	43	584.42
70	585.02	71	586.02	72	586.82	93	587.92	143	587.52
193	589.52	223	591.52	238	599.02	293	599.52	393	600.62

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-110	.045	-72	.035	72	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-72	72	2742	2742	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 7.85

INPUT
Description: Surveyed X-Section
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-263.81	617.07	-223.45	606.59	-184.2	603.88	-147.4	593.26	-107.65	591.84
-100.72	588	-71	583.91	-67	584.14	-44	581.1	-37	580.77
-33	580.91	-22	580.58	-13	581.35	0	581.8	8	581.96
19	583.23	38	583.1	53	584.49	64	583.42	71.73	587.97
78.37	590.53	90.01	591.89	104.15	595.16	140.99	599.72	157.58	600.51
195.15	600.54	254.01	603.78	402.64	602.39	415.85	603.4	420.28	603.35

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-263.81	.048	-100.72	.035	71.73	.048	140.99	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-100.72	71.73	487	487	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 7.7

INPUT
Description: Surveyed X-Section
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-199.79	619.07	-196.6	618.6	-169	608.58	-118.63	591.97	-104.8	592.66
-101.08	589.65	-94.68	588.22	-78	584.15	-74	584.27	-44	584.4
-8	584.48	0	584.32	27	584.34	47	584.45	77	582.89
82	583.71	97.78	588	107.82	592.18	149.54	592.67	163.67	598.72
171.69	599.98	210.9	600.17	221.51	600.73	241.21	604.02	245.36	603.9
261.96	602.25	264.19	601.97	330.44	600.75	389.74	601.41	391.84	601.81
424.74	602.77	446.84	602.79	916.4	602.857				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-199.79	.048	-94.68	.035	97.78	.048	171.69	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-94.68	97.78	334	334	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 7.55

INPUT
Description: Surveyed X-Section
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-194.325	619.07	-165.57	613	-127.885	592.62	-117.56	588.21	-96.5	584.63
-90	584.09	-80.5	584.42	-66	583.18	-49	584.5	-32	583.82
-5.5	584.34	-.5	583.98	0	584.14	13	584.49	33	584.24
44	584.58	53.5	584.02	74	584.5	96.5	583.37	128.24	588.26
131.775	589.61	134.415	592.31	153.81	597.94	164.575	599.04	168.87	599.09
225.325	599.57	274.525	599.95	322.97	599.632	375.25	599.77	436.545	600.07
489.26	599.34	538.995	598.8	555.695	598.99				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-194.325	.048	-117.56	.035	128.24	.048	168.87	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-117.56	128.24	534	534	534	.1	.3

Skew Angle = 60

BRIDGE

RIVER: RIVER-1
REACH: Reach-1 RS: 7.48

INPUT
Description:
Distance from Upstream XS = 157.11
Deck/Roadway Width = 290.78
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 10

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-353.44	619.62		-166.51	620.12		-166.51	620.12	614.84
-127.03	620.87	615.26	-57.39	621.62	616.01	32.24	622.62	617.11
114.43	623.47	617.87	208.58	624.37	618.91	208.58	624.37	
1111.36	628.63							

Upstream Bridge Cross Section Data
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-194.325	619.07	-165.57	613	-127.885	592.62	-117.56	588.21	-96.5	584.63
-90	584.09	-80.5	584.42	-66	583.18	-49	584.5	-32	583.82
-5.5	584.34	-.5	583.98	0	584.14	13	584.49	33	584.24
44	584.58	53.5	584.02	74	584.5	96.5	583.37	128.24	588.26
131.775	589.61	134.415	592.31	153.81	597.94	164.575	599.04	168.87	599.09
225.325	599.57	274.525	599.95	322.97	599.632	375.25	599.77	436.545	600.07
489.26	599.34	538.995	598.8	555.695	598.99				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-194.325	.048	-117.56	.035	128.24	.048	168.87	.032

Bank Sta: Left	Right	Coeff Contr.	Expan.
-117.56	128.24	.1	.3

Skew Angle = 60

Downstream Deck/Roadway Coordinates
num= 10

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-378.46	626.23		-166.51	629.83		-166.51	629.83	624.81
-127.03	630.43	625.09	-57.39	630.93	625.66	32.24	631.68	626.47
114.43	632.43	627.08	208.58	632.83	627.86	208.58	632.83	
955.2	629.41							

```
Downstream Bridge Cross Section Data
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
-206.124   610.6-156.235  605.73-133.665  595.23-129.586  589.44-127.544  588.32
-101.303  584.37 -99.669  584.53 -70.803  583.68 -58.821  584.13  -45.75  583.84
       0  584.51   7.625  584.19   15.25  584.47  28.866  584.08  53.919  584.37
  61.544  583.95  77.339  584.25 108.988  588.11 110.987  589.88 114.875  592.87
 122.484   599.2 128.175  600.18 158.937  600.26 520.239 598.048

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
-206.124    .048-127.544    .035 108.988    .048

Bank Sta: Left   Right    Coeff Contr.   Expan.
      -127.544 108.988             .1       .3
Skew Angle = 57

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  4

Pier Data
Pier Station     Upstream= -127.03    Downstream= -127.03
Upstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.72    5.25  615.64
Downstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.75    5.25  625.09

Pier Data
Pier Station     Upstream=  -57.39    Downstream=  -57.39
Upstream     num=       2
    Width   Elev    Width   Elev
    5.25  584.78    5.25  616.39
Downstream     num=       2
    Width   Elev    Width   Elev
    5.25  584.78    5.25  625.66

Pier Data
Pier Station     Upstream=   32.24    Downstream=   32.24
Upstream     num=       2
    Width   Elev    Width   Elev
    5.25  584.78    5.25  617.49
Downstream     num=       2
    Width   Elev    Width   Elev
    5.25  584.78    5.25  626.47

Pier Data
Pier Station     Upstream=  114.43    Downstream=  114.43
Upstream     num=       2
    Width   Elev    Width   Elev
    5.25  584.78    5.25  618.25
Downstream     num=       2
    Width   Elev    Width   Elev
    5.25  584.78    5.25  627.08

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum              Cd   =    1.33
       Yarnell               KVal =    1.05
Selected Low Flow Methods = Highest Energy Answer
```

```
High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 7.40

INPUT
Description: Surveyed X-Section
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
-206.124   610.6-156.235  605.73-133.665  595.23-129.586  589.44-127.544  588.32
-101.303  584.37 -99.669  584.53 -70.803  583.68 -58.821  584.13  -45.75  583.84
       0  584.51   7.625  584.19   15.25  584.47  28.866  584.08  53.919  584.37
  61.544  583.95  77.339  584.25 108.988  588.11 110.987  589.88 114.875  592.87
 122.484   599.2 128.175  600.18 158.937  600.26 520.239 598.048

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
-206.124    .048-127.544    .035 108.988    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      -127.544 108.988              388     388     388             .1       .3
Skew Angle = 57

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 7.25

INPUT
Description: Surveyed X-Section
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -394.32  609.08 -341.14  610.77 -244.47  611.19 -233.48  610.44 -190.46  601.72
 -152.08  599.83  -127.3   592.5 -109.84  592.64 -100.38  588.19     -77  584.27
     -45  583.58      -9   584.1       0  583.78      11  583.48      35  583.57
      53  583.94      73  584.18   91.62  588.31  103.06  591.36  120.59  591.44
  143.71  600.73  147.59  600.83  150.02  600.61  178.17  600.48  232.51  598.41
  259.28  597.52

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -394.32    .048 -100.38    .035   91.62    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      -100.38   91.62              315     315     315             .1       .3
```

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 7

INPUT
Description: FIS XS M (old Hodgkins XS B)
Adjusted stations by -180
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-180	599.72	-150	594.72	-110	589.72	-100	586.32	-60	584.02
-10	582.92	20	584.02	70	584.92	100	586.32	135	590.92
175	599.22	270	600.42	380	600.62				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-180	.048	-100	.035	100	.048

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-100	100	313	313	313	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 6.8

INPUT
Description: Surveyed X-Section
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-371.24	609.22	-242.95	611.88	-191.65	602.68	-185.9	602.43	-134.6	592.46
-119.44	597.89	-109.07	589.54	-105.08	588.07	-77	584.45	-76	584.4
-68	584.42	-32	583.31	-11	584.06	0	584.03	42	583.9
76	584.41	90.83	588.17	98.54	590.96	105.31	592.31	119.03	591.85
136.29	598.42	147.08	601.47	150.31	601.92	153.41	601.51	185.66	601.38
188.55	601.63	206.55	603.54	213.01	603.427	230.45	601.016		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-371.24	.048	-105.08	.035	90.83	.048

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-105.08	90.83	3437	3437	3437	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 6

INPUT
Description: FIS XS L ((old Hodgkins XS A)
Adjusted stations by
-792.5
Extended XS Using county maps
Added Station 533.5
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-392.5	607.72	-292.5	607.52	-192.5	606.32	-92.5	586.42	-91.5	585.52
-52.5	584.32	-2.5	584.02	37.5	584.42	91.5	585.52	92.5	586.42
152.5	595.42	192.5	596.42	292.5	597.42	352.5	597.92	533.5	600

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-392.5	.048	-92.5	.035	92.5	.048

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-92.5	92.5	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3	n4
Reach-1	9	.045	.035	.042	
Reach-1	8	.045	.035	.032	
Reach-1	7.85	.048	.035	.048	.032
Reach-1	7.7	.048	.035	.048	.032
Reach-1	7.55	.048	.035	.048	.032
Reach-1	7.48	Bridge			
Reach-1	7.40	.048	.035	.048	
Reach-1	7.25	.048	.035	.048	
Reach-1	7	.048	.035	.048	
Reach-1	6.8	.048	.035	.048	
Reach-1	6	.048	.035	.048	

SUMMARY OF REACH LENGTHS

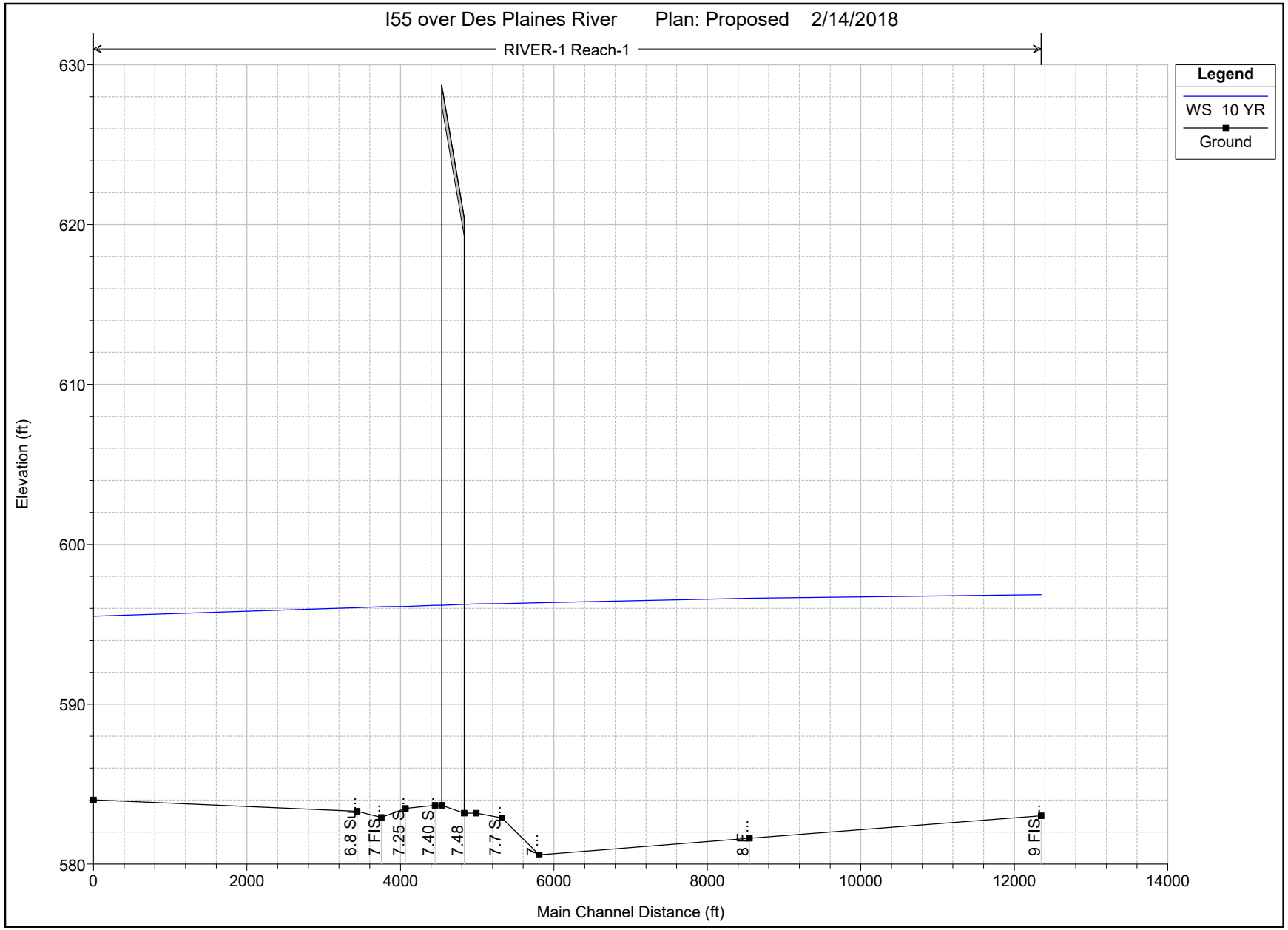
River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	9	3800	3800	3800
Reach-1	8	2742	2742	2742
Reach-1	7.85	487	487	487
Reach-1	7.7	334	334	334
Reach-1	7.55	534	534	534
Reach-1	7.48	Bridge		
Reach-1	7.40	388	388	388
Reach-1	7.25	315	315	315
Reach-1	7	313	313	313
Reach-1	6.8	3437	3437	3437
Reach-1	6	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	9	.1	.3
Reach-1	8	.1	.3
Reach-1	7.85	.1	.3
Reach-1	7.7	.1	.3
Reach-1	7.55	.1	.3
Reach-1	7.48	Bridge	
Reach-1	7.40	.1	.3
Reach-1	7.25	.1	.3
Reach-1	7	.1	.3
Reach-1	6.8	.1	.3
Reach-1	6	.1	.3

10-Year Proposed


I55 over Des Plaines River Plan: Proposed 2/14/2018
RIVER-1 Reach-1
Legend
WS 10 YR
Ground
Elevation (ft)
630
620
610
600
590
580
0
2000
4000
6000
8000
10000
12000
14000
Main Channel Distance (ft)
6.8 Su...
7 FIS...
7.25 S...
7.40 S...
7.48
7.7 S...
7...
8 F...
9 FIS...

HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1 Profile: 10 YR

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9	10 YR	6000.00	583.02	596.86		596.89	0.000044	1.54	4547.13	434.89	0.08
Reach-1	8	10 YR	6000.00	581.62	596.63		596.68	0.000071	1.98	3390.46	337.13	0.10
Reach-1	7.85	10 YR	6000.00	580.58	596.35		596.44	0.000114	2.50	2635.10	271.85	0.12
Reach-1	7.7	10 YR	6000.00	582.89	596.29		596.38	0.000129	2.49	2654.69	289.73	0.13
Reach-1	7.55	10 YR	6000.00	583.18	596.27	587.12	596.34	0.000088	2.05	3020.64	282.71	0.11
Reach-1	7.48		Bridge									
Reach-1	7.40	10 YR	6000.00	583.68	596.19		596.26	0.000102	2.18	2795.96	254.59	0.11
Reach-1	7.25	10 YR	6000.00	583.48	596.12		596.22	0.000132	2.52	2580.66	271.78	0.13
Reach-1	7	10 YR	6000.00	582.92	596.09		596.17	0.000111	2.31	2910.05	318.19	0.12
Reach-1	6.8	10 YR	6000.00	583.31	596.03		596.13	0.000139	2.55	2526.02	275.51	0.13
Reach-1	6	10 YR	6000.00	584.02	595.50	587.79	595.61	0.000169	2.71	2500.08	293.83	0.14

HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1 Profile: 10 YR

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Reach-1	9	10 YR	596.89	596.86	0.03	0.21	0.00	802.61	4476.39	721.01	434.89
Reach-1	8	10 YR	596.68	596.63	0.05	0.24	0.00	251.75	3772.32	1975.94	337.13
Reach-1	7.85	10 YR	596.44	596.35	0.09	0.06	0.00	174.77	5684.72	140.51	271.85
Reach-1	7.7	10 YR	596.38	596.29	0.09	0.04	0.01	143.19	5639.34	217.48	289.73
Reach-1	7.55	10 YR	596.34	596.27	0.06	0.02	0.00	58.77	5892.31	48.92	282.71
Reach-1	7.48		Bridge								
Reach-1	7.40	10 YR	596.26	596.19	0.07	0.04	0.00	24.62	5944.87	30.52	254.59
Reach-1	7.25	10 YR	596.22	596.12	0.09	0.04	0.01	120.14	5695.49	184.37	271.78
Reach-1	7	10 YR	596.17	596.09	0.08	0.04	0.00	227.99	5408.08	363.92	318.19
Reach-1	6.8	10 YR	596.13	596.03	0.10	0.52	0.00	81.95	5766.27	151.78	275.51
Reach-1	6	10 YR	595.61	595.50	0.11			225.93	5470.93	303.14	293.83

Errors Warnings and Notes for Plan : Pro

Location:	River: RIVER-1 Reach: Reach-1 RS: 7.48 Profile: 10 YR
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream
	energy. The program defaulted to the next valid (user selected) method. If the Yarnell method
	was the only one selected, the program will default to an energy based solution.
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Location:	River: RIVER-1 Reach: Reach-1 RS: 6.8 Profile: 10 YR
Warning:	Divided flow computed for this cross-section.

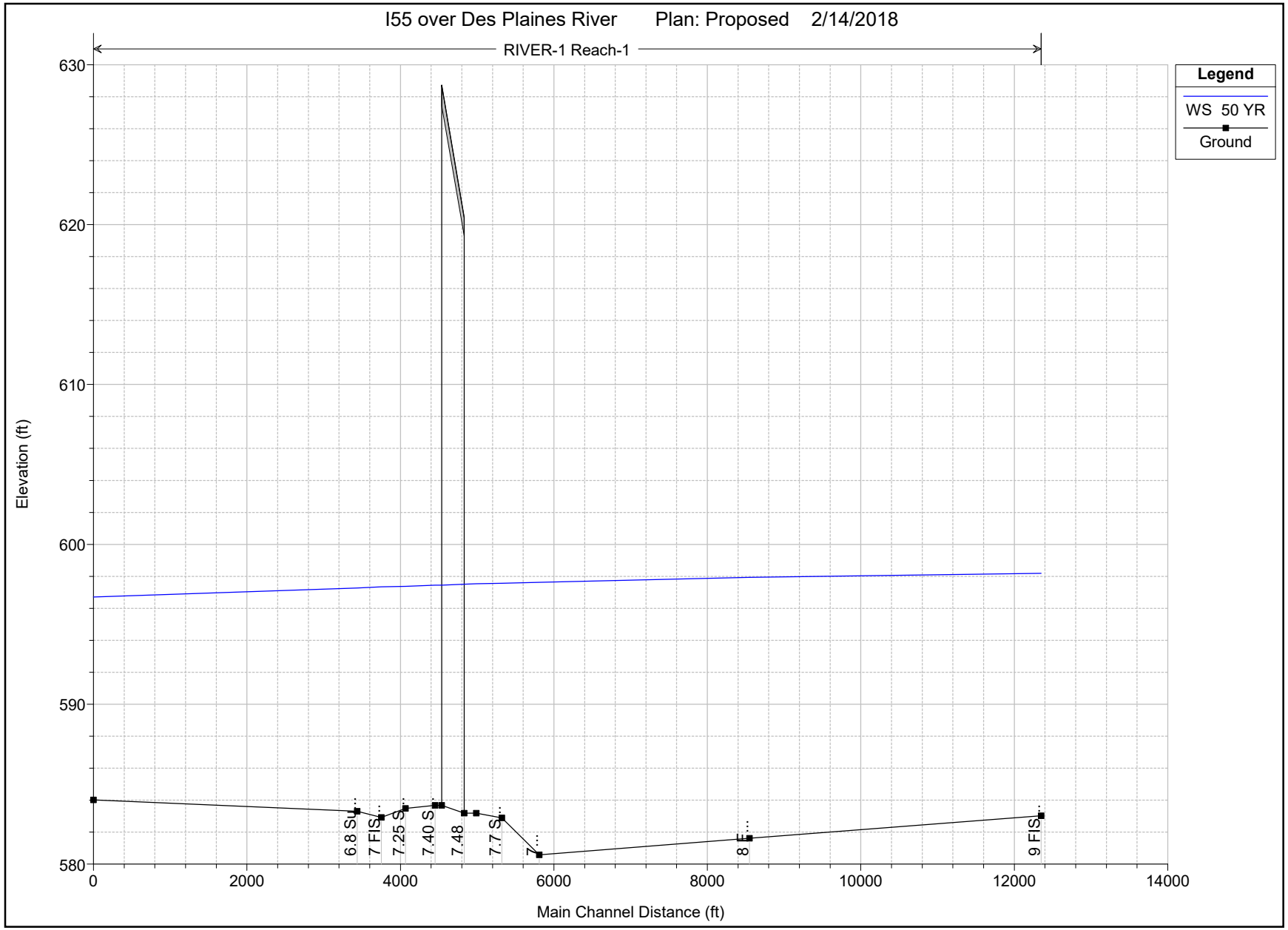
50-Year Proposed

HEC-RAS Plan: Pro River: RIVER-1 Reach: Reach-1 Profile: 50 YR

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9	50 YR	7500.00	583.02	598.18		598.22	0.000047	1.71	5126.72	440.76	0.08
Reach-1	8	50 YR	7500.00	581.62	597.94		598.00	0.000075	2.18	3832.96	341.58	0.10
Reach-1	7.85	50 YR	7500.00	580.58	597.62		597.74	0.000126	2.80	2990.41	286.54	0.13
Reach-1	7.7	50 YR	7500.00	582.89	597.56		597.67	0.000139	2.76	3026.64	296.54	0.13
Reach-1	7.55	50 YR	7500.00	583.18	597.54	587.57	597.62	0.000096	2.30	3383.39	289.42	0.11
Reach-1	7.48		Bridge									
Reach-1	7.40	50 YR	7500.00	583.68	597.44		597.53	0.000112	2.45	3117.76	258.79	0.12
Reach-1	7.25	50 YR	7500.00	583.48	597.37		597.48	0.000144	2.81	2924.07	279.10	0.14
Reach-1	7	50 YR	7500.00	582.92	597.34		597.44	0.000120	2.56	3315.31	331.68	0.13
Reach-1	6.8	50 YR	7500.00	583.31	597.27		597.39	0.000150	2.84	2876.03	290.13	0.14
Reach-1	6	50 YR	7500.00	584.02	596.70	588.31	596.83	0.000180	2.99	2887.45	364.66	0.15

HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1 Profile: 50 YR

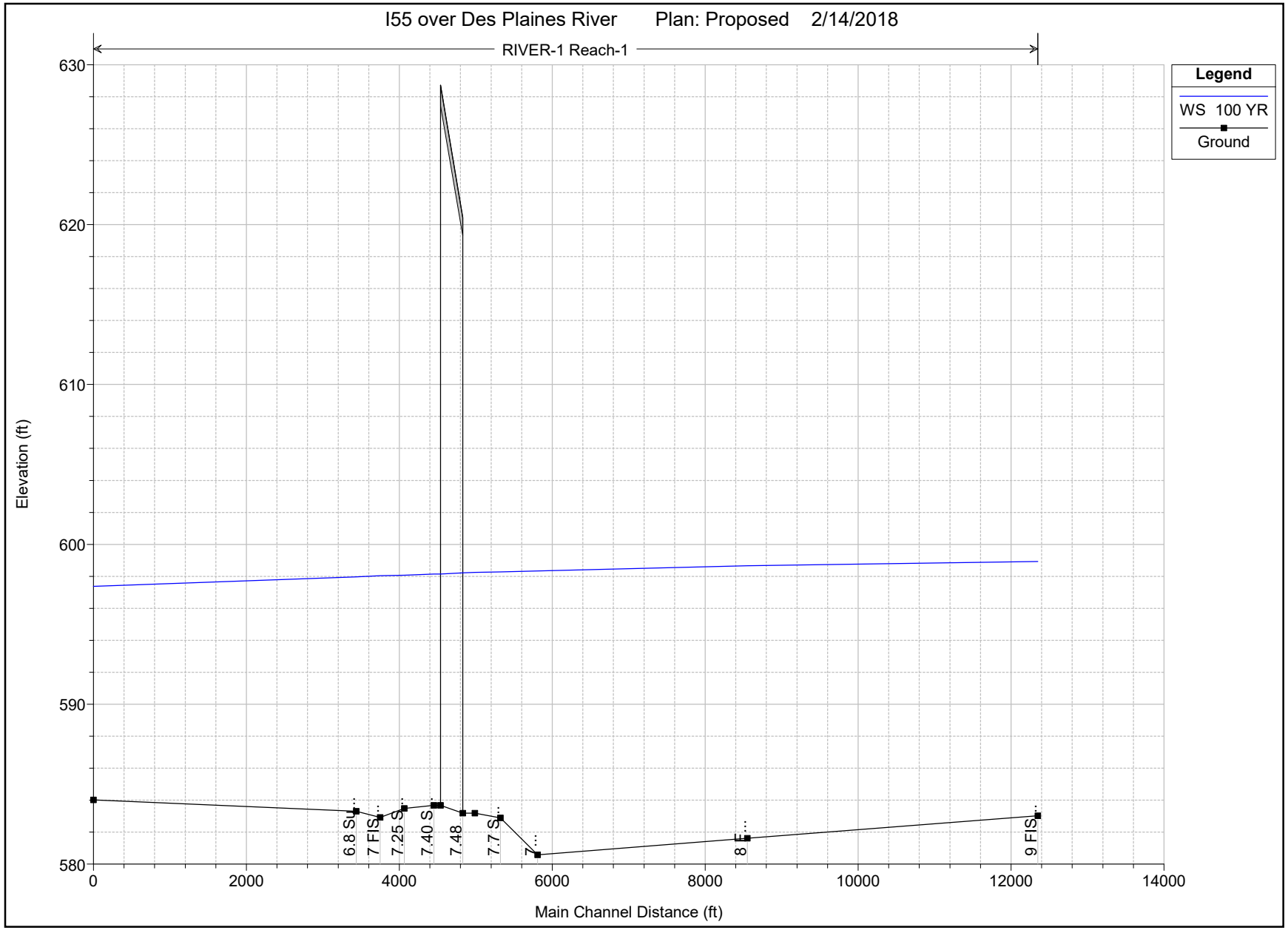
Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Reach-1	9	50 YR	598.22	598.18	0.04	0.22	0.00	1054.61	5469.38	976.01	440.76
Reach-1	8	50 YR	598.00	597.94	0.06	0.26	0.01	331.75	4553.30	2614.96	341.58
Reach-1	7.85	50 YR	597.74	597.62	0.11	0.06	0.00	291.50	6983.06	225.44	286.53
Reach-1	7.7	50 YR	597.67	597.56	0.11	0.04	0.01	221.48	6929.55	348.97	296.54
Reach-1	7.55	50 YR	597.62	597.54	0.08	0.02	0.00	89.67	7332.17	78.16	289.42
Reach-1	7.48		Bridge								
Reach-1	7.40	50 YR	597.53	597.44	0.09	0.05	0.00	37.75	7415.25	47.00	258.79
Reach-1	7.25	50 YR	597.48	597.37	0.12	0.04	0.01	197.75	7022.58	279.67	279.10
Reach-1	7	50 YR	597.44	597.34	0.09	0.04	0.00	348.48	6643.37	508.15	331.68
Reach-1	6.8	50 YR	597.39	597.27	0.12	0.56	0.00	141.70	7120.24	238.06	290.13
Reach-1	6	50 YR	596.83	596.70	0.13			323.96	6704.55	471.50	364.66


I55 over Des Plaines River Plan: Proposed 2/14/2018
RIVER-1 Reach-1
Legend
WS 50 YR
Ground
Elevation (ft)
630
620
610
600
590
580
0
2000
4000
6000
8000
10000
12000
14000
Main Channel Distance (ft)
6.8 Su...
7 FIS...
7.25 S...
7.40 S...
7.48
7.7 S...
7...
8 F...
9 FIS...

Errors Warnings and Notes for Plan : Pro

Location:	River: RIVER-1 Reach: Reach-1 RS: 7.48 Profile: 50 YR
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream
	energy. The program defaulted to the next valid (user selected) method. If the Yarnell method
	was the only one selected, the program will default to an energy based solution.
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Location:	River: RIVER-1 Reach: Reach-1 RS: 6.8 Profile: 50 YR
Warning:	Divided flow computed for this cross-section.

100-Year Proposed


I55 over Des Plaines River Plan: Proposed 2/14/2018
RIVER-1 Reach-1
Legend
WS 100 YR
Ground
Elevation (ft)
630
620
610
600
590
580
0
2000
4000
6000
8000
10000
12000
14000
Main Channel Distance (ft)
6.8 Su...
7 FIS...
7.25 S...
7.40 S...
7.48
7.7 S...
7....
8 E...
9 FIS...

HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1 Profile: 100 YR

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9	100 YR	8400.00	583.02	598.92		598.96	0.000049	1.80	5452.52	444.02	0.08
Reach-1	8	100 YR	8400.00	581.62	598.66		598.73	0.000077	2.28	4081.92	344.06	0.10
Reach-1	7.85	100 YR	8400.00	580.58	598.33		598.46	0.000132	2.96	3196.79	294.74	0.13
Reach-1	7.7	100 YR	8400.00	582.89	598.27		598.39	0.000143	2.91	3238.04	300.34	0.14
Reach-1	7.55	100 YR	8400.00	583.18	598.25	587.83	598.34	0.000101	2.43	3589.92	295.13	0.12
Reach-1	7.48		Bridge									
Reach-1	7.40	100 YR	8400.00	583.68	598.14		598.25	0.000118	2.60	3300.76	276.69	0.13
Reach-1	7.25	100 YR	8400.00	583.48	598.07		598.19	0.000149	2.96	3124.76	299.60	0.14
Reach-1	7	100 YR	8400.00	582.92	598.04		598.14	0.000124	2.70	3549.65	339.24	0.13
Reach-1	6.8	100 YR	8400.00	583.31	597.96		598.10	0.000156	3.00	3080.01	298.01	0.14
Reach-1	6	100 YR	8400.00	584.02	597.38	588.60	597.52	0.000183	3.13	3159.70	436.08	0.15

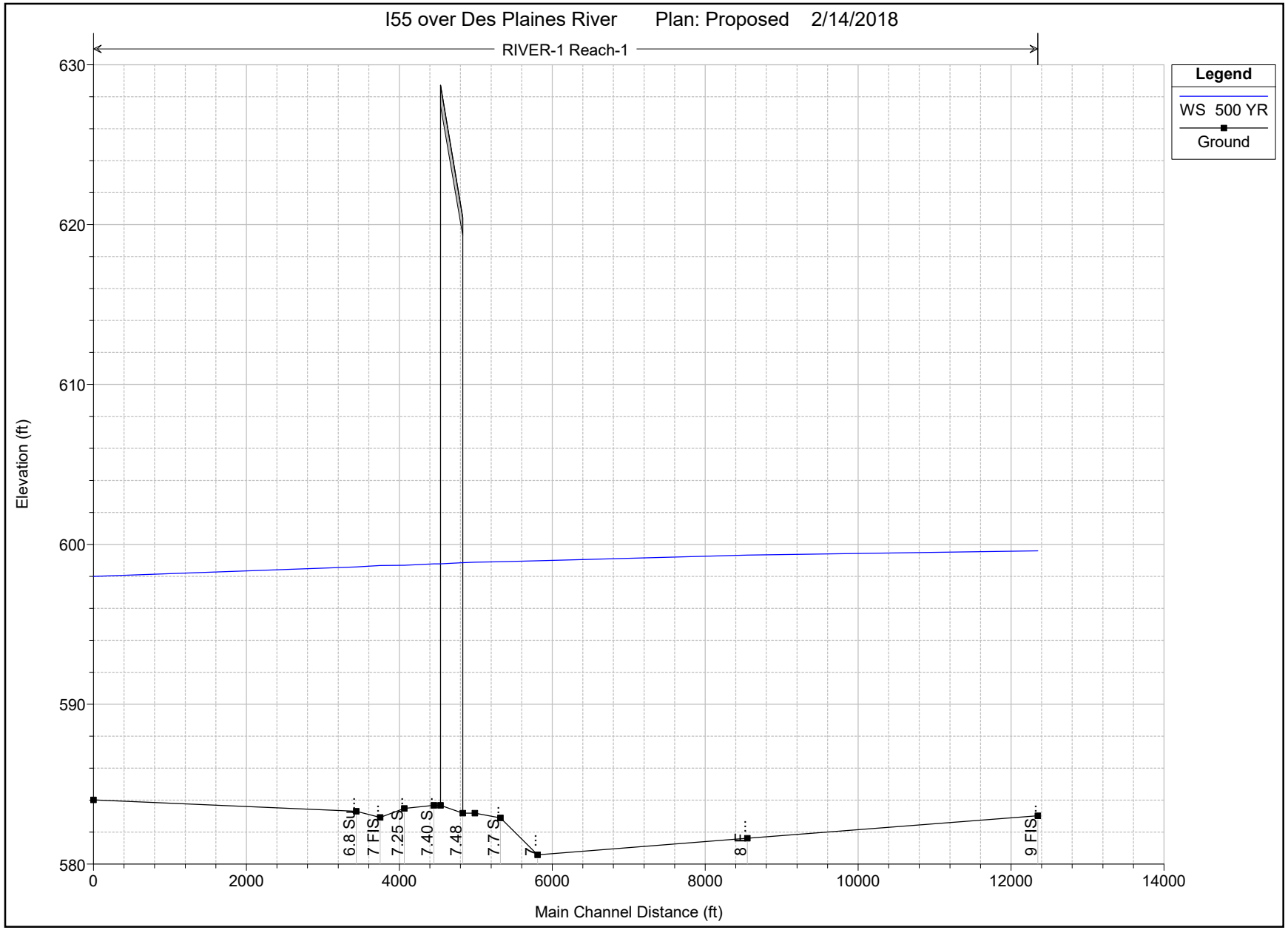
HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1 Profile: 100 YR

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Reach-1	9	100 YR	598.96	598.92	0.04	0.23	0.00	1208.04	6056.57	1135.39	444.02
Reach-1	8	100 YR	598.73	598.66	0.07	0.27	0.01	381.23	5012.45	3006.33	344.06
Reach-1	7.85	100 YR	598.46	598.33	0.13	0.07	0.00	370.35	7744.62	285.03	294.74
Reach-1	7.7	100 YR	598.39	598.27	0.12	0.04	0.01	273.59	7690.82	435.59	300.34
Reach-1	7.55	100 YR	598.34	598.25	0.09	0.02	0.00	110.39	8189.43	100.18	295.13
Reach-1	7.48		Bridge								
Reach-1	7.40	100 YR	598.25	598.14	0.10	0.05	0.00	47.14	8294.63	58.24	276.69
Reach-1	7.25	100 YR	598.19	598.07	0.13	0.04	0.01	250.50	7806.78	342.73	299.60
Reach-1	7	100 YR	598.14	598.04	0.10	0.04	0.00	428.74	7370.70	600.55	339.24
Reach-1	6.8	100 YR	598.10	597.96	0.13	0.58	0.00	186.73	7918.03	295.24	298.01
Reach-1	6	100 YR	597.52	597.38	0.14			387.77	7410.14	602.09	436.08

Errors Warnings and Notes for Plan : Pro

Location:	River: RIVER-1 Reach: Reach-1 RS: 7.48 Profile: 100 YR
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream
	energy. The program defaulted to the next valid (user selected) method. If the Yarnell method
	was the only one selected, the program will default to an energy based solution.
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Location:	River: RIVER-1 Reach: Reach-1 RS: 7.40 Profile: 100 YR
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: RIVER-1 Reach: Reach-1 RS: 7.25 Profile: 100 YR
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.

500-Year Proposed


I55 over Des Plaines River Plan: Proposed 2/14/2018
RIVER-1 Reach-1
Legend
WS 500 YR
Ground
Elevation (ft)
630
620
610
600
590
580
0
2000
4000
6000
8000
10000
12000
14000
Main Channel Distance (ft)
6.8 Su...
7 FIS...
7.25 S...
7.40 S...
7.48
7.7 S...
7...
8 E...
9 FIS...

HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1 Profile: 500 YR

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9	500 YR	9300.00	583.02	599.59		599.64	0.000051	1.89	5751.22	446.99	0.08
Reach-1	8	500 YR	9300.00	581.62	599.32		599.40	0.000080	2.39	4314.57	379.45	0.11
Reach-1	7.85	500 YR	9300.00	580.58	598.97		599.11	0.000138	3.12	3388.43	302.15	0.14
Reach-1	7.7	500 YR	9300.00	582.89	598.91		599.04	0.000149	3.05	3431.47	304.54	0.14
Reach-1	7.55	500 YR	9300.00	583.18	598.89	588.07	598.99	0.000105	2.57	3781.79	318.60	0.12
Reach-1	7.48		Bridge									
Reach-1	7.40	500 YR	9300.00	583.68	598.78		598.89	0.000123	2.75	3508.86	382.01	0.13
Reach-1	7.25	500 YR	9300.00	583.48	598.69		598.83	0.000155	3.12	3319.94	321.10	0.15
Reach-1	7	500 YR	9300.00	582.92	598.67		598.78	0.000129	2.83	3765.07	346.04	0.13
Reach-1	6.8	500 YR	9300.00	583.31	598.59		598.73	0.000162	3.15	3267.36	303.01	0.15
Reach-1	6	500 YR	9300.00	584.02	597.99	588.90	598.14	0.000186	3.26	3448.41	509.23	0.16

HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1 Profile: 500 YR

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Reach-1	9	500 YR	599.64	599.59	0.05	0.24	0.00	1361.64	6641.30	1297.07	446.99
Reach-1	8	500 YR	599.40	599.32	0.08	0.28	0.01	433.06	5467.37	3399.58	379.45
Reach-1	7.85	500 YR	599.11	598.97	0.14	0.07	0.00	452.44	8498.64	348.92	302.15
Reach-1	7.7	500 YR	599.04	598.91	0.13	0.04	0.01	327.65	8447.11	525.24	304.54
Reach-1	7.55	500 YR	598.99	598.89	0.10	0.02	0.00	132.03	9042.12	125.85	318.60
Reach-1	7.48		Bridge								
Reach-1	7.40	500 YR	598.89	598.78	0.12	0.05	0.00	57.32	9165.21	77.46	382.01
Reach-1	7.25	500 YR	598.83	598.69	0.14	0.04	0.01	305.47	8582.60	411.93	321.10
Reach-1	7	500 YR	598.78	598.67	0.11	0.04	0.00	512.07	8092.89	695.04	346.04
Reach-1	6.8	500 YR	598.73	598.59	0.15	0.60	0.00	239.75	8705.41	354.85	303.01
Reach-1	6	500 YR	598.14	597.99	0.15			452.25	8084.19	763.56	509.23

Errors Warnings and Notes for Plan : Pro

Location:	River: RIVER-1 Reach: Reach-1 RS: 7.55 Profile: 500 YR
Warning:	Divided flow computed for this cross-section.
Location:	River: RIVER-1 Reach: Reach-1 RS: 7.48 Profile: 500 YR
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream
	energy. The program defaulted to the next valid (user selected) method. If the Yarnell method
	was the only one selected, the program will default to an energy based solution.
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Location:	River: RIVER-1 Reach: Reach-1 RS: 7.40 Profile: 500 YR
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: RIVER-1 Reach: Reach-1 RS: 7.25 Profile: 500 YR
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.

Structure Tables

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

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Reach-1	7.7	500 YR	599.04	598.91		0.04	0.01	304.54	327.65	8447.11	525.24	3.05
Reach-1	7.7	100 YR	598.39	598.27		0.04	0.01	300.34	273.59	7690.82	435.59	2.91
Reach-1	7.7	50 YR	597.67	597.56		0.04	0.01	296.54	221.48	6929.55	348.97	2.76
Reach-1	7.7	10 YR	596.38	596.29		0.04	0.01	289.73	143.19	5639.34	217.48	2.49
Reach-1	7.55	500 YR	598.99	598.89	588.07	0.02	0.00	318.60	132.03	9042.12	125.85	2.57
Reach-1	7.55	100 YR	598.34	598.25	587.83	0.02	0.00	295.13	110.39	8189.43	100.18	2.43
Reach-1	7.55	50 YR	597.62	597.54	587.57	0.02	0.00	289.42	89.67	7332.17	78.16	2.30
Reach-1	7.55	10 YR	596.34	596.27	587.12	0.02	0.00	282.71	58.77	5892.31	48.92	2.05
Reach-1	7.48 BR U	500 YR	598.96	598.85	588.25	0.05	0.00	281.12	82.65	9053.17	164.18	2.75
Reach-1	7.48 BR U	100 YR	598.32	598.21	587.98	0.05	0.00	273.71	70.25	8200.07	129.68	2.61
Reach-1	7.48 BR U	50 YR	597.60	597.51	587.71	0.05	0.00	268.24	58.50	7341.11	100.39	2.46
Reach-1	7.48 BR U	10 YR	596.32	596.24	587.23	0.04	0.00	261.56	41.03	5897.21	61.76	2.19
Reach-1	7.48 BR D	500 YR	598.91	598.78	588.43	0.02	0.01	242.27	23.46	9237.28	39.26	2.93
Reach-1	7.48 BR D	100 YR	598.27	598.15	588.18	0.01	0.00	240.16	17.48	8349.49	33.03	2.77
Reach-1	7.48 BR D	50 YR	597.55	597.45	587.92	0.01	0.00	237.81	12.48	7460.29	27.24	2.62
Reach-1	7.48 BR D	10 YR	596.28	596.19	587.43	0.01	0.00	233.61	6.59	5974.54	18.88	2.32
Reach-1	7.40	500 YR	598.89	598.78		0.05	0.00	382.01	57.32	9165.21	77.46	2.75
Reach-1	7.40	100 YR	598.25	598.14		0.05	0.00	276.69	47.14	8294.63	58.24	2.60
Reach-1	7.40	50 YR	597.53	597.44		0.05	0.00	258.79	37.75	7415.25	47.00	2.45
Reach-1	7.40	10 YR	596.26	596.19		0.04	0.00	254.59	24.62	5944.87	30.52	2.18
Reach-1	7.25	500 YR	598.83	598.69		0.04	0.01	321.10	305.47	8582.60	411.93	3.12
Reach-1	7.25	100 YR	598.19	598.07		0.04	0.01	299.60	250.50	7806.78	342.73	2.96
Reach-1	7.25	50 YR	597.48	597.37		0.04	0.01	279.10	197.75	7022.58	279.67	2.81
Reach-1	7.25	10 YR	596.22	596.12		0.04	0.01	271.78	120.14	5695.49	184.37	2.52

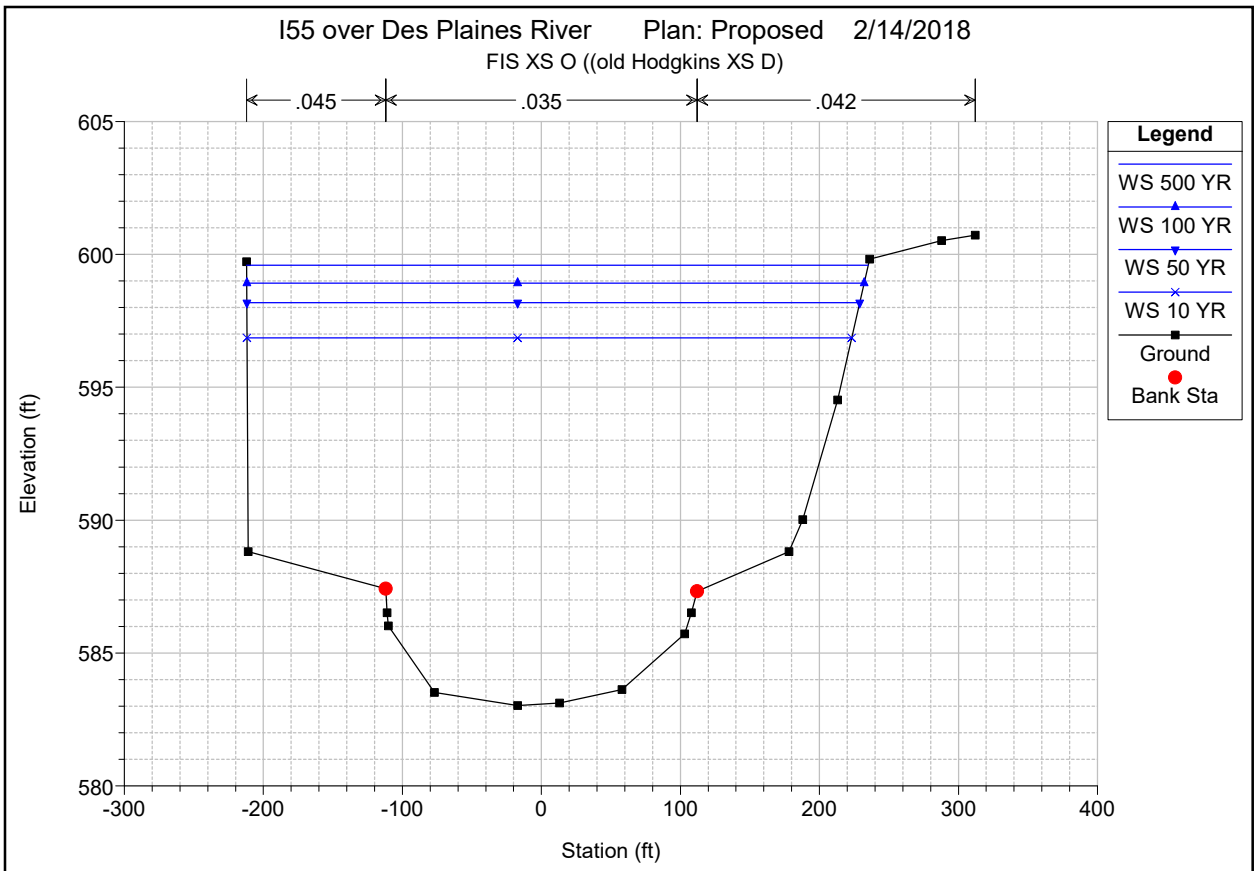
HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1

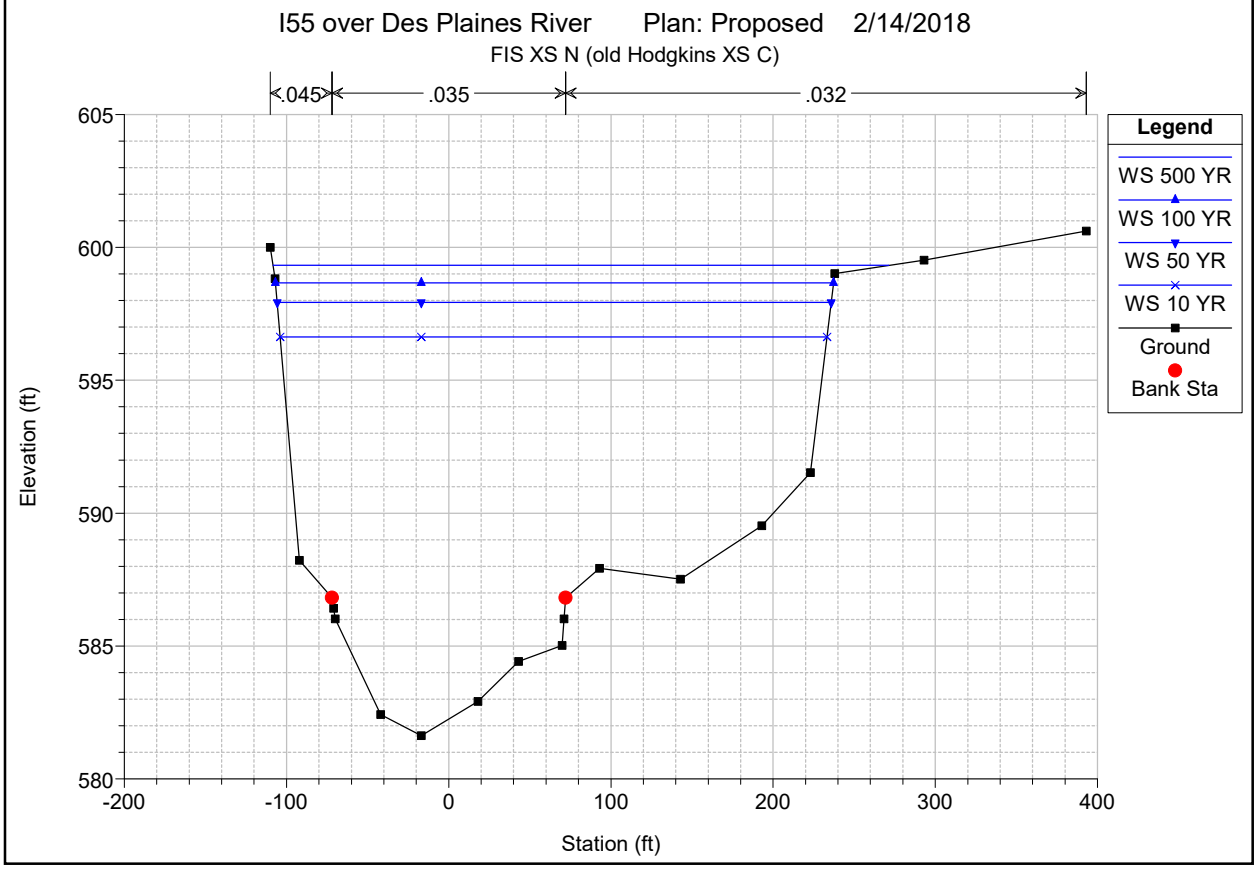
Reach	River Sta	Profile	E.G. US.	Min El Prs	BR Open Area	Prs O WS	Q Total	Min El Weir Flow	Q Weir	Delta EG	BR Sluice Coef
			(ft)	(ft)	(sq ft)	(ft)	(cfs)	(ft)	(cfs)	(ft)	
Reach-1	7.48	500 YR	598.99	619.29	9827.16		9300.00	628.74		0.10	
Reach-1	7.48	100 YR	598.34	619.29	9827.16		8400.00	628.74		0.09	
Reach-1	7.48	50 YR	597.62	619.29	9827.16		7500.00	628.74		0.09	
Reach-1	7.48	10 YR	596.34	619.29	9827.16		6000.00	628.74		0.08	

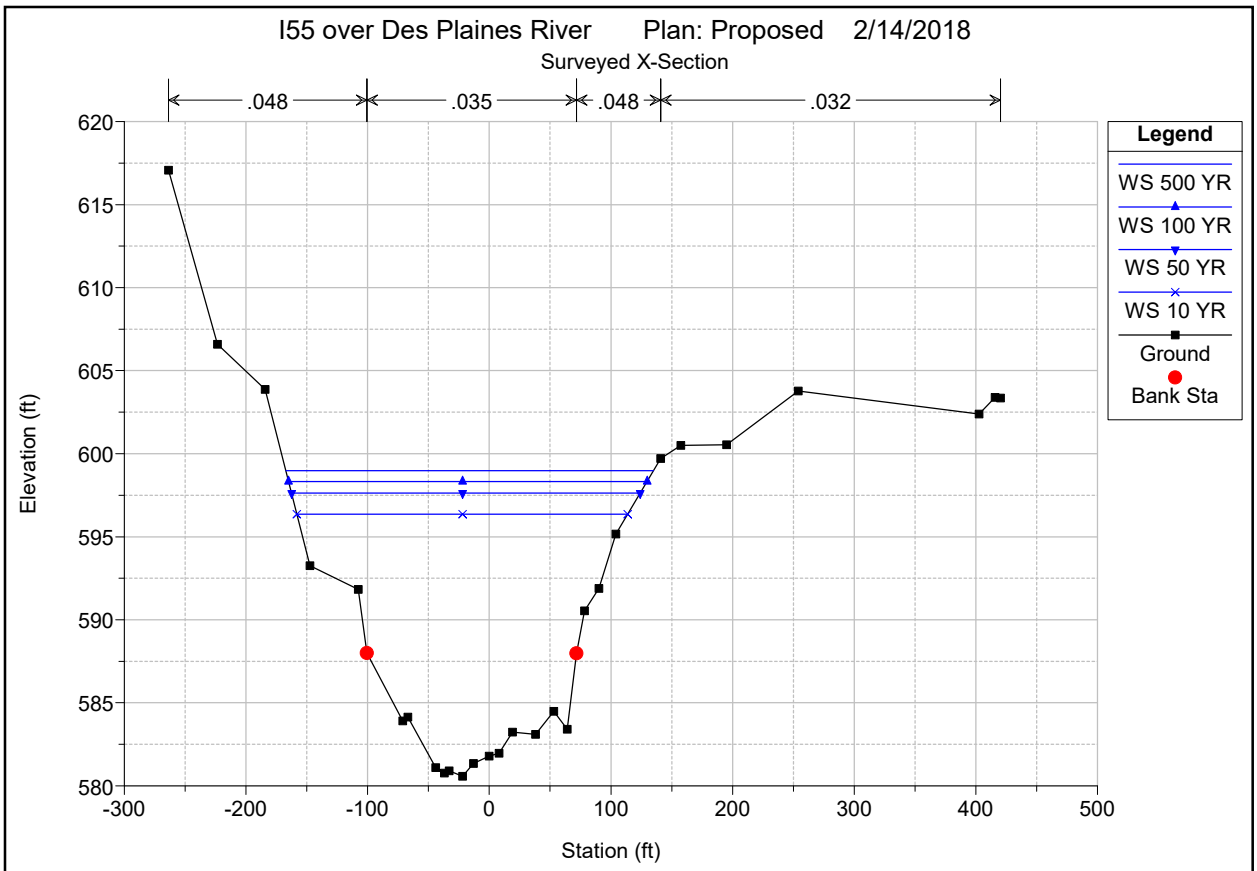
HEC-RAS Plan: Existing River: RIVER-1 Reach: Reach-1

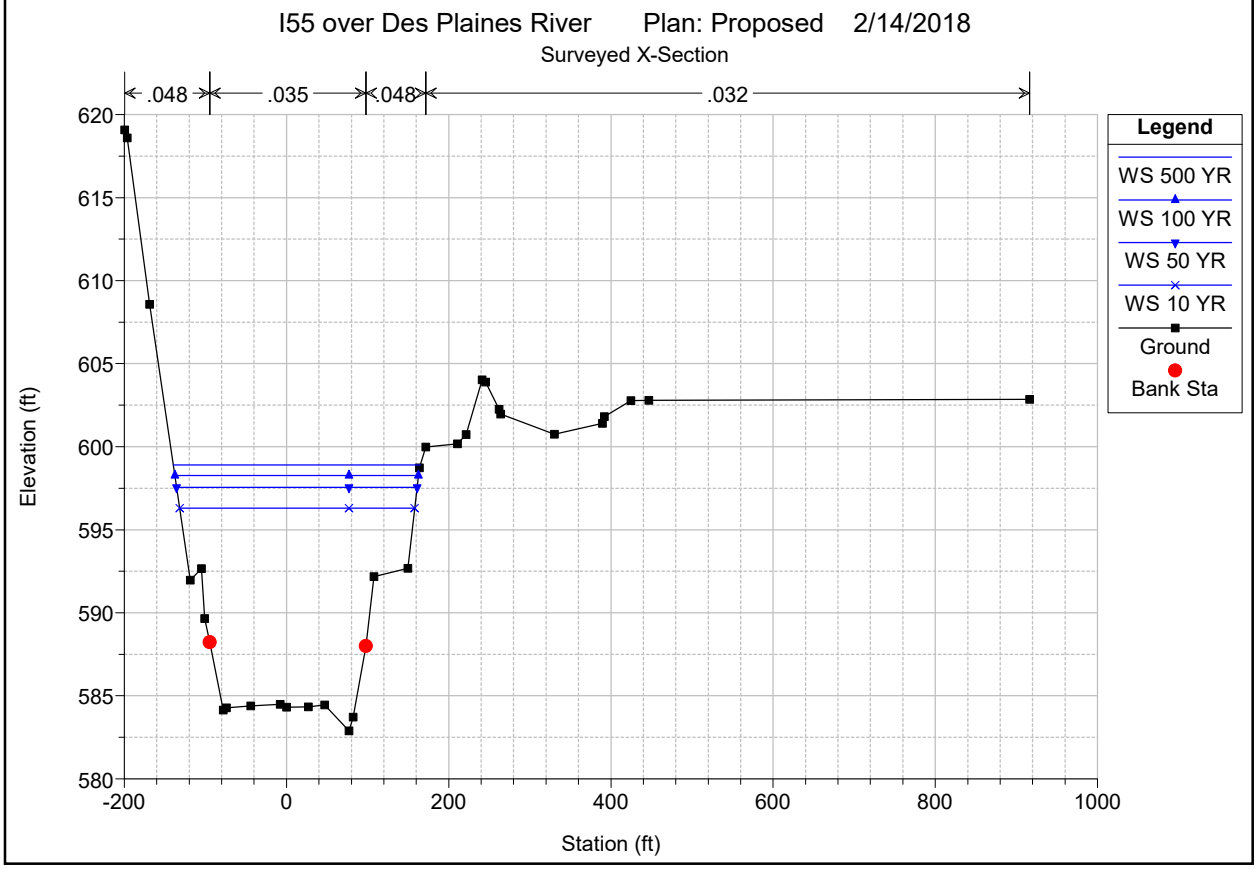
Reach	River Sta	Profile	E.G. US.	W.S. US.	BR Sel Method	Energy EG	Momen. EG	Yarnell EG	WSPRO EG	Prs O EG	Prs/Wr EG	Energy/Wr EG
			(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Reach-1	7.48	500 YR	598.99	598.89	Energy only	598.99						
Reach-1	7.48	100 YR	598.34	598.25	Energy only	598.34						
Reach-1	7.48	50 YR	597.62	597.54	Energy only	597.62						
Reach-1	7.48	10 YR	596.34	596.27	Energy only	596.34						

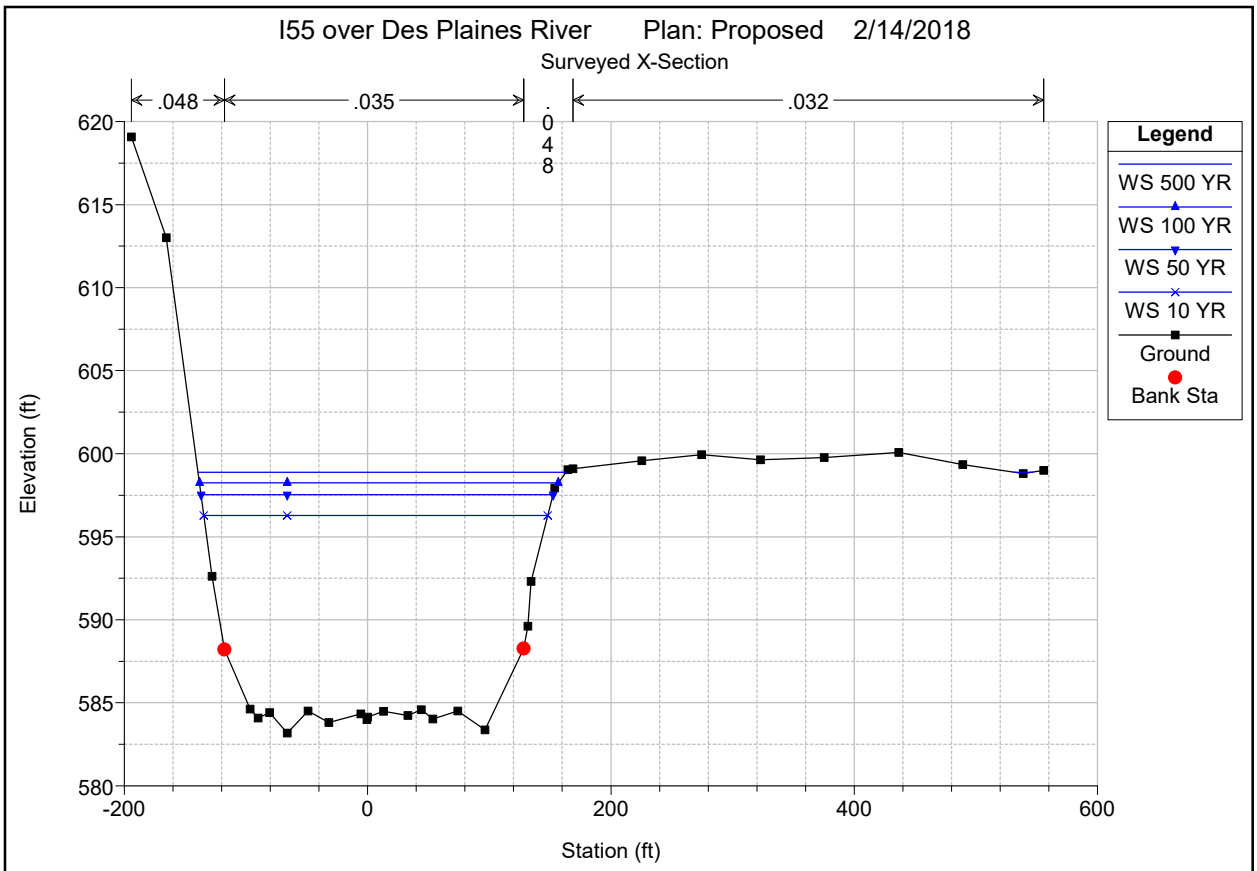
Plotted Cross Sections

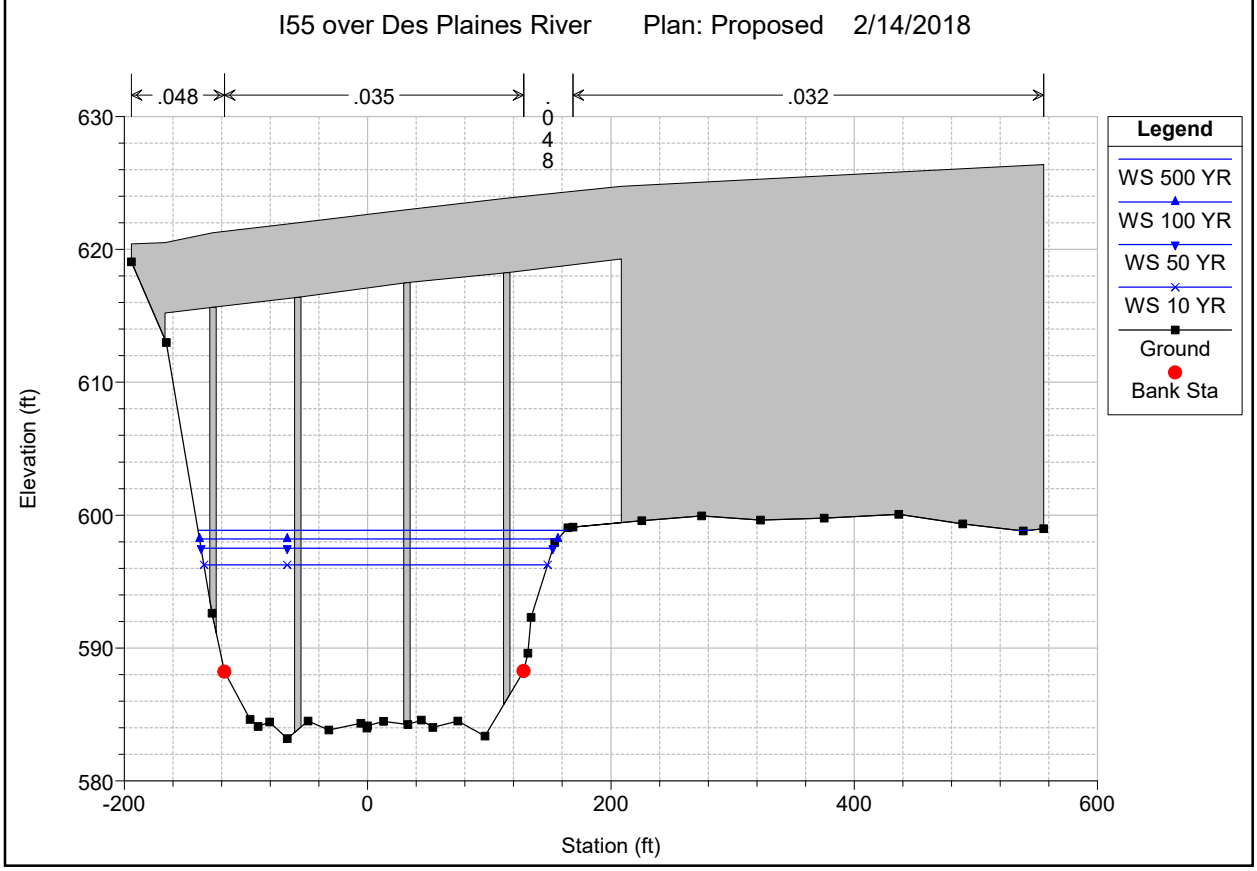

I55 over Des Plaines River Plan: Proposed 2/14/2018
FIS XS O ((old Hodgkins XS D)
.045
.035
.042
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
605
600
595
590
585
580
-300
-200
-100
0
100
200
300
400

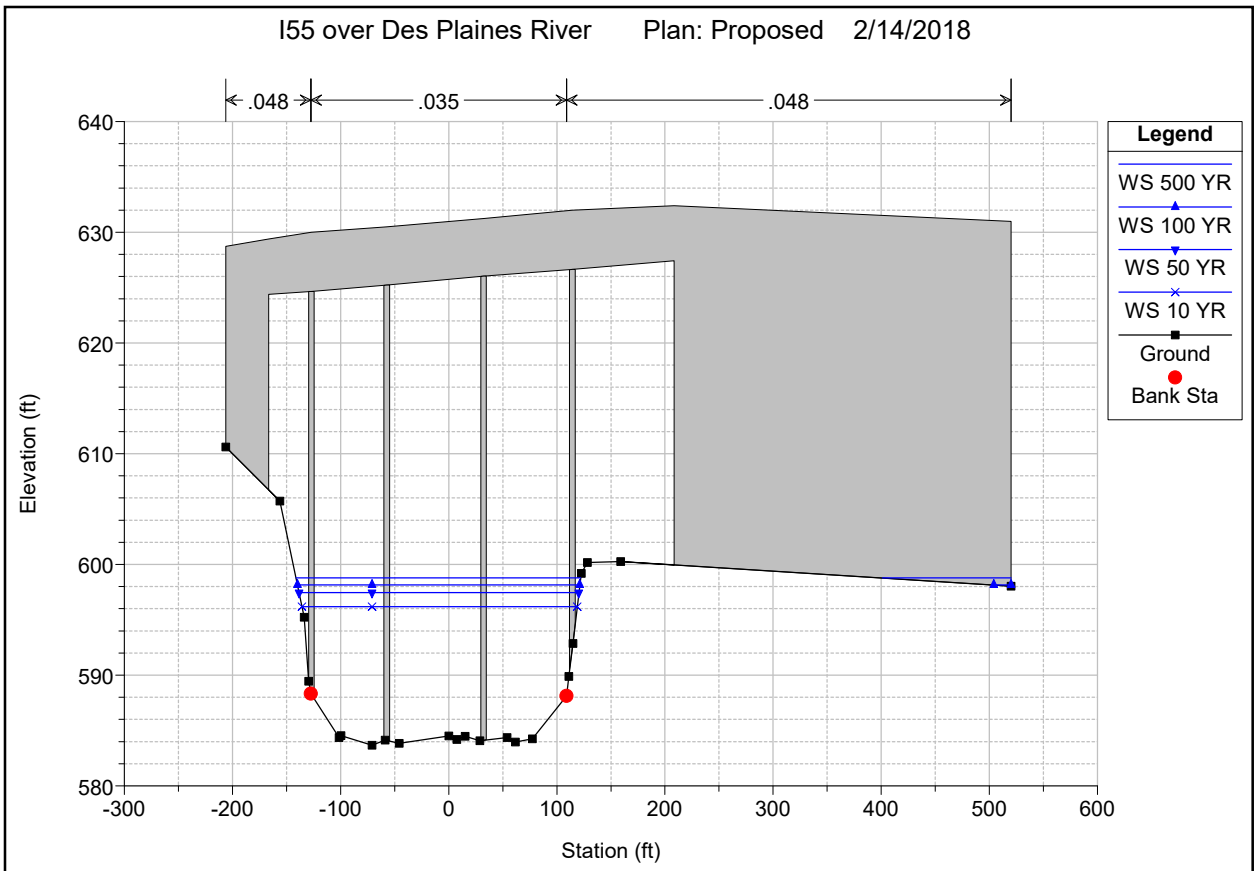

I55 over Des Plaines River Plan: Proposed 2/14/2018
FIS XS N (old Hodgkins XS C)
.045
.035
.032
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
605
600
595
590
585
580
-200
-100
0
100
200
300
400

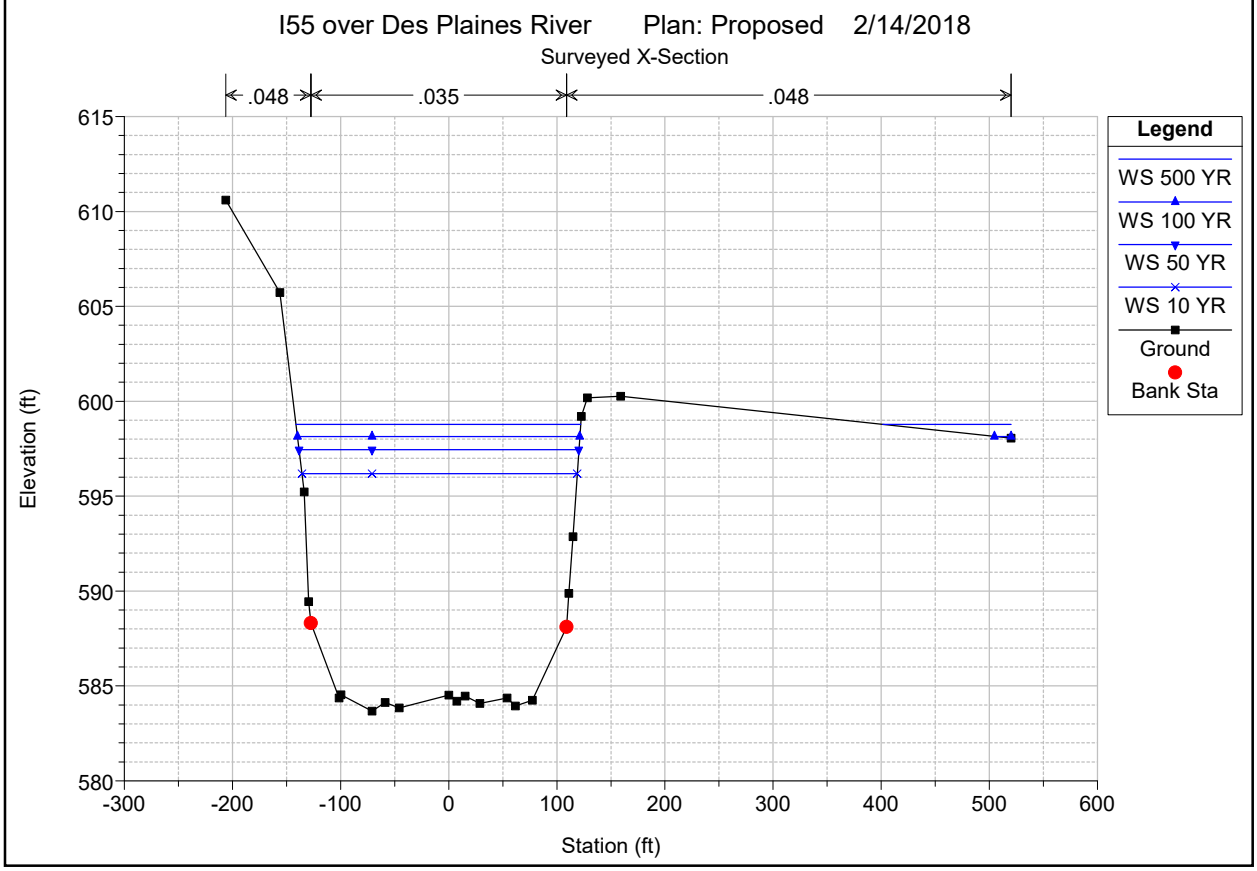

I55 over Des Plaines River Plan: Proposed 2/14/2018
Surveyed X-Section
.048
.035
.048
.032
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
Elevation (ft)
620
615
610
605
600
595
590
585
580
-300
-200
-100
0
100
200
300
400
500
Station (ft)

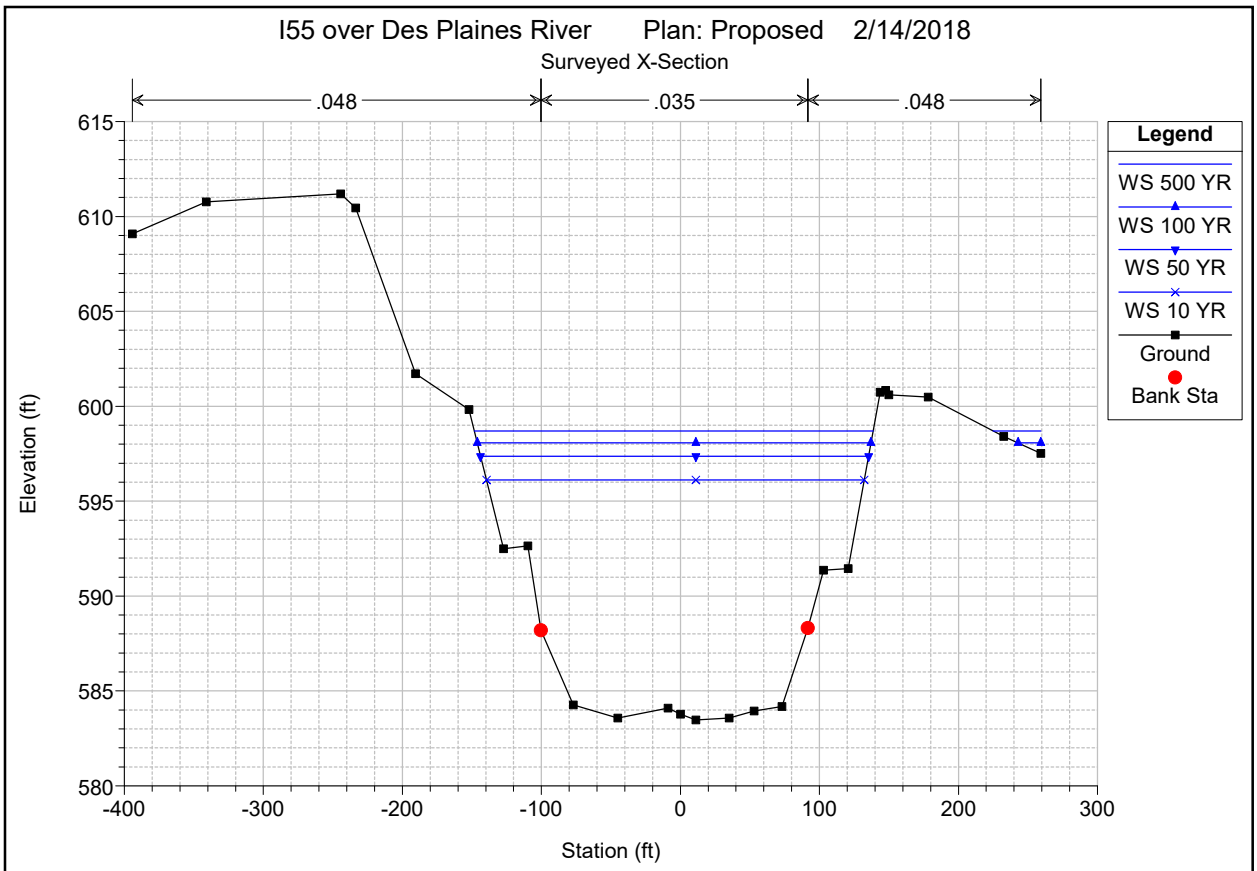

I55 over Des Plaines River Plan: Proposed 2/14/2018
Surveyed X-Section
.048
.035
.048
.032
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
Elevation (ft)
620
615
610
605
600
595
590
585
580
-200
0
200
400
600
800
1000
Station (ft)

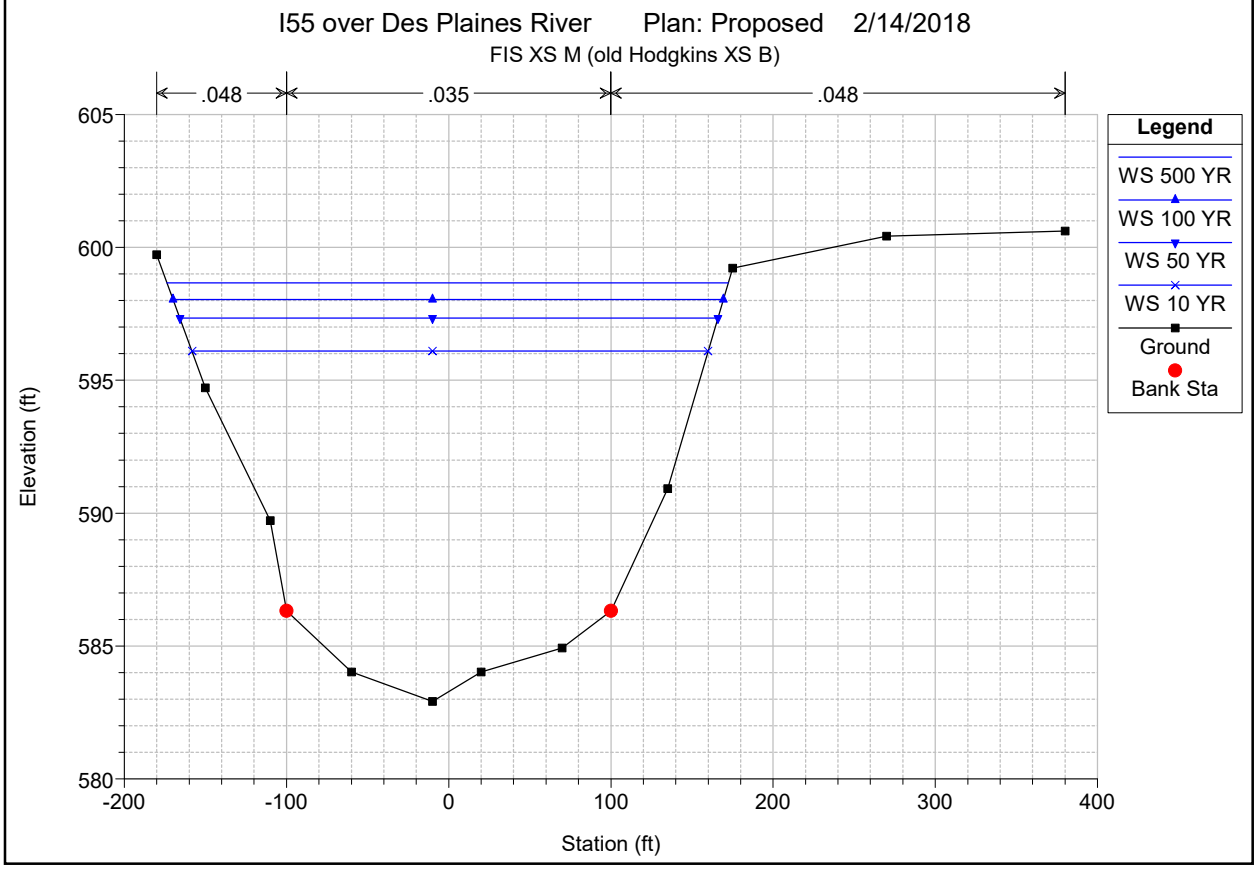

I55 over Des Plaines River Plan: Proposed 2/14/2018
Surveyed X-Section
.048
.035
.048
.032
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
Elevation (ft)
620
615
610
605
600
595
590
585
580
-200
0
200
400
600
Station (ft)

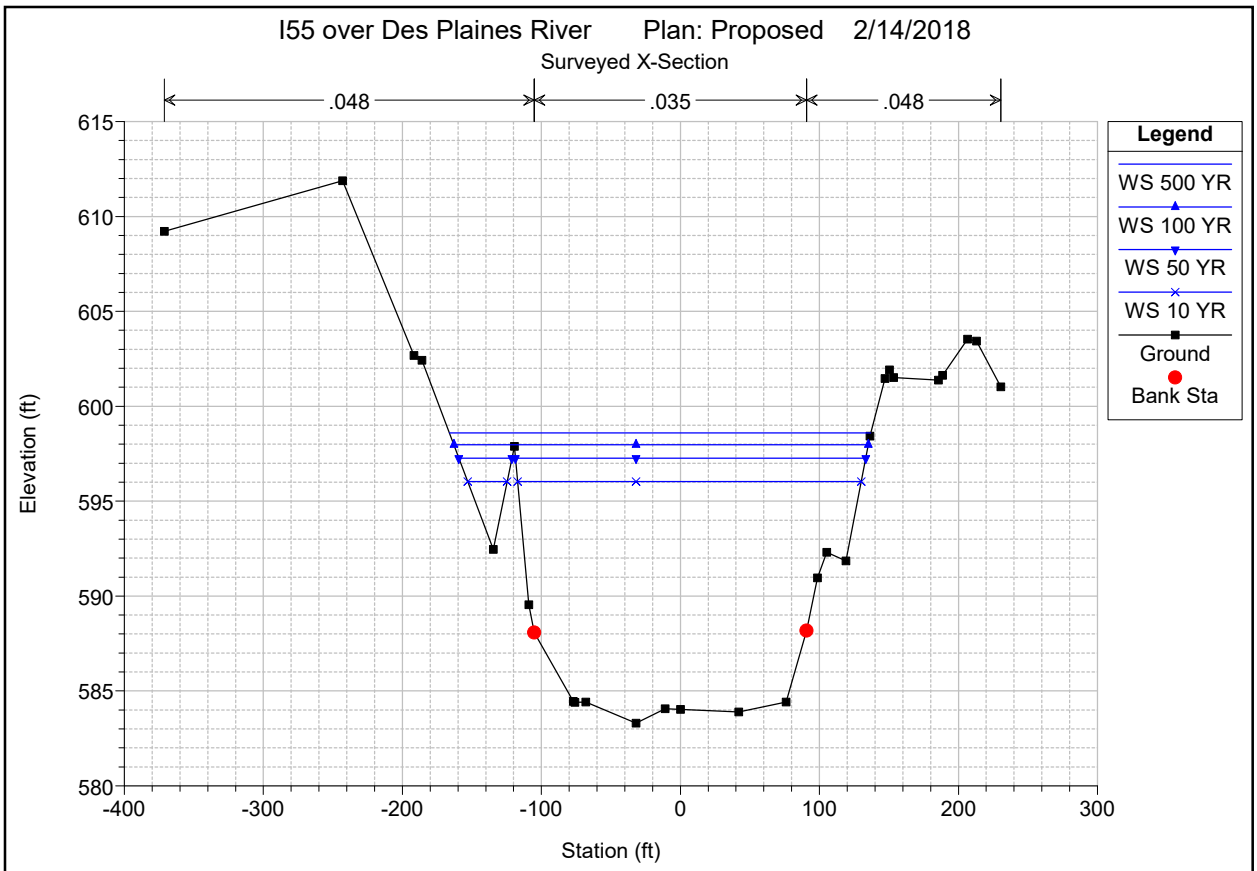

I55 over Des Plaines River Plan: Proposed 2/14/2018
.048
.035
.048
.032
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
Elevation (ft)
630
620
610
600
590
580
-200
0
200
400
600
Station (ft)

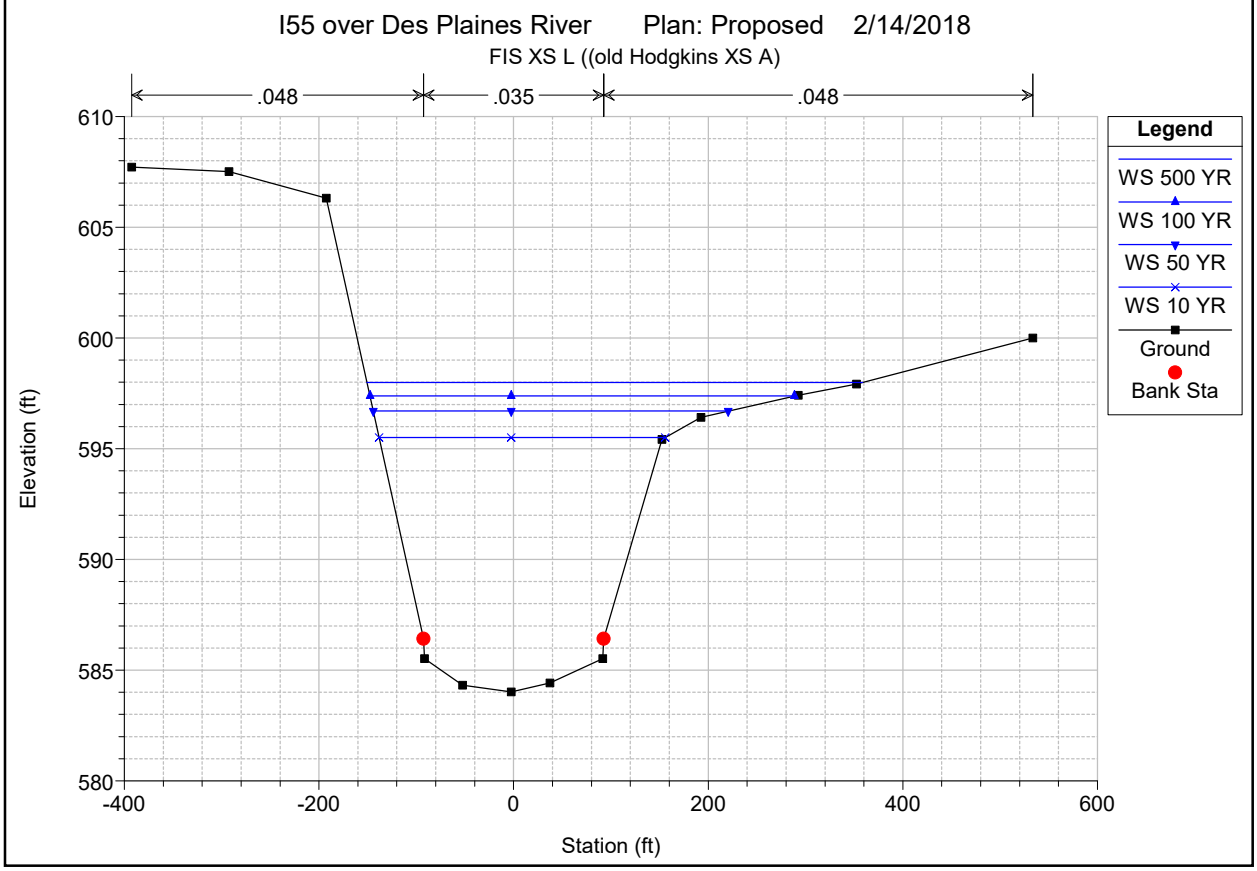

I55 over Des Plaines River Plan: Proposed 2/14/2018
.048
.035
.048
Elevation (ft)
640
630
620
610
600
590
580
-300
-200
-100
0
100
200
300
400
500
600
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta


I55 over Des Plaines River Plan: Proposed 2/14/2018
Surveyed X-Section
.048
.035
.048
Elevation (ft)
615
610
605
600
595
590
585
580
-300
-200
-100
0
100
200
300
400
500
600
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta


I55 over Des Plaines River Plan: Proposed 2/14/2018
Surveyed X-Section
.048
.035
.048
615
610
605
600
595
590
585
580
Elevation (ft)
-400
-300
-200
-100
0
100
200
300
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta


I55 over Des Plaines River Plan: Proposed 2/14/2018
FIS XS M (old Hodgkins XS B)
.048
.035
.048
605
600
595
590
585
580
Elevation (ft)
-200
-100
0
100
200
300
400
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta


I55 over Des Plaines River Plan: Proposed 2/14/2018
Surveyed X-Section
.048
.035
.048
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
615
610
605
600
595
590
585
580
-400
-300
-200
-100
0
100
200
300

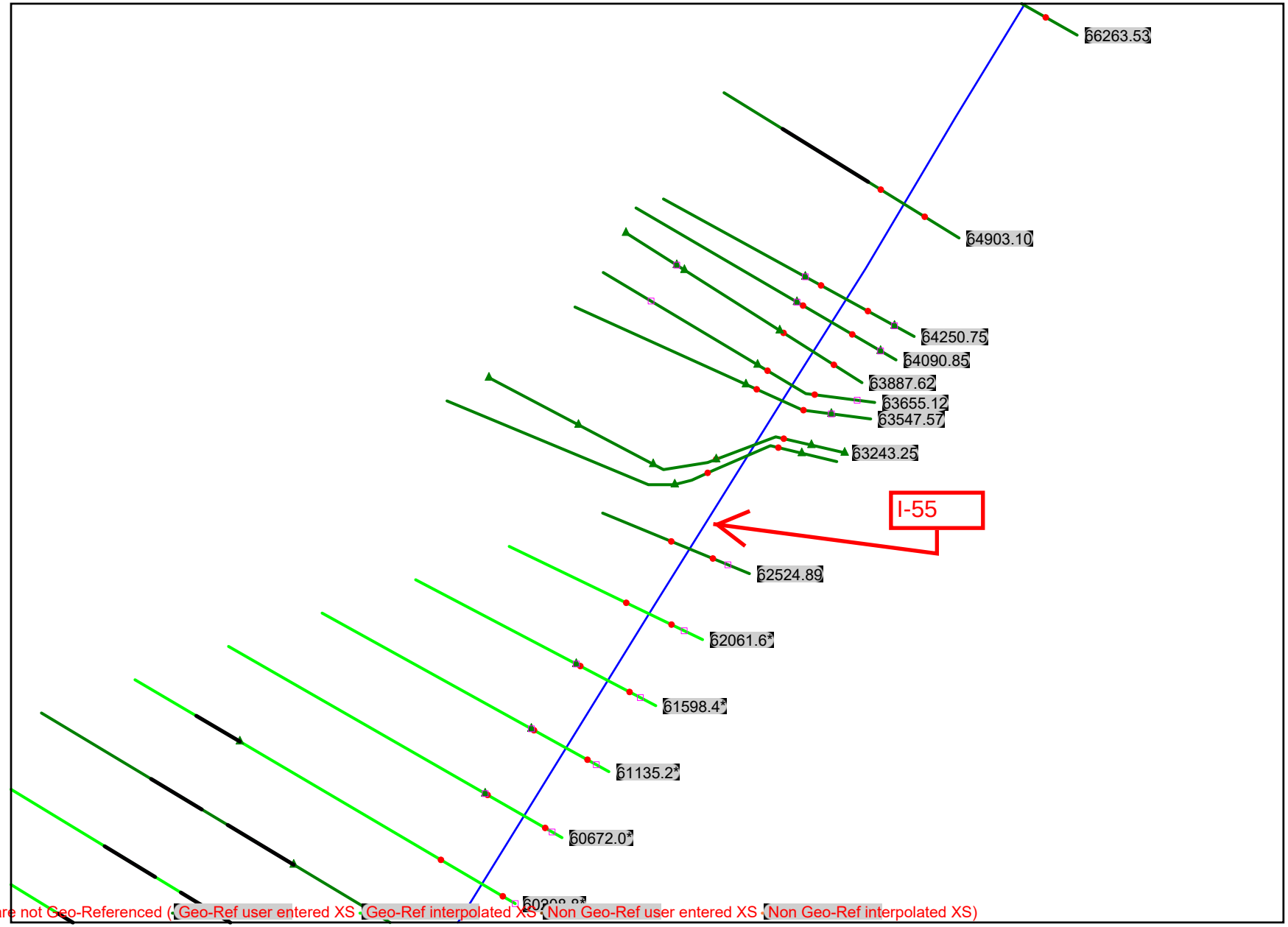

I55 over Des Plaines River Plan: Proposed 2/14/2018
FIS XS L ((old Hodgkins XS A)
.048
.035
.048
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
610
605
600
595
590
585
580
-400
-200
0
200
400
600

TAB F

SECTION 13.F

MWRD BASELINE MODEL

Baseline Conditions
HEC-RAS Geometry



HEC-RAS Version 4.0.0 March 2008
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: DPR_BL Deliverable
Project File : DPR_BL_Deliverable.prj
Run Date and Time: 2/25/2011 10:01:12 AM

Project in English units

Project Description:
Lower Des Plaines River Unsteady HEC-RAS for MWRD LDPRDWP ****more details
below****

Data Sources:
Cook County 2 ft topo for XS pulled using
HEC-GeoRAS
Channel information from steady HEC-RAS model from USACE File:
LEV_37_14.DAT
Flow data for direct tributary areas to Lower Des Plaines River
from CBBEL HEC-HMS model
Inflow hydrographs for Cook County sub-watershed from
HEC-RAS output files for individual LDPRDWP Phase B sub-watershed
analyses.

Vertical Datum: NAVD 1988

Des Plaines River alternatives are
modeled.

PLAN DATA

Plan Title: DPR BL 100 1110
Plan File : n:\Idot\110203.00001\Drain\Model\Des Plaines River MWRD Hydraulic
Model\DPR_BL_Deliverable.p81

Geometry Title: DPR BL 1110
Geometry File : n:\Idot\110203.00001\Drain\Model\Des Plaines River MWRD Hydraulic
Model\DPR_BL_Deliverable.g13

Flow Title   :
Flow File   :

Plan Description:
Lower Des Plaines River Watershed
Modified Baseline 100-year
10-day
Calibrated to September 2008 storm
Streams: Des Plaines River
(DPR)

Addresses comments from AECOM from 101910

```
Plan Summary Information:
Number of:  Cross Sections =  981    Multiple Openings  =    1
            Culverts       =    0    Inline Structures  =    3
            Bridges        =   49    Lateral Structures =    0

Computational Information
    Water surface calculation tolerance  =  0.01
    Critical depth calculation tolerance =  0.01
    Maximum number of iterations         =  20
    Maximum difference tolerance         =  0.3
    Flow tolerance factor                =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow



GEOMETRY DATA

Geometry Title: DPR BL 1110
Geometry File : n:\Idot\110203.00001\Drain\Model\Des Plaines River MWRD Hydraulic
Model\DPR_BL_Deliverable.g13

CROSS SECTION


RIVER: Des Plaines
REACH: 1                 RS: 257312.2

INPUT
Description:
Station Elevation Data    num=     103
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     648   36.24  647.35   36.59     646   37.66  644.31    37.8     644
   38.07  643.75   39.61     642   39.63  641.99   39.65  641.98   39.79  641.91
   43.21   640.2   43.64     640   46.94  638.72   48.84     638   51.53  637.05
   52.76  636.61   54.27  636.08   54.29  636.07    54.5     636   58.31  634.32
      59     634    60.7  633.18   63.19     632      64  631.42      65   631.3
      68  630.85      73  630.15     102  628.88     115  629.03     154   629.4
     170   630.3     183  630.76     186  631.27     187  632.02  207.81  633.73
  208.67     634  209.89   634.6  212.34  635.81  212.77     636  216.01   637.5
  216.67  637.79  216.98  637.93  217.04  637.95  217.05  637.96  217.15     638
  219.15  638.79  220.23  639.17  220.81  639.38  222.48     640  222.89  640.12
  223.78  640.37  224.86  640.69  228.59     642  231.23   642.5  232.44     644
  236.39  644.79  237.05  644.76  238.45  645.73  239.44     646  242.26  646.14
   244.3  647.31   246.2  647.59  246.24  647.61  246.39  647.63  246.66   647.7
  248.21  647.93  248.26  647.94  248.63     648   249.2  648.03  251.34  648.14
  252.06  648.17  253.84  648.24  253.98  648.25  254.67  648.27  254.74  648.28
  254.95  648.29  256.26  648.34  256.53  648.35   256.7  648.36  257.92  648.41
  258.52  648.43  258.73  648.44     260   648.5   260.6  648.52   260.8  648.53
   261.4  648.55  262.54   648.6  263.12  648.62  263.97  648.66  264.42  648.67
   265.4   648.7  265.94  648.72  267.06  648.75  268.06  648.77  268.74  648.78
  269.83  648.79  270.46   648.8  271.13  648.81  271.85  648.82  273.35  648.83
  273.87  648.84   275.2  648.85  276.11  648.86

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .19   63.19    .045     187     .19

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         63.19     187            78.13   75.54   71.49             .1       .3

CROSS SECTION
```

252.12	594.35	253.14	594	262.94	592.48	264.53	592.24	266.15	592
268.16	591.53	269.73	591.16	274.35	590.1	274.5	590.06	274.62	590.04
274.79	590	276.73	589.43	278.55	588.94	278.88	588.85	279.7	588.63
281.94	588	306	586.8	307	586.4	308	586	336	582.4
371	581.6	396	582.9	421	584.4	448	585	449	586
450	586.8	460.82	588.58	462.22	590	480.36	591	492.3	591.66
498.44	592	500.61	592.15	525.18	593.78	526.84	594	530.21	595.43
531.07	595.8	531.54	596	533.2	596.93	534.24	597.51	534.64	597.73
535.13	598	535.22	598.05	538.53	600	755.43	600.13	1115.91	602
1127.13	601.71	1147.45	601.5	1147.65	601.49	1148.01	601.5	1148.56	601.49
1148.74	601.48	1149.14	601.47	1149.45	601.46	1149.91	601.45	1150.3	601.44
1150.61	601.43	1150.98	601.42	1151.67	601.41	1152.14	601.4	1179.92	601.62
1184.33	602	1293.84	603.27	1294.39	603.36	1297.96	604	1308.14	604.92
1320.26	606	1342.45	605.31	1342.9	605.29	1343.79	605.26	1378.32	604
1510.51	605.42	1511.07	605.44	1531.24	606	1612.17	607.05	1614.81	607.11
1616.83	607.16	1618.03	607.18						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	235.82	.043	538.53	.075

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

235.82	538.53	641.4	652.34	665.7	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
625	1215	610

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 64250.75

INPUT
Description:
Station Elevation Data num= 225

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	607.09	27.85	606.29	38.22	606	48.98	606.2	54.99	608
58.26	609.25	60.19	610	64.58	611.84	64.96	612	65.44	612.19
70.16	614	73.1	614.88	77.05	616	131.59	616.99	132.01	616.98
212.62	616	230.47	614.23	231.46	614	234.24	613.09	236.59	612.31
236.88	612.22	237.53	612	238.23	611.79	240.67	611.04	243.28	610.25
244.11	610	252.24	608.16	252.93	608	264.84	607.27	268.11	607.07
270.81	606.9	284.89	606.03	285.31	606	285.62	605.94	296.55	604
298.23	603.47	298.33	603.44	298.64	603.34	300.16	602.85	301.06	602.57
302.87	602	308.26	600.21	308.88	600	309.13	599.92	309.29	599.87
310	599.63	310.21	599.56	312.57	598.79	314.97	598	318.9	596.7
321.03	596	321.41	595.89	321.71	595.8	325.63	594.62	327.66	594
333.77	593.21	335.13	593.04	336.79	592.83	341.06	592.32	341.73	592.23
342.11	592.18	342.4	592.15	342.65	592.12	342.66	592.11	343.88	592
345.5	591.75	348.61	591.24	350.97	590.91	355.11	590	355.46	589.75
356.64	588.9	357.87	588	396	586.8	397	586.4	398	586
426	582.4	451	581.6	486	582.9	511	584.4	538	585
539	586	540	586.8	553.16	589.89	553.33	589.97	553.38	590
553.56	590.02	553.65	590.03	553.9	590.05	554.26	590.09	573.69	592
575.36	592.36	582.96	594	588.67	595.36	591.39	596	595.05	596.99
596.59	597.4	598.49	598	599.73	598.11	599.9	598.12	621.47	600
642.39	600.3	643.31	600.32	647.17	600.42	649.09	600.47	652.64	600.56
655.73	600.65	660.05	600.76	661.21	600.79	665.76	600.91	669.51	601.01
671.03	601.05	672.45	601.09	675.09	601.17	680.39	601.28	681.6	601.31
713.66	602	716.1	602.1	718.23	602.38	718.89	602.5	719.95	602.65
720.52	602.74	720.89	602.81	727.1	604	769.7	603.53	779.79	603.26
780.48	603.2	780.81	603.17	781.6	603.1	782.29	603.04	784.55	602.96
785.46	602.87	785.68	602.85	786.56	602.78	787.56	602.69	791.46	602.55
791.66	602.53	793.31	602.37	794.04	602.35	794.53	602.31	796.21	602.17
797.15	602.1	797.71	602.09	798.62	602	851.94	601.69	862.01	602
1039.33	602.08	1041.93	602.2	1043.83	602.27	1044.06	602.28	1046.28	602.35
1050.93	602.42	1053.39	602.39	1054.24	602.43	1055.19	602.41	1056.03	602.39
1057.94	602.38	1058.54	602.37	1059.55	602.4	1060.75	602.41	1069.16	602
1382.04	603.1	1383.17	603.13	1390.7	603.43	1393.66	603.56	1404.02	603.98
1404.06	603.99	1404.39	604	1453.34	603.62	1461.59	602	1512.28	602.98

1514.86	603.29	1516.71	603.53	1517.1	603.58	1517.7	603.65	1518.26	603.72
1518.3	603.73	1518.41	603.74	1518.69	603.78	1518.74	603.79	1518.96	603.82
1519.06	603.84	1519.14	603.85	1522.9	603.71	1523.35	603.66	1537.68	602
1544.83	600.96	1546.21	600.86	1546.51	600.83	1547.18	600.74	1549.37	600.45
1550.82	600.47	1551.43	600.48	1551.93	600.51	1552.19	600.48	1552.32	600.46
1553.22	600.37	1553.53	600.39	1553.76	600.36	1553.96	600.34	1554.65	600.4
1561.12	600.73	1561.85	600.76	1581.88	600.55	1587.27	600.61	1597.82	600.9
1598.42	600.92	1600.32	600.95	1600.73	600.96	1601.71	600.99	1601.9	601
1603.26	601.04	1603.59	601.05	1604.58	601.07	1605.96	601.11	1627.72	602
1635.39	602.41	1637.98	602.61	1639.62	602.74	1642.7	602.98	1646.82	603.3
1649.07	603.48	1655.89	604	1663.13	604.23	1666.95	604.35	1673.98	604.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	308.26	.043	621.47	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
308.26	621.47	166.78	159.9	153.4	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	131.59	616.99	F
727.1	1673.98	604	F

Left Levee Station= 131.59 Elevation= 616.99
Right Levee Station= 727.1 Elevation= 604

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 64090.85

INPUT
Description:
Station Elevation Data num= 320

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	608.08	12.9	608.18	13.86	608.12	14.68	608.08	16.12	608
19.13	608.01	19.14	608.02	19.27	608.04	21.66	608.45	22.71	608.66
24.6	609	25.49	609.19	25.61	609.22	29.31	610	29.61	610.1
31.18	610.62	32.16	610.94	34.8	611.82	35.34	612	37.41	612.77
40.69	614	41.67	614.39	45.74	616	48.76	617.1	49.88	617.51
51.23	618	57.99	618.31	58.18	618.32	59.67	618.38	60.76	618.44
104.53	619.11	105.51	619.09	106.8	619.08	107.97	619.06	108.65	619.04
162.85	618	178.69	617.46	180.82	617.33	190.18	616.78	192.13	616.67
202.55	616.05	202.73	616.04	203.32	616	203.65	615.92	211.18	614
213.22	613.38	217.77	612	219.6	611.4	223.8	610	225.61	609.48
230.74	608	233.62	607.78	233.97	607.76	234.59	607.72	235.12	607.69
239.73	607.35	240.73	607.28	242.01	607.21	244.76	607.01	246.92	606.89
248.89	606.75	253.78	606.48	255.77	606.35	262.27	606	267.43	605.6
269.75	605.37	270.51	605.3	271.23	605.23	278.84	604.48	280.51	604.32
281.31	604.24	281.82	604.19	283.6	604	286.72	603.1	290.52	602
293.51	600.85	294.46	600.49	295.76	600	298.67	598.86	300.87	598
301.79	597.64	306.11	596	307.76	595.41	308.35	595.21	309.55	594.79
310.39	594.5	310.72	594.39	311.87	594	317.54	593.52	324.15	592.94
330.91	592.35	333.06	592.16	333.51	592.12	334.82	592	343.36	591.28
351.58	590.59	354.63	590.33	357.64	590.08	358.5	590	358.98	589.81
364.02	588	376	586.8	377	586.4	378	586	406	582.4
431	581.6	466	582.9	491	584.4	518	585	519	586
520	586.8	540.98	588.66	544.59	590	547.48	590.54	548.34	590.65
549.6	590.83	552.24	591.26	554.9	591.59	557.41	591.9	558.18	592
559.02	592.12	559.11	592.13	561.27	592.43	561.78	592.51	562.34	592.6
563.17	592.72	564.13	592.87	565.74	593.12	566.79	593.29	569	593.65
570.44	593.89	571.07	594	578.9	595.41	581.97	595.97	582.12	596
582.31	596.04	583.76	596.39	584.32	596.52	585.4	596.79	590.61	598
606.32	598.8	609.39	598.95	613.05	599.13	619.66	599.45	628.65	599.89
630.01	599.95	631	600	655.6	600.34	664.75	602	668.89	603.26
671.34	604	697.63	602.92	698.12	602.79	701.06	602	731.58	601.28
746.87	600.92	749.32	600.87	751.46	600.82	754.14	600.76	757.57	600.68
782.86	600.14	786.24	600.06	789.09	600	882.15	600.27	890.58	602
951.23	601.42	952.16	601.41	953.37	601.4	953.91	601.39	954.06	601.4
973.13	601.47	974.34	601.45	983.97	601.19	984.32	601.18	986.16	601.15
988.17	601.1	989.77	601.06	998.17	600.82	999.88	600.77	1002.61	600.7

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 1003.72  600.66 1004.08  600.65 1005.12  600.63 1006.73   600.6 1007.17  600.59
 1014.02  600.36  1014.5  600.34 1015.17  600.33 1021.42  600.16 1027.25  600.12
 1027.96  600.13 1037.82  600.18 1039.55  600.19 1055.36  600.25 1068.92  600.26
 1071.13  600.28 1073.31  600.29 1074.82  600.31 1076.33  600.32 1080.65  600.36
 1081.57  600.37 1082.34  600.38 1187.02  601.32 1189.62  601.34 1222.61  601.62
 1225.53  601.67 1227.33  601.69 1243.73  601.91 1247.88  601.97 1250.44     602
 1367.37  603.35 1371.67  603.52 1373.68  603.59 1374.31  603.61 1384.13     604
 1434.67  603.74 1435.16  603.49 1438.11     602 1444.25  601.51 1444.86  601.47
 1445.67  601.42 1446.57  601.36  1449.1  601.21 1453.04  600.95 1467.41     600
 1506.93  600.03 1512.19  600.48 1512.91  600.54 1516.48  600.85 1520.08  601.17
 1521.14  601.26 1522.17  601.35 1523.49  601.47 1524.59  601.56 1525.08  601.61
 1525.61  601.65 1525.96  601.68 1528.18  601.89 1528.23   601.9 1529.31     602
 1558.62  601.51 1560.19  601.12 1564.57     600 1590.24  600.03 1590.61  600.06
  1597.2  600.54 1598.63  600.66 1599.71  600.75 1602.44  600.95 1604.24  601.08
 1605.35  601.18 1605.98  601.22 1606.48  601.26 1607.84  601.38 1608.88  601.46
 1610.26  601.57 1610.91  601.62 1611.15  601.64 1612.93  601.78 1615.38  601.97
 1615.44  601.98 1615.73     602 1616.86  602.06 1619.61   602.2 1619.97  602.22
 1620.54  602.25 1622.22  602.34 1622.53  602.36 1622.86  602.38 1627.34  602.62
 1628.16  602.67 1629.22  602.73 1631.24  602.84 1632.18  602.89 1634.28  603.01
 1636.27  603.12 1638.06  603.22 1640.02  603.33  1640.8  603.38 1642.71  603.48
 1644.22  603.56 1644.33  603.57 1646.77  603.69 1646.86   603.7 1647.53  603.73
 1648.53  603.78 1650.83  603.89 1650.89   603.9  1652.2  603.96 1653.01     604
 1656.73  604.08 1657.32  604.09 1672.99  604.38 1673.66   604.4 1675.27  604.43
 1677.71  604.47 1679.64   604.5 1680.26  604.51  1683.4  604.56 1684.04  604.57
 1684.81  604.58 1685.97   604.6 1686.69  604.61 1687.63  604.62 1716.14  604.72
 1716.89  604.71    1719  604.72 1742.19   604.7 1743.04  604.69 1743.86  604.68
 1745.46  604.66 1751.34  604.61    1753  604.59 1753.75  604.58 1755.57  604.57
 1756.68  604.55 1758.79  604.54 1760.19  604.53 1761.25  604.52  1763.2  604.52

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  295.76    .043  630.01    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        295.76  630.01             213  203.23  194.62             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0  104.53  619.11       F
  671.34  1763.2     604       F
Left Levee      Station=  104.53      Elevation=  619.11
Right Levee     Station=  671.34      Elevation=     604

CROSS SECTION


RIVER: Des Plaines
REACH: 1                  RS: 63887.62

INPUT
Description:
Station Elevation Data    num=     196
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     622   11.58  621.97   16.09  621.78   16.68  621.76   18.01   621.7
   18.86  621.67   19.17  621.66   23.01   621.5   23.49  621.48   25.11  621.41
   25.78  621.38    26.1  621.37   26.58  621.35   27.26  621.32    29.5  621.23
   30.78  621.18   32.62   621.1    35.2  620.99   36.83  620.92   37.54  620.89
   38.96  620.84   40.35  620.77   41.38  620.73   42.39  620.69   44.12  620.62
   44.94  620.58   46.08  620.53   46.75  620.51   48.83  620.41    49.4  620.39
    49.8  620.38   52.48  620.26   52.86  620.24   53.29  620.22   58.08  620.02
   58.32  620.01   58.44     620   59.88  619.95   62.07  619.87   64.63  619.79
   66.23  619.73   66.39  619.72   67.95  619.67   74.21  619.45    74.6  619.43
   76.31  619.37   89.25  618.88   93.08  618.74   93.64  618.72   94.39  618.69
   95.78  618.64   96.27  618.62   96.46  618.61   97.29  618.58   99.17  618.52
   99.74  618.49  100.65  618.46  112.19     618  115.55  616.48  116.61     616
  119.86  614.74  121.75     614  123.84  613.18  126.86     612  128.55  611.22
  131.23     610   131.6  609.84  135.74     608  135.97  607.95  145.04     606
  164.21   605.7  174.84     604  176.08  603.75   176.3  603.71  178.51  603.26
     181  602.78  181.64  602.65  182.52  602.47  184.08  602.18  184.98     602
  186.55  601.67  187.14  601.55  187.96  601.37  188.47  601.26  190.21  600.91
  191.03  600.73  194.37     600  195.48   599.6  199.63     598  200.48  597.62
   203.9     596  209.89  594.21  209.98  594.18  210.61     594  216.66  592.79
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217.38	592.65	220.68	592	222.5	591.87	222.6	591.86	228.25	591.45
228.98	591.4	229.72	591.34	232.45	591.15	234.52	591.01	235.27	590.96
237.63	590.79	239.97	590.63	242.13	590.49	245.09	590.27	245.38	590.26
245.89	590.22	248.72	590	250.23	589.3	252.93	588	276	586.8
277	586.4	278	586	306	582.4	331	581.6	366	582.9
391	584.4	418	585	419	586	420	586.8	448.14	588.97
448.36	589.07	450.33	590	453.15	591.28	454.7	592	483.66	593.35
490.56	593.92	491.4	594	495.04	595.04	498.37	596	501.22	596.99
504.11	598	507.83	598.24	508.62	598.28	513.51	598.6	518.53	598.92
519.56	598.99	521.37	599.11	523.91	599.26	524.21	599.28	525.89	599.39
543.32	600	568.38	601.69	570.12	602	598.72	601.67	609.03	601.09
609.92	601.05	611.49	600.96	615.81	600.76	621.18	600.47	628.42	600
1164.93	601.83	1167.04	601.86	1168.84	601.87	1169.97	601.89	1172.73	601.92
1176.08	601.95	1176.52	601.96	1180.97	602	1231.3	602.54	1255.83	603.21
1274.3	603.72	1277.58	603.81	1277.98	603.82	1284.6	604	1332.96	603.57
1333.95	603.26	1338.03	602	1339.88	601.27	1341.38	600.66	1342.99	600
1465.55	600.04	1466.03	600.08	1467.46	600.22	1467.93	600.27	1468.5	600.32
1469.03	600.38	1469.62	600.43	1469.83	600.42	1477.97	600.53	1507	600.89
1507.94	600.95	1509.63	601.09	1512.16	601.34	1512.4	601.36	1513.63	601.47
1514.25	601.46	1514.54	601.48	1514.9	601.51	1517.5	601.75	1520.58	602
1636.1	602								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	194.37	.043	543.32	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
194.37	543.32	164.06	232.5	238.77	.1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
570.12	1231.3	602	F
1284.6	1636.1	604	F

Right Levee Station= 1284.6 Elevation= 604

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 63655.12

INPUT
Description:
Station Elevation Data num= 434

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	610	26.43	610.12	26.7	610.13	27.97	610.2	31.35	610.37
31.62	610.39	32.5	610.43	33.3	610.47	33.5	610.48	34.45	610.53
37.73	610.7	39.5	610.79	42.52	610.94	43.89	611.01	45.83	611.11
47.77	611.21	50.16	611.32	50.73	611.35	53.4	611.48	54.32	611.52
54.44	611.53	58.43	611.72	58.53	611.73	61.83	611.89	61.98	611.9
62.18	611.91	64.04	612	65.99	612.51	67.22	612.85	68.34	613.17
68.84	613.3	69.41	613.45	70.06	613.63	71.41	614	71.79	614.13
71.84	614.15	73.14	614.57	73.67	614.75	74.5	615.03	75.76	615.46
76.4	615.68	76.65	615.76	77.33	616	78.88	616.58	80.08	617.02
82.72	618	83.14	618.15	83.35	618.22	83.52	618.28	83.64	618.33
83.94	618.43	85.67	619.03	86.24	619.23	87.63	619.7	87.94	619.81
88.51	620	89.67	620.36	89.82	620.4	90.78	620.7	93.45	621.52
94.32	621.79	94.87	621.95	94.98	621.99	95.01	622	100.52	623.12
104	623.95	104.2	624	156.26	623.61	157	623.58	157.52	623.57
157.81	623.55	158.43	623.53	159.66	623.51	160.4	623.48	161.23	623.45
161.69	623.44	163.38	623.41	164.37	623.38	165.43	623.34	166.12	623.31
166.96	623.29	168.36	623.24	169.43	623.21	170.68	623.18	171.62	623.15
172.21	623.13	173.45	623.09	173.69	623.08	174.06	623.07	175.62	623.02
176.13	623.01	176.91	622.98	177.62	622.96	178.33	622.93	179.4	622.9
181.47	622.84	182.5	622.8	182.87	622.79	183.41	622.77	184.77	622.73
185.34	622.71	186.18	622.68	187.42	622.64	187.87	622.63	189.01	622.6
190.73	622.54	191.03	622.53	191.91	622.5	192.33	622.48	195.8	622.37
197.83	622.31	198.02	622.3	198.76	622.28	199.02	622.27	200.08	622.24
201.08	622.21	202.4	622.17	204.38	622.12	204.47	622.11	206.27	622.06
207.77	622.01	208.09	622	208.89	621.96	212.27	621.8	212.64	621.78
212.73	621.77	213.53	621.73	213.72	621.72	214.5	621.68	215.06	621.64
215.44	621.62	218.59	621.45	219.08	621.42	219.42	621.4	219.96	621.37

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  220.37  621.35  222.12  621.24  223.68  621.15  225.36  621.05  225.63  621.04
  227.07  620.96   228.4  620.88  229.62  620.81  230.37  620.76  231.53  620.69
  231.91  620.67  232.36  620.65  233.17   620.6  235.42  620.47   235.8  620.45
   236.2  620.42  239.23  620.25  239.42  620.23  240.41  620.18  240.76  620.16
  243.38     620  260.06   619.4  262.95  619.26  263.71  619.25   264.2  619.24
  265.22  619.22  265.63  619.19  267.01  619.17  267.37  619.15  267.44  619.14
  267.94  619.12  268.92   619.1  269.31  619.09  270.35  619.07  271.07  619.06
  275.99  618.76  276.38  618.75  276.92  618.74  277.29  618.73  277.55  618.72
  278.14  618.68  278.71  618.67  279.59  618.61  280.25  618.59  282.69  618.42
  283.18  618.41   283.5   618.4  283.64  618.39  288.67     618  289.34  617.74
   289.4  617.71  289.44  617.69  290.42  617.26  291.37  616.86   291.4  616.85
  291.42  616.84  291.62  616.75  292.05  616.56  292.28  616.46  293.32     616
   295.2  615.27  296.06  614.94  297.91  614.25  298.34  614.09  298.49  614.04
  298.59     614  298.79  613.93  298.82  613.92  301.76  612.98  302.12  612.87
  302.22  612.84   302.3  612.81   304.4  612.15  304.87     612  305.39  611.81
   306.1  611.57  306.32  611.49  307.17  611.19  308.51   610.7  308.99  610.54
  309.93  610.19  310.08  610.14  310.45     610  311.19  609.73  311.63  609.56
  313.36  608.92  314.28  608.58  314.88  608.36  315.83     608  315.85  607.99
  315.88  607.98  318.55  607.07  319.08  606.88   319.5  606.74  319.81  606.63
  320.14  606.52  321.69     606  322.96  605.69  323.17  605.65  323.47  605.58
  323.89  605.49  324.46  605.36  324.97  605.24   325.5  605.12  327.08  604.76
   328.3   604.5  328.73   604.4  330.32  604.06  330.36  604.05   330.6     604
  331.22  603.88  331.38  603.84   332.9  603.54  333.15   603.5  333.46  603.44
  334.67   603.2  335.83  602.97  336.36  602.87  337.06  602.73  337.77  602.59
  338.64  602.42  338.99  602.35  339.07  602.33  340.78     602  341.31  601.89
  341.34  601.88  341.38  601.87  342.49  601.64  343.35  601.46  344.51  601.17
  345.86  600.88   346.6  600.69  347.02  600.59   348.5   600.2  348.64  600.17
  349.25     600  349.93  599.79  350.58  599.57  352.83  598.85  353.66  598.57
  354.29  598.37  355.38     598  356.69  597.61  356.85  597.56  357.85  597.27
  359.35  596.85   360.8  596.45  362.27  596.05  362.28  596.04  362.35  596.03
  362.45     596  364.24  595.58  364.51  595.52  365.53  595.28  366.17  595.11
  366.91  594.94   367.9  594.68  368.56  594.53  370.06  594.14  370.15  594.12
  370.56     594  373.95  593.65  374.26  593.62  376.88  593.36  377.79  593.25
  378.74  593.14  379.13   593.1  380.62  592.94  383.02  592.66  384.19  592.54
  384.65  592.49  386.71  592.26  386.88  592.24  388.36  592.07  388.54  592.05
  389.01     592  389.94  591.85  390.05  591.84   391.4  591.63  391.78  591.58
  392.94  591.41  393.91  591.29  394.29  591.24  395.18  591.14  395.76  591.07
  396.95  590.96  397.56  590.92  397.86   590.9  401.03  591.14  401.77  590.93
   401.8  590.92  403.24  590.38  404.05     590  405.38  589.36   405.6  589.25
  405.88  589.12  407.07   588.5  407.94     588     426   586.8     427   586.4
     428     586     456   582.4     481   581.6     516   582.9     541   584.4
     568     585     569     586     570   586.8  608.19  589.47  609.33     590
  612.06  591.23  613.77     592  616.89  592.14  618.09  592.19  623.14  592.42
  658.92     594   660.6  594.73  663.57     596  664.86  596.76  667.16     598
  693.11  598.95  706.49  599.44   721.7     600  723.88  600.47   728.1  601.34
  730.91  601.93  731.22     602  731.28  602.03  731.94  602.34  735.49     604
  761.04  602.63  762.82     602  766.42  601.09  770.63     600 1366.88  601.64
 1384.21  601.77 1388.72   601.8 1414.45     602 1416.42  602.02 1421.76  602.36
 1430.91  602.85 1431.95  602.89 1432.75  602.93 1433.38  602.95 1433.67  602.97
  1434.2     603 1434.64  603.02 1434.94  603.04  1436.6  603.08 1437.75  603.14
 1458.56  603.69 1459.35  603.72 1462.77  603.87 1462.88  603.88 1467.61  603.82
 1469.09  603.83 1469.64  603.79 1470.74  603.71 1470.94   603.7 1473.19  603.53
  1473.6   603.5 1473.92  603.48 1477.38  603.28 1485.85  602.62 1489.26  602.35
  1493.7     602 1494.31  601.47 1494.65  601.17 1495.07  600.81 1495.97     600
 1610.97  599.45 1618.08  599.34 1619.05  599.32 1619.93  599.31 1621.79   599.3
  1629.8  599.16 1670.08  598.79 1671.19  598.78 1701.29  599.37 1702.02  599.43
 1702.88   599.5 1704.07  599.61  1705.1  599.71 1706.28  599.82 1706.58  599.85
 1708.01  599.98 1708.21     600 1711.33  600.64 1717.65     602 1722.46  601.95
 1722.71  601.92 1722.91   601.9 1728.18  601.26 1729.68  601.08 1732.51  600.74
 1734.78  600.46 1736.95  600.21 1738.76     600 1788.43     600

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  354.29    .043  667.16    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        354.29  667.16           124.53  107.55  133.96             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  735.49 1788.43     604       F
Left Levee      Station=     104      Elevation=  623.95
```

Right Levee Station= 1462.88 Elevation= 603.88

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 63547.57

INPUT
Description:
Station Elevation Data num= 441

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	599.76	1.54	600	3.05	600.69	5.92	602	5.95	602.02
5.97	602.03	7.72	602.96	9.67	604	10.68	604.55	10.89	604.66
10.94	604.69	11.03	604.74	12.11	605.32	13.36	606	14.86	606.81
15.62	607.22	17.1	608	23.3	608.26	25.67	608.36	29.87	608.54
31.77	608.62	34.23	608.73	36.32	608.81	38.23	608.9	44.52	609.16
47.3	609.28	53.58	609.56	54.1	609.59	60.73	609.88	61.03	609.89
61.19	609.9	61.79	609.93	62.23	609.94	63.2	609.99	63.54	610
70.22	610.28	70.78	610.3	74.94	610.48	75.68	610.51	83.21	610.83
84.28	610.88	85.86	610.95	88.3	611.06	91.96	611.23	92.48	611.25
93.47	611.29	95.04	611.37	98.52	611.52	101.09	611.63	101.61	611.65
101.94	611.67	102.57	611.69	103.11	611.71	103.22	611.72	105.63	611.81
105.97	611.83	107.84	611.89	107.9	611.9	109.21	611.94	110.8	612
111.08	612.05	112.25	612.25	112.57	612.32	114.21	612.63	114.84	612.76
116.95	613.21	117.39	613.3	117.86	613.4	118.58	613.55	120.33	613.96
120.36	613.97	120.51	614	121.95	614.44	122.15	614.5	122.48	614.6
123.55	614.92	125.39	615.49	125.86	615.63	126.08	615.7	127.06	616
128.75	616.5	129.01	616.58	129.61	616.75	129.94	616.85	130.36	616.97
131.33	617.26	132.33	617.55	133.67	617.94	133.88	618	134.81	618.26
135.45	618.43	138.21	619.19	138.76	619.35	138.87	619.37	139.47	619.54
139.54	619.56	141.12	620	141.18	620.02	141.21	620.03	142.93	620.53
143.2	620.62	143.97	620.84	147.32	621.88	147.54	621.94	147.72	622
148.11	622.11	148.23	622.14	148.41	622.19	150.45	622.75	151.78	623.16
152.62	623.4	152.64	623.41	152.78	623.44	152.91	623.48	154.65	624
232.77	623.98	233.62	623.95	234.82	623.9	235.56	623.88	235.79	623.87
236.34	623.84	239.43	623.72	239.66	623.71	240.02	623.7	240.07	623.69
242.94	623.58	243.34	623.56	243.79	623.54	244.4	623.52	244.8	623.5
245.01	623.49	246.56	623.43	247.02	623.41	247.83	623.38	248.28	623.36
249.38	623.31	249.85	623.29	250.1	623.28	250.28	623.27	251.28	623.23
252.3	623.18	252.63	623.17	252.99	623.15	254.07	623.11	254.24	623.1
254.49	623.09	255.63	623.04	256.47	623	256.9	622.98	257.46	622.96
257.92	622.93	258.97	622.89	260.26	622.83	260.74	622.81	261.28	622.78
261.9	622.76	262.48	622.73	263.11	622.7	264.52	622.63	265.42	622.59
266.16	622.56	266.85	622.53	267.14	622.52	268.64	622.44	269.07	622.42
269.87	622.38	270.24	622.37	271.05	622.33	271.84	622.29	271.99	622.28
272.77	622.24	273.09	622.23	274.93	622.13	275.77	622.08	276.62	622.04
277.35	622	279.09	621.94	280	621.91	280.85	621.88	281.13	621.87
283.69	621.78	285.17	621.73	286.34	621.69	287.05	621.67	288.29	621.63
288.91	621.61	289.5	621.59	291.76	621.51	292.69	621.48	293.74	621.44
294.59	621.42	295.6	621.39	296.7	621.35	297.47	621.33	298.48	621.29
299.48	621.26	300.04	621.24	301.69	621.19	302.66	621.16	303.67	621.13
303.96	621.12	305.28	621.08	306.04	621.05	307.98	621	308.89	620.97
309.54	620.95	310.21	620.93	311.06	620.91	314.36	620.82	314.84	620.8
315.51	620.78	316.11	620.77	318.58	620.69	319.34	620.67	328.64	620.35
328.85	620.34	329.29	620.33	329.48	620.32	331.22	620.26	333.36	620.18
333.51	620.17	333.89	620.16	334.16	620.15	335.86	620.1	336.3	620.08
338.09	620.02	339.01	620	339.73	619.92	340.93	619.8	341.01	619.79
341.1	619.77	342.66	619.6	342.82	619.58	343.98	619.46	344.85	619.37
345.16	619.34	345.74	619.27	346.43	619.19	353.65	618	353.81	617.92
353.89	617.87	354.28	617.66	355.18	617.19	355.47	617.02	357.27	616
357.44	615.9	357.62	615.8	357.96	615.62	359.81	614.59	360.87	614
362.23	613.4	362.3	613.37	365.34	612	365.37	611.99	365.67	611.87
365.94	611.76	366.39	611.58	367.35	611.18	369.24	610.41	370.2	610
370.35	609.93	370.52	609.86	371.77	609.33	372.03	609.22	372.34	609.09
373.45	608.61	374.85	608	375.02	607.93	375.05	607.91	375.23	607.83
377.27	606.92	377.41	606.85	378.72	606.27	378.97	606.16	379.32	606
379.66	605.84	379.7	605.82	380.43	605.47	381.19	605.12	382.32	604.58
383.61	604	384.08	603.77	384.21	603.71	384.37	603.64	384.64	603.51
385.66	603.03	386.34	602.72	387.77	602.07	387.85	602.03	387.92	602
389.61	601.24	390.79	600.72	390.81	600.71	391.51	600.4	391.65	600.34

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  392.42     600  394.69  598.99  395.16  598.77  396.86     598  396.95  597.96
  397.01  597.93  398.96  597.07  401.38     596  401.61  595.91  401.69  595.88
  401.72  595.86  402.66  595.45  405.98     594  406.98  593.65  407.46  593.47
  408.04  593.26  408.07  593.25   408.1  593.24  409.69  592.67  411.58     592
  414.26  591.71   415.1  591.62  427.56     590     428     586     456   582.4
     481   581.6     516   582.9     541   584.4     568     585     569     586
     570   586.8     591   587.9     641   587.5  649.98  589.81  650.36     590
  664.46  591.77  666.33  591.98  666.49     592  670.69  592.56  670.87  592.58
  671.64  592.67  672.53  592.79   674.6  593.02  675.12  593.08  675.79  593.16
  677.29  593.35  682.88     594  683.49  594.11  684.17  594.25  685.67  594.55
  685.84  594.59  686.82  594.78  686.95  594.81  692.57     596   693.8  596.53
  696.52  597.71  696.93  597.88  697.19     598  721.21  598.78  731.38  599.11
  758.95     600  760.63  600.51   765.7     602  766.45  602.34  776.82     602
  797.63   600.3  798.73     600  1325.7   600.8 1327.04  600.81 1330.08  600.82
  1331.8  600.83 1332.91  600.84 1335.08  600.85 1336.34  600.86 1338.35  600.87
 1340.35  600.88 1342.33  600.89 1343.39   600.9  1345.2  600.91 1368.59  601.09
 1370.53   601.1 1371.27  601.11 1372.88  601.12 1375.46  601.14 1413.48  601.46
 1414.83  601.47 1419.29   601.5 1419.77  601.51 1420.92  601.52 1422.26  601.53
 1423.83  601.54 1432.67  601.61 1433.64  601.62 1434.57  601.63 1435.85  601.64
  1461.1  601.86 1464.14  601.89 1476.82     602 1533.85  600.62 1534.88     600
 1541.33  599.94 1546.39   599.9  1576.4  599.62 1579.16   599.6 1590.38  599.49
 1607.98  599.34 1631.52  599.13 1699.12  598.53 1705.11  598.47 1715.94  598.38
 1719.14  598.35 1725.52  598.29 1728.49  598.26 1739.45  598.17 1741.87  598.15
 1742.72  598.14 1745.69  598.12 1746.85  598.11 1750.88  598.07    1752  598.06
 1760.16     598 1812.74  598.78 1815.82  599.37 1817.14  599.61 1817.49  599.68
 1817.73  599.72 1818.17   599.8 1819.24     600 1820.99  600.28 1826.99  601.34
 1827.89   601.5 1828.68  601.63 1828.93  601.67 1829.06   601.7 1829.45  601.76
 1829.67   601.8 1830.81     602 1846.51  601.33 1852.92  600.93 1853.47  600.89
 1856.02   600.7 1856.69  600.65 1858.57  600.54 1861.74  600.28 1862.78   600.2
 1865.07  600.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  396.95    .043  696.52    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        396.95  696.52             231.3  304.32  542.78             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0  232.77  623.98       F
  766.45 1865.07  602.34       F
Left Levee      Station=  232.77      Elevation=  623.98

CROSS SECTION


RIVER: Des Plaines
REACH: 1                 RS: 63243.25

INPUT
Description:
Station Elevation Data    num=     500
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  607.14      .56   607.4    1.46  607.82    1.85     608   16.28  608.69
   17.25  608.74   17.65  608.76   19.86  608.86   21.06  608.92   22.67  608.99
   24.31  609.07   36.22  609.62   40.03  609.79    40.6  609.82   44.57     610
   44.79  610.07   46.55  610.67   46.88  610.78   50.44     612   50.68   612.1
   50.84  612.16   51.19   612.3   52.88  612.98   53.81  613.35   55.41     614
   57.91  615.04   58.93  615.47   59.22  615.58   60.21     616   64.26  617.74
   64.89     618    69.2  617.92   69.58  617.89   74.41   617.5   84.65  616.57
   87.81   616.3   88.45  616.24    89.1  616.19   89.75  616.13   91.11     616
   96.01  614.99   96.82  614.82   97.71  614.63   98.84  614.37   99.04  614.33
  100.05   614.1  100.48     614  101.74  613.73  102.97  613.44   105.6  612.85
  106.44  612.67  107.28  612.47  107.55   612.4  108.03  612.29  108.34  612.22
  109.26     612  141.82  612.21  142.83  612.42  143.71   612.6     145  612.88
  146.04  613.07  146.48  613.16  149.03  613.66   149.4  613.74   149.6  613.77
  150.71     614  152.38  614.44  153.87  614.85  154.82  615.12  156.12  615.48
  156.62  615.61  158.04     616  158.39  616.11  158.89  616.26  160.62  616.79
  161.46  617.04   162.2  617.27     164  617.81  164.22  617.88  164.62     618
  166.35  618.56  167.63  618.97  168.74  619.33  170.26  619.82  170.41  619.88
   170.8     620  172.03  620.41  172.26  620.49  173.48   620.9  174.56  621.26
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174.97	621.4	176.77	622	179.88	622.93	181.82	623.47	182.08	623.54
182.29	623.61	182.94	623.78	183.76	624	184.01	624.06	185.04	624.32
185.37	624.41	186.06	624.59	186.3	624.65	187.85	625.06	189.7	625.54
190.72	625.8	191.04	625.89	191.47	626	193.34	626.42	193.66	626.49
195.06	626.8	195.59	626.92	197.34	627.3	198.37	627.53	200.14	627.92
200.5	628	210.37	627.87	212.74	627.71	213.98	627.62	214.31	627.6
215.54	627.51	216.98	627.42	217.49	627.38	217.92	627.36	220.01	627.21
220.6	627.18	220.93	627.16	221.31	627.13	222.94	627.04	223.84	626.98
224.24	626.96	225.66	626.86	226.2	626.83	227.42	626.77	228.13	626.73
228.6	626.7	229.47	626.65	229.93	626.62	230.94	626.58	231.41	626.55
233.34	626.46	234.02	626.42	234.27	626.41	236.36	626.32	236.83	626.29
237.06	626.28	239.28	626.2	239.53	626.18	241.32	626.12	244.32	626.03
245.94	626	251.52	625.98	252.83	625.97	255.06	625.96	256.5	625.95
258.07	625.93	259.55	625.92	261.93	625.89	262.97	625.87	265.64	625.82
266.95	625.79	267.19	625.78	268.97	625.74	269.37	625.73	269.92	625.71
270.42	625.7	271.82	625.67	272.04	625.66	272.52	625.65	272.93	625.63
275.03	625.58	276.18	625.55	276.74	625.52	277.74	625.5	277.96	625.49
279.98	625.43	281.41	625.38	282.21	625.36	282.74	625.34	283.99	625.3
284.35	625.29	284.88	625.27	285.53	625.25	286.24	625.23	286.87	625.21
287.17	625.2	287.93	625.18	288.35	625.17	289.51	625.13	290.31	625.1
291.03	625.08	291.93	625.05	292.41	625.03	292.7	625.02	293.38	625
293.94	624.98	295.45	624.93	295.7	624.92	296.4	624.89	296.85	624.88
297.46	624.86	299.29	624.79	300.46	624.75	301.56	624.71	301.98	624.7
302.48	624.68	304.59	624.6	304.89	624.59	306.29	624.54	307.59	624.5
307.89	624.49	308.41	624.47	308.83	624.46	317.29	624.15	320.75	624
323.44	623.38	323.84	623.26	324.5	623.09	324.85	622.99	326.31	622.53
327.17	622.29	328.12	622	329.51	621.21	329.75	621.06	329.87	620.99
331.52	620	334.63	618	337.71	616	338.73	615.34	339.42	614.89
340	614.51	340.79	614	341.3	613.66	341.94	613.25	343.85	612
344.1	611.84	346.91	610	347.54	609.59	348.06	609.24	348.56	608.92
348.76	608.79	349.96	608	351.23	607.17	353.39	605.75	353.58	605.62
356.04	604	356.24	603.87	356.54	603.67	357.99	602.71	361.2	600.6
362.1	600	362.57	599.68	365.11	598	366.82	596.86	368.12	596
368.33	595.86	371.14	594	373.43	592.47	374.12	592	374.64	591.63
376.92	590	378.75	588.69	379.72	588	426	586.8	427	586.4
428	586	456	582.4	481	581.6	516	582.9	541	584.4
568	585	569	586	570	586.8	591	587.9	641	587.5
746.02	589.51	747.27	590	748.51	590.49	752.39	592	753.25	592.12
753.36	592.15	753.49	592.17	753.8	592.22	753.87	592.23	758.67	592.96
761.09	593.39	761.92	593.55	762.84	593.73	763.55	593.84	764.29	594
766.05	594.25	766.12	594.26	766.22	594.28	766.47	594.32	766.6	594.34
770.29	594.87	770.82	594.95	771.05	594.98	771.79	595.09	772.53	595.2
773.68	595.36	774.4	595.47	774.79	595.53	776.4	595.77	777.61	595.95
777.71	595.97	777.92	596	778	596.02	778.55	596.12	778.61	596.14
780.35	596.5	780.67	596.57	781.44	596.73	782.3	596.91	782.5	596.95
786.71	598	789.51	598.05	790.62	598.06	793.56	598	905.28	597.44
911.86	596	912.09	595.92	915.23	594.87	917.87	594	918.63	593.74
920.26	593.26	923.98	592	924.61	591.72	927.29	591.04	927.93	590.94
928.57	590.85	929.78	590.69	935.1	590.64	935.45	590.61	935.65	590.6
936.1	590.57	936.52	590.55	936.85	590.53	937.15	590.53	937.59	590.55
938.43	590.65	941.78	590.62	942.26	590.61	943.01	590.68	943.67	590.72
946.83	590.69	947.88	590.72	948.16	590.75	954.02	590.69	954.55	590.68
957.65	590.65	958.54	590.64	962.34	590.61	967.27	590.56	967.91	590.55
971.9	590.51	973.22	590.5	975.64	590.47	982.53	590.41	986.42	590.37
986.69	590.36	989.32	590.33	989.53	590.32	989.94	590.31	990.41	590.27
996.26	590.21	996.6	590.19	999.32	590.17	999.55	590.16	1003.12	590.13
1003.53	590.14	1015.95	590.2	1017.65	590.22	1018	590.23	1020.54	590.24
1020.98	590.25	1024.37	590.27	1028.59	590.32	1030.99	590.33	1036.64	590.34
1037.22	590.35	1037.64	590.34	1041.16	592	1106.9	592.32	1107.28	592.43
1108.24	592.73	1108.95	592.94	1109.44	593.09	1110.72	593.51	1112.65	594.06
1113.59	594.36	1114.02	594.49	1114.89	594.76	1116.13	595.15	1116.86	595.39
1117.07	595.46	1118.71	596	1119.28	596.2	1120.27	596.57	1120.47	596.64
1120.82	596.77	1122.78	597.52	1123.97	597.97	1124.85	598.03	1125.84	598.06
1133.32	598.31	1133.75	598.33	1134.44	598.35	1134.91	598.37	1136.36	598.42
1137.28	598.45	1137.97	598.47	1138.25	598.48	1138.68	598.49	1139.06	598.5
1139.6	598.53	1145.6	598.73	1146.6	598.76	1147.66	598.81	1148.81	598.85
1149.26	598.87	1150.41	598.91	1150.84	598.92	1152.27	598.98	1153.12	599.01
1154.04	599.05	1154.55	599.07	1155.74	599.11	1159.91	599.26	1160.28	599.28
1161.34	599.32	1162.25	599.35	1163.8	599.42	1164.31	599.43	1165.05	599.46
1166.44	599.52	1166.83	599.54	1169.16	599.63	1169.94	599.67	1171.39	599.72
1172.94	599.78	1175.41	599.88	1178.15	599.99	1178.45	600	1501.55	601.09

1522.35	601.2	1525.01	601.21	1536.16	601.27	1546.77	601.3	1549.01	601.31
1553.45	601.34	1572.37	601.44	1573.35	601.45	1587.6	601.53	1588.51	601.54
1613.32	601.66	1625.3	601.74	1628.55	601.75	1647.85	601.88	1662.52	601.75
1663.67	601.88	1664.58	602	1713.48	601.47	1718.59	600	1719.22	599.33
1720.49	598	1721.96	596.47	1722.41	596	1727.33	597.06	1729.55	598
1731.33	598.76	1731.56	598.86	1734.22	600	1743.89	599.71	1793.01	598.98
1793.35	598.98	1794.52	598.93	1799.84	598.47	1800.34	598.4	1801.14	598.33
1802.57	598.24	1802.99	598.21	1803.54	598.22	1803.8	598.21	1805.25	598.2
1807.19	598.22	1808.14	598.21	1811.4	598.14	1812.84	598	1840.43	598.35
1842.05	598.54	1852.94	600	2189.26	600.25	2195.8	600.38	2196.55	600.39
2201.88	600.5	2245.1	601.31	2246.51	601.33	2249.09	601.39	2257.22	601.54

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	365.11	.043	786.71	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
365.11	786.71	61.83	72.73	116.44	.1	.3

Ineffective Flow num= 3

Sta L	Sta R	Elev	Permanent
0	200.14	628	F
786.71	1170	598	F
1664.58	2257.22	602	F

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 63170.51

INPUT
Description:
Station Elevation Data num= 496

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	608.38	5.27	608.64	7.25	608.73	32.94	609.94	34.14	610
35.71	610.63	37.43	611.33	39.04	612	41.95	613.22	43.84	614
45.38	614.63	46.81	615.2	49.93	616.43	53.95	618	87	617.86
89.76	617.34	90.81	617.1	92.75	616.66	94.7	616.29	97.8	615.2
99.85	614.46	101.05	614.05	102.39	613.75	103.71	613.49	104.96	613.26
106.67	612.95	107.8	612.76	109.1	612.51	111.57	612.02	156.02	612.04
157.59	612.36	159.15	612.65	161.64	613.21	165.26	614	166.7	614.46
171.39	616	173.1	616.6	175.24	617.34	177.12	618	181.68	619.6
184.63	620.6	186.61	621.27	188.78	622	191.29	622.78	192.41	623.13
194.89	623.93	196.63	624.46	197.8	624.8	199.59	625.33	201.06	625.77
204.54	626.63	206.58	627.08	210.63	628	242.95	627.93	244.67	627.87
245.88	627.83	249.02	627.71	251.66	627.62	257.46	627.41	258.51	627.38
259.97	627.32	261.11	627.29	262.18	627.25	266.17	627.12	269.22	627.01
270.88	626.97	276.83	626.78	277.86	626.74	281.14	626.65	285.02	626.53
286.18	626.49	299.43	626.09	301.6	626.03	304.93	625.65	305.98	625.43
307.75	625.15	309.03	624.86	310.18	624.66	312.87	624	313.65	623.54
314.83	622.84	316.34	622	318.22	620.71	319.26	620	320.45	619.17
322.12	618	323.64	616.93	324.97	616	326.81	614.71	328.36	613.62
330.65	612	335.29	608.73	336.33	608	338.59	606.4	339.15	606
340.75	604.88	341.98	604	344.52	602.2	346.16	601.03	347.92	599.78
350.01	598.29	350.99	597.59	353.21	596	353.95	595.47	354.84	594.83
355.99	594	356.91	593.33	358.72	592	359.68	591.32	361.53	590
401.44	589.11	403.82	588.48	405.7	588	426	586.8	427	586.4
428	586	456	582.4	481	581.6	516	582.9	541	584.4
568	585	569	586	570	586.8	591	587.9	641	587.5
646.8	588.41	647.34	588.47	648.23	588.58	653.05	589.09	654.45	589.32
656.21	589.69	757.52	590	757.94	590.14	758.02	590.16	758.14	590.19
758.25	590.22	759.57	590.61	760.03	590.74	760.31	590.81	761.18	591.04
763.07	591.56	764.17	591.88	764.36	591.93	764.39	591.94	764.62	592
765.62	592.21	766.63	592.42	766.85	592.47	767.31	592.56	768.15	592.74
768.39	592.79	768.93	592.9	769.56	593.02	769.89	593.1	770.47	593.24
770.83	593.32	771.37	593.43	771.76	593.52	772.78	593.79	772.82	593.8
773.53	593.97	773.66	594	774.53	594.14	774.65	594.16	776.28	594.41
776.34	594.42	776.47	594.45	777.42	594.6	778	594.7	778.62	594.79
778.96	594.85	779.79	595	780.38	595.08	780.98	595.18	781.64	595.29
782.2	595.39	782.69	595.45	783.57	595.6	784.14	595.71	784.31	595.74
785.28	595.9	785.34	595.91	785.78	596	786.95	596.16	787.02	596.17

787.09	596.18	787.74	596.28	788.91	596.44	789.39	596.5	789.88	596.58
790.59	596.67	791.44	596.8	792.33	596.94	792.73	596.98	793.49	597.07
794.45	597.22	795.55	597.33	795.73	597.36	795.98	597.38	796.35	597.42
796.9	597.5	797.03	597.52	798.94	597.68	801.07	597.88	802.36	597.99
851.71	599.06	858.62	599.25	865.06	599.41	868.85	599.54	871.95	599.61
873.56	599.66	880.59	599.89	883.6	600	886.52	601.02	888.8	601.78
893.02	603.25	895.14	604	896.79	604.6	900.72	606	901.95	606.42
906.21	608	913.45	609.33	914.63	609.45	918.48	609.73	920.98	609.95
923.44	610.11	924.58	610.19	926.03	610.3	927.4	610.39	929.31	610.53
930.5	610.59	932.83	610.74	939.07	611.07	940.11	611.11	941.63	611.18
946.3	611.37	947.31	611.4	951.69	611.61	953.25	611.7	954.54	611.78
957.46	611.97	958.66	612.08	959.78	612.19	961.92	612.36	964.85	612.62
968.3	612.87	969.62	612.94	970.91	613	972.12	613.06	974.6	613.21
975.8	613.26	977.05	613.35	985.43	613.89	987.23	614	989.46	614.12
990.86	614.2	992.31	614.29	994.56	614.42	995.77	614.5	997.74	614.61
999.9	614.71	1001.19	614.74	1003	614.77	1004.39	614.78	1009.37	614.74
1012.52	614.41	1013.92	614.25	1015.9	614	1017.31	613.81	1018.94	613.6
1020.29	613.43	1021.86	613.25	1025.9	612.76	1029.85	612.32	1030.96	612.21
1032.08	612.09	1034.01	611.9	1036.17	611.71	1040.78	611.36	1042.28	611.27
1044.16	611.14	1046.02	611.02	1049.03	610.81	1058.11	610.08	1060.19	609.91
1061.97	609.76	1064.53	609.54	1066.25	609.4	1068.23	609.25	1072.17	608.94
1075.5	608.67	1077.65	608.51	1079.33	608.41	1080.78	608.32	1081.97	608.26
1083.04	608.2	1086.14	608.05	1089.72	607.84	1092.17	607.68	1093.62	607.58
1096.53	607.36	1101.93	606.93	1103.35	606.82	1107.47	606.49	1108.52	606.4
1109.87	606.3	1112.04	606.12	1115.75	605.84	1117.83	605.7	1120.17	605.55
1126.17	605.18	1127.29	605.1	1128.61	605.01	1129.94	604.91	1131.36	604.8
1137.86	604.34	1139.05	604.26	1143.3	604	1146.04	603.84	1148.17	603.72
1149.56	603.65	1154.24	603.4	1156.92	603.25	1158.17	603.17	1159.74	602.99
1161.8	602.57	1166.44	601.65	1167.53	601.43	1168.61	601.22	1170.13	600.92
1172.43	600.46	1177.47	599.46	1181.72	598.6	1183.91	598.15	1186.23	597.7
1188.23	597.33	1189.6	597.09	1191.78	596.7	1194.81	596.18	1195.93	596
1197.07	595.85	1201.38	595.29	1202.49	595.15	1207.38	594.49	1209.34	594.22
1210.51	594.07	1212.27	593.97	1214.38	593.91	1216.45	593.86	1218.88	593.81
1220.6	593.77	1223.27	593.7	1224.72	593.67	1231.82	593.48	1233.54	593.44
1234.93	593.4	1238.74	593.31	1239.8	593.27	1243.45	593.17	1246.33	593.11
1247.86	593.06	1249.08	593.04	1250.24	593	1251.38	592.98	1254.34	592.9
1268.35	594	1283.6	593.93	1287.14	593.15	1288.62	592.83	1292.21	592
1303.2	592.36	1306.38	593.43	1307.8	593.91	1309.74	594.56	1312.47	595.49
1313.95	596	1316.1	596.76	1319.77	598	1327.08	598.24	1329.32	598.33
1338.16	598.63	1339.18	598.67	1344.16	598.84	1347.45	598.94	1349.37	598.99
1350.5	599.03	1353.16	599.11	1354.96	599.17	1356.4	599.21	1362.16	599.4
1363.5	599.45	1365.45	599.53	1366.82	599.58	1368.3	599.64	1374.27	599.86
1375.76	599.9	1376.77	599.94	1378.14	599.98	1427.21	600.14	1428.91	600.15
1442.86	600	1697	601.07	1702.21	602	1751.94	600.47	1753.88	600
1754.92	599.09	1756.18	598	1758.24	596.36	1759.06	595.71	1761.24	594
1765.45	595.37	1766.12	596	1767.95	597.73	1779	598.85	1780.3	598.87
1783.61	598.91	1788.55	599.2	1810.67	600	1914.57	599.99	1921.1	599.41
1922.19	599.34	1923.72	599.21	1924.91	599.14	1927.51	598.95	1930.28	598.73
1932.06	598.56	1934.29	598.36	1936.73	598.05	1939.66	597.69	1942.3	597.45
1943.44	597.34	1944.67	597.21	1947.16	597.07	1949.59	596.9	1950.78	596.79
1952.86	596.53	1954.89	596.17	1956.64	595.91	1959.25	595.68	1960.86	595.63
1961.97	595.58	1963.53	595.59	1966	595.56	1968.28	595.5	1970.35	595.38
1972.43	595.24	1975.08	595.01	1978.65	594.71	1980.17	594.51	1985	594.03
2039.47	594.17	2041.74	594.46	2042.97	594.52	2046.12	594.6	2047.9	594.58
2049.49	594.54	2053.09	594.47	2055.87	594.48	2057.05	594.51	2059.46	594.58
2064.07	594.8	2066.05	594.92	2068.05	595.03	2069.62	595.14	2070.65	595.21
2072.75	595.37	2075.65	595.65	2078.29	596	2079.73	596.22	2081.64	596.54
2083.21	596.77	2084.55	596.92	2088.56	597.26	2089.57	597.32	2092.79	597.53
2094.98	597.66	2097.57	597.83	2098.87	597.91	2100.16	598	2103.77	598.23
2104.94	598.31	2107	598.44	2108.43	598.54	2109.99	598.64	2124.14	598.13
2126.97	598.15	2154.53	600	2244.09	600.06	2261.55	600.46	2321.6	601.64
2326.19	602	2330.76	602.1	2370.06	603.11	2371.44	603.15	2405.23	604
2435.69	604.21								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	350.99	.043	798.94	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
350.99	798.94	763.32	645.62	374.25	.1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	210.63	628	F
1004.39	2435.69	614.78	F

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 62524.89

INPUT
Description:
Station Elevation Data num= 310

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	609.79	3.06	610	83.31	610.86	136.86	612	146.82	610.6
147.48	610.46	147.9	610.37	149.38	610.06	149.65	610	149.92	609.94
159.33	608	164.82	607.44	165.64	607.36	168.39	607.08	168.92	607.04
169.76	606.96	171.02	606.87	172.5	606.72	174.54	606.58	175	606.54
176.19	606.45	176.38	606.43	181.13	606	185.08	605.84	187.35	605.67
188.5	605.57	189.16	605.52	191.35	605.33	191.67	605.31	192.12	605.26
192.77	605.22	193.76	605.15	195.74	604.95	198.1	604.81	199.43	604.72
201.23	604.61	203.73	604.46	204.17	604.42	205.92	604.32	207.32	604.24
211.41	604	213.59	603.87	216.58	603.67	221.08	603.18	224.78	602.86
225.55	602.8	228.58	602.39	229.31	602.32	229.39	602.31	231.49	602
234.31	600.89	236.24	600.13	236.44	600.05	236.56	600	238.9	599.09
239.57	598.83	241.73	598	242.54	597.68	243.63	597.26	245.37	596.58
246.89	596	249.19	595.15	249.5	595.03	250.4	594.7	252.3	594
253.9	593.49	257.55	592.22	257.97	592.08	257.99	592.07	258.02	592.06
258.09	592.04	258.11	592.03	258.21	592	258.56	591.87	263.38	590
264.12	589.63	266.32	588.52	267.12	588.12	267.33	588	267.33	586.4
268	585.5	307	584.3	357	584	397	584.4	451	585.5
452	586.4	483.48	588.31	484.28	588.54	487.01	589.35	489.17	590
494.88	591.24	496.85	591.66	497.47	591.8	498.39	592	499.73	592.44
504.51	594	508.13	595.34	509.9	596	515.38	598	516.5	598.41
520.84	600	634.91	600	635.89	600.29	636.23	600.38	637.3	600.68
637.59	600.76	638.74	601.09	639.61	601.31	639.74	601.35	640.6	601.57
640.64	601.58	640.72	601.6	641.24	601.73	641.51	601.8	642.36	602
643.27	602.24	643.35	602.26	643.62	602.33	645.12	602.72	645.67	602.86
645.99	602.94	646.41	603.05	647.03	603.21	647.58	603.35	648.85	603.68
649	603.72	649.68	603.89	649.75	603.91	650.1	604	650.96	604.24
651.13	604.29	652.21	604.59	652.68	604.72	653.21	604.87	654.08	605.11
655.58	605.53	655.86	605.61	656.05	605.66	656.17	605.7	656.65	605.83
656.73	605.86	657.24	606	658.12	606.26	658.42	606.34	658.93	606.49
659.49	606.65	660.57	606.96	661.26	607.16	661.68	607.28	662.42	607.49
662.73	607.58	664.25	608	664.29	608.01	664.97	608.19	665.34	608.28
665.59	608.35	667.06	608.73	667.12	608.74	668.14	609	669.16	609.26
669.22	609.27	669.26	609.28	669.5	609.34	671.1	609.74	671.31	609.79
671.38	609.81	672.13	610	672.9	610.19	673	610.21	673.55	610.35
673.91	610.44	674.69	610.63	674.88	610.68	675.71	610.88	676.07	610.98
676.5	611.08	677.42	611.31	677.87	611.43	678.63	611.62	680.01	611.98
680.1	612	682.03	612.52	682.18	612.56	682.35	612.61	682.45	612.64
683.2	612.85	683.57	612.96	683.66	612.98	684.31	613.17	684.45	613.21
686.26	613.76	686.35	613.78	686.53	613.84	687.05	614	687.8	614.24
688.08	614.33	689.18	614.68	689.54	614.79	689.79	614.87	691.08	615.28
692.1	615.59	692.14	615.6	692.63	615.75	692.82	615.81	692.98	615.86
693.27	615.95	693.45	616	695.18	616.53	695.61	616.66	696.33	616.87
696.78	617	697.34	617.17	698.44	617.48	699.17	617.69	699.47	617.77
699.88	617.89	699.91	617.9	700.29	618	701.67	618.37	702.15	618.5
702.24	618.53	702.33	618.55	703.84	618.95	704.9	619.23	705.48	619.38
705.81	619.47	706.41	619.63	706.55	619.67	707.79	620	708.16	620.09
708.26	620.11	709.28	620.35	709.37	620.37	709.52	620.41	710.53	620.65
711.19	620.8	712.29	621.05	712.94	621.2	713.13	621.25	713.25	621.27
714.18	621.49	714.64	621.59	714.65	621.6	716.28	621.97	716.41	622
716.85	622.1	717.18	622.17	717.35	622.21	718.98	622.56	719.28	622.63
719.34	622.65	719.87	622.77	721.14	623.06	722.57	623.41	723.04	623.52
723.16	623.55	723.23	623.56	723.57	623.65	723.69	623.67	725.04	624
725.17	624.03	725.51	624.1	725.95	624.2	726.12	624.23	727.63	624.56
728.42	624.74	729.25	624.91	729.27	624.92	729.34	624.93	729.87	625.04
731.25	625.35	731.73	625.45	731.96	625.49	733.31	625.79	733.38	625.81
734.1	625.96	734.12	625.97	734.26	626	735.18	626.2	736.29	626.44
736.78	626.55	737.45	626.7	737.61	626.73	737.87	626.79	738.73	626.98

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  739.77  627.22  740.56  627.39  741.42  627.59  741.46   627.6  741.61  627.63
  742.69  627.88  742.77   627.9   743.2     628  745.06  628.42  745.53  628.52
  746.82  628.81  747.09  628.87  747.42  628.94  748.35  629.15  749.11  629.31
   749.6  629.42  749.75  629.45  750.38  629.59  750.53  629.62  751.34  629.79
  751.49  629.82  751.57  629.84  751.65  629.86  752.35     630  929.26     630

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  231.49    .043  494.88    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        231.49  494.88           467.59  463.22   457.8             .3       .5
Left Levee      Station=  136.31      Elevation=  611.99

CROSS SECTION


RIVER: Des Plaines
REACH: 1                  RS: 62061.6*

INPUT
Description:
Station Elevation Data    num=     186
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     2.1  608.49    4.77  608.66   74.78   609.3  121.49   610.2  130.18  609.02
  130.76   608.9  131.12  608.83  132.41  608.57  132.89  608.47  141.09  606.84
     149  606.06  150.19  605.96  151.29  605.89  152.58  605.76  154.36  605.64
   155.8  605.53  158.65  605.28  160.11  605.13  163.56  604.96  165.54  604.79
  166.54  604.69  169.03  604.46   169.7  604.39  171.13  604.28  172.86  604.09
  174.92  603.95  176.08  603.86  179.83  603.59  181.74  603.45  182.96  603.37
  188.43  602.99  191.04  602.79  194.43  602.39  194.96  602.33  198.19  602.02
  198.86  601.96   201.5  601.59  202.14  601.52  204.04  601.23  206.85  600.17
  208.77  599.45  208.88   599.4  208.96  599.37  209.08  599.32  209.63  599.12
  211.41  598.46  212.08  598.21  214.22  597.42  215.03  597.11  216.01  596.75
  216.11  596.71  217.84  596.07  218.56  595.81  219.35  595.52  220.46  595.13
  221.16  594.88  221.64  594.71  221.95  594.59  222.84  594.28  223.43  594.07
  224.73   593.6  226.32   593.1  229.12  592.14   229.8  591.91  229.84   591.9
  229.95  591.86  230.09  591.81  230.37  591.72  230.39  591.71  230.42   591.7
  230.49  591.68  230.51  591.67  230.61  591.64  230.96  591.52  235.75  589.71
  236.49  589.37  236.62   589.3  237.19  588.79  237.19  588.64  238.67  588.01
  239.47  587.67  239.68  587.57  239.68  586.24  240.34  585.48  277.35  584.35
  279.12   584.3  328.83     584  349.48  584.21  377.36  584.58  377.87  584.73
  378.06  584.74  391.45  585.26  394.27  585.56  396.28  585.77  397.97  585.94
   400.3  586.17     402  586.33  425.98  586.63  427.92  586.61  442.55  586.56
  444.52  586.64  445.75  587.42  452.11  587.86  452.91  587.94  453.45  587.98
  453.49  587.98  454.05  588.06  457.25  588.47   459.2  588.68  459.81  588.75
  460.21  588.79  462.44  589.02  484.49  590.08  485.48  590.28  488.84  590.97
  491.49  591.53  498.52  592.61  500.29  592.85  500.99  592.95   501.4  593.04
  501.98  593.16  502.17  593.21  503.06   593.4  503.41  593.48  503.94  593.59
  504.68   593.8  505.45  594.05  505.87  594.19  506.06  594.26  506.43  594.39
  506.98  594.59  507.29   594.7  507.52  594.78   508.1     595  508.64   595.2
  509.03  595.34  509.21  595.41  510.07  595.73  510.59  595.92  515.41  596.74
  515.89  596.83  532.17     600    1000     600 1023.83  624.67 1033.64  624.88
 1037.32     625 1050.62  625.33 1149.06  625.34 1151.19   625.4 1154.77  625.49
 1192.93  625.88 1194.75     626 1195.48   626.1 1196.33   626.2 1196.84  626.27
 1197.26  626.33 1198.43   626.6 1198.75  626.67 1199.47  626.82 1199.98  626.92
 1200.36     627 1201.66  627.24 1202.18  627.33 1203.12  627.52  1203.9  627.67
 1205.31  627.97 1205.78  628.07 1206.37   628.2    1207  628.33 1207.84  628.52
 1208.54  628.67 1210.16     629 1211.06  629.17 1211.96  629.33 1213.22   629.5
 1214.55  629.67 1216.82  629.73  1219.2  629.79 1222.31  629.85  1224.8  629.9
 1230.71  629.98  1233.8  630.01 1239.01  630.05 1242.18  630.09 1251.49     630
 1260.39     630

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     2.1    .075  204.04    .043  498.52    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        204.04  498.52           467.59  463.22   457.8             .3       .5
Left Levee      Station=  121.59      Elevation=  610.19
```

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 61598.4*

INPUT
Description:
Station Elevation Data num= 238

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4.21	607.19	6.49	607.33	66.25	607.74	106.13	608.39	113.54	607.44
114.03	607.34	115.45	607.07	115.85	606.99	122.86	605.68	126.95	605.3
127.56	605.24	129.61	605.05	131.56	604.9	132.67	604.8	134.19	604.7
135.41	604.61	137.85	604.41	139.09	604.27	142.04	604.07	143.73	603.91
145.07	603.77	146.7	603.59	147.28	603.53	147.93	603.47	149.97	603.24
152.07	603.06	152.72	603	155.92	602.73	163.27	602.11	165.49	601.91
168.39	601.54	168.84	601.48	172.17	601.12	174.43	600.78	174.97	600.72
176.6	600.46	179.38	599.45	181.29	598.76	181.41	598.72	181.49	598.69
181.61	598.65	182.16	598.45	183.92	597.82	184.58	597.59	186.72	596.83
187.52	596.54	188.49	596.2	188.6	596.16	190.32	595.55	191.03	595.31
191.82	595.03	192.92	594.66	193.61	594.42	194.09	594.26	194.4	594.15
195.29	593.85	195.87	593.65	197.17	593.2	198.75	592.71	201.53	591.78
202.2	591.55	202.24	591.53	202.36	591.49	202.5	591.45	202.77	591.36
202.79	591.35	202.82	591.34	202.89	591.32	202.91	591.31	203.01	591.28
203.36	591.16	208.12	589.42	208.85	589.1	208.99	589.04	209.55	588.32
209.55	588.02	211.03	587.5	211.82	587.22	212.03	587.14	212.03	586.08
212.69	585.47	249.48	584.34	251.24	584.3	300.67	584	325.18	584.25
358.28	584.76	358.9	585.07	359.12	585.08	375.02	585.9	378.37	586.45
380.76	586.83	382.77	587.15	385.52	587.57	387.55	587.86	416.02	588.06
418.33	587.99	435.69	587.64	438.04	587.78	439.5	588.45	447.05	589.01
448	589.12	448.65	589.18	448.69	589.19	449.36	589.31	453.15	589.98
455.47	590.31	456.2	590.41	456.67	590.47	459.32	590.82	485.5	591.84
486.67	592.01	490.66	592.6	493.82	593.07	502.16	593.99	503.86	594.16
505.69	594.36	506.27	594.49	507.38	594.73	508.38	594.94	508.66	595
509.15	595.11	509.9	595.27	510.97	595.59	511.58	595.8	512.07	595.96
512.67	596.15	512.94	596.25	513.47	596.45	514.26	596.74	515.03	597.02
516.63	597.65	517.19	597.88	517.44	597.97	519.42	598.74	526.31	599.47
527	599.56	530	600	674.34	600	674.8	599.94	677.27	599.08
678.29	598.72	679.84	598.33	680.79	598.09	681.04	598.02	682.2	597.71
682.64	597.61	682.99	597.53	683.54	597.41	685.15	597.05	685.75	596.91
686.64	596.71	687.45	596.54	688.02	596.41	689.58	596.09	691.42	595.7
691.71	595.64	692.2	595.49	693.99	594.95	694.55	594.79	695.64	594.35
696.67	594	699.93	593.34	702.12	593.54	702.5	593.62	703.53	593.83
704.42	594.02	710.34	594.24	712.67	594.34	722.49	594.72	753.8	594.68
756.51	594.76	760.35	594.89	764.23	595.02	768.3	595.17	770.28	595.24
774.27	595.41	778.38	595.59	781.76	595.74	783.12	595.8	787.01	596
796.66	596.5	798.97	596.61	802.68	596.81	807.44	597.05	808.45	597.11
809.98	597.19	815.34	597.46	816.67	597.53	817.83	597.6	824.47	597.93
825.71	598	830.32	598.26	831.72	598.33	832.72	598.39	835.91	598.58
845.89	599.17	852.29	599.59	853.34	599.66	855.8	599.85	856.65	599.91
859.33	600	1300	600	1431.87	620.67	1433.48	620.73	1434.82	620.78
1436.88	620.84	1440.5	620.98	1495.06	621.75	1497.67	622	1499.92	622.41
1500.65	622.55	1501.25	622.67	1502.92	623.19	1503.38	623.33	1505.15	623.84
1505.69	624	1507.54	624.47	1510.75	625.33	1512.77	625.93	1512.99	626
1513.44	626.14	1515.18	626.67	1517.38	627.33	1519.7	628	1522.27	628.67
1524.19	629.02	1525.98	629.33	1529.22	629.46	1535.23	629.65	1538.68	629.76
1544.56	629.87	1549.09	629.96	1552.68	630.02	1560.95	630.11	1564.66	630.16
1568.39	630.22	1578.8	630	1591.53	630				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4.21	.075	176.6	.043	502.16	.075

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
176.6 502.16 467.59 463.22 457.8 .3 .5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
530	1591.53	600	F

Left Levee Station= 106.13 Elevation= 610
Right Levee Station= 530 Elevation= 600

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 61135.2*

INPUT
Description:
Station Elevation Data num= 184

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
6.31	605.9	8.2	605.99	57.72	606.18	90.76	606.59	96.9	605.86
97.31	605.79	98.82	605.52	104.62	604.52	108.01	604.22	110.21	604.03
111.06	603.97	112.75	603.84	114.01	603.76	115.03	603.69	117.04	603.54
118.08	603.4	120.51	603.19	121.91	603.03	122.62	602.94	124.38	602.72
124.86	602.66	125.4	602.6	127.09	602.38	128.55	602.23	132.02	601.86
138.1	601.23	139.95	601.03	142.35	600.68	143.4	600.54	145.01	600.34
145.48	600.29	147.35	599.98	147.8	599.92	149.15	599.68	151.92	598.73
153.82	598.08	153.93	598.04	154.01	598.01	154.13	597.97	154.68	597.79
156.43	597.19	157.09	596.97	159.21	596.25	160.01	595.98	160.98	595.65
161.08	595.62	162.79	595.04	163.5	594.81	164.28	594.55	165.37	594.2
166.07	593.97	166.55	593.82	166.85	593.71	167.73	593.43	168.32	593.24
169.6	592.81	171.17	592.31	173.93	591.41	174.61	591.18	174.65	591.17
174.76	591.13	174.9	591.09	175.17	591	175.19	590.99	175.22	590.98
175.29	590.96	175.31	590.95	175.41	590.92	175.75	590.81	180.49	589.13
181.22	588.84	181.35	588.78	181.91	587.84	181.91	587.39	183.38	586.99
184.17	586.78	184.37	586.71	184.37	585.91	185.03	585.45	221.61	584.33
223.36	584.29	272.5	584	300.89	584.28	339.21	584.95	339.92	585.4
340.18	585.41	358.6	586.54	362.47	587.33	365.24	587.9	367.56	588.36
370.75	588.96	373.1	589.4	406.06	589.49	408.74	589.37	428.84	588.73
431.56	588.92	433.25	589.47	441.99	590.16	443.09	590.3	443.84	590.38
443.89	590.39	444.66	590.55	449.06	591.48	451.75	591.93	452.58	592.07
453.13	592.15	456.2	592.61	486.52	593.61	487.87	593.75	492.49	594.22
496.14	594.6	505.8	595.36	508.01	595.55	510.39	595.77	511.15	595.93
512.59	596.25	513.9	596.53	514.25	596.6	514.89	596.74	515.23	596.81
515.87	596.95	517.25	597.39	518.06	597.66	519.47	598.11	519.82	598.25
521.54	598.9	522.11	599.11	522.53	599.27	524.62	600	738.46	600
739.96	599.78	740.54	599.65	741	599.56	741.71	599.41	743.8	598.95
745.74	598.53	751.96	597.3	752.33	597.23	752.97	597.04	756.03	596.11
757.45	595.52	758.78	595	759.37	594.86	760.07	594.7	761.35	594.39
763.02	594.01	765.87	594.3	767.71	594.74	768.86	595.01	775.18	595.29
776.56	595.34	779.6	595.48	781.09	595.54	790.47	595.95	792.36	596.04
833.09	595.93	841.61	596.07	851.95	596.27	860.75	596.45	869.46	596.65
878.5	596.9	887.6	597.15	893.76	597.33	896.67	597.4	904.17	597.62
913.14	597.87	926.62	598.24	932.62	598.44	935.74	598.54	941.12	598.72
944.03	598.81	961.18	599.44	965.75	599.64	971.29	599.87	973.68	599.98
974.48	600	1850	600	1873.2	630.04	1882.89	630.17	1885.95	630.21
1889.95	630.28	1892.97	630.33	1906.11	630	1922.66	630		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
6.31	.075	149.15	.043	505.8	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
149.15	505.8	467.59	463.22	457.8	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
524.62	1922.66	600	F

Left Levee Station= 90.76 Elevation= 610
Right Levee Station= 524.62 Elevation= 600

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 60672.0*

INPUT
Description:
Station Elevation Data num= 205

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8.41	604.6	9.91	604.65	49.18	604.62	75.39	604.78	80.27	604.28

80.59	604.23	81.52	604.09	86.39	603.36	91.08	603	92.11	602.94
92.83	602.88	94.06	602.81	96.24	602.66	97.06	602.54	98.99	602.31
100.1	602.15	100.66	602.06	102.06	601.85	102.44	601.79	102.87	601.73
104.21	601.53	106.89	601.16	108.12	601	109.19	600.85	114.41	600.15
116.61	599.78	117.15	599.7	118.42	599.5	120.28	599.17	120.68	599.11
121.7	598.91	124.46	598.01	126.34	597.4	126.46	597.36	126.54	597.33
126.66	597.3	127.2	597.12	128.94	596.56	129.6	596.35	131.71	595.67
132.5	595.41	133.46	595.1	133.56	595.07	135.26	594.53	135.97	594.31
136.75	594.06	137.83	593.73	138.52	593.52	139	593.37	139.3	593.27
140.18	593.01	140.76	592.83	142.04	592.41	143.6	591.92	146.34	591.04
147.01	590.82	147.05	590.81	147.17	590.77	147.3	590.72	147.58	590.64
147.6	590.63	147.62	590.62	147.69	590.6	147.71	590.6	147.81	590.56
148.15	590.45	152.86	588.85	153.58	588.57	153.72	588.52	154.28	587.36
154.28	586.76	155.73	586.48	156.52	586.33	156.72	586.28	156.72	585.75
157.38	585.44	193.74	584.32	195.48	584.29	244.33	584	276.59	584.32
320.14	585.13	320.95	585.73	321.24	585.75	342.17	587.17	346.57	588.22
349.72	588.97	352.35	589.58	355.98	590.36	358.64	590.93	396.1	590.92
399.14	590.75	421.99	589.82	425.07	590.05	427	590.49	436.94	591.31
438.19	591.48	439.03	591.59	439.09	591.59	439.97	591.8	444.96	592.99
448.02	593.55	448.97	593.72	449.59	593.83	453.07	594.41	487.53	595.38
489.07	595.48	494.31	595.84	498.47	596.13	509.45	596.74	512.16	596.94
515.09	597.18	516.03	597.38	517.36	597.68	517.8	597.77	519.41	598.11
519.85	598.21	520.63	598.37	521.05	598.46	521.84	598.64	523.54	599.19
524.53	599.52	525.31	599.77	526.27	600	806.13	600	807.06	599.93
812.5	598.91	812.95	598.82	813.75	598.58	817.51	597.44	817.75	597.37
819.26	596.7	820.9	596	821.62	595.81	822.48	595.6	824.06	595.19
826.12	594.67	829.62	595.05	831.88	595.64	832.13	595.71	833.31	596.01
841.09	596.37	842.79	596.44	862.24	597.36	912.38	597.18	916.72	597.21
922.86	597.25	929.09	597.3	935.59	597.36	938.77	597.38	946.44	597.46
951.74	597.51	957.16	597.57	965.55	597.68	968.92	597.72	984.71	597.92
999.89	598.12	1010.93	598.27	1027.52	598.48	1034.91	598.63	1038.76	598.69
1048.96	598.87	1062.53	599.13	1070.08	599.28	1077.07	599.45	1083.88	599.61
1087.15	599.71	1090.64	599.8	1094.62	599.89	1098.27	599.96	1101.13	600
2000	600	2108.27	615.09	2109.24	615.33	2111.92	616.38	2112.65	616.67
2115.48	617.69	2116.35	618	2119.31	618.95	2120.51	619.33	2124.45	620.67
2127.68	621.87	2128.04	622	2128.76	622.27	2130.11	622.79	2135.07	624.67
2138.79	626	2142.89	627.33	2145.79	627.99	2148.83	628.67	2154.03	628.91
2156.22	629.01	2159.47	629.14	2162.57	629.27	2165.32	629.37	2169.17	629.51
2175.52	629.65	2185.84	629.91	2188.85	629.99	2194.1	630.07	2204.84	630.22
2208.6	630.28	2212.08	630.35	2217.25	630.45	2233.42	630	2253.79	630

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8.41	.075	121.7	.043	509.45	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
121.7	509.45	467.59	463.22	457.8	.1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
526.27	2253.79	600	F

Left Levee Station= 75.39 Elevation= 610
Right Levee Station= 526.27 Elevation= 600

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 60208.8*

INPUT
Description:
Station Elevation Data num= 196

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10.52	603.3	60.02	602.98	63.63	602.7	64.55	602.59	68.15	602.2
70.14	602.08	71.43	602	72.92	601.92	74.25	601.86	75.43	601.79
76.04	601.67	77.47	601.42	78.29	601.26	78.71	601.18	79.74	600.98
80.25	600.88	80.61	600.82	81.32	600.67	85.01	599.98	86.99	599.62
88.86	599.27	90.27	598.97	90.89	598.85	91.83	598.66	93.2	598.37
93.5	598.31	94.26	598.14	97	597.3	98.87	596.72	98.98	596.68
99.06	596.66	99.18	596.62	99.72	596.46	101.45	595.92	102.1	595.73
104.2	595.08	104.99	594.84	105.95	594.55	106.05	594.52	107.74	594.02

```
 5711.28  662.56 5712.27  662.62 5715.51  662.95

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .07 2094.12    .038 4550.39     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       2094.12 4550.39          1312.55 1305.66  914.77             .1       .3
Left Levee      Station= 2094.14      Elevation=     610
```

SUMMARY OF MANNING'S N VALUES

River:Des Plaines

Reach	River Sta.	n1	n2	n3
1	257312.2	.19	.045	.19
1	257236.*	.19	.045	.19
1	257161.1	.19	.045	.19
1	256937.*	.19	.045	.19
1	256713.*	.19	.045	.19
1	256488.*	.19	.045	.19
1	256264.*	.19	.045	.19
1	256040.*	.19	.045	.19
1	255816.*	.19	.045	.19
1	255592.7	.19	.045	.19
1	255414.*	.19	.045	.19
1	255235.*	.19	.045	.19
1	255057.*	.19	.045	.19
1	254879.*	.19	.045	.19
1	254700.8	.19	.045	.19
1	254500.*	.19	.045	.19
1	254300.*	.19	.045	.19
1	254100.*	.19	.045	.19
1	253900.*	.19	.045	.19
1	253700.*	.19	.045	.19
1	253500.*	.19	.045	.19
1	253300.*	.19	.045	.19
1	253100.*	.19	.045	.19
1	252900.*	.19	.045	.19
1	252701.*	.19	.045	.19
1	252501.*	.19	.045	.19
1	252301.*	.19	.045	.19
1	252101.0	.19	.045	.19
1	252035.7	.19	.045	.19
1	252008	Bridge		
1	251971.8	.19	.045	.19
1	251791.*	.19	.045	.19
1	251611.*	.19	.045	.19
1	251431.7	.19	.045	.19
1	251099.7	.19	.045	.19
1	250960.6	.19	.045	.19
1	250464.6	.19	.045	.19
1	248624.1	.19	.045	.19
1	247996.4	.19	.045	.19
1	247888.5	.19	.045	.19
1	247718.6	.19	.045	.19
1	247621.9	.19	.045	.19
1	247228.4	.19	.045	.19
1	247113.4	.19	.045	.19
1	246632.0	.19	.045	.19
1	245740.2	.19	.045	.19
1	245275.2	.19	.045	.19
1	245145.2	.19	.045	.19
1	245140.2	Inl Struct		
1	245135.2	.19	.045	.19
1	244984.7	.19	.045	.19
1	244813.*	.19	.045	.19
1	244642.*	.19	.045	.19

1	86923.9*	.09	.05	.09
1	86425.9*	.09	.05	.09
1	85927.98	.09	.05	.09
1	85781.03	.09	.05	.09
1	85700	Bridge		
1	85683.39	.09	.05	.09
1	85557.71	.075	.048	.075
1	85218.0*	.075	.046	.075
1	84878.3*	.075	.045	.075
1	84538.60	.075	.043	.075
1	83788.26	.075	.043	.075
1	83026.35	.075	.043	.075
1	82725.92	.075	.043	.075
1	82700	Bridge		
1	82651.28	.075	.043	.075
1	82604.98	.075	.043	.075
1	82283.96	.075	.043	.075
1	82234.17	.075	.043	.075
1	82220	Bridge		
1	82199.67	.075	.043	.075
1	82141.78	.075	.043	.075
1	82120	Bridge		
1	82107.68	.075	.043	.075
1	81889.79	.075	.043	.075
1	80640.82	.075	.043	.075
1	79900.84	.075	.043	.075
1	79597.21	.075	.043	.075
1	78741.10	.075	.043	.075
1	77821.42	.075	.043	.075
1	77614.32	.075	.043	.075
1	77273.46	.075	.043	.075
1	76738.39	.075	.043	.075
1	76627.92	.075	.043	.075
1	76395.75	.075	.043	.075
1	76067.4*	.075	.043	.075
1	75739.06	.075	.043	.075
1	75327.5*	.075	.043	.075
1	74916.0*	.075	.043	.075
1	74504.4*	.075	.043	.075
1	74092.9*	.075	.043	.075
1	73681.42	.075	.043	.075
1	73262.0*	.075	.043	.075
1	72842.5*	.075	.043	.075
1	72423.1*	.075	.043	.075
1	72003.7*	.075	.043	.075
1	71584.3*	.075	.043	.075
1	71164.92	.075	.043	.075
1	71064.93	.075	.043	.075
1	69898.32	.075	.043	.075
1	69647.47	.075	.043	.075
1	69504.5	.075	.043	.075
1	69302.93	.075	.043	.075
1	67372.14	.075	.043	.075
1	66263.53	.075	.043	.075
1	64903.10	.075	.043	.075
1	64250.75	.075	.043	.075
1	64090.85	.075	.043	.075
1	63887.62	.075	.043	.075
1	63655.12	.075	.043	.075
1	63547.57	.075	.043	.075
1	63243.25	.075	.043	.075
1	63170.51	.075	.043	.075
1	62524.89	.075	.043	.075
1	62061.6*	.075	.043	.075
1	61598.4*	.075	.043	.075
1	61135.2*	.075	.043	.075
1	60672.0*	.075	.043	.075
1	60208.8*	.075	.043	.075
1	59745.58	.075	.043	.075
1	59256.1*	.075	.043	.075
1	58766.7*	.075	.043	.075

1		25619.6*		.07	.038	.07
1		25180.5*		.07	.038	.07
1		24741.4*		.07	.038	.07
1		24302.2*		.07	.038	.07
1		23863.1*		.07	.038	.07
1		23424.0*		.07	.038	.07
1		22984.9*		.07	.038	.07
1		22545.79		.07	.038	.07
1		22053.7*		.07	.038	.07
1		21561.7*		.07	.038	.07
1		21069.6*		.07	.038	.07
1		20577.6*		.07	.038	.07
1		20085.6*		.07	.038	.07
1		19593.6*		.07	.038	.07
1		19101.5*		.07	.038	.07
1		18609.5*		.07	.038	.07
1		18117.5*		.07	.038	.07
1		17625.4*		.07	.038	.07
1		17133.4*		.07	.038	.07
1		16641.4*		.07	.038	.07
1		16149.3*		.07	.038	.07
1		15657.3*		.07	.038	.07
1		15165.3*		.07	.038	.07
1		14673.2*		.07	.038	.07
1		14181.2*		.07	.038	.07
1		13689.2*		.07	.038	.07
1		13197.18		.07	.038	.07
1		12722.4*		.07	.038	.07
1		12247.6*		.07	.038	.07
1		11772.83		.07	.038	.07
1		11612.58		.07	.038	.07
1		11550	Bridge			
1		11442.25		.07	.038	.07
1		11147		.07	.038	.07
1		10747		.07	.038	.07
1		10647		.07	.038	.07
1		10550	Bridge			
1		10487		.07	.038	.07
1		10108.7*		.07	.038	.07
1		9730.46*		.07	.038	.07
1		9352.193		.07	.038	.07
1		8878.68*		.07	.038	.07
1		8405.17*		.07	.038	.07
1		7931.66*		.07	.038	.07
1		7458.16*		.07	.038	.07
1		6984.65*		.07	.038	.07
1		6511.14*		.07	.038	.07
1		6037.636		.07	.038	.07
1		5564.43*		.07	.038	.07
1		5091.24*		.07	.038	.07
1		4618.04*		.07	.038	.07
1		4144.84*		.07	.038	.07
1		3671.64*		.07	.038	.07
1		3198.45*		.07	.038	.07
1		2725.25*		.07	.038	.07
1		2252.05*		.07	.038	.07
1		1778.85*		.07	.038	.07
1		1305.659		.07	.038	.07

SUMMARY OF REACH LENGTHS

River: Des Plaines

Reach	River Sta.	Left	Channel	Right
1	257312.2	78.13	75.54	71.49
1	257236.*	78.13	75.54	71.49
1	257161.1	205.52	224.06	243.84

1	82120	Bridge			
1	82107.68	233.49	217.89	161.91	
1	81889.79	1483.6	1248.97	947.18	
1	80640.82	741.02	739.98	692.13	
1	79900.84	315.42	303.62	295.58	
1	79597.21	840.45	856.11	870.84	
1	78741.10	880.24	919.68	944.78	
1	77821.42	187.66	207.1	232.47	
1	77614.32	193.58	340.87	525.16	
1	77273.46	608.7	535.06	484.25	
1	76738.39	129.02	110.47	101.55	
1	76627.92	215.64	232.18	238.34	
1	76395.75	315.98	328.34	343.01	
1	76067.4*	315.98	328.34	343.01	
1	75739.06	421.65	411.53	401.83	
1	75327.5*	421.65	411.53	401.83	
1	74916.0*	421.65	411.53	401.83	
1	74504.4*	421.65	411.53	401.83	
1	74092.9*	421.65	411.53	401.83	
1	73681.42	426.49	419.42	399.98	
1	73262.0*	426.49	419.42	399.98	
1	72842.5*	426.49	419.42	399.98	
1	72423.1*	426.49	419.42	399.98	
1	72003.7*	426.49	419.42	399.98	
1	71584.3*	426.49	419.42	399.98	
1	71164.92	100	100	100	
1	71064.93	1178.08	1166.62	1209.65	
1	69898.32	246.3	250.85	263.97	
1	69647.47	134.48	142.97	159.89	
1	69504.5	196.88	201.57	210.73	
1	69302.93	1857.62	1930.79	2022.08	
1	67372.14	1174.18	1108.61	1019.91	
1	66263.53	1368.75	1360.44	1355.65	
1	64903.10	641.4	652.34	665.7	
1	64250.75	166.78	159.9	153.4	
1	64090.85	213	203.23	194.62	
1	63887.62	164.06	232.5	238.77	
1	63655.12	124.53	107.55	133.96	
1	63547.57	231.3	304.32	542.78	
1	63243.25	61.83	72.73	116.44	
1	63170.51	763.32	645.62	374.25	
1	62524.89	467.59	463.22	457.8	
1	62061.6*	467.59	463.22	457.8	
1	61598.4*	467.59	463.22	457.8	
1	61135.2*	467.59	463.22	457.8	
1	60672.0*	467.59	463.22	457.8	
1	60208.8*	467.59	463.22	457.8	
1	59745.58	490.27	489.41	489.27	
1	59256.1*	490.27	489.41	489.27	
1	58766.7*	490.27	489.41	489.27	
1	58277.3*	490.27	489.41	489.27	
1	57787.9*	490.27	489.41	489.27	
1	57298.5*	490.27	489.41	489.27	
1	56809.1*	490.27	489.41	489.27	
1	56319.7*	490.27	489.41	489.27	
1	55830.2*	490.27	489.41	489.27	
1	55340.8*	490.27	489.41	489.27	
1	54851.4*	490.27	489.41	489.27	
1	54362.0*	490.27	489.41	489.27	
1	53872.64	473.04	470.69	466.08	
1	53401.9*	473.04	470.69	466.08	
1	52931.2*	473.04	470.69	466.08	
1	52460.5*	473.04	470.69	466.08	
1	51989.8*	473.04	470.69	466.08	
1	51519.1*	473.04	470.69	466.08	
1	51048.4*	473.04	470.69	466.08	
1	50577.7*	473.04	470.69	466.08	
1	50107.1*	473.04	470.69	466.08	
1	49636.4*	473.04	470.69	466.08	
1	49165.7*	473.04	470.69	466.08	
1	48695.02	470.2	470.8	465.05	

1	15657.3*	490.83	492.03	493.13
1	15165.3*	490.83	492.03	493.13
1	14673.2*	490.83	492.03	493.13
1	14181.2*	490.83	492.03	493.13
1	13689.2*	490.83	492.03	493.13
1	13197.18	649.58	474.78	310.28
1	12722.4*	649.58	474.78	310.28
1	12247.6*	649.58	474.78	310.28
1	11772.83	139.59	160.25	143.36
1	11612.58	112.41	170.33	264.3
1	11550	Bridge		
1	11442.25	160	290	400
1	11147	400	400	400
1	10747	100	100	100
1	10647	160	160	160
1	10550	Bridge		
1	10487	378.33	378.33	378.33
1	10108.7*	378.33	378.33	378.33
1	9730.46*	378.33	378.33	378.33
1	9352.193	478.03	473.51	472.79
1	8878.68*	478.03	473.51	472.79
1	8405.17*	478.03	473.51	472.79
1	7931.66*	478.03	473.51	472.79
1	7458.16*	478.03	473.51	472.79
1	6984.65*	478.03	473.51	472.79
1	6511.14*	478.03	473.51	472.79
1	6037.636	466.68	473.2	467.8
1	5564.43*	466.68	473.2	467.8
1	5091.24*	466.68	473.2	467.8
1	4618.04*	466.68	473.2	467.8
1	4144.84*	466.68	473.2	467.8
1	3671.64*	466.68	473.2	467.8
1	3198.45*	466.68	473.2	467.8
1	2725.25*	466.68	473.2	467.8
1	2252.05*	466.68	473.2	467.8
1	1778.85*	466.68	473.2	467.8
1	1305.659	1312.55	1305.66	914.77

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Des Plaines

Reach	River Sta.	Contr.	Expan.
1	257312.2	.1	.3
1	257236.*	.1	.3
1	257161.1	.1	.3
1	256937.*	.1	.3
1	256713.*	.1	.3
1	256488.*	.1	.3
1	256264.*	.1	.3
1	256040.*	.1	.3
1	255816.*	.1	.3
1	255592.7	.1	.3
1	255414.*	.1	.3
1	255235.*	.1	.3
1	255057.*	.1	.3
1	254879.*	.1	.3
1	254700.8	.1	.3
1	254500.*	.1	.3
1	254300.*	.1	.3
1	254100.*	.1	.3
1	253900.*	.1	.3
1	253700.*	.1	.3
1	253500.*	.1	.3
1	253300.*	.1	.3
1	253100.*	.1	.3
1	252900.*	.1	.3

1		100981.4	.1	.3
1		100937.8	.3	.5
1		100903.4	Bridge	
1		100870.8	.3	.5
1		100728.5	.1	.3
1		99862.75	.1	.3
1		99283.76	.1	.3
1		98322.32	.1	.3
1		97901.20	.1	.3
1		97743.57	.1	.3
1		97613.98	.1	.3
1		96674.10	.1	.3
1		96072.37	.1	.3
1		95826.32	.1	.3
1		94845.81	.1	.3
1		93876.16	.1	.3
1		93749.18	.1	.3
1		93744.18	Inl Struct	
1		93739.18	.1	.3
1		93633.38	.1	.3
1		93298.31	.1	.3
1		93124.5*	.1	.3
1		92603.25	.1	.3
1		90981.94	.1	.3
1		89314.28	.1	.3
1		88959.03	.1	.3
1		88344.98	.1	.3
1		87883.4*	.1	.3
1		87421.90	.1	.3
1		86923.9*	.1	.3
1		86425.9*	.1	.3
1		85927.98	.1	.3
1		85781.03	.3	.5
1		85700	Bridge	
1		85683.39	.3	.5
1		85557.71	.1	.3
1		85218.0*	.1	.3
1		84878.3*	.1	.3
1		84538.60	.1	.3
1		83788.26	.1	.3
1		83026.35	.1	.3
1		82725.92	.3	.5
1		82700	Bridge	
1		82651.28	.1	.3
1		82604.98	.3	.5
1		82283.96	.3	.5
1		82234.17	.3	.5
1		82220	Bridge	
1		82199.67	.3	.5
1		82141.78	.3	.5
1		82120	Bridge	
1		82107.68	.3	.5
1		81889.79	.3	.5
1		80640.82	.1	.3
1		79900.84	.1	.3
1		79597.21	.1	.3
1		78741.10	.3	.5
1		77821.42	.1	.3
1		77614.32	.3	.5
1		77273.46	.3	.5
1		76738.39	.3	.5
1		76627.92	.3	.5
1		76395.75	.3	.5
1		76067.4*	.1	.3
1		75739.06	.1	.3
1		75327.5*	.1	.3
1		74916.0*	.1	.3
1		74504.4*	.1	.3
1		74092.9*	.1	.3
1		73681.42	.1	.3
1		73262.0*	.1	.3

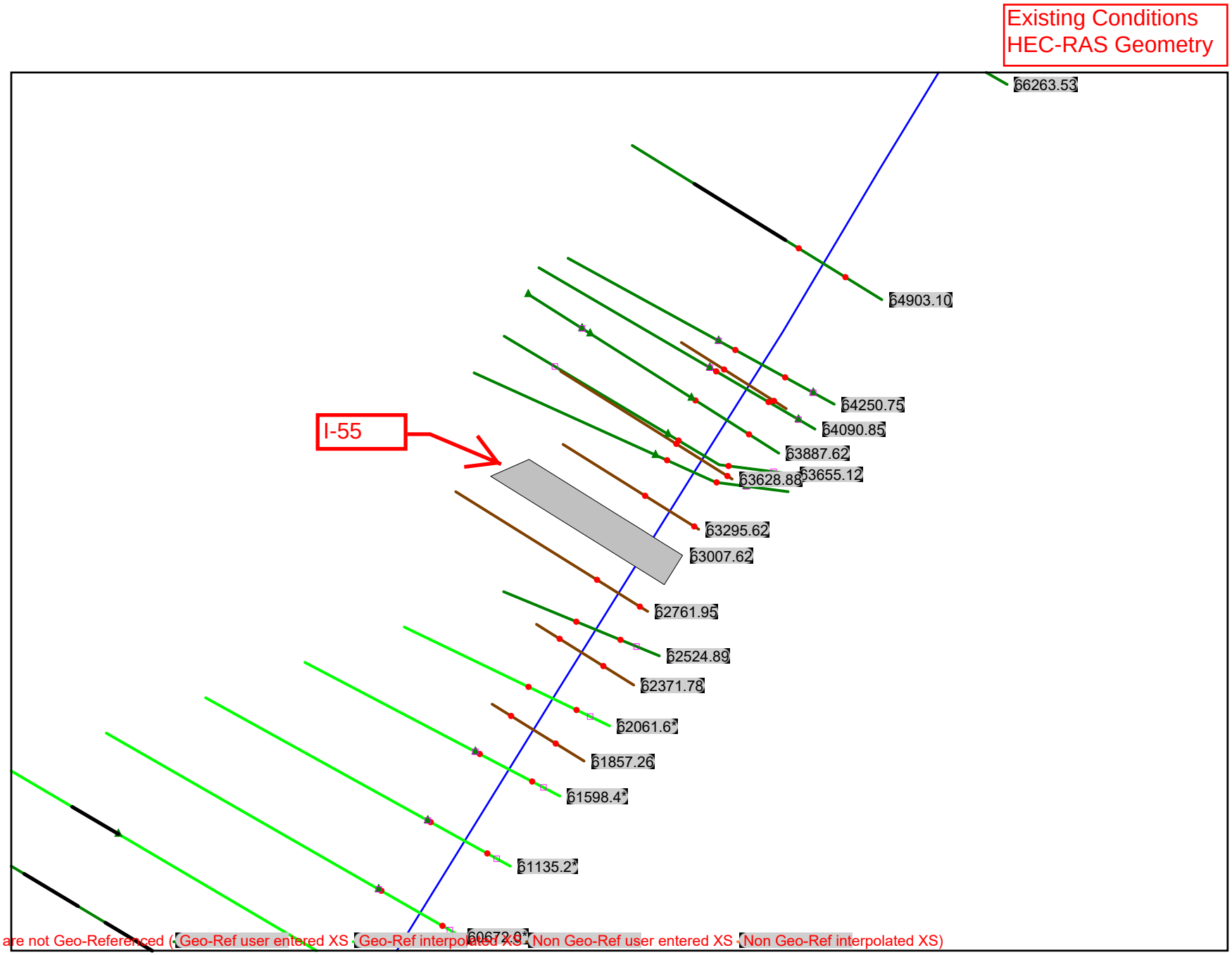
HEC-RAS Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Des Plaines	1	64250.75	Max WS	DPR BL 100 1110	9630.93	581.60	600.85		600.94	0.000176	2.45	3950.82	357.21	0.12
Des Plaines	1	64250.75	Max WS	DPR BL 50 1110	8915.56	581.60	600.41		600.50	0.000170	2.35	3798.32	339.27	0.12
Des Plaines	1	64250.75	Max WS	DPR BL 10 1110	7066.04	581.60	599.16		599.22	0.000144	2.08	3404.41	300.34	0.11
Des Plaines	1	64090.85	Max WS	DPR BL 100 1110	9631.18	581.60	600.82		600.92	0.000191	2.45	3947.37	364.67	0.13
Des Plaines	1	64090.85	Max WS	DPR BL 50 1110	8915.83	581.60	600.38		600.47	0.000186	2.36	3788.63	361.11	0.12
Des Plaines	1	64090.85	Max WS	DPR BL 10 1110	7066.39	581.60	599.13		599.20	0.000158	2.10	3371.50	315.08	0.11
Des Plaines	1	63887.62	Max WS	DPR BL 100 1110	9631.51	581.60	600.79		600.88	0.000172	2.33	4135.57	610.44	0.12
Des Plaines	1	63887.62	Max WS	DPR BL 50 1110	8916.17	581.60	600.36		600.43	0.000167	2.24	3978.19	466.00	0.12
Des Plaines	1	63887.62	Max WS	DPR BL 10 1110	7066.83	581.60	599.11		599.17	0.000139	1.99	3552.82	324.57	0.11
Des Plaines	1	63655.12	Max WS	DPR BL 100 1110	9631.59	581.60	600.76		600.84	0.000154	2.35	4183.54	656.37	0.11
Des Plaines	1	63655.12	Max WS	DPR BL 50 1110	8916.49	581.60	600.32		600.40	0.000148	2.26	4019.43	492.65	0.11
Des Plaines	1	63655.12	Max WS	DPR BL 10 1110	7067.26	581.60	599.08		599.14	0.000132	1.99	3568.54	344.42	0.10
Des Plaines	1	63547.57	Max WS	DPR BL 100 1110	9632.03	581.60	600.74		600.82	0.000143	2.33	4235.25	1169.48	0.11
Des Plaines	1	63547.57	Max WS	DPR BL 50 1110	8916.69	581.60	600.31		600.38	0.000136	2.23	4074.69	861.53	0.11
Des Plaines	1	63547.57	Max WS	DPR BL 10 1110	7065.76	581.60	599.06		599.12	0.000119	1.95	3633.75	510.74	0.10
Des Plaines	1	63243.25	Max WS	DPR BL 100 1110	9632.36	581.60	600.75		600.78	0.000060	1.51	8237.36	1540.02	0.07
Des Plaines	1	63243.25	Max WS	DPR BL 50 1110	8917.28	581.60	600.32		600.35	0.000057	1.44	7812.21	1385.96	0.07
Des Plaines	1	63243.25	Max WS	DPR BL 10 1110	7066.60	581.60	599.07		599.09	0.000051	1.27	6790.50	862.66	0.06
Des Plaines	1	63170.51	Max WS	DPR BL 100 1110	9632.77	581.60	600.74		600.78	0.000076	1.65	5986.18	1518.44	0.08
Des Plaines	1	63170.51	Max WS	DPR BL 50 1110	8917.41	581.60	600.30		600.34	0.000073	1.58	5751.96	1380.66	0.08
Des Plaines	1	63170.51	Max WS	DPR BL 10 1110	7066.79	581.60	599.06		599.09	0.000065	1.39	5099.60	920.23	0.07
Des Plaines	1	62524.89	Max WS	DPR BL 100 1110	9633.65	584.00	600.60		600.71	0.000167	2.59	3904.35	401.99	0.12
Des Plaines	1	62524.89	Max WS	DPR BL 50 1110	8918.27	584.00	600.18		600.27	0.000158	2.48	3733.14	399.38	0.12
Des Plaines	1	62524.89	Max WS	DPR BL 10 1110	7067.99	584.00	598.96		599.03	0.000132	2.14	3369.09	278.74	0.11
Des Plaines	1	62061.6*	Max WS	DPR BL 100 1110	9634.05	584.00	600.54		600.63	0.000150	2.39	4387.50	794.67	0.11
Des Plaines	1	62061.6*	Max WS	DPR BL 50 1110	8918.01	584.00	600.12		600.20	0.000144	2.30	4050.30	793.13	0.11
Des Plaines	1	62061.6*	Max WS	DPR BL 10 1110	7067.18	584.00	598.91		598.97	0.000121	2.00	3604.99	316.35	0.10
Des Plaines	1	61598.4*	Max WS	DPR BL 100 1110	9635.11	584.00	600.49		600.57	0.000135	2.20	5396.88	1126.76	0.11
Des Plaines	1	61598.4*	Max WS	DPR BL 50 1110	8918.77	584.00	600.06		600.13	0.000132	2.13	4914.57	1122.72	0.11
Des Plaines	1	61598.4*	Max WS	DPR BL 10 1110	7069.97	584.00	598.86		598.91	0.000119	1.90	3755.92	339.49	0.10

TAB G

SECTION 13.G

EXISTING CONDITIONS
DESIGN MODEL


Existing Conditions
HEC-RAS Geometry
66263.53
64903.10
64250.75
64090.85
63887.62
63655.12
63628.88
63295.62
63007.62
62761.95
62524.89
62371.78
62061.6*
61857.26
61598.4*
61135.2*
60672.9*
I-55
12 of the 985 XS's are not Geo-Referenced (Geo-Ref user entered XS Geo-Ref interpolated XS Non Geo-Ref user entered XS Non Geo-Ref interpolated XS)

HEC-RAS Version 4.0.0 March 2008
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
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PROJECT DATA
Project Title: DPR_BL Deliverable
Project File : DPR_BL_Deliverable.prj
Run Date and Time: 2/15/2018 1:09:51 PM

Project in English units

Project Description:
Lower Des Plaines River Unsteady HEC-RAS for MWRD LDPRDWP ****more details below****

Data Sources:
Cook County 2 ft topo for XS pulled using
HEC-GeoRAS
Channel information from steady HEC-RAS model from USACE File:
LEV_37_14.DAT
Flow data for direct tributary areas to Lower Des Plaines River
from CBBEL HEC-HMS model
Inflow hydrographs for Cook County sub-watershed from
HEC-RAS output files for individual LDPRDWP Phase B sub-watershed
analyses.

Vertical Datum: NAVD 1988

Des Plaines River alternatives are
modeled.

PLAN DATA

Plan Title: DPR EXIDOT 0218 500
Plan File : n:\Idot\110203.00001\Drain\Model\Des Plaines River MWRD Hydraulic Model\DPR_BL_Deliverable.p17

Geometry Title: DPR EXIDOT 0917
Geometry File : n:\Idot\110203.00001\Drain\Model\Des Plaines River MWRD Hydraulic Model\DPR_BL_Deliverable.g01

Flow Title :
Flow File :

Plan Description:
Computation interval reduced from 20 minutes to 10 minutes, iad
09122017.
Lower Des Plaines River Watershed
Modified Baseline 500-year
10-day
Calibrated to September 2008 storm
Streams: Des Plaines River
(DPR)

Plan Summary Information:
Number of: Cross Sections = 985 Multiple Openings = 1
Culverts = 0 Inline Structures = 3
Bridges = 50 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

GEOMETRY DATA

Geometry Title: DPR EXIDOT 0917
Geometry File : n:\Idot\110203.00001\Drain\Model\Des Plaines River MWRD Hydraulic Model\DPR_BL_Deliverable.g01

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 257312.2

INPUT
Description:
Station Elevation Data num= 103

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	648	36.24	647.35	36.59	646	37.66	644.31	37.8	644
38.07	643.75	39.61	642	39.63	641.99	39.65	641.98	39.79	641.91
43.21	640.2	43.64	640	46.94	638.72	48.84	638	51.53	637.05
52.76	636.61	54.27	636.08	54.29	636.07	54.5	636	58.31	634.32
59	634	60.7	633.18	63.19	632	64	631.42	65	631.3
68	630.85	73	630.15	102	628.88	115	629.03	154	629.4
170	630.3	183	630.76	186	631.27	187	632.02	207.81	633.73
208.67	634	209.89	634.6	212.34	635.81	212.77	636	216.01	637.5
216.67	637.79	216.98	637.93	217.04	637.95	217.05	637.96	217.15	638
219.15	638.79	220.23	639.17	220.81	639.38	222.48	640	222.89	640.12
223.78	640.37	224.86	640.69	228.59	642	231.23	642.5	232.44	644
236.39	644.79	237.05	644.76	238.45	645.73	239.44	646	242.26	646.14
244.3	647.31	246.2	647.59	246.24	647.61	246.39	647.63	246.66	647.7
248.21	647.93	248.26	647.94	248.63	648	249.2	648.03	251.34	648.14
252.06	648.17	253.84	648.24	253.98	648.25	254.67	648.27	254.74	648.28
254.95	648.29	256.26	648.34	256.53	648.35	256.7	648.36	257.92	648.41
258.52	648.43	258.73	648.44	260	648.5	260.6	648.52	260.8	648.53
261.4	648.55	262.54	648.6	263.12	648.62	263.97	648.66	264.42	648.67
265.4	648.7	265.94	648.72	267.06	648.75	268.06	648.77	268.74	648.78
269.83	648.79	270.46	648.8	271.13	648.81	271.85	648.82	273.35	648.83
273.87	648.84	275.2	648.85	276.11	648.86				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.19	63.19	.045	187	.19

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
63.19	187	78.13	75.54	71.49	.1	.3

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 257236.*

INPUT
Description:
Station Elevation Data num= 228

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	648.27	11.61	647.99	40.09	647.74	40.62	647.73	81.02	647.25
81.27	647.25	81.97	647.24	87.31	647.18	87.69	647.18	92.67	647.12
94.63	647.11	122.38	646.87	286.03	646.22	288.5	646.19	316.94	645.94
320	645.24	329.36	644.32	330.59	644.15	332.95	644.01	346.42	643.03
346.59	643.02	346.77	643.02	347.99	642.97	349.93	642.9	377.9	641.73
381.66	641.58	397.96	641.01	410.52	640.49	411.27	640.46	417.36	640.21
427.14	640	448.95	639.56	449.94	639.52	450.67	639.49	450.85	639.48
451.22	639.47	456.22	639.26	457.12	639.22	461.42	639.04	465.58	638.87
474.58	638.49	474.63	638.49	474.8	638.48	476.64	638.4	492.18	637.61
509.96	636.83	516	636.56	519.34	636.4	521.82	636.26	522.84	636.21
526.92	635.99	527.76	635.95	530.86	635.79	533.71	635.64	538.69	635.38
549.3	634.1	549.37	634.09	550.01	633.87	550.75	633.62	551.89	633.23
552.64	633	553.35	632.69	553.89	632.44	554.48	632.17	555	632.01
555.16	631.95	555.22	631.94	555.44	631.86	556.02	631.67	556.76	631.43
557.71	631.12	563.59	630.59	574.97	629.61	578.21	629.39	603.84	629.2
641	628.54	649.56	628.75	675.23	629.33	685.76	629.94	692.98	630.24
694.32	630.99	696.3	632.29	696.96	633.01	697.56	633.34	698.9	634.04
700.21	634.45	700.25	634.48	700.94	634.83	701	634.85	701.91	634.99
701.99	635.02	702.45	635.1	705.5	635.62	707.07	635.94	707.34	635.99
707.49	636.01	707.67	636.04	707.83	636.06	708.12	636.09	708.18	636.09
708.64	636.14	708.7	636.15	709.1	636.18	709.6	636.2	709.99	636.23
747.88	637.19	749.99	637.34	752.98	637.66	758.97	638.32	760.02	638.42
767.95	639.24	769.57	639.4	770.33	639.47	770.47	639.49	770.5	639.49
770.74	639.51	775.64	639.95	778.28	640.16	779.7	640.28	783.79	640.62
784.79	640.69	786.97	640.84	789.61	641.02	798.74	641.75	799.39	641.78
799.56	641.8	800.24	641.84	801.38	641.99	801.46	642	801.61	642.01
802.38	642.09	802.43	642.09	803.19	642.15	803.82	642.19	805.09	642.24
805.2	642.24	806.36	642.49	806.73	642.57	808.16	642.94	810.64	643.06
811.34	643.1	812.26	643.15	812.62	643.17	812.92	643.19	817.83	643.4
819.45	643.38	822.87	643.87	825.3	644.01	832.2	644.08	834.8	644.39
837.19	644.77	840.96	645.04	841.84	645.09	841.94	645.1	842.3	645.12
842.97	645.17	845.94	645.33	846.62	645.36	846.76	645.37	846.88	645.37
847.09	645.38	847.67	645.41	847.79	645.42	848.39	645.44	848.66	645.44
848.87	645.45	849.18	645.46	849.6	645.47	850.16	645.49	850.45	645.49
850.52	645.5	851.3	645.52	851.92	645.53	852.07	645.54	854.42	645.66
856.18	645.75	858.91	645.89	859.2	645.9	859.42	645.91	859.88	645.94
860.54	645.98	860.8	645.99	860.88	646	860.91	646	862.06	646.07
862.57	646.09	862.58	646.1	862.74	646.11	863.25	646.14	863.32	646.15
866.46	646.28	867.12	646.31	867.54	646.33	868.58	646.38	869.36	646.42
870.52	646.47	871.12	646.49	871.99	646.53	872.5	646.56	873.01	646.58
873.76	646.62	875.61	646.71	877.08	646.77	877.16	646.78	877.57	646.8
879.04	646.87	881.83	647.02	883.25	647.09	885.33	647.2	886.43	647.25
888.33	647.35	888.83	647.37	890.15	647.44	891.24	647.5	892.89	647.58
895.34	647.7	897	647.78	899.67	647.91	901.21	647.99	902.85	648.07
903.45	648.1	904.1	648.12	904.61	648.14	908.29	648.28	909.56	648.34
911.8	648.42	912.81	648.42	915.04	648.43				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.19	552.64	.045	696.96	.19

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
552.64	696.96	78.13	75.54	71.49	.1	.3

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 257161.1

INPUT
Description:

Station Elevation Data num= 130

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	648.53	21.9	648	75.6	647.56	76.59	647.55	152.77	646.67
153.24	646.66	154.56	646.65	164.64	646.54	165.36	646.53	174.75	646.44
178.44	646.41	230.76	646	539.35	645.02	544.02	644.98	659.84	644
750.41	642.74	775.51	642.24	786.99	642	846.57	642	848.43	641.96
850.15	641.92	850.85	641.91	860.27	641.7	861.97	641.65	877.93	641.29
894.89	640.9	928.08	640	979.29	638.99	983.98	638.85	985.89	638.8
993.59	638.59	995.17	638.55	1006.39	638.25	1015.78	638	1035.8	636.02
1035.92	636	1037.13	635.59	1038.52	635.14	1040.68	634.42	1042.09	634
1043.2	633.61	1044.04	633.27	1045.77	632.62	1046.03	632.52	1046.11	632.49
1046.46	632.35	1047.36	632	1050	631	1082	628.7	1122	628.8
1180	628.2	1205	629.8	1206.91	634	1207.88	634.63	1210.01	636
1212.09	636.78	1212.16	636.82	1213.25	637.5	1213.35	637.55	1214.79	637.8
1214.93	637.86	1215.65	638	1220.51	638.94	1223	639.52	1223.43	639.61
1223.67	639.65	1223.96	639.7	1224.22	639.73	1224.68	639.78	1224.77	639.79
1225.5	639.87	1225.6	639.88	1226.23	639.93	1227.04	639.96	1227.65	640
1369.92	641.51	1370.2	641.53	1371.27	641.57	1373.09	641.78	1373.22	641.79
1373.45	641.8	1374.68	641.89	1374.76	641.9	1375.98	641.95	1376.98	641.99
1379	641.98	1381.02	641.89	1381.6	641.87	1387.83	641.91	1388.94	641.94
1390.41	641.96	1390.98	641.97	1391.46	642	1426.27	642.03	1436.08	642.55
1444	642.77	1445.08	642.8	1445.84	642.81	1446.76	642.83	1447.91	642.86
1448.34	642.87	1448.66	642.88	1449.83	642.9	1450.72	642.92	1451.18	642.93
1451.29	642.94	1452.53	642.96	1453.52	642.98	1453.76	642.99	1464.64	643.57
1465.1	643.59	1465.46	643.6	1466.19	643.65	1467.66	643.74	1467.82	643.75
1469.66	643.87	1470.49	643.92	1471.66	644	1480.03	644.38	1481.28	644.44
1484.07	644.57	1487.09	644.72	1488.27	644.78	1493.68	645.03	1511.46	646
1516.1	646.26	1535.53	647.38	1536.56	647.42	1548.82	648	1553.97	648

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 64250.75

INPUT
Description:
Station Elevation Data num= 225

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	607.09	27.85	606.29	38.22	606	48.98	606.2	54.99	608
58.26	609.25	60.19	610	64.58	611.84	64.96	612	65.44	612.19
70.16	614	73.1	614.88	77.05	616	131.59	616.99	132.01	616.98
212.62	616	230.47	614.23	231.46	614	234.24	613.09	236.59	612.31
236.88	612.22	237.53	612	238.23	611.79	240.67	611.04	243.28	610.25
244.11	610	252.24	608.16	252.93	608	264.84	607.27	268.11	607.07
270.81	606.9	284.89	606.03	285.31	606	285.62	605.94	296.55	604
298.23	603.47	298.33	603.44	298.64	603.34	300.16	602.85	301.06	602.57
302.87	602	308.26	600.21	308.88	600	309.13	599.92	309.29	599.87
310	599.63	310.21	599.56	312.57	598.79	314.97	598	318.9	596.7
321.03	596	321.41	595.89	321.71	595.8	325.63	594.62	327.66	594
333.77	593.21	335.13	593.04	336.79	592.83	341.06	592.32	341.73	592.23
342.11	592.18	342.4	592.15	342.65	592.12	342.66	592.11	343.88	592
345.5	591.75	348.61	591.24	350.97	590.91	355.11	590	355.46	589.75
356.64	588.9	357.87	588	396	586.8	397	586.4	398	586
426	582.4	451	581.6	486	582.9	511	584.4	538	585
539	586	540	586.8	553.16	589.89	553.33	589.97	553.38	590
553.56	590.02	553.65	590.03	553.9	590.05	554.26	590.09	573.69	592
575.36	592.36	582.96	594	588.67	595.36	591.39	596	595.05	596.99
596.59	597.4	598.49	598	599.73	598.11	599.9	598.12	621.47	600
642.39	600.3	643.31	600.32	647.17	600.42	649.09	600.47	652.64	600.56
655.73	600.65	660.05	600.76	661.21	600.79	665.76	600.91	669.51	601.01
671.03	601.05	672.45	601.09	675.09	601.17	680.39	601.28	681.6	601.31
713.66	602	716.1	602.1	718.23	602.38	718.89	602.5	719.95	602.65
720.52	602.74	720.89	602.81	727.1	604	769.7	603.53	779.79	603.26
780.48	603.2	780.81	603.17	781.6	603.1	782.29	603.04	784.55	602.96
785.46	602.87	785.68	602.85	786.56	602.78	787.56	602.69	791.46	602.55
791.66	602.53	793.31	602.37	794.04	602.35	794.53	602.31	796.21	602.17
797.15	602.1	797.71	602.09	798.62	602	851.94	601.69	862.01	602
1039.33	602.08	1041.93	602.2	1043.83	602.27	1044.06	602.28	1046.28	602.35
1050.93	602.42	1053.39	602.39	1054.24	602.43	1055.19	602.41	1056.03	602.39
1057.94	602.38	1058.54	602.37	1059.55	602.4	1060.75	602.41	1069.16	602

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 1382.04   603.1 1383.17  603.13  1390.7  603.43 1393.66  603.56 1404.02  603.98
 1404.06  603.99 1404.39     604 1453.34  603.62 1461.59     602 1512.28  602.98
 1514.86  603.29 1516.71  603.53  1517.1  603.58  1517.7  603.65 1518.26  603.72
  1518.3  603.73 1518.41  603.74 1518.69  603.78 1518.74  603.79 1518.96  603.82
 1519.06  603.84 1519.14  603.85  1522.9  603.71 1523.35  603.66 1537.68     602
 1544.83  600.96 1546.21  600.86 1546.51  600.83 1547.18  600.74 1549.37  600.45
 1550.82  600.47 1551.43  600.48 1551.93  600.51 1552.19  600.48 1552.32  600.46
 1553.22  600.37 1553.53  600.39 1553.76  600.36 1553.96  600.34 1554.65   600.4
 1561.12  600.73 1561.85  600.76 1581.88  600.55 1587.27  600.61 1597.82   600.9
 1598.42  600.92 1600.32  600.95 1600.73  600.96 1601.71  600.99  1601.9     601
 1603.26  601.04 1603.59  601.05 1604.58  601.07 1605.96  601.11 1627.72     602
 1635.39  602.41 1637.98  602.61 1639.62  602.74  1642.7  602.98 1646.82   603.3
 1649.07  603.48 1655.89     604 1663.13  604.23 1666.95  604.35 1673.98  604.57

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  308.26    .043  621.47    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        308.26  621.47           140.59  134.11  112.35             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0  131.59  616.99       F
   727.1 1673.98     604       F
Left Levee      Station=  131.59      Elevation=  616.99
Right Levee     Station=   727.1      Elevation=     604

CROSS SECTION


RIVER: Des Plaines
REACH: 1                 RS: 64116.64

INPUT
Description:
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  617.07   40.36  606.59   79.61  603.88  116.41  593.26  156.16  591.84
  163.09     588  192.81  583.91  196.81  584.14  219.81   581.1  226.81  580.77
  230.81  580.91  241.81  580.58  250.81  581.35  263.81   581.8  271.81  581.96
  282.81  583.23  301.81   583.1  316.81  584.49  327.81  583.42  335.54  587.97
  342.18  590.53  353.82  591.89  367.96  595.16   404.8  599.72  421.39  600.51
  458.96  600.54  517.82  603.78  666.45  602.39  679.66   603.4  684.09  603.35

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075   79.61    .043   404.8    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         79.61   404.8            26.19   25.79   41.05             .1       .3

CROSS SECTION


RIVER: Des Plaines
REACH: 1                 RS: 64090.85

INPUT
Description:
Station Elevation Data    num=     320
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  608.08    12.9  608.18   13.86  608.12   14.68  608.08   16.12     608
   19.13  608.01   19.14  608.02   19.27  608.04   21.66  608.45   22.71  608.66
    24.6     609   25.49  609.19   25.61  609.22   29.31     610   29.61   610.1
   31.18  610.62   32.16  610.94    34.8  611.82   35.34     612   37.41  612.77
   40.69     614   41.67  614.39   45.74     616   48.76   617.1   49.88  617.51
   51.23     618   57.99  618.31   58.18  618.32   59.67  618.38   60.76  618.44
  104.53  619.11  105.51  619.09   106.8  619.08  107.97  619.06  108.65  619.04
  162.85     618  178.69  617.46  180.82  617.33  190.18  616.78  192.13  616.67
  202.55  616.05  202.73  616.04  203.32     616  203.65  615.92  211.18     614
  213.22  613.38  217.77     612   219.6   611.4   223.8     610  225.61  609.48
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  230.74     608  233.62  607.78  233.97  607.76  234.59  607.72  235.12  607.69
  239.73  607.35  240.73  607.28  242.01  607.21  244.76  607.01  246.92  606.89
  248.89  606.75  253.78  606.48  255.77  606.35  262.27     606  267.43   605.6
  269.75  605.37  270.51   605.3  271.23  605.23  278.84  604.48  280.51  604.32
  281.31  604.24  281.82  604.19   283.6     604  286.72   603.1  290.52     602
  293.51  600.85  294.46  600.49  295.76     600  298.67  598.86  300.87     598
  301.79  597.64  306.11     596  307.76  595.41  308.35  595.21  309.55  594.79
  310.39   594.5  310.72  594.39  311.87     594  317.54  593.52  324.15  592.94
  330.91  592.35  333.06  592.16  333.51  592.12  334.82     592  343.36  591.28
  351.58  590.59  354.63  590.33  357.64  590.08   358.5     590  358.98  589.81
  364.02     588     376   586.8     377   586.4     378     586     406   582.4
     431   581.6     466   582.9     491   584.4     518     585     519     586
     520   586.8  540.98  588.66  544.59     590  547.48  590.54  548.34  590.65
   549.6  590.83  552.24  591.26   554.9  591.59  557.41   591.9  558.18     592
  559.02  592.12  559.11  592.13  561.27  592.43  561.78  592.51  562.34   592.6
  563.17  592.72  564.13  592.87  565.74  593.12  566.79  593.29     569  593.65
  570.44  593.89  571.07     594   578.9  595.41  581.97  595.97  582.12     596
  582.31  596.04  583.76  596.39  584.32  596.52   585.4  596.79  590.61     598
  606.32   598.8  609.39  598.95  613.05  599.13  619.66  599.45  628.65  599.89
  630.01  599.95     631     600   655.6  600.34  664.75     602  668.89  603.26
  671.34     604  697.63  602.92  698.12  602.79  701.06     602  731.58  601.28
  746.87  600.92  749.32  600.87  751.46  600.82  754.14  600.76  757.57  600.68
  782.86  600.14  786.24  600.06  789.09     600  882.15  600.27  890.58     602
  951.23  601.42  952.16  601.41  953.37   601.4  953.91  601.39  954.06   601.4
  973.13  601.47  974.34  601.45  983.97  601.19  984.32  601.18  986.16  601.15
  988.17   601.1  989.77  601.06  998.17  600.82  999.88  600.77 1002.61   600.7
 1003.72  600.66 1004.08  600.65 1005.12  600.63 1006.73   600.6 1007.17  600.59
 1014.02  600.36  1014.5  600.34 1015.17  600.33 1021.42  600.16 1027.25  600.12
 1027.96  600.13 1037.82  600.18 1039.55  600.19 1055.36  600.25 1068.92  600.26
 1071.13  600.28 1073.31  600.29 1074.82  600.31 1076.33  600.32 1080.65  600.36
 1081.57  600.37 1082.34  600.38 1187.02  601.32 1189.62  601.34 1222.61  601.62
 1225.53  601.67 1227.33  601.69 1243.73  601.91 1247.88  601.97 1250.44     602
 1367.37  603.35 1371.67  603.52 1373.68  603.59 1374.31  603.61 1384.13     604
 1434.67  603.74 1435.16  603.49 1438.11     602 1444.25  601.51 1444.86  601.47
 1445.67  601.42 1446.57  601.36  1449.1  601.21 1453.04  600.95 1467.41     600
 1506.93  600.03 1512.19  600.48 1512.91  600.54 1516.48  600.85 1520.08  601.17
 1521.14  601.26 1522.17  601.35 1523.49  601.47 1524.59  601.56 1525.08  601.61
 1525.61  601.65 1525.96  601.68 1528.18  601.89 1528.23   601.9 1529.31     602
 1558.62  601.51 1560.19  601.12 1564.57     600 1590.24  600.03 1590.61  600.06
  1597.2  600.54 1598.63  600.66 1599.71  600.75 1602.44  600.95 1604.24  601.08
 1605.35  601.18 1605.98  601.22 1606.48  601.26 1607.84  601.38 1608.88  601.46
 1610.26  601.57 1610.91  601.62 1611.15  601.64 1612.93  601.78 1615.38  601.97
 1615.44  601.98 1615.73     602 1616.86  602.06 1619.61   602.2 1619.97  602.22
 1620.54  602.25 1622.22  602.34 1622.53  602.36 1622.86  602.38 1627.34  602.62
 1628.16  602.67 1629.22  602.73 1631.24  602.84 1632.18  602.89 1634.28  603.01
 1636.27  603.12 1638.06  603.22 1640.02  603.33  1640.8  603.38 1642.71  603.48
 1644.22  603.56 1644.33  603.57 1646.77  603.69 1646.86   603.7 1647.53  603.73
 1648.53  603.78 1650.83  603.89 1650.89   603.9  1652.2  603.96 1653.01     604
 1656.73  604.08 1657.32  604.09 1672.99  604.38 1673.66   604.4 1675.27  604.43
 1677.71  604.47 1679.64   604.5 1680.26  604.51  1683.4  604.56 1684.04  604.57
 1684.81  604.58 1685.97   604.6 1686.69  604.61 1687.63  604.62 1716.14  604.72
 1716.89  604.71    1719  604.72 1742.19   604.7 1743.04  604.69 1743.86  604.68
 1745.46  604.66 1751.34  604.61    1753  604.59 1753.75  604.58 1755.57  604.57
 1756.68  604.55 1758.79  604.54 1760.19  604.53 1761.25  604.52  1763.2  604.52

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  295.76    .043  630.01    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        295.76  630.01              213  203.23  194.62             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0  104.53  619.11       F
  671.34  1763.2     604       F
Left Levee      Station=  104.53      Elevation=  619.11
Right Levee     Station=  671.34      Elevation=     604

CROSS SECTION
```

RIVER: Des Plaines
REACH: 1 RS: 63887.62

INPUT
Description:
Station Elevation Data num= 196

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	622	11.58	621.97	16.09	621.78	16.68	621.76	18.01	621.7
18.86	621.67	19.17	621.66	23.01	621.5	23.49	621.48	25.11	621.41
25.78	621.38	26.1	621.37	26.58	621.35	27.26	621.32	29.5	621.23
30.78	621.18	32.62	621.1	35.2	620.99	36.83	620.92	37.54	620.89
38.96	620.84	40.35	620.77	41.38	620.73	42.39	620.69	44.12	620.62
44.94	620.58	46.08	620.53	46.75	620.51	48.83	620.41	49.4	620.39
49.8	620.38	52.48	620.26	52.86	620.24	53.29	620.22	58.08	620.02
58.32	620.01	58.44	620	59.88	619.95	62.07	619.87	64.63	619.79
66.23	619.73	66.39	619.72	67.95	619.67	74.21	619.45	74.6	619.43
76.31	619.37	89.25	618.88	93.08	618.74	93.64	618.72	94.39	618.69
95.78	618.64	96.27	618.62	96.46	618.61	97.29	618.58	99.17	618.52
99.74	618.49	100.65	618.46	112.19	618	115.55	616.48	116.61	616
119.86	614.74	121.75	614	123.84	613.18	126.86	612	128.55	611.22
131.23	610	131.6	609.84	135.74	608	135.97	607.95	145.04	606
164.21	605.7	174.84	604	176.08	603.75	176.3	603.71	178.51	603.26
181	602.78	181.64	602.65	182.52	602.47	184.08	602.18	184.98	602
186.55	601.67	187.14	601.55	187.96	601.37	188.47	601.26	190.21	600.91
191.03	600.73	194.37	600	195.48	599.6	199.63	598	200.48	597.62
203.9	596	209.89	594.21	209.98	594.18	210.61	594	216.66	592.79
217.38	592.65	220.68	592	222.5	591.87	222.6	591.86	228.25	591.45
228.98	591.4	229.72	591.34	232.45	591.15	234.52	591.01	235.27	590.96
237.63	590.79	239.97	590.63	242.13	590.49	245.09	590.27	245.38	590.26
245.89	590.22	248.72	590	250.23	589.3	252.93	588	276	586.8
277	586.4	278	586	306	582.4	331	581.6	366	582.9
391	584.4	418	585	419	586	420	586.8	448.14	588.97
448.36	589.07	450.33	590	453.15	591.28	454.7	592	483.66	593.35
490.56	593.92	491.4	594	495.04	595.04	498.37	596	501.22	596.99
504.11	598	507.83	598.24	508.62	598.28	513.51	598.6	518.53	598.92
519.56	598.99	521.37	599.11	523.91	599.26	524.21	599.28	525.89	599.39
543.32	600	568.38	601.69	570.12	602	598.72	601.67	609.03	601.09
609.92	601.05	611.49	600.96	615.81	600.76	621.18	600.47	628.42	600
1164.93	601.83	1167.04	601.86	1168.84	601.87	1169.97	601.89	1172.73	601.92
1176.08	601.95	1176.52	601.96	1180.97	602	1231.3	602.54	1255.83	603.21
1274.3	603.72	1277.58	603.81	1277.98	603.82	1284.6	604	1332.96	603.57
1333.95	603.26	1338.03	602	1339.88	601.27	1341.38	600.66	1342.99	600
1465.55	600.04	1466.03	600.08	1467.46	600.22	1467.93	600.27	1468.5	600.32
1469.03	600.38	1469.62	600.43	1469.83	600.42	1477.97	600.53	1507	600.89
1507.94	600.95	1509.63	601.09	1512.16	601.34	1512.4	601.36	1513.63	601.47
1514.25	601.46	1514.54	601.48	1514.9	601.51	1517.5	601.75	1520.58	602
1636.1	602								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	194.37	.043	543.32	.075

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
194.37 543.32 164.06 232.5 238.77 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
570.12	1231.3	602	F
1284.6	1636.1	604	F

Right Levee Station= 1284.6 Elevation= 604

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 63655.12

INPUT
Description:
Station Elevation Data num= 434

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	610	26.43	610.12	26.7	610.13	27.97	610.2	31.35	610.37

31.62	610.39	32.5	610.43	33.3	610.47	33.5	610.48	34.45	610.53
37.73	610.7	39.5	610.79	42.52	610.94	43.89	611.01	45.83	611.11
47.77	611.21	50.16	611.32	50.73	611.35	53.4	611.48	54.32	611.52
54.44	611.53	58.43	611.72	58.53	611.73	61.83	611.89	61.98	611.9
62.18	611.91	64.04	612	65.99	612.51	67.22	612.85	68.34	613.17
68.84	613.3	69.41	613.45	70.06	613.63	71.41	614	71.79	614.13
71.84	614.15	73.14	614.57	73.67	614.75	74.5	615.03	75.76	615.46
76.4	615.68	76.65	615.76	77.33	616	78.88	616.58	80.08	617.02
82.72	618	83.14	618.15	83.35	618.22	83.52	618.28	83.64	618.33
83.94	618.43	85.67	619.03	86.24	619.23	87.63	619.7	87.94	619.81
88.51	620	89.67	620.36	89.82	620.4	90.78	620.7	93.45	621.52
94.32	621.79	94.87	621.95	94.98	621.99	95.01	622	100.52	623.12
104	623.95	104.2	624	156.26	623.61	157	623.58	157.52	623.57
157.81	623.55	158.43	623.53	159.66	623.51	160.4	623.48	161.23	623.45
161.69	623.44	163.38	623.41	164.37	623.38	165.43	623.34	166.12	623.31
166.96	623.29	168.36	623.24	169.43	623.21	170.68	623.18	171.62	623.15
172.21	623.13	173.45	623.09	173.69	623.08	174.06	623.07	175.62	623.02
176.13	623.01	176.91	622.98	177.62	622.96	178.33	622.93	179.4	622.9
181.47	622.84	182.5	622.8	182.87	622.79	183.41	622.77	184.77	622.73
185.34	622.71	186.18	622.68	187.42	622.64	187.87	622.63	189.01	622.6
190.73	622.54	191.03	622.53	191.91	622.5	192.33	622.48	195.8	622.37
197.83	622.31	198.02	622.3	198.76	622.28	199.02	622.27	200.08	622.24
201.08	622.21	202.4	622.17	204.38	622.12	204.47	622.11	206.27	622.06
207.77	622.01	208.09	622	208.89	621.96	212.27	621.8	212.64	621.78
212.73	621.77	213.53	621.73	213.72	621.72	214.5	621.68	215.06	621.64
215.44	621.62	218.59	621.45	219.08	621.42	219.42	621.4	219.96	621.37
220.37	621.35	222.12	621.24	223.68	621.15	225.36	621.05	225.63	621.04
227.07	620.96	228.4	620.88	229.62	620.81	230.37	620.76	231.53	620.69
231.91	620.67	232.36	620.65	233.17	620.6	235.42	620.47	235.8	620.45
236.2	620.42	239.23	620.25	239.42	620.23	240.41	620.18	240.76	620.16
243.38	620	260.06	619.4	262.95	619.26	263.71	619.25	264.2	619.24
265.22	619.22	265.63	619.19	267.01	619.17	267.37	619.15	267.44	619.14
267.94	619.12	268.92	619.1	269.31	619.09	270.35	619.07	271.07	619.06
275.99	618.76	276.38	618.75	276.92	618.74	277.29	618.73	277.55	618.72
278.14	618.68	278.71	618.67	279.59	618.61	280.25	618.59	282.69	618.42
283.18	618.41	283.5	618.4	283.64	618.39	288.67	618	289.34	617.74
289.4	617.71	289.44	617.69	290.42	617.26	291.37	616.86	291.4	616.85
291.42	616.84	291.62	616.75	292.05	616.56	292.28	616.46	293.32	616
295.2	615.27	296.06	614.94	297.91	614.25	298.34	614.09	298.49	614.04
298.59	614	298.79	613.93	298.82	613.92	301.76	612.98	302.12	612.87
302.22	612.84	302.3	612.81	304.4	612.15	304.87	612	305.39	611.81
306.1	611.57	306.32	611.49	307.17	611.19	308.51	610.7	308.99	610.54
309.93	610.19	310.08	610.14	310.45	610	311.19	609.73	311.63	609.56
313.36	608.92	314.28	608.58	314.88	608.36	315.83	608	315.85	607.99
315.88	607.98	318.55	607.07	319.08	606.88	319.5	606.74	319.81	606.63
320.14	606.52	321.69	606	322.96	605.69	323.17	605.65	323.47	605.58
323.89	605.49	324.46	605.36	324.97	605.24	325.5	605.12	327.08	604.76
328.3	604.5	328.73	604.4	330.32	604.06	330.36	604.05	330.6	604
331.22	603.88	331.38	603.84	332.9	603.54	333.15	603.5	333.46	603.44
334.67	603.2	335.83	602.97	336.36	602.87	337.06	602.73	337.77	602.59
338.64	602.42	338.99	602.35	339.07	602.33	340.78	602	341.31	601.89
341.34	601.88	341.38	601.87	342.49	601.64	343.35	601.46	344.51	601.17
345.86	600.88	346.6	600.69	347.02	600.59	348.5	600.2	348.64	600.17
349.25	600	349.93	599.79	350.58	599.57	352.83	598.85	353.66	598.57
354.29	598.37	355.38	598	356.69	597.61	356.85	597.56	357.85	597.27
359.35	596.85	360.8	596.45	362.27	596.05	362.28	596.04	362.35	596.03
362.45	596	364.24	595.58	364.51	595.52	365.53	595.28	366.17	595.11
366.91	594.94	367.9	594.68	368.56	594.53	370.06	594.14	370.15	594.12
370.56	594	373.95	593.65	374.26	593.62	376.88	593.36	377.79	593.25
378.74	593.14	379.13	593.1	380.62	592.94	383.02	592.66	384.19	592.54
384.65	592.49	386.71	592.26	386.88	592.24	388.36	592.07	388.54	592.05
389.01	592	389.94	591.85	390.05	591.84	391.4	591.63	391.78	591.58
392.94	591.41	393.91	591.29	394.29	591.24	395.18	591.14	395.76	591.07
396.95	590.96	397.56	590.92	397.86	590.9	401.03	591.14	401.77	590.93
401.8	590.92	403.24	590.38	404.05	590	405.38	589.36	405.6	589.25
405.88	589.12	407.07	588.5	407.94	588	426	586.8	427	586.4
428	586	456	582.4	481	581.6	516	582.9	541	584.4
568	585	569	586	570	586.8	608.19	589.47	609.33	590
612.06	591.23	613.77	592	616.89	592.14	618.09	592.19	623.14	592.42
658.92	594	660.6	594.73	663.57	596	664.86	596.76	667.16	598
693.11	598.95	706.49	599.44	721.7	600	723.88	600.47	728.1	601.34

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  730.91  601.93  731.22     602  731.28  602.03  731.94  602.34  735.49     604
  761.04  602.63  762.82     602  766.42  601.09  770.63     600 1366.88  601.64
 1384.21  601.77 1388.72   601.8 1414.45     602 1416.42  602.02 1421.76  602.36
 1430.91  602.85 1431.95  602.89 1432.75  602.93 1433.38  602.95 1433.67  602.97
  1434.2     603 1434.64  603.02 1434.94  603.04  1436.6  603.08 1437.75  603.14
 1458.56  603.69 1459.35  603.72 1462.77  603.87 1462.88  603.88 1467.61  603.82
 1469.09  603.83 1469.64  603.79 1470.74  603.71 1470.94   603.7 1473.19  603.53
  1473.6   603.5 1473.92  603.48 1477.38  603.28 1485.85  602.62 1489.26  602.35
  1493.7     602 1494.31  601.47 1494.65  601.17 1495.07  600.81 1495.97     600
 1610.97  599.45 1618.08  599.34 1619.05  599.32 1619.93  599.31 1621.79   599.3
  1629.8  599.16 1670.08  598.79 1671.19  598.78 1701.29  599.37 1702.02  599.43
 1702.88   599.5 1704.07  599.61  1705.1  599.71 1706.28  599.82 1706.58  599.85
 1708.01  599.98 1708.21     600 1711.33  600.64 1717.65     602 1722.46  601.95
 1722.71  601.92 1722.91   601.9 1728.18  601.26 1729.68  601.08 1732.51  600.74
 1734.78  600.46 1736.95  600.21 1738.76     600 1788.43     600

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  354.29    .043  667.16    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        354.29  667.16            50.04   26.24   25.23             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  735.49 1788.43     604       F
Left Levee      Station=     104      Elevation=  623.95
Right Levee     Station= 1462.88      Elevation=  603.88

CROSS SECTION


RIVER: Des Plaines
REACH: 1                 RS: 63628.88

INPUT
Description:
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  619.07    3.19   618.6   30.79  608.58   81.16  591.97   94.99  592.66
   98.71  589.65  105.11  588.22  121.79  584.15  125.79  584.27  155.79   584.4
  191.79  584.48  199.79  584.32  226.79  584.34  246.79  584.45  276.79  582.89
  281.79  583.71  297.57     588  307.61  592.18  349.33  592.67  363.46  598.72
  371.48  599.98  410.69  600.17   421.3  600.73     441  604.02  445.15   603.9
  461.75  602.25  463.98  601.97  530.23  600.75  589.53  601.41  591.63  601.81
  624.53  602.77  646.63  602.79 1116.19 602.857

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075   30.79    .043  363.46    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         30.79  363.46            74.49   81.31  108.73             .1       .3

CROSS SECTION


RIVER: Des Plaines
REACH: 1                 RS: 63547.57

INPUT
Description:
Station Elevation Data    num=     441
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  599.76    1.54     600    3.05  600.69    5.92     602    5.95  602.02
    5.97  602.03    7.72  602.96    9.67     604   10.68  604.55   10.89  604.66
   10.94  604.69   11.03  604.74   12.11  605.32   13.36     606   14.86  606.81
   15.62  607.22    17.1     608    23.3  608.26   25.67  608.36   29.87  608.54
   31.77  608.62   34.23  608.73   36.32  608.81   38.23   608.9   44.52  609.16
    47.3  609.28   53.58  609.56    54.1  609.59   60.73  609.88   61.03  609.89
   61.19   609.9   61.79  609.93   62.23  609.94    63.2  609.99   63.54     610
   70.22  610.28   70.78   610.3   74.94  610.48   75.68  610.51   83.21  610.83
```

84.28	610.88	85.86	610.95	88.3	611.06	91.96	611.23	92.48	611.25
93.47	611.29	95.04	611.37	98.52	611.52	101.09	611.63	101.61	611.65
101.94	611.67	102.57	611.69	103.11	611.71	103.22	611.72	105.63	611.81
105.97	611.83	107.84	611.89	107.9	611.9	109.21	611.94	110.8	612
111.08	612.05	112.25	612.25	112.57	612.32	114.21	612.63	114.84	612.76
116.95	613.21	117.39	613.3	117.86	613.4	118.58	613.55	120.33	613.96
120.36	613.97	120.51	614	121.95	614.44	122.15	614.5	122.48	614.6
123.55	614.92	125.39	615.49	125.86	615.63	126.08	615.7	127.06	616
128.75	616.5	129.01	616.58	129.61	616.75	129.94	616.85	130.36	616.97
131.33	617.26	132.33	617.55	133.67	617.94	133.88	618	134.81	618.26
135.45	618.43	138.21	619.19	138.76	619.35	138.87	619.37	139.47	619.54
139.54	619.56	141.12	620	141.18	620.02	141.21	620.03	142.93	620.53
143.2	620.62	143.97	620.84	147.32	621.88	147.54	621.94	147.72	622
148.11	622.11	148.23	622.14	148.41	622.19	150.45	622.75	151.78	623.16
152.62	623.4	152.64	623.41	152.78	623.44	152.91	623.48	154.65	624
232.77	623.98	233.62	623.95	234.82	623.9	235.56	623.88	235.79	623.87
236.34	623.84	239.43	623.72	239.66	623.71	240.02	623.7	240.07	623.69
242.94	623.58	243.34	623.56	243.79	623.54	244.4	623.52	244.8	623.5
245.01	623.49	246.56	623.43	247.02	623.41	247.83	623.38	248.28	623.36
249.38	623.31	249.85	623.29	250.1	623.28	250.28	623.27	251.28	623.23
252.3	623.18	252.63	623.17	252.99	623.15	254.07	623.11	254.24	623.1
254.49	623.09	255.63	623.04	256.47	623	256.9	622.98	257.46	622.96
257.92	622.93	258.97	622.89	260.26	622.83	260.74	622.81	261.28	622.78
261.9	622.76	262.48	622.73	263.11	622.7	264.52	622.63	265.42	622.59
266.16	622.56	266.85	622.53	267.14	622.52	268.64	622.44	269.07	622.42
269.87	622.38	270.24	622.37	271.05	622.33	271.84	622.29	271.99	622.28
272.77	622.24	273.09	622.23	274.93	622.13	275.77	622.08	276.62	622.04
277.35	622	279.09	621.94	280	621.91	280.85	621.88	281.13	621.87
283.69	621.78	285.17	621.73	286.34	621.69	287.05	621.67	288.29	621.63
288.91	621.61	289.5	621.59	291.76	621.51	292.69	621.48	293.74	621.44
294.59	621.42	295.6	621.39	296.7	621.35	297.47	621.33	298.48	621.29
299.48	621.26	300.04	621.24	301.69	621.19	302.66	621.16	303.67	621.13
303.96	621.12	305.28	621.08	306.04	621.05	307.98	621	308.89	620.97
309.54	620.95	310.21	620.93	311.06	620.91	314.36	620.82	314.84	620.8
315.51	620.78	316.11	620.77	318.58	620.69	319.34	620.67	328.64	620.35
328.85	620.34	329.29	620.33	329.48	620.32	331.22	620.26	333.36	620.18
333.51	620.17	333.89	620.16	334.16	620.15	335.86	620.1	336.3	620.08
338.09	620.02	339.01	620	339.73	619.92	340.93	619.8	341.01	619.79
341.1	619.77	342.66	619.6	342.82	619.58	343.98	619.46	344.85	619.37
345.16	619.34	345.74	619.27	346.43	619.19	353.65	618	353.81	617.92
353.89	617.87	354.28	617.66	355.18	617.19	355.47	617.02	357.27	616
357.44	615.9	357.62	615.8	357.96	615.62	359.81	614.59	360.87	614
362.23	613.4	362.3	613.37	365.34	612	365.37	611.99	365.67	611.87
365.94	611.76	366.39	611.58	367.35	611.18	369.24	610.41	370.2	610
370.35	609.93	370.52	609.86	371.77	609.33	372.03	609.22	372.34	609.09
373.45	608.61	374.85	608	375.02	607.93	375.05	607.91	375.23	607.83
377.27	606.92	377.41	606.85	378.72	606.27	378.97	606.16	379.32	606
379.66	605.84	379.7	605.82	380.43	605.47	381.19	605.12	382.32	604.58
383.61	604	384.08	603.77	384.21	603.71	384.37	603.64	384.64	603.51
385.66	603.03	386.34	602.72	387.77	602.07	387.85	602.03	387.92	602
389.61	601.24	390.79	600.72	390.81	600.71	391.51	600.4	391.65	600.34
392.42	600	394.69	598.99	395.16	598.77	396.86	598	396.95	597.96
397.01	597.93	398.96	597.07	401.38	596	401.61	595.91	401.69	595.88
401.72	595.86	402.66	595.45	405.98	594	406.98	593.65	407.46	593.47
408.04	593.26	408.07	593.25	408.1	593.24	409.69	592.67	411.58	592
414.26	591.71	415.1	591.62	427.56	590	428	586	456	582.4
481	581.6	516	582.9	541	584.4	568	585	569	586
570	586.8	591	587.9	641	587.5	649.98	589.81	650.36	590
664.46	591.77	666.33	591.98	666.49	592	670.69	592.56	670.87	592.58
671.64	592.67	672.53	592.79	674.6	593.02	675.12	593.08	675.79	593.16
677.29	593.35	682.88	594	683.49	594.11	684.17	594.25	685.67	594.55
685.84	594.59	686.82	594.78	686.95	594.81	692.57	596	693.8	596.53
696.52	597.71	696.93	597.88	697.19	598	721.21	598.78	731.38	599.11
758.95	600	760.63	600.51	765.7	602	766.45	602.34	776.82	602
797.63	600.3	798.73	600	1325.7	600.8	1327.04	600.81	1330.08	600.82
1331.8	600.83	1332.91	600.84	1335.08	600.85	1336.34	600.86	1338.35	600.87
1340.35	600.88	1342.33	600.89	1343.39	600.9	1345.2	600.91	1368.59	601.09
1370.53	601.1	1371.27	601.11	1372.88	601.12	1375.46	601.14	1413.48	601.46
1414.83	601.47	1419.29	601.5	1419.77	601.51	1420.92	601.52	1422.26	601.53
1423.83	601.54	1432.67	601.61	1433.64	601.62	1434.57	601.63	1435.85	601.64
1461.1	601.86	1464.14	601.89	1476.82	602	1533.85	600.62	1534.88	600

```
 1541.33  599.94 1546.39   599.9  1576.4  599.62 1579.16   599.6 1590.38  599.49
 1607.98  599.34 1631.52  599.13 1699.12  598.53 1705.11  598.47 1715.94  598.38
 1719.14  598.35 1725.52  598.29 1728.49  598.26 1739.45  598.17 1741.87  598.15
 1742.72  598.14 1745.69  598.12 1746.85  598.11 1750.88  598.07    1752  598.06
 1760.16     598 1812.74  598.78 1815.82  599.37 1817.14  599.61 1817.49  599.68
 1817.73  599.72 1818.17   599.8 1819.24     600 1820.99  600.28 1826.99  601.34
 1827.89   601.5 1828.68  601.63 1828.93  601.67 1829.06   601.7 1829.45  601.76
 1829.67   601.8 1830.81     602 1846.51  601.33 1852.92  600.93 1853.47  600.89
 1856.02   600.7 1856.69  600.65 1858.57  600.54 1861.74  600.28 1862.78   600.2
 1865.07  600.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  396.95    .043  696.52    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        396.95  696.52           273.56  251.95  228.94             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0  232.77  623.98       F
  766.45 1865.07  602.34       F
Left Levee      Station=  232.77      Elevation=  623.98

CROSS SECTION


RIVER: Des Plaines
REACH: 1                  RS: 63295.62

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  619.07  28.755     613   66.44  592.62  76.765  588.21  97.825  584.63
 104.325  584.09 113.825  584.42 128.325  583.18 145.325   584.5 162.325  583.82
 188.825  584.34 193.825  583.98 194.325  584.14 207.325  584.49 227.325  584.24
 238.325  584.58 247.825  584.02 268.325   584.5 290.825  583.37 322.565  588.26
   326.1  589.61  328.74  592.31 348.135  597.94   358.9  599.04 363.195  599.09
  419.65  599.57  468.85  599.95 517.295 599.632 569.575  599.77  630.87  600.07
 683.585  599.34  733.32   598.8  750.02  598.99  873.59     600  882.83     601

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  28.755    .043 348.135    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        28.755 348.135           533.48  533.67  533.99             .1       .3

BRIDGE


RIVER: Des Plaines
REACH: 1                  RS: 63007.62

INPUT
Description: I-55
Distance from Upstream XS =     169
Deck/Roadway Width        =     268
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      10
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 -159.12     620           27.81   620.5           27.81   620.5  615.22
   67.29  621.25  615.64  136.93     622  616.39  226.56     623  617.49
  308.75  623.85  618.25   402.9  624.75  619.29   402.9  624.75
 1305.68  629.01

Upstream Bridge Cross Section Data
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  619.07  28.755     613   66.44  592.62  76.765  588.21  97.825  584.63
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 104.325  584.09 113.825  584.42 128.325  583.18 145.325   584.5 162.325  583.82
 188.825  584.34 193.825  583.98 194.325  584.14 207.325  584.49 227.325  584.24
 238.325  584.58 247.825  584.02 268.325   584.5 290.825  583.37 322.565  588.26
   326.1  589.61  328.74  592.31 348.135  597.94   358.9  599.04 363.195  599.09
  419.65  599.57  468.85  599.95 517.295 599.632 569.575  599.77  630.87  600.07
 683.585  599.34  733.32   598.8  750.02  598.99  873.59     600  882.83     601

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  28.755    .043 348.135    .075

Bank Sta: Left   Right    Coeff Contr.   Expan.
        28.755 348.135             .1       .3

Downstream  Deck/Roadway Coordinates
    num=      10
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 -172.34   625.8           39.61   629.4           39.61   629.4  624.38
   79.09     630  624.66  148.73   630.5  625.23  238.36  631.25  626.04
  320.55     632  626.65   414.7   632.4  627.43   414.7   632.4
 1305.68  628.98

Downstream Bridge Cross Section Data
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   610.6  49.889  605.73  72.459  595.23  76.538  589.44   78.58  588.32
 104.821  584.37 106.455  584.53 135.321  583.68 147.303  584.13 160.374  583.84
 206.124  584.51 213.749  584.19 221.374  584.47  234.99  584.08 260.043  584.37
 267.668  583.95 283.463  584.25 315.112  588.11 317.111  589.88 320.999  592.87
 328.608   599.2 334.299  600.18 365.061  600.26 726.363 598.048 843.557     600
  1247.4     601

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  49.889    .043 328.608    .075

Bank Sta: Left   Right    Coeff Contr.   Expan.
        49.889 328.608             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  4

Pier Data
Pier Station     Upstream=   67.29    Downstream=   79.09
Upstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.72    5.25  615.64
Downstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.75    5.25  624.66

Pier Data
Pier Station     Upstream=  136.93    Downstream=  148.73
Upstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.72    5.25  616.39
Downstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.75    5.25  625.23

Pier Data
Pier Station     Upstream=  226.56    Downstream=  238.36
Upstream     num=       2
    Width   Elev    Width   Elev
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    5.25  578.72    5.25  617.49
Downstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.75    5.25  626.04

Pier Data
Pier Station     Upstream=  308.75    Downstream=  320.55
Upstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.72    5.25  618.25
Downstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.75    5.25  626.65

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum              Cd   =     1.2
       Yarnell               KVal =      .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Des Plaines
REACH: 1                 RS: 62761.95

INPUT
Description:
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   610.6  49.889  605.73  72.459  595.23  76.538  589.44   78.58  588.32
 104.821  584.37 106.455  584.53 135.321  583.68 147.303  584.13 160.374  583.84
 206.124  584.51 213.749  584.19 221.374  584.47  234.99  584.08 260.043  584.37
 267.668  583.95 283.463  584.25 315.112  588.11 317.111  589.88 320.999  592.87
 328.608   599.2 334.299  600.18 365.061  600.26 726.363 598.048 843.557     600
  1247.4     601

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  49.889    .043 328.608    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        49.889 328.608           249.41  237.05  270.54             .1       .3

CROSS SECTION


RIVER: Des Plaines
REACH: 1                 RS: 62524.89

INPUT
Description:
Station Elevation Data    num=     310
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  609.79    3.06     610   83.31  610.86  136.86     612  146.82   610.6
  147.48  610.46   147.9  610.37  149.38  610.06  149.65     610  149.92  609.94
  159.33     608  164.82  607.44  165.64  607.36  168.39  607.08  168.92  607.04
  169.76  606.96  171.02  606.87   172.5  606.72  174.54  606.58     175  606.54
  176.19  606.45  176.38  606.43  181.13     606  185.08  605.84  187.35  605.67
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188.5	605.57	189.16	605.52	191.35	605.33	191.67	605.31	192.12	605.26
192.77	605.22	193.76	605.15	195.74	604.95	198.1	604.81	199.43	604.72
201.23	604.61	203.73	604.46	204.17	604.42	205.92	604.32	207.32	604.24
211.41	604	213.59	603.87	216.58	603.67	221.08	603.18	224.78	602.86
225.55	602.8	228.58	602.39	229.31	602.32	229.39	602.31	231.49	602
234.31	600.89	236.24	600.13	236.44	600.05	236.56	600	238.9	599.09
239.57	598.83	241.73	598	242.54	597.68	243.63	597.26	245.37	596.58
246.89	596	249.19	595.15	249.5	595.03	250.4	594.7	252.3	594
253.9	593.49	257.55	592.22	257.97	592.08	257.99	592.07	258.02	592.06
258.09	592.04	258.11	592.03	258.21	592	258.56	591.87	263.38	590
264.12	589.63	266.32	588.52	267.12	588.12	267.33	588	267.33	586.4
268	585.5	307	584.3	357	584	397	584.4	451	585.5
452	586.4	483.48	588.31	484.28	588.54	487.01	589.35	489.17	590
494.88	591.24	496.85	591.66	497.47	591.8	498.39	592	499.73	592.44
504.51	594	508.13	595.34	509.9	596	515.38	598	516.5	598.41
520.84	600	634.91	600	635.89	600.29	636.23	600.38	637.3	600.68
637.59	600.76	638.74	601.09	639.61	601.31	639.74	601.35	640.6	601.57
640.64	601.58	640.72	601.6	641.24	601.73	641.51	601.8	642.36	602
643.27	602.24	643.35	602.26	643.62	602.33	645.12	602.72	645.67	602.86
645.99	602.94	646.41	603.05	647.03	603.21	647.58	603.35	648.85	603.68
649	603.72	649.68	603.89	649.75	603.91	650.1	604	650.96	604.24
651.13	604.29	652.21	604.59	652.68	604.72	653.21	604.87	654.08	605.11
655.58	605.53	655.86	605.61	656.05	605.66	656.17	605.7	656.65	605.83
656.73	605.86	657.24	606	658.12	606.26	658.42	606.34	658.93	606.49
659.49	606.65	660.57	606.96	661.26	607.16	661.68	607.28	662.42	607.49
662.73	607.58	664.25	608	664.29	608.01	664.97	608.19	665.34	608.28
665.59	608.35	667.06	608.73	667.12	608.74	668.14	609	669.16	609.26
669.22	609.27	669.26	609.28	669.5	609.34	671.1	609.74	671.31	609.79
671.38	609.81	672.13	610	672.9	610.19	673	610.21	673.55	610.35
673.91	610.44	674.69	610.63	674.88	610.68	675.71	610.88	676.07	610.98
676.5	611.08	677.42	611.31	677.87	611.43	678.63	611.62	680.01	611.98
680.1	612	682.03	612.52	682.18	612.56	682.35	612.61	682.45	612.64
683.2	612.85	683.57	612.96	683.66	612.98	684.31	613.17	684.45	613.21
686.26	613.76	686.35	613.78	686.53	613.84	687.05	614	687.8	614.24
688.08	614.33	689.18	614.68	689.54	614.79	689.79	614.87	691.08	615.28
692.1	615.59	692.14	615.6	692.63	615.75	692.82	615.81	692.98	615.86
693.27	615.95	693.45	616	695.18	616.53	695.61	616.66	696.33	616.87
696.78	617	697.34	617.17	698.44	617.48	699.17	617.69	699.47	617.77
699.88	617.89	699.91	617.9	700.29	618	701.67	618.37	702.15	618.5
702.24	618.53	702.33	618.55	703.84	618.95	704.9	619.23	705.48	619.38
705.81	619.47	706.41	619.63	706.55	619.67	707.79	620	708.16	620.09
708.26	620.11	709.28	620.35	709.37	620.37	709.52	620.41	710.53	620.65
711.19	620.8	712.29	621.05	712.94	621.2	713.13	621.25	713.25	621.27
714.18	621.49	714.64	621.59	714.65	621.6	716.28	621.97	716.41	622
716.85	622.1	717.18	622.17	717.35	622.21	718.98	622.56	719.28	622.63
719.34	622.65	719.87	622.77	721.14	623.06	722.57	623.41	723.04	623.52
723.16	623.55	723.23	623.56	723.57	623.65	723.69	623.67	725.04	624
725.17	624.03	725.51	624.1	725.95	624.2	726.12	624.23	727.63	624.56
728.42	624.74	729.25	624.91	729.27	624.92	729.34	624.93	729.87	625.04
731.25	625.35	731.73	625.45	731.96	625.49	733.31	625.79	733.38	625.81
734.1	625.96	734.12	625.97	734.26	626	735.18	626.2	736.29	626.44
736.78	626.55	737.45	626.7	737.61	626.73	737.87	626.79	738.73	626.98
739.77	627.22	740.56	627.39	741.42	627.59	741.46	627.6	741.61	627.63
742.69	627.88	742.77	627.9	743.2	628	745.06	628.42	745.53	628.52
746.82	628.81	747.09	628.87	747.42	628.94	748.35	629.15	749.11	629.31
749.6	629.42	749.75	629.45	750.38	629.59	750.53	629.62	751.34	629.79
751.49	629.82	751.57	629.84	751.65	629.86	752.35	630	929.26	630

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	231.49	.043	494.88	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
231.49	494.88	161.35	153.11	122.12	.3	.5

Left Levee Station= 136.31 Elevation= 611.99

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 62371.78

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	609.08	53.18	610.77	149.85	611.19	160.84	610.44	203.86	601.72
242.24	599.83	267.02	592.5	284.48	592.64	293.94	588.19	317.32	584.27
349.32	583.58	385.32	584.1	394.32	583.78	405.32	583.48	429.32	583.57
447.32	583.94	467.32	584.18	485.94	588.31	497.38	591.36	514.91	591.44
538.03	600.73	541.91	600.83	544.34	600.61	572.49	600.48	626.83	598.41
653.6	597.52								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	203.86	.043	497.38	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
203.86	497.38	306.24	310.11	335.68	.1	.3

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 62061.6*

INPUT
Description:
Station Elevation Data num= 186

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.1	608.49	4.77	608.66	74.78	609.3	121.49	610.2	130.18	609.02
130.76	608.9	131.12	608.83	132.41	608.57	132.89	608.47	141.09	606.84
149	606.06	150.19	605.96	151.29	605.89	152.58	605.76	154.36	605.64
155.8	605.53	158.65	605.28	160.11	605.13	163.56	604.96	165.54	604.79
166.54	604.69	169.03	604.46	169.7	604.39	171.13	604.28	172.86	604.09
174.92	603.95	176.08	603.86	179.83	603.59	181.74	603.45	182.96	603.37
188.43	602.99	191.04	602.79	194.43	602.39	194.96	602.33	198.19	602.02
198.86	601.96	201.5	601.59	202.14	601.52	204.04	601.23	206.85	600.17
208.77	599.45	208.88	599.4	208.96	599.37	209.08	599.32	209.63	599.12
211.41	598.46	212.08	598.21	214.22	597.42	215.03	597.11	216.01	596.75
216.11	596.71	217.84	596.07	218.56	595.81	219.35	595.52	220.46	595.13
221.16	594.88	221.64	594.71	221.95	594.59	222.84	594.28	223.43	594.07
224.73	593.6	226.32	593.1	229.12	592.14	229.8	591.91	229.84	591.9
229.95	591.86	230.09	591.81	230.37	591.72	230.39	591.71	230.42	591.7
230.49	591.68	230.51	591.67	230.61	591.64	230.96	591.52	235.75	589.71
236.49	589.37	236.62	589.3	237.19	588.79	237.19	588.64	238.67	588.01
239.47	587.67	239.68	587.57	239.68	586.24	240.34	585.48	277.35	584.35
279.12	584.3	328.83	584	349.48	584.21	377.36	584.58	377.87	584.73
378.06	584.74	391.45	585.26	394.27	585.56	396.28	585.77	397.97	585.94
400.3	586.17	402	586.33	425.98	586.63	427.92	586.61	442.55	586.56
444.52	586.64	445.75	587.42	452.11	587.86	452.91	587.94	453.45	587.98
453.49	587.98	454.05	588.06	457.25	588.47	459.2	588.68	459.81	588.75
460.21	588.79	462.44	589.02	484.49	590.08	485.48	590.28	488.84	590.97
491.49	591.53	498.52	592.61	500.29	592.85	500.99	592.95	501.4	593.04
501.98	593.16	502.17	593.21	503.06	593.4	503.41	593.48	503.94	593.59
504.68	593.8	505.45	594.05	505.87	594.19	506.06	594.26	506.43	594.39
506.98	594.59	507.29	594.7	507.52	594.78	508.1	595	508.64	595.2
509.03	595.34	509.21	595.41	510.07	595.73	510.59	595.92	515.41	596.74
515.89	596.83	532.17	600	1000	600	1023.83	624.67	1033.64	624.88
1037.32	625	1050.62	625.33	1149.06	625.34	1151.19	625.4	1154.77	625.49
1192.93	625.88	1194.75	626	1195.48	626.1	1196.33	626.2	1196.84	626.27
1197.26	626.33	1198.43	626.6	1198.75	626.67	1199.47	626.82	1199.98	626.92
1200.36	627	1201.66	627.24	1202.18	627.33	1203.12	627.52	1203.9	627.67
1205.31	627.97	1205.78	628.07	1206.37	628.2	1207	628.33	1207.84	628.52
1208.54	628.67	1210.16	629	1211.06	629.17	1211.96	629.33	1213.22	629.5
1214.55	629.67	1216.82	629.73	1219.2	629.79	1222.31	629.85	1224.8	629.9
1230.71	629.98	1233.8	630.01	1239.01	630.05	1242.18	630.09	1251.49	630
1260.39	630								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2.1	.075	204.04	.043	498.52	.075

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
204.04 498.52 239.73 204.34 186.6 .3 .5
Left Levee Station= 121.59 Elevation= 610.19

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 61857.26

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	609.22	128.29	611.88	179.59	602.68	185.34	602.43	236.64	592.46
251.8	597.89	262.17	589.54	266.16	588.07	294.24	584.45	295.24	584.4
303.24	584.42	339.24	583.31	360.24	584.06	371.24	584.03	413.24	583.9
447.24	584.41	462.07	588.17	469.78	590.96	476.55	592.31	490.27	591.85
507.53	598.42	518.32	601.47	521.55	601.92	524.65	601.51	556.9	601.38
559.79	601.63	577.79	603.54	584.25	603.427	601.69	601.016		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	185.34	.043	476.55	.075

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
185.34 476.55 227.86 258.88 271.2 .1 .3

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 61598.4*

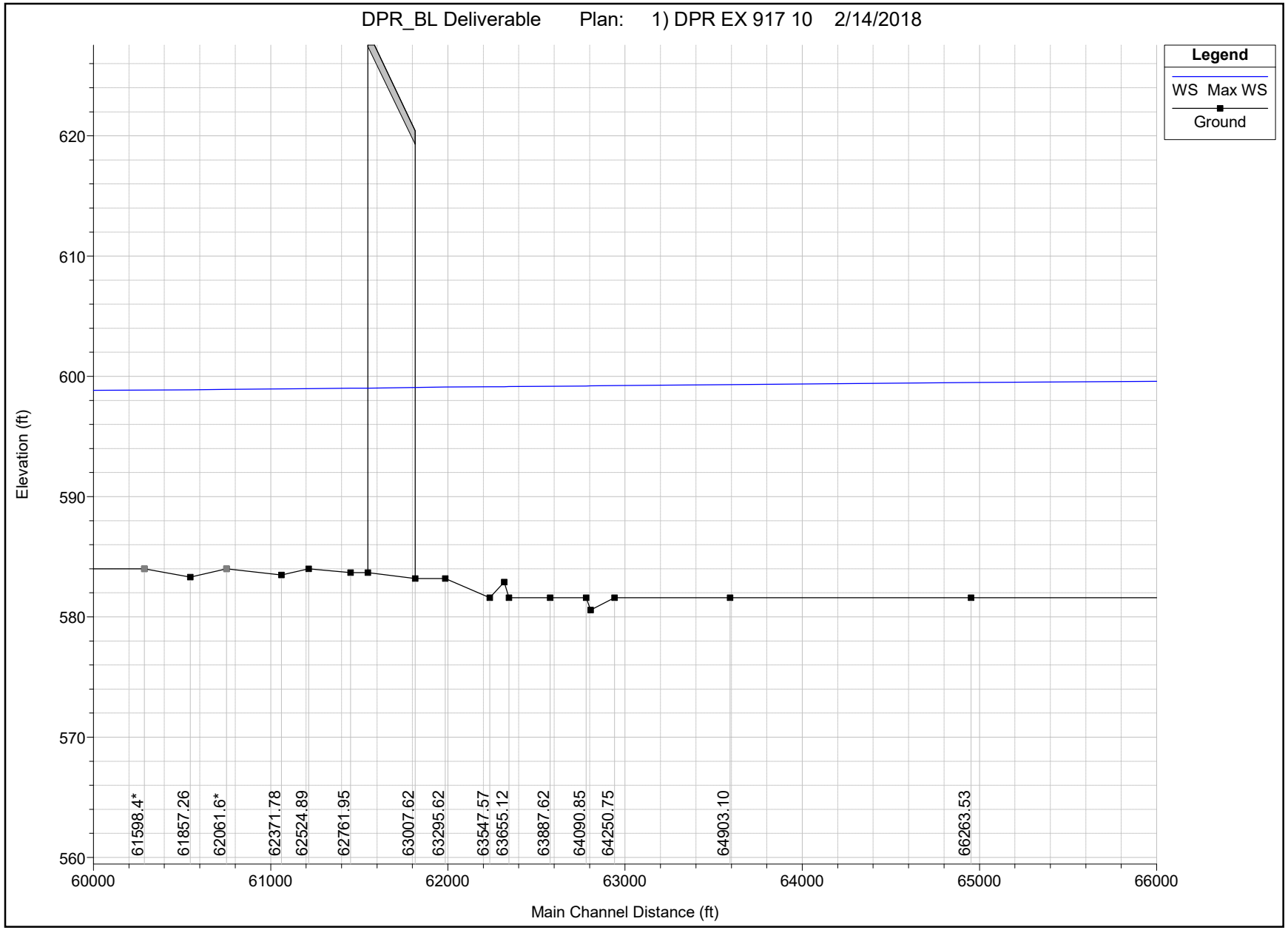
INPUT
Description:
Station Elevation Data num= 238

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4.21	607.19	6.49	607.33	66.25	607.74	106.13	608.39	113.54	607.44
114.03	607.34	115.45	607.07	115.85	606.99	122.86	605.68	126.95	605.3
127.56	605.24	129.61	605.05	131.56	604.9	132.67	604.8	134.19	604.7
135.41	604.61	137.85	604.41	139.09	604.27	142.04	604.07	143.73	603.91
145.07	603.77	146.7	603.59	147.28	603.53	147.93	603.47	149.97	603.24
152.07	603.06	152.72	603	155.92	602.73	163.27	602.11	165.49	601.91
168.39	601.54	168.84	601.48	172.17	601.12	174.43	600.78	174.97	600.72
176.6	600.46	179.38	599.45	181.29	598.76	181.41	598.72	181.49	598.69
181.61	598.65	182.16	598.45	183.92	597.82	184.58	597.59	186.72	596.83
187.52	596.54	188.49	596.2	188.6	596.16	190.32	595.55	191.03	595.31
191.82	595.03	192.92	594.66	193.61	594.42	194.09	594.26	194.4	594.15
195.29	593.85	195.87	593.65	197.17	593.2	198.75	592.71	201.53	591.78
202.2	591.55	202.24	591.53	202.36	591.49	202.5	591.45	202.77	591.36
202.79	591.35	202.82	591.34	202.89	591.32	202.91	591.31	203.01	591.28
203.36	591.16	208.12	589.42	208.85	589.1	208.99	589.04	209.55	588.32
209.55	588.02	211.03	587.5	211.82	587.22	212.03	587.14	212.03	586.08
212.69	585.47	249.48	584.34	251.24	584.3	300.67	584	325.18	584.25
358.28	584.76	358.9	585.07	359.12	585.08	375.02	585.9	378.37	586.45
380.76	586.83	382.77	587.15	385.52	587.57	387.55	587.86	416.02	588.06
418.33	587.99	435.69	587.64	438.04	587.78	439.5	588.45	447.05	589.01
448	589.12	448.65	589.18	448.69	589.19	449.36	589.31	453.15	589.98
455.47	590.31	456.2	590.41	456.67	590.47	459.32	590.82	485.5	591.84
486.67	592.01	490.66	592.6	493.82	593.07	502.16	593.99	503.86	594.16
505.69	594.36	506.27	594.49	507.38	594.73	508.38	594.94	508.66	595
509.15	595.11	509.9	595.27	510.97	595.59	511.58	595.8	512.07	595.96
512.67	596.15	512.94	596.25	513.47	596.45	514.26	596.74	515.03	597.02
516.63	597.65	517.19	597.88	517.44	597.97	519.42	598.74	526.31	599.47
527	599.56	530	600	674.34	600	674.8	599.94	677.27	599.08
678.29	598.72	679.84	598.33	680.79	598.09	681.04	598.02	682.2	597.71
682.64	597.61	682.99	597.53	683.54	597.41	685.15	597.05	685.75	596.91
686.64	596.71	687.45	596.54	688.02	596.41	689.58	596.09	691.42	595.7
691.71	595.64	692.2	595.49	693.99	594.95	694.55	594.79	695.64	594.35

```
  696.67     594  699.93  593.34  702.12  593.54   702.5  593.62  703.53  593.83
  704.42  594.02  710.34  594.24  712.67  594.34  722.49  594.72   753.8  594.68
  756.51  594.76  760.35  594.89  764.23  595.02   768.3  595.17  770.28  595.24
  774.27  595.41  778.38  595.59  781.76  595.74  783.12   595.8  787.01     596
  796.66   596.5  798.97  596.61  802.68  596.81  807.44  597.05  808.45  597.11
  809.98  597.19  815.34  597.46  816.67  597.53  817.83   597.6  824.47  597.93
  825.71     598  830.32  598.26  831.72  598.33  832.72  598.39  835.91  598.58
  845.89  599.17  852.29  599.59  853.34  599.66   855.8  599.85  856.65  599.91
  859.33     600    1300     600 1431.87  620.67 1433.48  620.73 1434.82  620.78
 1436.88  620.84  1440.5  620.98 1495.06  621.75 1497.67     622 1499.92  622.41
 1500.65  622.55 1501.25  622.67 1502.92  623.19 1503.38  623.33 1505.15  623.84
 1505.69     624 1507.54  624.47 1510.75  625.33 1512.77  625.93 1512.99     626
 1513.44  626.14 1515.18  626.67 1517.38  627.33  1519.7     628 1522.27  628.67
 1524.19  629.02 1525.98  629.33 1529.22  629.46 1535.23  629.65 1538.68  629.76
 1544.56  629.87 1549.09  629.96 1552.68  630.02 1560.95  630.11 1564.66  630.16
 1568.39  630.22  1578.8     630 1591.53     630

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    4.21    .075   176.6    .043  502.16    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         176.6  502.16           467.59  463.22   457.8             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
     530 1591.53     600       F
Left Levee      Station=  106.13      Elevation=     610
Right Levee     Station=     530      Elevation=     600


SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Des Plaines


      Reach          River Sta.     Contr.    Expan.

 1                    257312.2        .1        .3
 1                    257236.*        .1        .3
 1                    257161.1        .1        .3
 1                    256937.*        .1        .3
 1                    256713.*        .1        .3
 1                    256488.*        .1        .3
 1                    256264.*        .1        .3
 1                    256040.*        .1        .3
 1                    255816.*        .1        .3
 1                    255592.7        .1        .3
 1                    255414.*        .1        .3
 1                    255235.*        .1        .3
 1                    255057.*        .1        .3
 1                    254879.*        .1        .3
 1                    254700.8        .1        .3
 1                    254500.*        .1        .3
 1                    254300.*        .1        .3
 1                    254100.*        .1        .3
 1                    253900.*        .1        .3
 1                    253700.*        .1        .3
 1                    253500.*        .1        .3
 1                    253300.*        .1        .3
 1                    253100.*        .1        .3
 1                    252900.*        .1        .3
 1                    252701.*        .1        .3
 1                    252501.*        .1        .3
 1                    252301.*        .1        .3
 1                    252101.0        .3        .5
 1                    252035.7        .3        .5
 1                    252008   Bridge
 1                    251971.8        .3        .5
 1                    251791.*        .3        .5
 1                    251611.*        .1        .3
 1                    251431.7        .1        .3
 1                    251099.7        .1        .3
```

1		250960.6	.1	.3
1		250464.6	.1	.3
1		64250.75	.1	.3
1		64116.64	.1	.3
1		64090.85	.1	.3
1		63887.62	.1	.3
1		63655.12	.1	.3
1		63628.88	.1	.3
1		63547.57	.1	.3
1		63295.62	.1	.3
1		63007.62	Bridge	
1		62761.95	.1	.3
1		62524.89	.3	.5
1		62371.78	.1	.3
1		62061.6*	.3	.5
1		61857.26	.1	.3
1		61598.4*	.3	.5
1		61135.2*	.3	.5
1		60672.0*	.1	.3
1		60208.8*	.1	.3
1		59745.58	.1	.3
1		59256.1*	.1	.3
1		58766.7*	.1	.3
1		58277.3*	.1	.3
1		57787.9*	.1	.3
1		57298.5*	.1	.3
1		56809.1*	.1	.3
1		56319.7*	.1	.3
1		55830.2*	.1	.3
1		55340.8*	.1	.3
1		54851.4*	.1	.3
1		54362.0*	.1	.3
1		53872.64	.1	.3
1		53401.9*	.1	.3

10-Year Existing


DPR_BL Deliverable Plan: 1) DPR EX 917 10 2/14/2018
Legend
WS Max WS
Ground
Elevation (ft)
620
610
600
590
580
570
560
61598.4*
61857.26
62061.6*
62371.78
62524.89
62761.95
63007.62
63295.62
63547.57
63655.12
63887.62
64090.85
64250.75
64903.10
66263.53
60000
61000
62000
63000
64000
65000
66000
Main Channel Distance (ft)

HEC-RAS Plan: DPR EX 917 10 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
				(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Des Plaines	1	64250.75	Max WS	599.29	599.23	0.07	0.02			7072.90		301.35
Des Plaines	1	64116.64	Max WS	599.27	599.21	0.06	0.00			7074.30		304.86
Des Plaines	1	64090.85	Max WS	599.27	599.20	0.07	0.03			7074.38		316.73
Des Plaines	1	63887.62	Max WS	599.24	599.18	0.06	0.03			7074.83		325.96
Des Plaines	1	63655.12	Max WS	599.21	599.15	0.06	0.00		0.11	7071.24	2.80	346.60
Des Plaines	1	63628.88	Max WS	599.20	599.14	0.06	0.01			7074.18	0.05	306.73
Des Plaines	1	63547.57	Max WS	599.19	599.14	0.06	0.03		0.22	7069.92	3.09	521.56
Des Plaines	1	63295.62	Max WS	599.17	599.12	0.05	0.02	0.00		7072.56	1.22	372.85
Des Plaines	1	63007.62		Bridge								
Des Plaines	1	62761.95	Max WS	599.07	599.01	0.06	0.03			7059.38	13.20	478.87
Des Plaines	1	62524.89	Max WS	599.04	598.97	0.07	0.02			7020.19	54.15	278.83
Des Plaines	1	62371.78	Max WS	599.02	598.95	0.07	0.04			6922.72	150.73	329.35
Des Plaines	1	62061.6*	Max WS	598.98	598.92	0.06	0.03			7036.40	37.73	316.46

HEC-RAS Plan: DPR EX 917 10 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Des Plaines	1	64250.75	Max WS	7072.90	581.60	599.23		599.29	0.000142	2.06	3425.33	301.35	0.11
Des Plaines	1	64116.64	Max WS	7074.30	580.58	599.21		599.27	0.000140	2.04	3459.70	304.86	0.11
Des Plaines	1	64090.85	Max WS	7074.38	581.60	599.20		599.27	0.000156	2.08	3393.93	316.73	0.11
Des Plaines	1	63887.62	Max WS	7074.83	581.60	599.18		599.24	0.000137	1.98	3576.04	325.96	0.11
Des Plaines	1	63655.12	Max WS	7074.14	581.60	599.15		599.21	0.000130	1.98	3593.39	346.60	0.10
Des Plaines	1	63628.88	Max WS	7074.23	582.89	599.14		599.20	0.000135	2.02	3502.83	306.73	0.10
Des Plaines	1	63547.57	Max WS	7073.23	581.60	599.14		599.19	0.000117	1.94	3657.89	521.56	0.10
Des Plaines	1	63295.62	Max WS	7073.78	583.18	599.12	587.43	599.17	0.000094	1.84	3859.32	372.85	0.09
Des Plaines	1	63007.62		Bridge									
Des Plaines	1	62761.95	Max WS	7072.58	583.68	599.01		599.07	0.000110	2.00	3630.87	478.87	0.10
Des Plaines	1	62524.89	Max WS	7074.34	584.00	598.97		599.04	0.000131	2.14	3373.75	278.83	0.11
Des Plaines	1	62371.78	Max WS	7073.44	583.48	598.95		599.02	0.000139	2.18	3403.53	329.35	0.11
Des Plaines	1	62061.6*	Max WS	7074.13	584.00	598.92		598.98	0.000121	2.00	3609.47	316.46	0.10

Errors Warnings and Notes for Plan : DPR EX 917 10

Location:	River: Des Plaines Reach: 1 RS: 252501.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252301.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252101.0 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252035.7 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Downstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 251791.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247996.4 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247888.5 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247718.6 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247621.9 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245275.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245145.2 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.
Location:	River: Des Plaines Reach: 1 RS: 245140.2 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.
Location:	River: Des Plaines Reach: 1 RS: 245135.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 244984.7 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 244813.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 244128.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 242992.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.

Errors Warnings and Notes for Plan : DPR EX 917 10 (Continued)

Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 93633.38 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 93124.5* Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 92603.25 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 90981.94 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 89314.28 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The composite Mannings n value for the channel was larger than the largest entered n value or
	smaller than the smallest entered n value.
Note:	Manning's n values were composited to a single value in the main channel.
Location:	River: Des Plaines Reach: 1 RS: 88344.98 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 87883.4* Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 85781.03 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 85700 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 83788.26 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 83026.35 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 82725.92 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82700 Profile: Max WS
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 82700 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82700 Profile: Max WS Downstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Location:	River: Des Plaines Reach: 1 RS: 82283.96 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.

Errors Warnings and Notes for Plan : DPR EX 917 10 (Continued)

Location:	River: Des Plaines Reach: 1 RS: 82234.17 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82220 Profile: Max WS
Note:	Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The
	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 82220 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82141.78 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS
Note:	Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The
	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 77614.32 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 76067.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 75739.06 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 69647.47 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63547.57 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63295.62 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63007.62 Profile: Max WS
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream
	energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was
	the only one selected, the program will default to an energy based solution.
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 63007.62 Profile: Max WS Downstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Location:	River: Des Plaines Reach: 1 RS: 62761.95 Profile: Max WS
Warning:	Divided flow computed for this cross-section.

Errors Warnings and Notes for Plan : DPR EX 917 10 (Continued)

Location:	River: Des Plaines Reach: 1 RS: 62371.78 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 51048.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50577.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50107.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 38488.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 35842.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 35367.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 34893.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 34418.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33943.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33469.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32994.46 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32535.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32075.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 31616.2* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 31156.8* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 30697.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 30238.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29778.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29319.23 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 29047.90 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28549.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28051.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 27553.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 27055.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.

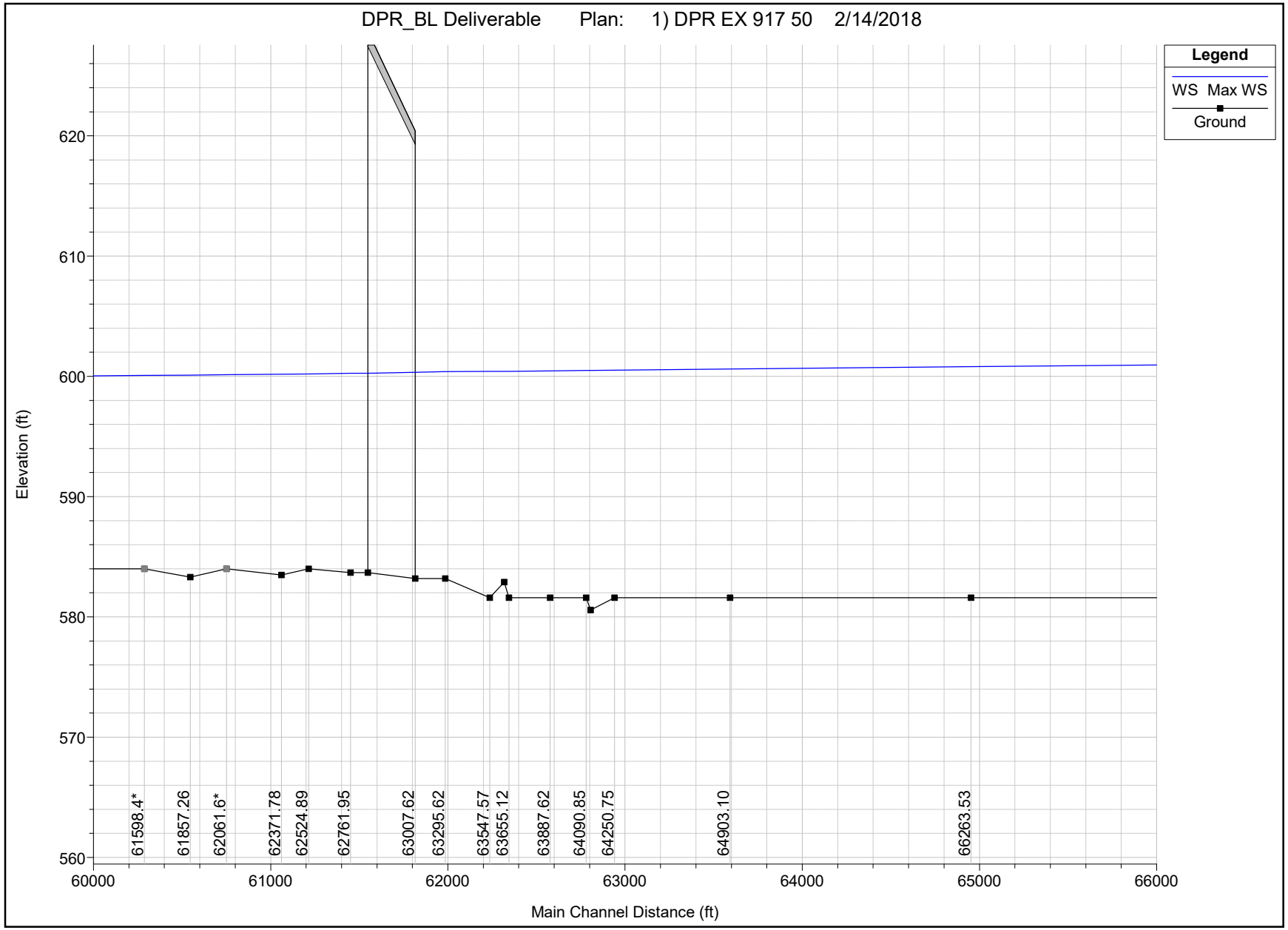
Errors Warnings and Notes for Plan : DPR EX 917 10 (Continued)

Location:	River: Des Plaines Reach: 1 RS: 26556.9* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 26058.80 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 25619.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 25180.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 19101.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 18609.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 18117.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 17625.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 17133.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 15657.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 15165.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 14673.2* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 14181.2* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 13689.2* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 13197.18 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 12722.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 12247.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 11772.83 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 11612.58 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 11550 Profile: Max WS
Note:	Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The
	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 11550 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 11550 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 11442.25 Profile: Max WS

Errors Warnings and Notes for Plan : DPR EX 917 10 (Continued)

Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 10747 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 10487 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 1305.659 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.

50-Year Existing


DPR_BL Deliverable Plan: 1) DPR EX 917 50 2/14/2018
Legend
WS Max WS
Ground
Elevation (ft)
620
610
600
590
580
570
560
61598.4*
61857.26
62061.6*
62371.78
62524.89
62761.95
63007.62
63295.62
63547.57
63655.12
63887.62
64090.85
64250.75
64903.10
66263.53
60000
61000
62000
63000
64000
65000
66000
Main Channel Distance (ft)

HEC-RAS Plan: DPR EX 917 50 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Des Plaines	1	64250.75	Max WS	8947.81	581.60	600.51		600.60	0.000166	2.34	3831.83	343.38	0.12
Des Plaines	1	64116.64	Max WS	8947.40	580.58	600.49		600.57	0.000162	2.32	3864.30	329.64	0.12
Des Plaines	1	64090.85	Max WS	8948.09	581.60	600.48		600.57	0.000182	2.34	3824.90	361.93	0.12
Des Plaines	1	63887.62	Max WS	8947.82	581.60	600.46		600.54	0.000163	2.23	4014.28	499.17	0.12
Des Plaines	1	63655.12	Max WS	8948.17	581.60	600.42		600.50	0.000145	2.25	4057.64	530.89	0.11
Des Plaines	1	63628.88	Max WS	8948.23	582.89	600.41		600.50	0.000154	2.30	3913.88	359.75	0.11
Des Plaines	1	63547.57	Max WS	8948.96	581.60	600.41		600.48	0.000134	2.22	4112.05	932.10	0.11
Des Plaines	1	63295.62	Max WS	8948.82	583.18	600.39	587.97	600.45	0.000110	2.10	4664.25	825.07	0.10
Des Plaines	1	63007.62		Bridge									
Des Plaines	1	62761.95	Max WS	8947.97	583.68	600.26		600.34	0.000130	2.29	4417.97	882.31	0.11
Des Plaines	1	62524.89	Max WS	8948.40	584.00	600.21		600.30	0.000158	2.48	3745.28	399.56	0.12
Des Plaines	1	62371.78	Max WS	8947.91	583.48	600.18		600.28	0.000169	2.50	3834.65	374.89	0.12
Des Plaines	1	62061.6*	Max WS	8949.18	584.00	600.15		600.23	0.000144	2.30	4071.31	793.23	0.11

HEC-RAS Plan: DPR EX 917 50 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
				(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Des Plaines	1	64250.75	Max WS	600.60	600.51	0.09	0.02		0.01	8946.86	0.94	343.38
Des Plaines	1	64116.64	Max WS	600.57	600.49	0.08	0.00			8946.57	0.83	329.64
Des Plaines	1	64090.85	Max WS	600.57	600.48	0.09	0.03		0.03	8947.03	1.03	361.93
Des Plaines	1	63887.62	Max WS	600.54	600.46	0.08	0.04		0.04	8947.63	0.15	499.17
Des Plaines	1	63655.12	Max WS	600.50	600.42	0.08	0.00		1.50	8923.59	23.07	530.89
Des Plaines	1	63628.88	Max WS	600.50	600.41	0.08	0.01			8945.09	3.14	359.75
Des Plaines	1	63547.57	Max WS	600.48	600.41	0.08	0.03		1.63	8921.98	25.35	932.10
Des Plaines	1	63295.62	Max WS	600.45	600.39	0.07	0.02	0.00		8865.93	82.89	825.07
Des Plaines	1	63007.62		Bridge								
Des Plaines	1	62761.95	Max WS	600.34	600.26	0.08	0.03			8825.95	122.02	882.31
Des Plaines	1	62524.89	Max WS	600.30	600.21	0.09	0.02			8909.65	38.75	399.56
Des Plaines	1	62371.78	Max WS	600.28	600.18	0.09	0.05			8703.22	244.69	374.89
Des Plaines	1	62061.6*	Max WS	600.23	600.15	0.08	0.03			8925.37	23.81	793.23

Errors Warnings and Notes for Plan : DPR EX 917 50

Location:	River: Des Plaines Reach: 1 RS: 253700.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 253500.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 253300.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 253100.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252501.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252301.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252101.0 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252035.7 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 251971.8 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 251791.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247996.4 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247888.5 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247718.6 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247621.9 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245740.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245275.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245145.2 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.

Errors Warnings and Notes for Plan : DPR EX 917 50 (Continued)

	bridge and weir flow over the embankment. The reported hydraulics are based on the flow and area
	inside of the bridge.
Location:	River: Des Plaines Reach: 1 RS: 111447.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 111292.4 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 111280 Profile: Max WS
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 111280 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 111280 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 109680.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 109428.1 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 109254.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 108602.1 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 108560 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 108560 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 106752.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 105648.1 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 104791.9 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 104720.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 104526.1 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 104473.4 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy

Errors Warnings and Notes for Plan : DPR EX 917 50 (Continued)

	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 89314.28 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The composite Mannings n value for the channel was larger than the largest entered n value or
	smaller than the smallest entered n value.
Note:	Manning's n values were composited to a single value in the main channel.
Location:	River: Des Plaines Reach: 1 RS: 88344.98 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 87883.4* Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 85781.03 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 85700 Profile: Max WS
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 85700 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 83788.26 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 83026.35 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 82725.92 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82700 Profile: Max WS
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 82700 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82604.98 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 82283.96 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 82234.17 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82220 Profile: Max WS
Note:	Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The
	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.

Errors Warnings and Notes for Plan : DPR EX 917 50 (Continued)

Location:	River: Des Plaines Reach: 1 RS: 82220 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82199.67 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 82141.78 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS
Note:	Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The
	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 77614.32 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 76627.92 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 76067.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 75739.06 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 74504.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 69647.47 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63887.62 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63655.12 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63547.57 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 63007.62 Profile: Max WS
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream
	energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was
	the only one selected, the program will default to an energy based solution.
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 62761.95 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 62371.78 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 51048.4* Profile: Max WS

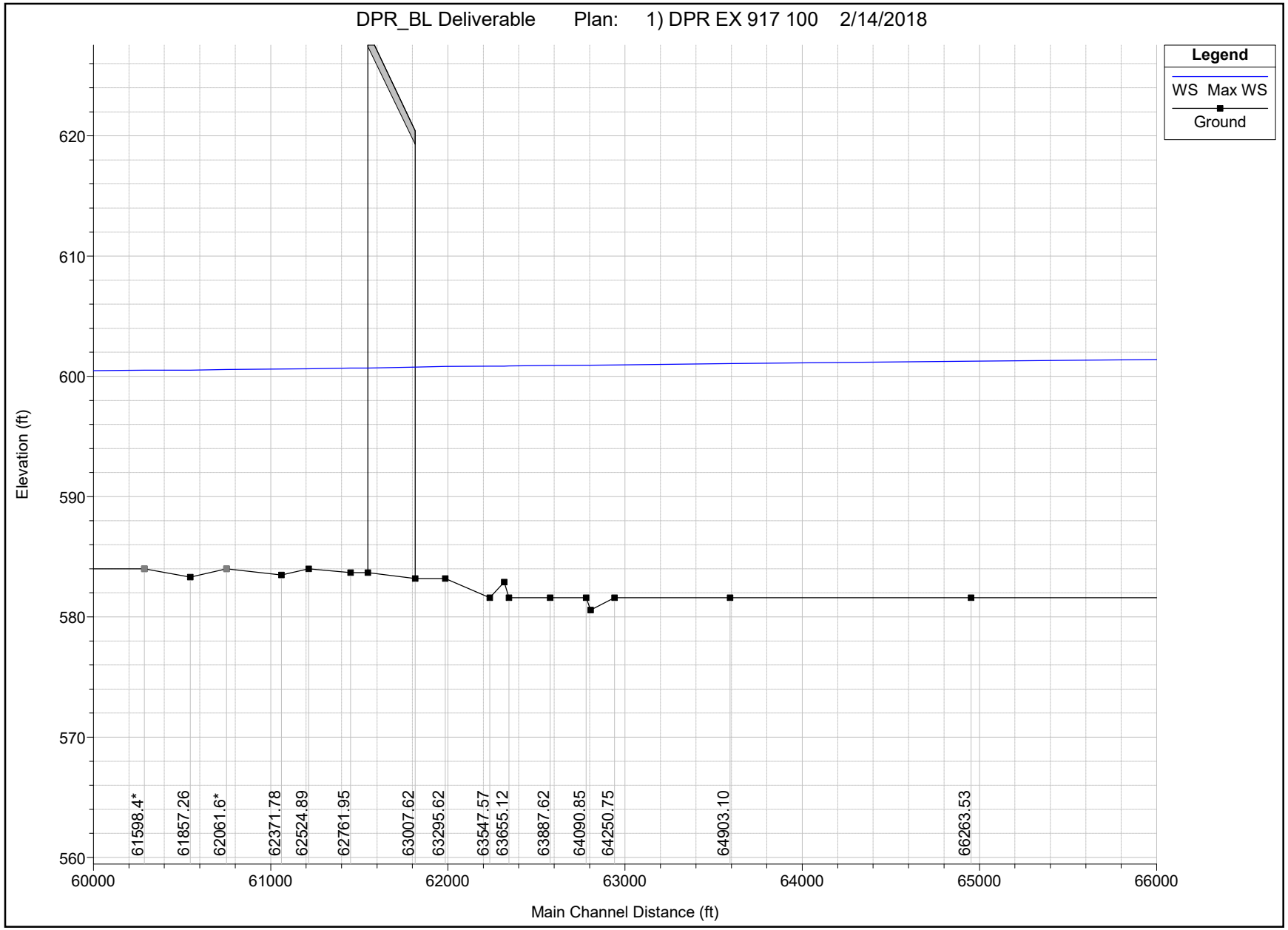
Errors Warnings and Notes for Plan : DPR EX 917 50 (Continued)

Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50577.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50107.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 36316.9* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 34893.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 34418.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33943.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33469.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32994.46 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32535.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32075.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 31616.2* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 31156.8* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 30697.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29778.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29319.23 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29047.90 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28549.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28051.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 27553.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 27055.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 25619.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 19101.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 18609.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 18117.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 17625.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 17133.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.

Errors Warnings and Notes for Plan : DPR EX 917 50 (Continued)

Location:	River: Des Plaines Reach: 1 RS: 16641.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 13689.2* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 13197.18 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 12722.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 12247.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 11772.83 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 11612.58 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 11550 Profile: Max WS
Note:	Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The
	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 11550 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 11550 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 11442.25 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 11147 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 10747 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 10550 Profile: Max WS Upstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Location:	River: Des Plaines Reach: 1 RS: 10487 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 1305.659 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.

100-Year Existing


DPR_BL Deliverable Plan: 1) DPR EX 917 100 2/14/2018
Legend
WS Max WS
Ground
Elevation (ft)
620
610
600
590
580
570
560
61598.4*
61857.26
62061.6*
62371.78
62524.89
62761.95
63007.62
63295.62
63547.57
63655.12
63887.62
64090.85
64250.75
64903.10
66263.53
60000
61000
62000
63000
64000
65000
66000
Main Channel Distance (ft)

HEC-RAS Plan: DPR EX 917 100 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Des Plaines	1	64250.75	Max WS	9658.01	581.60	600.95		601.05	0.000172	2.44	3987.57	361.38	0.12
Des Plaines	1	64116.64	Max WS	9658.53	580.58	600.93		601.02	0.000169	2.42	4026.92	376.26	0.12
Des Plaines	1	64090.85	Max WS	9658.59	581.60	600.93		601.02	0.000187	2.44	3985.43	365.52	0.12
Des Plaines	1	63887.62	Max WS	9658.59	581.60	600.90		600.98	0.000168	2.32	4173.95	645.54	0.12
Des Plaines	1	63655.12	Max WS	9659.22	581.60	600.86		600.95	0.000151	2.34	4223.71	696.21	0.11
Des Plaines	1	63628.88	Max WS	9658.98	582.89	600.85		600.94	0.000161	2.40	4074.55	382.58	0.12
Des Plaines	1	63547.57	Max WS	9659.12	581.60	600.85		600.93	0.000140	2.32	4274.39	1225.32	0.11
Des Plaines	1	63295.62	Max WS	9659.51	583.18	600.82	588.16	600.90	0.000114	2.18	5027.65	829.94	0.10
Des Plaines	1	63007.62		Bridge									
Des Plaines	1	62761.95	Max WS	9659.19	583.68	600.69		600.77	0.000136	2.38	4836.86	1059.85	0.11
Des Plaines	1	62524.89	Max WS	9659.91	584.00	600.63		600.74	0.000167	2.59	3916.13	402.17	0.12
Des Plaines	1	62371.78	Max WS	9660.14	583.48	600.61		600.71	0.000184	2.61	3999.41	419.68	0.13
Des Plaines	1	62061.6*	Max WS	9660.35	584.00	600.57		600.66	0.000150	2.39	4406.32	794.75	0.11

HEC-RAS Plan: DPR EX 917 100 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
				(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Des Plaines	1	64250.75	Max WS	601.05	600.95	0.09	0.02		0.11	9653.55	4.34	361.38
Des Plaines	1	64116.64	Max WS	601.02	600.93	0.09	0.00			9653.67	4.87	376.26
Des Plaines	1	64090.85	Max WS	601.02	600.93	0.09	0.04		0.18	9654.00	4.41	365.52
Des Plaines	1	63887.62	Max WS	600.98	600.90	0.08	0.04		0.27	9657.42	0.90	645.54
Des Plaines	1	63655.12	Max WS	600.95	600.86	0.08	0.00		2.59	9620.03	36.60	696.21
Des Plaines	1	63628.88	Max WS	600.94	600.85	0.09	0.01			9648.82	10.16	382.58
Des Plaines	1	63547.57	Max WS	600.93	600.85	0.08	0.03		2.59	9616.12	40.41	1225.32
Des Plaines	1	63295.62	Max WS	600.90	600.82	0.07	0.03	0.00		9490.15	169.37	829.94
Des Plaines	1	63007.62		Bridge								
Des Plaines	1	62761.95	Max WS	600.77	600.69	0.09	0.04			9448.09	211.10	1059.85
Des Plaines	1	62524.89	Max WS	600.74	600.63	0.10	0.03			9590.58	69.33	402.17
Des Plaines	1	62371.78	Max WS	600.71	600.61	0.10	0.05			9374.76	285.38	419.68
Des Plaines	1	62061.6*	Max WS	600.66	600.57	0.09	0.03			9576.14	84.21	794.75

Errors Warnings and Notes for Plan : DPR EX 917 100

Location:	River: Des Plaines Reach: 1 RS: 253300.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 253100.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252900.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252701.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252501.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252301.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252101.0 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252035.7 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Upstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 251971.8 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247996.4 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247888.5 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247718.6 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247621.9 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245740.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245275.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245145.2 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water

Errors Warnings and Notes for Plan : DPR EX 917 100 (Continued)

Location:	River: Des Plaines Reach: 1 RS: 83026.35 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 82725.92 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82700 Profile: Max WS
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 82700 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82700 Profile: Max WS Downstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Location:	River: Des Plaines Reach: 1 RS: 82604.98 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 82283.96 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 82234.17 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82220 Profile: Max WS
Note:	Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The
	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 82220 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82199.67 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 82141.78 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS
Note:	Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The
	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.

Errors Warnings and Notes for Plan : DPR EX 917 100 (Continued)

Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82107.68 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 77614.32 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 76627.92 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 76067.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 75739.06 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 69647.47 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63887.62 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63655.12 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63628.88 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63547.57 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 63007.62 Profile: Max WS
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream
	energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was
	the only one selected, the program will default to an energy based solution.
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 63007.62 Profile: Max WS Downstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Location:	River: Des Plaines Reach: 1 RS: 62371.78 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 59745.58 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 59256.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 58766.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 58277.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 51048.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50577.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50107.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.

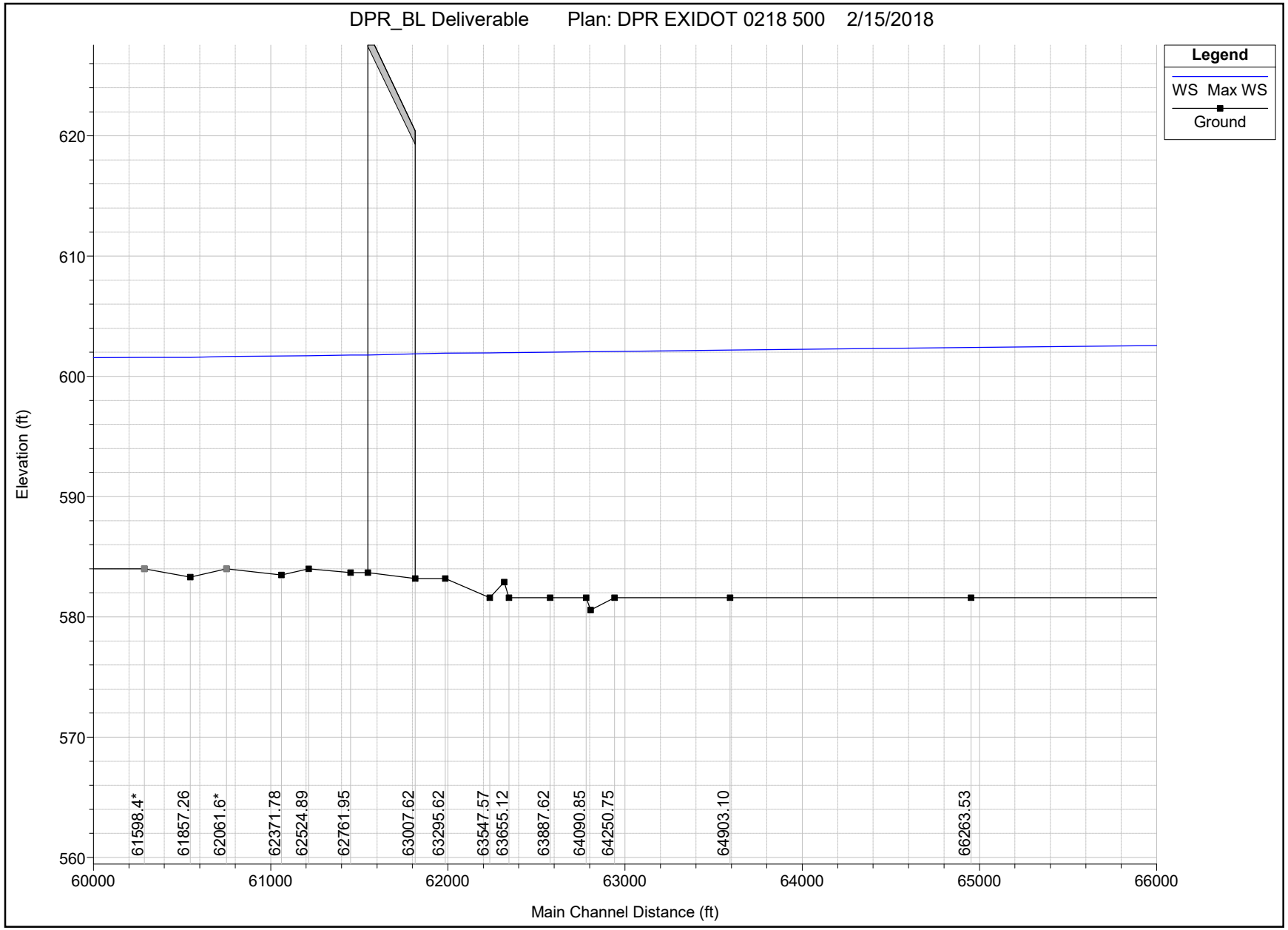
Errors Warnings and Notes for Plan : DPR EX 917 100 (Continued)

Location:	River: Des Plaines Reach: 1 RS: 34893.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 34418.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33943.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33469.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32994.46 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32535.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32075.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 31616.2* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 31156.8* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29319.23 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29047.90 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28549.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28051.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 27553.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 27055.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 25619.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 24302.2* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 19593.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 19101.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 18609.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 18117.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 17133.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 16641.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 16149.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 13197.18 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 12722.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 12247.6* Profile: Max WS

Errors Warnings and Notes for Plan : DPR EX 917 100 (Continued)

Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 11772.83 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 11612.58 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 11550 Profile: Max WS
Note:	Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The
	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 11550 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 11550 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 11442.25 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 11147 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 10747 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 10487 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 1305.659 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.

500-Year Existing


DPR_BL Deliverable Plan: DPR EXIDOT 0218 500 2/15/2018
Legend
WS Max WS
Ground
Elevation (ft)
620
610
600
590
580
570
560
61598.4*
61857.26
62061.6*
62371.78
62524.89
62761.95
63007.62
63295.62
63547.57
63655.12
63887.62
64090.85
64250.75
64903.10
66263.53
60000
61000
62000
63000
64000
65000
66000
Main Channel Distance (ft)

HEC-RAS Plan: DPR BL 500 EX ID Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Des Plaines	1	64250.75	Max WS	11568.17	581.60	602.07		602.18	0.000185	2.68	4418.79	412.68	0.13
Des Plaines	1	64116.64	Max WS	11568.55	580.58	602.05		602.15	0.000185	2.65	4459.24	400.35	0.13
Des Plaines	1	64090.85	Max WS	11568.66	581.60	602.04		602.15	0.000198	2.66	4397.40	374.50	0.13
Des Plaines	1	63887.62	Max WS	11569.28	581.60	602.02		602.11	0.000173	2.50	5227.32	997.61	0.12
Des Plaines	1	63655.12	Max WS	11569.88	581.60	601.97		602.07	0.000164	2.57	4651.00	1037.94	0.12
Des Plaines	1	63628.88	Max WS	11568.80	582.89	601.96		602.07	0.000177	2.63	4580.72	510.24	0.12
Des Plaines	1	63547.57	Max WS	11570.26	581.60	601.95		602.06	0.000154	2.56	4689.15	1456.68	0.12
Des Plaines	1	63295.62	Max WS	11571.00	583.18	601.94	588.67	602.02	0.000123	2.37	5953.55	833.62	0.11
Des Plaines	1	63007.62		Bridge									
Des Plaines	1	62761.95	Max WS	11569.89	583.68	601.78		601.88	0.000143	2.55	6118.40	1189.02	0.11
Des Plaines	1	62524.89	Max WS	11570.66	584.00	601.71		601.84	0.000187	2.86	4354.58	408.96	0.13
Des Plaines	1	62371.78	Max WS	11569.74	583.48	601.69		601.81	0.000221	2.87	4471.09	449.03	0.14
Des Plaines	1	62061.6*	Max WS	11570.71	584.00	601.65		601.75	0.000161	2.59	5265.52	800.49	0.12

HEC-RAS Plan: DPR BL 500 EX ID Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
				(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Des Plaines	1	64250.75	Max WS	602.18	602.07	0.11	0.02		1.29	11537.46	29.42	412.68
Des Plaines	1	64116.64	Max WS	602.15	602.05	0.11	0.00			11532.53	36.02	400.35
Des Plaines	1	64090.85	Max WS	602.15	602.04	0.11	0.04		1.48	11545.85	21.33	374.50
Des Plaines	1	63887.62	Max WS	602.11	602.02	0.10	0.04		2.43	11390.29	176.56	997.61
Des Plaines	1	63655.12	Max WS	602.07	601.97	0.10	0.00		7.51	11478.79	83.58	1037.94
Des Plaines	1	63628.88	Max WS	602.07	601.96	0.11	0.01			11504.92	63.88	510.24
Des Plaines	1	63547.57	Max WS	602.06	601.95	0.10	0.03		6.50	11471.21	92.55	1456.68
Des Plaines	1	63295.62	Max WS	602.02	601.94	0.08	0.03	0.00		11071.75	499.25	833.62
Des Plaines	1	63007.62		Bridge								
Des Plaines	1	62761.95	Max WS	601.88	601.78	0.09	0.04			10870.46	699.43	1189.02
Des Plaines	1	62524.89	Max WS	601.84	601.71	0.12	0.03			11389.22	181.44	408.96
Des Plaines	1	62371.78	Max WS	601.81	601.69	0.12	0.06			11182.86	386.88	449.03
Des Plaines	1	62061.6*	Max WS	601.75	601.65	0.10	0.04		0.05	11210.49	360.17	800.49

Errors Warnings and Notes for Plan : DPR BL 500 EX ID

Location:	River: Des Plaines Reach: 1 RS: 252035.7 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Upstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	For the cross section inside the bridge at the upstream end, the water surface and energy have been
	projected from the upstream cross section. The selected bridge modeling method does not compute
	answers inside the bridge.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Downstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	For the cross section inside the bridge at the downstream end, the water surface and energy have
	been projected from the downstream cross section. The selected bridge modeling method does not
	compute answers inside the bridge.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 251971.8 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 251611.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 251099.7 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 250960.6 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247996.4 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247888.5 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247718.6 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247621.9 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245740.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245145.2 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.
Location:	River: Des Plaines Reach: 1 RS: 245140.2 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.
Location:	River: Des Plaines Reach: 1 RS: 244984.7 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 244813.* Profile: Max WS

Errors Warnings and Notes for Plan : DPR BL 500 EX ID (Continued)

	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 82725.92 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82700 Profile: Max WS
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 82700 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82604.98 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 82283.96 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 82234.17 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82220 Profile: Max WS
Note:	Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The
	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 82220 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82199.67 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 82141.78 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS
Note:	Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The
	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82107.68 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.

Errors Warnings and Notes for Plan : DPR BL 500 EX ID (Continued)

Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 81889.79 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 80640.82 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 79900.84 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 79597.21 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 77821.42 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 77614.32 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 76067.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 72842.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 67372.14 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63655.12 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63628.88 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63547.57 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 63295.62 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 63007.62 Profile: Max WS
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream
	energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was
	the only one selected, the program will default to an energy based solution.
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 63007.62 Profile: Max WS Upstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Location:	River: Des Plaines Reach: 1 RS: 63007.62 Profile: Max WS Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 62761.95 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 62371.78 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 61857.26 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.

Errors Warnings and Notes for Plan : DPR BL 500 EX ID (Continued)

Location:	River: Des Plaines Reach: 1 RS: 59745.58 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 59256.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 58766.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 58277.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 57787.9* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 57298.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 51989.8* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 51519.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 51048.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50577.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50107.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 49636.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 49165.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 38114.6* Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 36316.9* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33943.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33469.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32994.46 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32535.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32075.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29047.90 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28549.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28051.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 25180.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 23863.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 23424.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 20577.6* Profile: Max WS

Structure Tables

HEC-RAS Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Plan	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
					(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Des Plaines	1	64250.75	Max WS	DPR EX 917 100	601.04	600.95		0.02		361.21	0.11	9653.65	4.30	2.44
Des Plaines	1	64250.75	Max WS	DPR EX 917 50	600.59	600.51		0.02		343.22	0.01	8946.23	0.93	2.34
Des Plaines	1	64250.75	Max WS	DPR EX 917 10	599.29	599.22		0.02		301.31		7074.02		2.07
Des Plaines	1	64116.64	Max WS	DPR EX 917 100	601.02	600.93		0.00		376.18		9653.72	4.80	2.42
Des Plaines	1	64116.64	Max WS	DPR EX 917 50	600.57	600.49		0.00		329.55		8946.57	0.82	2.32
Des Plaines	1	64116.64	Max WS	DPR EX 917 10	599.27	599.21		0.00		304.83		7073.21		2.04
Des Plaines	1	64090.85	Max WS	DPR EX 917 100	601.01	600.92		0.04		365.49	0.17	9654.03	4.37	2.44
Des Plaines	1	64090.85	Max WS	DPR EX 917 50	600.57	600.48		0.04		361.89	0.03	8946.41	1.01	2.35
Des Plaines	1	64090.85	Max WS	DPR EX 917 10	599.27	599.20		0.03		316.66		7073.28		2.08
Des Plaines	1	63887.62	Max WS	DPR EX 917 100	600.98	600.89		0.04		644.13	0.27	9657.74	0.89	2.32
Des Plaines	1	63887.62	Max WS	DPR EX 917 50	600.53	600.45		0.04		497.93	0.04	8948.24	0.14	2.23
Des Plaines	1	63887.62	Max WS	DPR EX 917 10	599.24	599.18		0.03		325.90		7073.72		1.98
Des Plaines	1	63655.12	Max WS	DPR EX 917 100	600.94	600.86		0.00		694.62	2.58	9619.92	36.48	2.34
Des Plaines	1	63655.12	Max WS	DPR EX 917 50	600.50	600.42		0.00		529.45	1.50	8924.27	22.98	2.25
Des Plaines	1	63655.12	Max WS	DPR EX 917 10	599.21	599.14		0.00		346.52	0.11	7071.27	2.78	1.98
Des Plaines	1	63628.88	Max WS	DPR EX 917 100	600.94	600.85		0.01		381.95		9649.19	10.08	2.40
Des Plaines	1	63628.88	Max WS	DPR EX 917 50	600.49	600.41		0.01		359.67		8945.13	3.10	2.30
Des Plaines	1	63628.88	Max WS	DPR EX 917 10	599.20	599.14		0.01		306.70		7074.20	0.04	2.02
Des Plaines	1	63547.57	Max WS	DPR EX 917 100	600.93	600.84		0.03		1224.04	2.58	9616.55	40.28	2.32
Des Plaines	1	63547.57	Max WS	DPR EX 917 50	600.48	600.40		0.03		929.47	1.62	8920.67	25.25	2.22
Des Plaines	1	63547.57	Max WS	DPR EX 917 10	599.19	599.13		0.03		521.12	0.21	7069.93	3.07	1.95
Des Plaines	1	63295.62	Max WS	DPR EX 917 100	600.89	600.82	588.16	0.03	0.00	829.90		9491.07	168.54	2.18
Des Plaines	1	63295.62	Max WS	DPR EX 917 50	600.45	600.38	587.97	0.02	0.00	825.03		8866.51	82.29	2.10
Des Plaines	1	63295.62	Max WS	DPR EX 917 10	599.17	599.11	587.43	0.02	0.00	371.87		7073.79	1.20	1.84
Des Plaines	1	63007.62BR U	Max WS	DPR EX 917 100	600.86	600.77	588.34	0.04	0.00	330.53		9622.08	37.52	2.39
Des Plaines	1	63007.62BR U	Max WS	DPR EX 917 50	600.41	600.33	588.14	0.04	0.00	329.72		8926.79	22.01	2.28
Des Plaines	1	63007.62BR U	Max WS	DPR EX 917 10	599.13	599.07	587.58	0.03	0.00	286.26		7074.03	0.96	1.98
Des Plaines	1	63007.62BR D	Max WS	DPR EX 917 100	600.81	600.70	588.53	0.03	0.01	333.01		9648.48	11.12	2.61
Des Plaines	1	63007.62BR D	Max WS	DPR EX 917 50	600.37	600.27	588.35	0.03	0.00	332.08		8947.65	1.16	2.49
Des Plaines	1	63007.62BR D	Max WS	DPR EX 917 10	599.10	599.03	587.78	0.02	0.00	243.10		7074.99		2.15
Des Plaines	1	62761.95	Max WS	DPR EX 917 100	600.77	600.69		0.04		1059.95		9448.44	211.16	2.38
Des Plaines	1	62761.95	Max WS	DPR EX 917 50	600.34	600.26		0.03		882.31		8825.95	122.02	2.29
Des Plaines	1	62761.95	Max WS	DPR EX 917 10	599.07	599.01		0.03		478.87		7060.56	13.20	2.00
Des Plaines	1	62524.89	Max WS	DPR EX 917 100	600.74	600.63		0.03		402.17		9590.33	69.34	2.59
Des Plaines	1	62524.89	Max WS	DPR EX 917 50	600.30	600.21		0.02		399.56		8910.46	38.75	2.48
Des Plaines	1	62524.89	Max WS	DPR EX 917 10	599.04	598.97		0.02		278.83		7019.02	54.15	2.14
Des Plaines	1	62371.78	Max WS	DPR EX 917 100	600.71	600.61		0.05		419.73		9374.52	285.38	2.61
Des Plaines	1	62371.78	Max WS	DPR EX 917 50	600.28	600.18		0.05		374.89		8703.95	244.71	2.50

HEC-RAS Locations: User Defined Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
					(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Des Plaines	1	62371.78	Max WS	DPR EX 917 10	599.02	598.95		0.04		329.35		6922.75	150.73	2.18
Des Plaines	1	62061.6*	Max WS	DPR EX 917 100	600.66	600.57		0.03		794.75		9576.50	84.22	2.39
Des Plaines	1	62061.6*	Max WS	DPR EX 917 50	600.23	600.15		0.03		793.23		8925.37	23.81	2.30
Des Plaines	1	62061.6*	Max WS	DPR EX 917 10	598.98	598.92		0.03		316.46		7036.43	37.73	2.00
Des Plaines	1	61857.26	Max WS	DPR EX 917 100	600.62	600.52		0.04		319.79		9478.03	182.74	2.60
Des Plaines	1	61857.26	Max WS	DPR EX 917 50	600.20	600.10		0.04		316.15		8787.63	161.08	2.49
Des Plaines	1	61857.26	Max WS	DPR EX 917 10	598.95	598.88		0.03		305.57		6964.60	108.70	2.18
Des Plaines	1	61598.4*	Max WS	DPR EX 917 100	600.58	600.51		0.06		1126.91	0.00	9313.71	347.45	2.20
Des Plaines	1	61598.4*	Max WS	DPR EX 917 50	600.15	600.08		0.06		1122.88		8753.67	195.44	2.14
Des Plaines	1	61598.4*	Max WS	DPR EX 917 10	598.92	598.86		0.06		339.57		7051.97	21.88	1.90

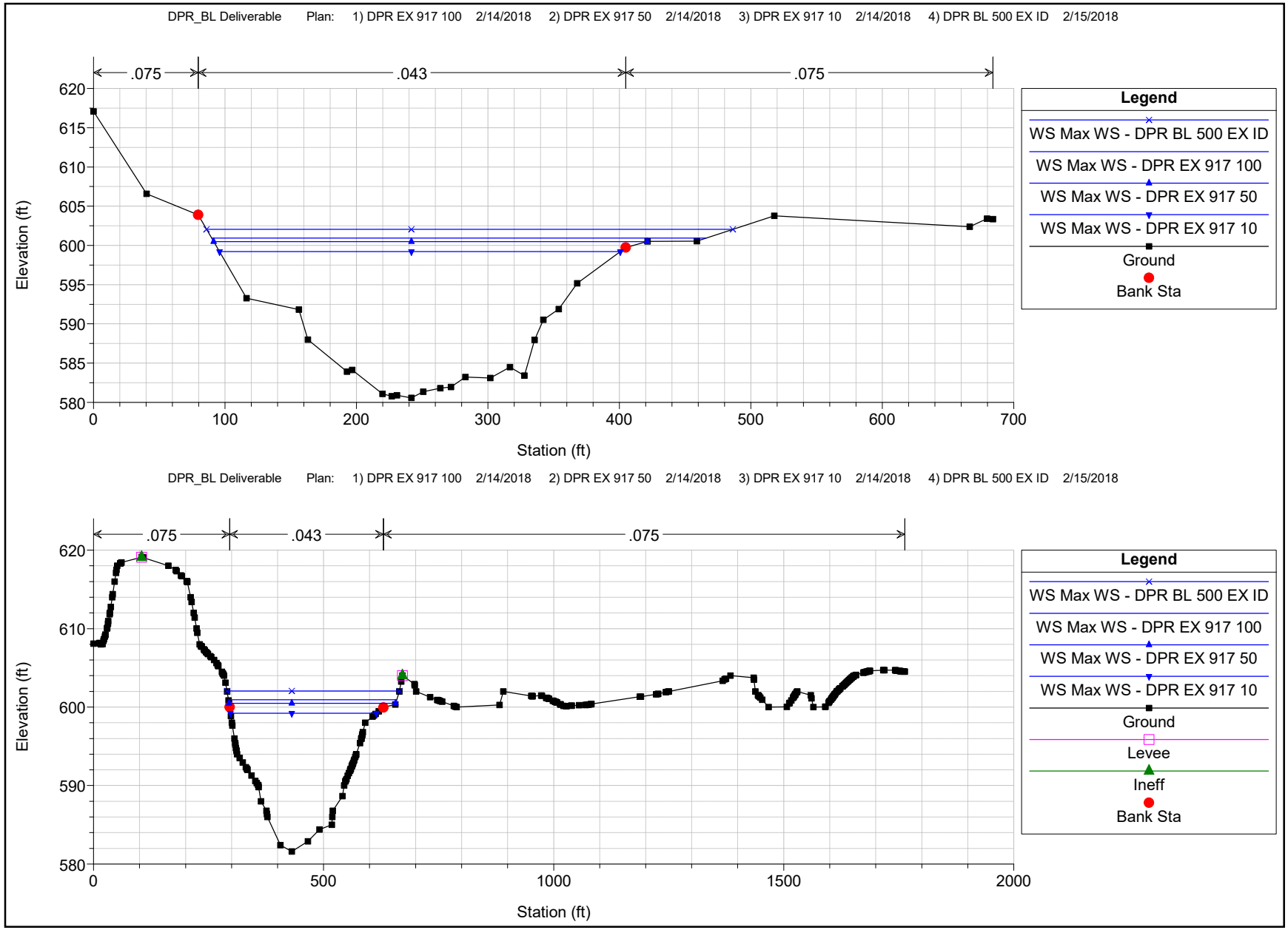
HEC-RAS Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Plan	E.G. US.	W.S. US.	Br Sel Method	Energy EG	Momen. EG	Yarnell EG	WSPRO EG	Prs O EG	Prs/Wr EG	Energy/Wr EG
					(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Des Plaines	1	63007.62	Max WS	DPR EX 917 100	600.89	600.82	Energy only	600.88						
Des Plaines	1	63007.62	Max WS	DPR EX 917 50	600.45	600.38	Energy only	600.44						
Des Plaines	1	63007.62	Max WS	DPR EX 917 10	599.17	599.11	Energy only	599.16						

HEC-RAS Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Plan	E.G. US.	W.S. US.	Br Sel Method	Energy EG	Momen. EG	Yarnell EG	WSPRO EG	Prs O EG	Prs/Wr EG	Energy/Wr EG
					(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Des Plaines	1	63007.62	Max WS	DPR EX 917 100	600.90	600.82	Energy only	600.89						
Des Plaines	1	63007.62	Max WS	DPR EX 917 50	600.45	600.39	Energy only	600.44						
Des Plaines	1	63007.62	Max WS	DPR EX 917 10	599.17	599.12	Energy only	599.16						
Des Plaines	1	63007.62	Max WS	DPR BL 500 EX ID	602.02	601.94	Energy only	602.01						

HEC-RAS Plotted Cross Sections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.075
.043
.075
Elevation (ft)
620
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610
605
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595
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0
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200
300
400
500
600
700
Station (ft)
Legend
WS Max WS - DPR BL 500 EX ID
WS Max WS - DPR EX 917 100
WS Max WS - DPR EX 917 50
WS Max WS - DPR EX 917 10
Ground
Bank Sta
DPR_BL Deliverable Plan: 1) DPR EX 917 100 2/14/2018 2) DPR EX 917 50 2/14/2018 3) DPR EX 917 10 2/14/2018 4) DPR BL 500 EX ID 2/15/2018
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Elevation (ft)
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Station (ft)
Legend
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WS Max WS - DPR EX 917 100
WS Max WS - DPR EX 917 50
WS Max WS - DPR EX 917 10
Ground
Levee
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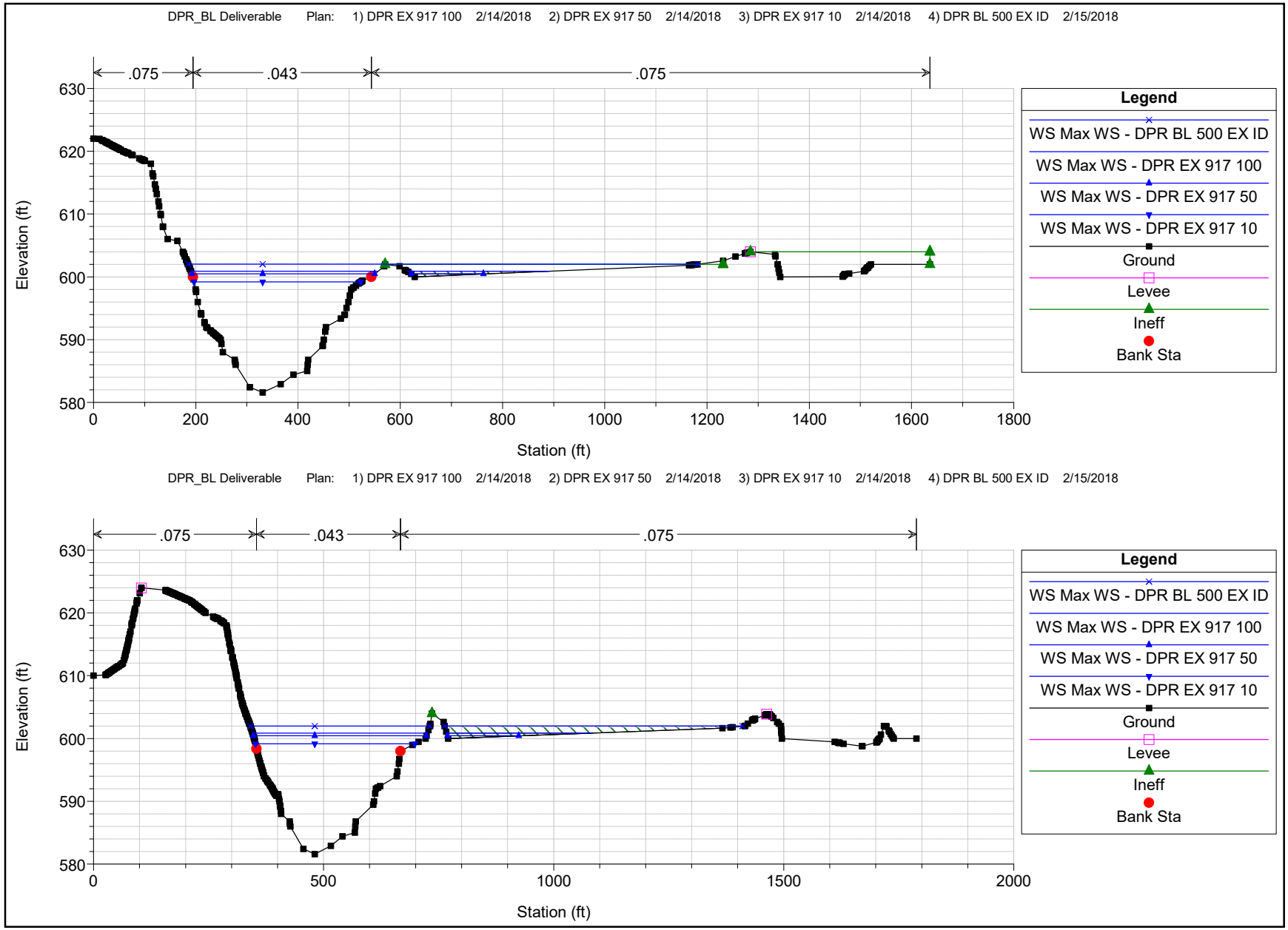
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Elevation (ft)
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Station (ft)
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WS Max WS - DPR BL 500 EX ID
WS Max WS - DPR EX 917 100
WS Max WS - DPR EX 917 50
WS Max WS - DPR EX 917 10
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DPR_BL Deliverable Plan: 1) DPR EX 917 100 2/14/2018 2) DPR EX 917 50 2/14/2018 3) DPR EX 917 10 2/14/2018 4) DPR BL 500 EX ID 2/15/2018
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Elevation (ft)
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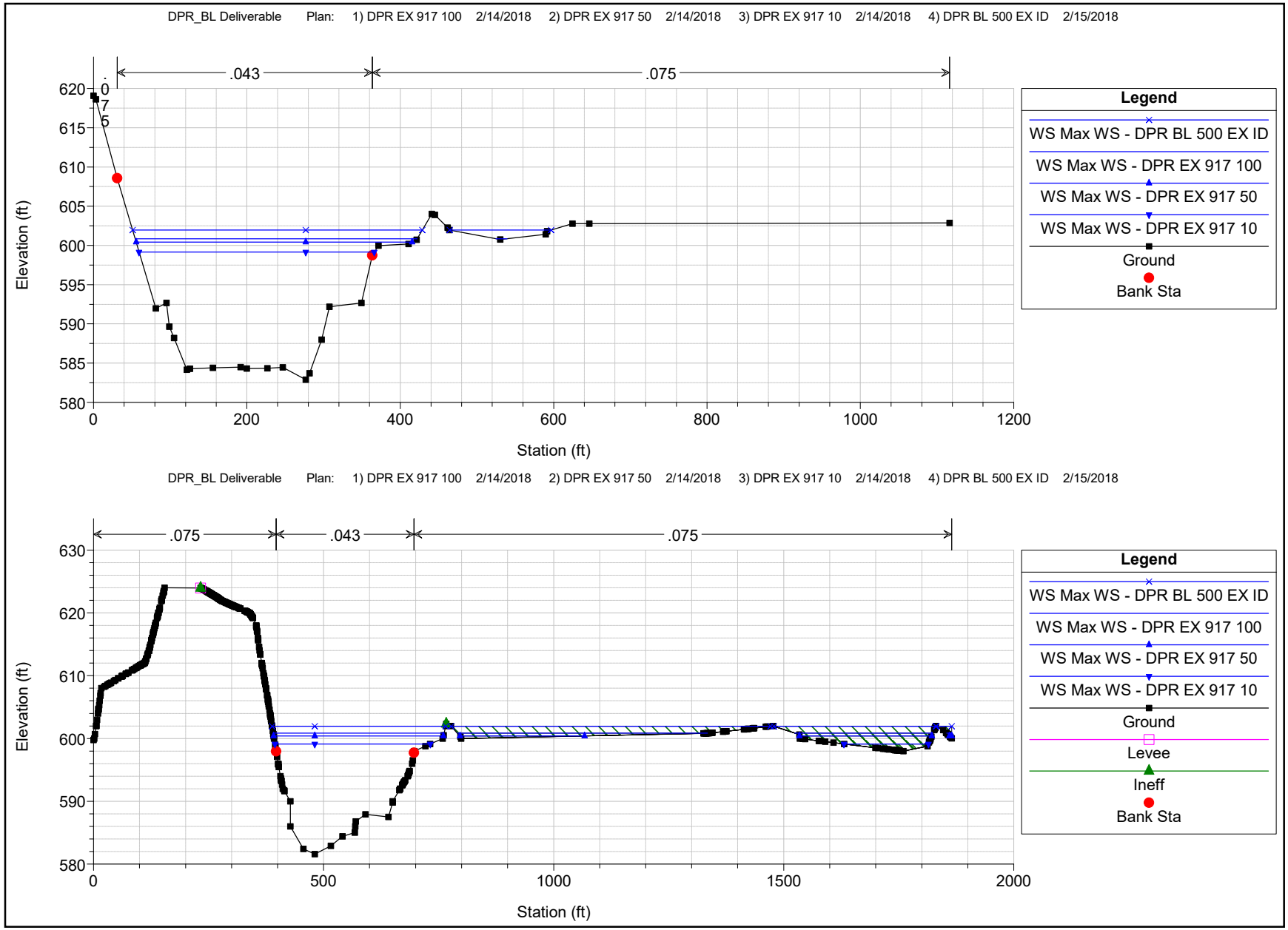
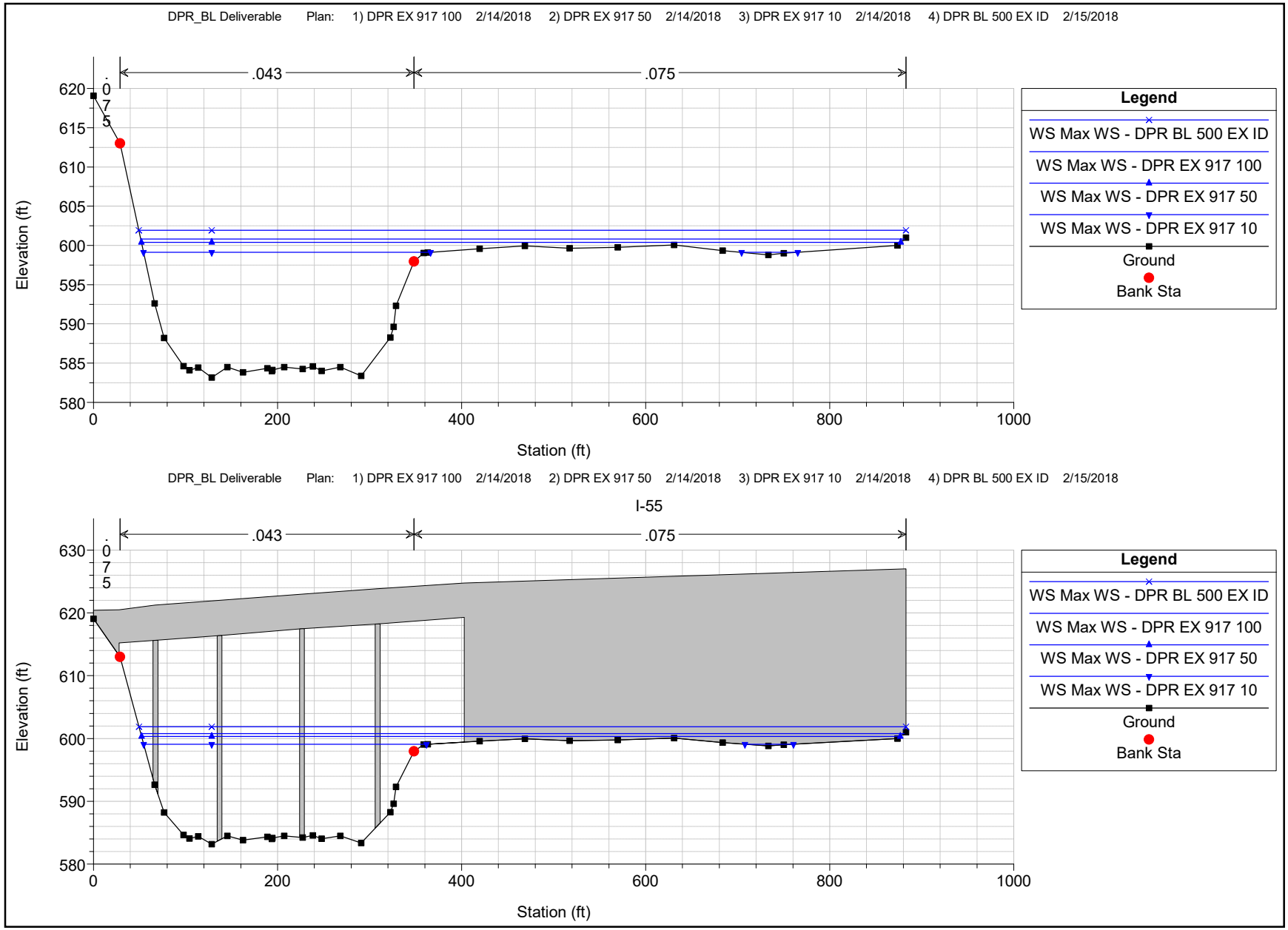
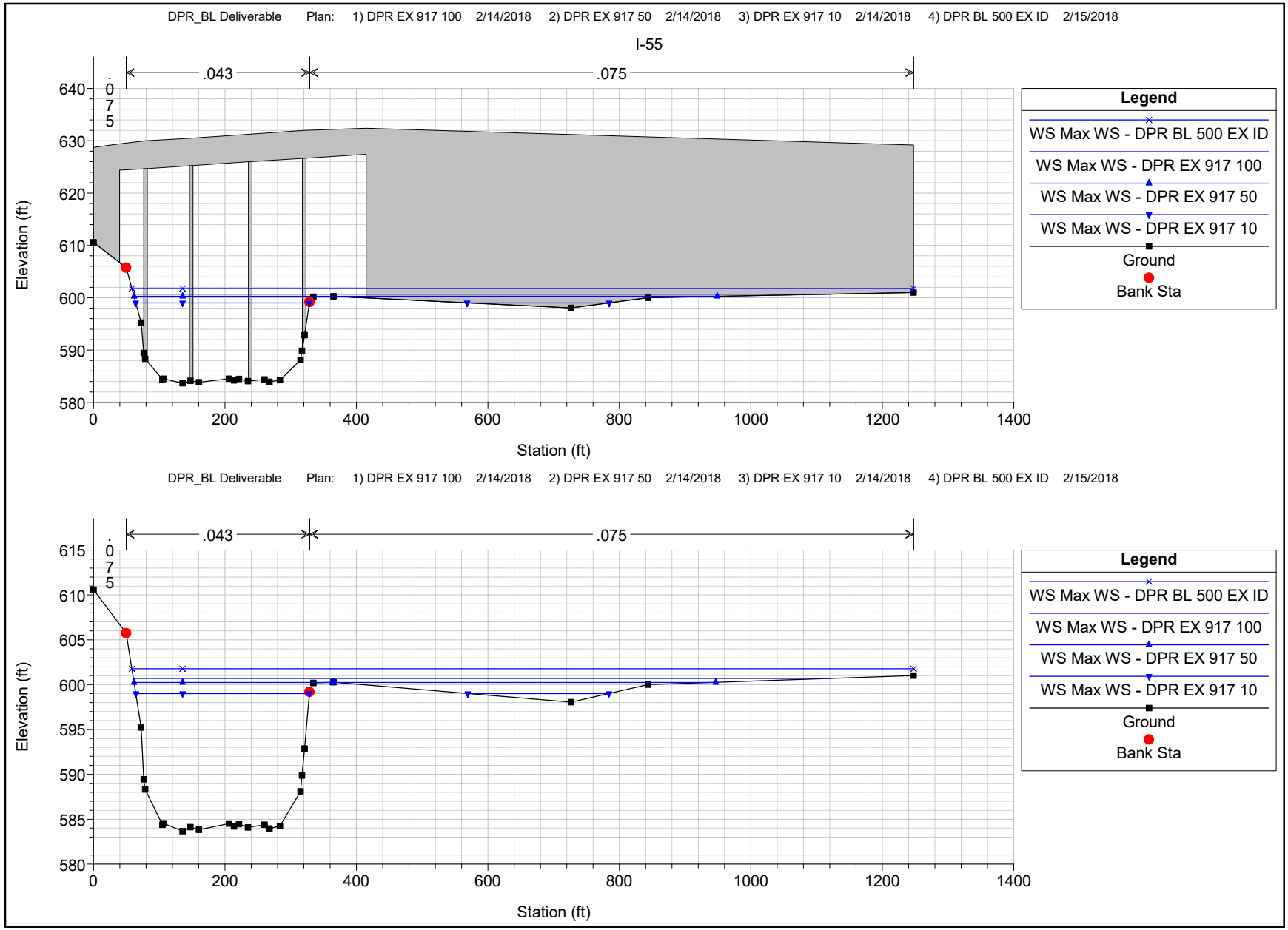
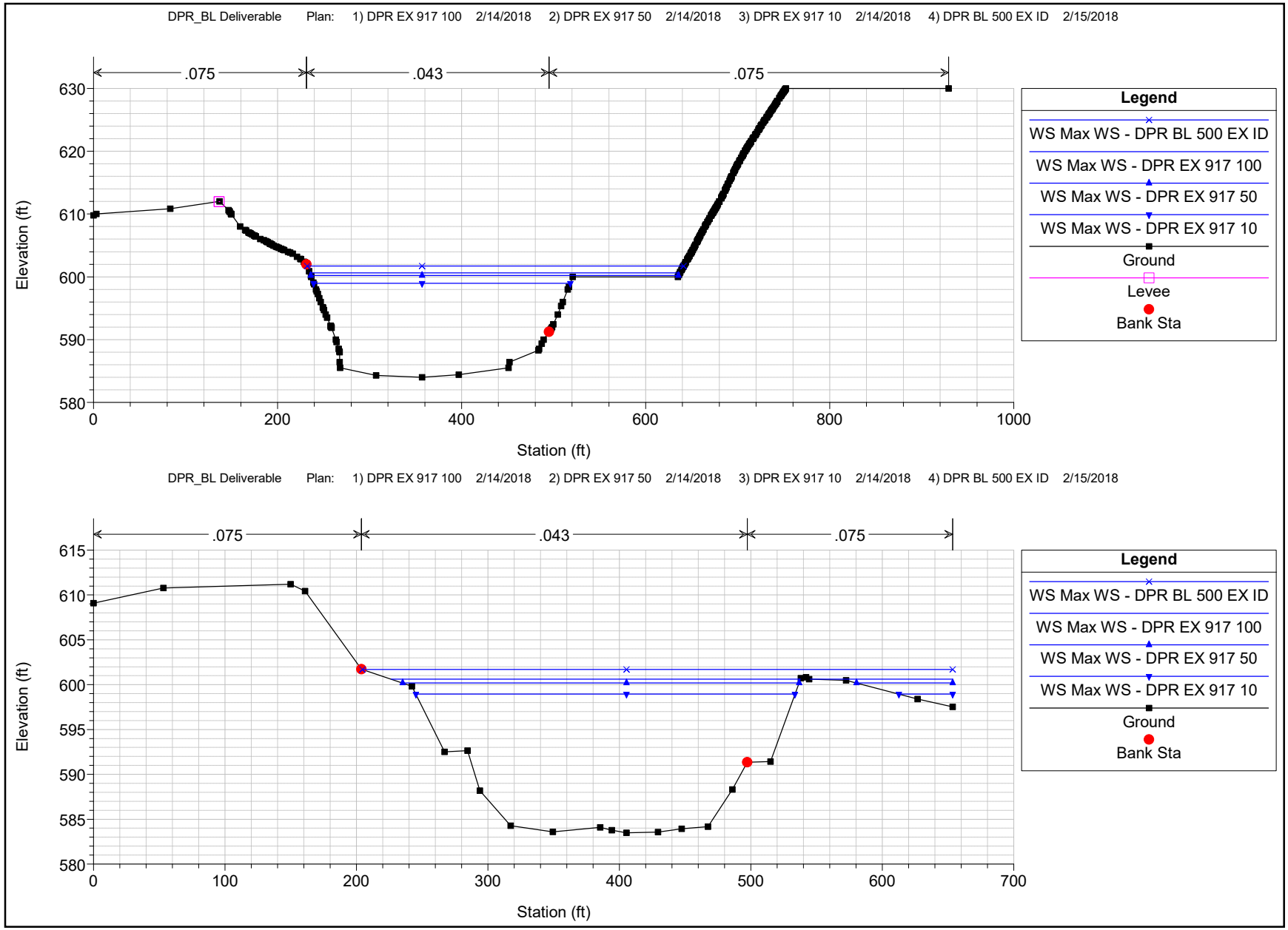
Station (ft)
Legend
WS Max WS - DPR BL 500 EX ID
WS Max WS - DPR EX 917 100
WS Max WS - DPR EX 917 50
WS Max WS - DPR EX 917 10
Ground
Levee
Ineff
Bank Sta


DPR_BL Deliverable Plan: 1) DPR EX 917 100 2/14/2018 2) DPR EX 917 50 2/14/2018 3) DPR EX 917 10 2/14/2018 4) DPR BL 500 EX ID 2/15/2018
.043
.075
.075
Elevation (ft)
Station (ft)
620
615
610
605
600
595
590
585
580
0
200
400
600
800
1000
1200
Legend
WS Max WS - DPR BL 500 EX ID
WS Max WS - DPR EX 917 100
WS Max WS - DPR EX 917 50
WS Max WS - DPR EX 917 10
Ground
Bank Sta
DPR_BL Deliverable Plan: 1) DPR EX 917 100 2/14/2018 2) DPR EX 917 50 2/14/2018 3) DPR EX 917 10 2/14/2018 4) DPR BL 500 EX ID 2/15/2018
.075
.043
.075
Elevation (ft)
Station (ft)
630
620
610
600
590
580
0
500
1000
1500
2000
Legend
WS Max WS - DPR BL 500 EX ID
WS Max WS - DPR EX 917 100
WS Max WS - DPR EX 917 50
WS Max WS - DPR EX 917 10
Ground
Levee
Ineff
Bank Sta


DPR_BL Deliverable Plan: 1) DPR EX 917 100 2/14/2018 2) DPR EX 917 50 2/14/2018 3) DPR EX 917 10 2/14/2018 4) DPR BL 500 EX ID 2/15/2018
.043
.075
.075
Elevation (ft)
Station (ft)
Legend
WS Max WS - DPR BL 500 EX ID
WS Max WS - DPR EX 917 100
WS Max WS - DPR EX 917 50
WS Max WS - DPR EX 917 10
Ground
Bank Sta
DPR_BL Deliverable Plan: 1) DPR EX 917 100 2/14/2018 2) DPR EX 917 50 2/14/2018 3) DPR EX 917 10 2/14/2018 4) DPR BL 500 EX ID 2/15/2018
I-55
.043
.075
.075
Elevation (ft)
Station (ft)
Legend
WS Max WS - DPR BL 500 EX ID
WS Max WS - DPR EX 917 100
WS Max WS - DPR EX 917 50
WS Max WS - DPR EX 917 10
Ground
Bank Sta


DPR_BL Deliverable Plan: 1) DPR EX 917 100 2/14/2018 2) DPR EX 917 50 2/14/2018 3) DPR EX 917 10 2/14/2018 4) DPR BL 500 EX ID 2/15/2018
I-55
.043
.075
.075
Elevation (ft)
Station (ft)
Legend
WS Max WS - DPR BL 500 EX ID
WS Max WS - DPR EX 917 100
WS Max WS - DPR EX 917 50
WS Max WS - DPR EX 917 10
Ground
Bank Sta
DPR_BL Deliverable Plan: 1) DPR EX 917 100 2/14/2018 2) DPR EX 917 50 2/14/2018 3) DPR EX 917 10 2/14/2018 4) DPR BL 500 EX ID 2/15/2018
.043
.075
.075
Elevation (ft)
Station (ft)
Legend
WS Max WS - DPR BL 500 EX ID
WS Max WS - DPR EX 917 100
WS Max WS - DPR EX 917 50
WS Max WS - DPR EX 917 10
Ground
Bank Sta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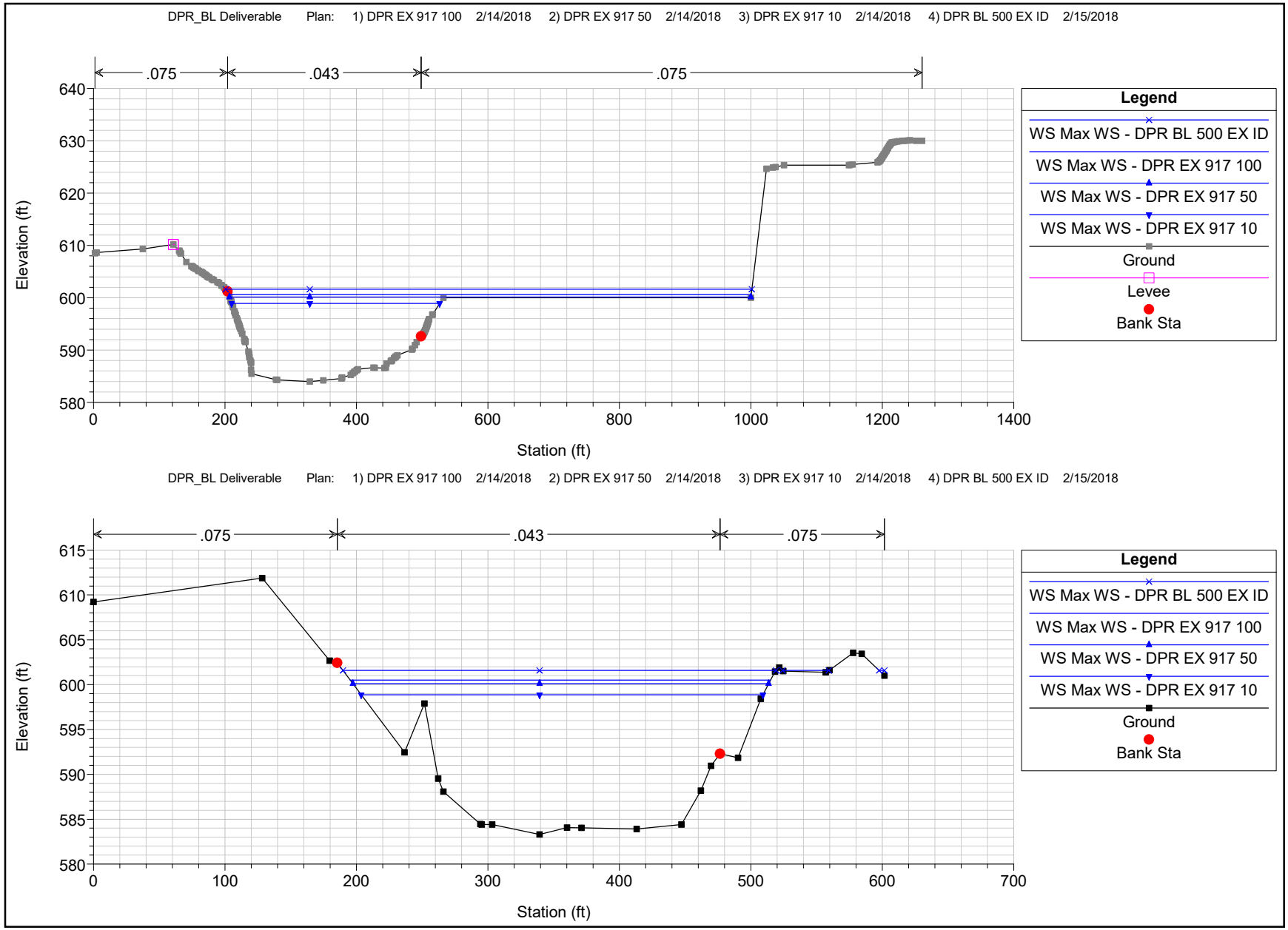
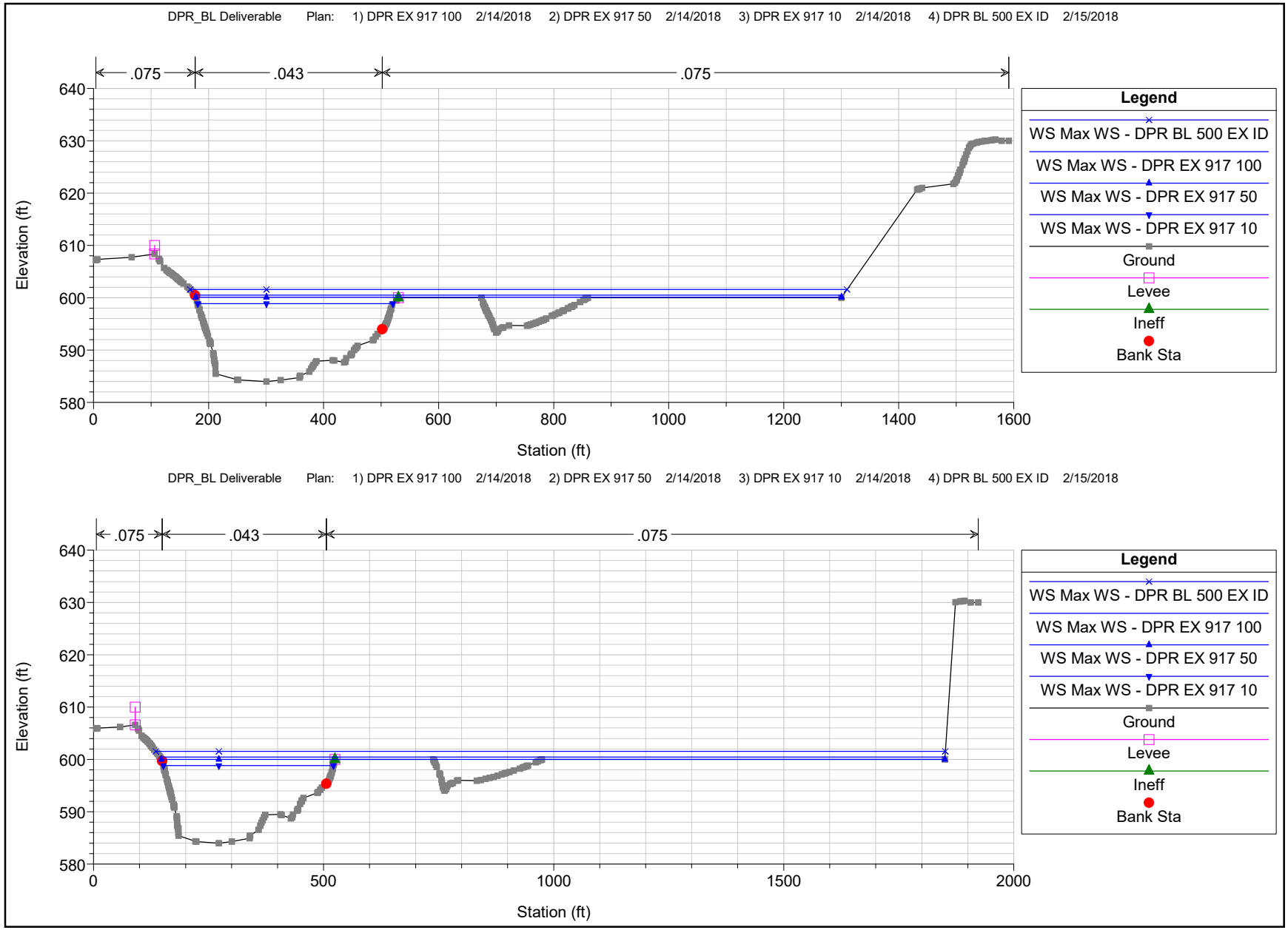
.075
.043
.075
Elevation (ft)
Station (ft)
Legend
WS Max WS - DPR BL 500 EX ID
WS Max WS - DPR EX 917 100
WS Max WS - DPR EX 917 50
WS Max WS - DPR EX 917 10
Ground
Levee
Bank Sta
DPR_BL Deliverable Plan: 1) DPR EX 917 100 2/14/2018 2) DPR EX 917 50 2/14/2018 3) DPR EX 917 10 2/14/2018 4) DPR BL 500 EX ID 2/15/2018
.075
.043
.075
Elevation (ft)
Station (ft)
Legend
WS Max WS - DPR BL 500 EX ID
WS Max WS - DPR EX 917 100
WS Max WS - DPR EX 917 50
WS Max WS - DPR EX 917 10
Ground
Bank Sta


DPR_BL Deliverable Plan: 1) DPR EX 917 100 2/14/2018 2) DPR EX 917 50 2/14/2018 3) DPR EX 917 10 2/14/2018 4) DPR BL 500 EX ID 2/15/2018
.075
.043
.075
Elevation (ft)
640
630
620
610
600
590
580
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS Max WS - DPR BL 500 EX ID
WS Max WS - DPR EX 917 100
WS Max WS - DPR EX 917 50
WS Max WS - DPR EX 917 10
Ground
Levee
Bank Sta
DPR_BL Deliverable Plan: 1) DPR EX 917 100 2/14/2018 2) DPR EX 917 50 2/14/2018 3) DPR EX 917 10 2/14/2018 4) DPR BL 500 EX ID 2/15/2018
.075
.043
.075
Elevation (ft)
615
610
605
600
595
590
585
580
0
100
200
300
400
500
600
700
Station (ft)
Legend
WS Max WS - DPR BL 500 EX ID
WS Max WS - DPR EX 917 100
WS Max WS - DPR EX 917 50
WS Max WS - DPR EX 917 10
Ground
Bank Sta

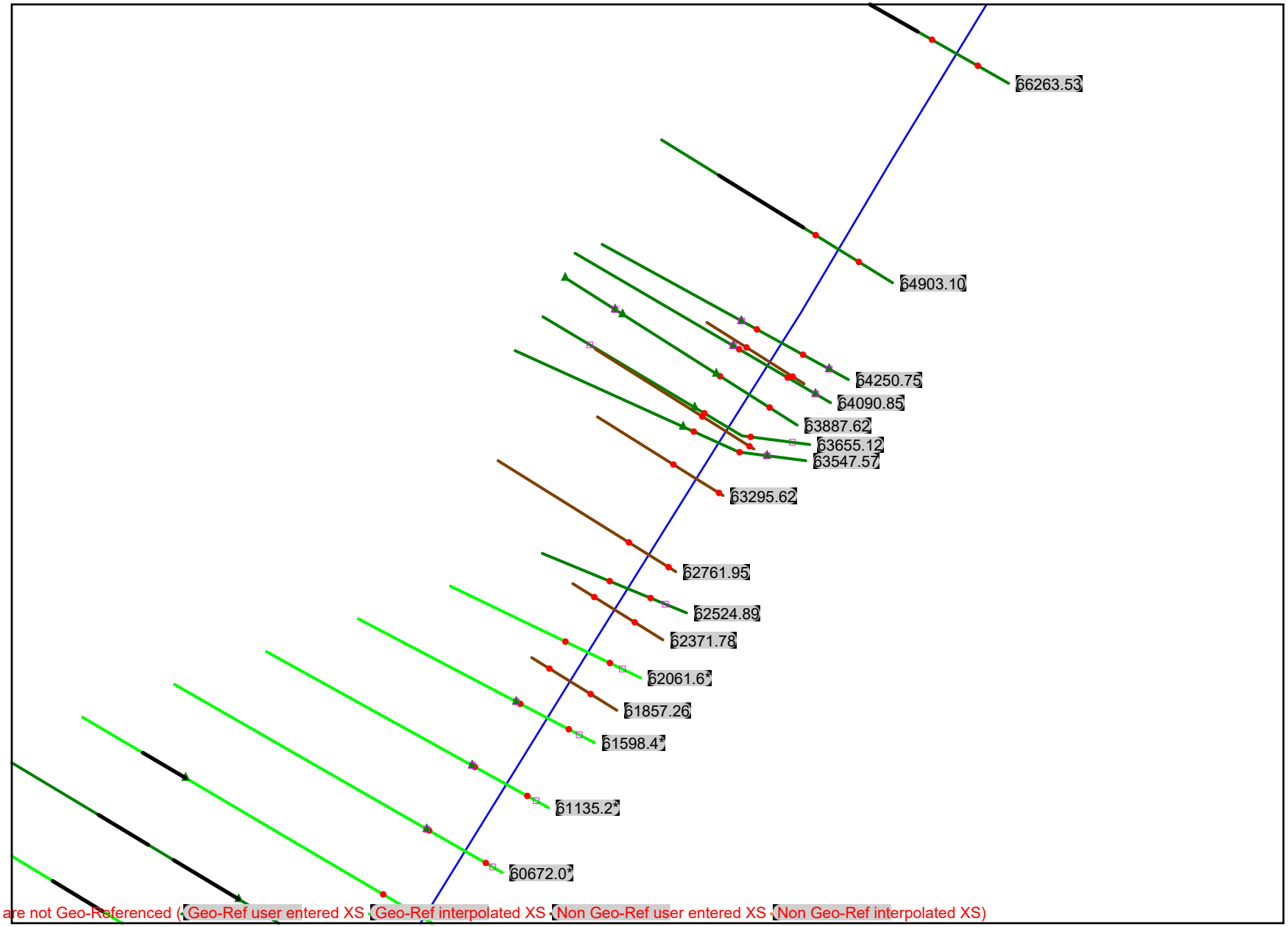

DPR_BL Deliverable Plan: 1) DPR EX 917 100 2/14/2018 2) DPR EX 917 50 2/14/2018 3) DPR EX 917 10 2/14/2018 4) DPR BL 500 EX ID 2/15/2018
.075
.043
.075
Elevation (ft)
640
630
620
610
600
590
580
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS Max WS - DPR BL 500 EX ID
WS Max WS - DPR EX 917 100
WS Max WS - DPR EX 917 50
WS Max WS - DPR EX 917 10
Ground
Levee
Ineff
Bank Sta
DPR_BL Deliverable Plan: 1) DPR EX 917 100 2/14/2018 2) DPR EX 917 50 2/14/2018 3) DPR EX 917 10 2/14/2018 4) DPR BL 500 EX ID 2/15/2018
.075
.043
.075
Elevation (ft)
640
630
620
610
600
590
580
0
500
1000
1500
2000
Station (ft)
Legend
WS Max WS - DPR BL 500 EX ID
WS Max WS - DPR EX 917 100
WS Max WS - DPR EX 917 50
WS Max WS - DPR EX 917 10
Ground
Levee
Ineff
Bank Sta

TAB H

SECTION 13.H

NATURAL CONDITIONS
DESIGN MODEL

Natural Conditions
HEC-RAS Geometry



12 of the 985 XS's are not Geo-Referenced (Geo-Ref user entered XS Geo-Ref interpolated XS Non Geo-Ref user entered XS Non Geo-Ref interpolated XS)

HEC-RAS Version 4.0.0 March 2008
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: DPR_BL Deliverable
Project File : DPR_BL_Deliverable.prj
Run Date and Time: 9/14/2017 3:43:27 PM

Project in English units

Project Description:
Lower Des Plaines River Unsteady HEC-RAS for MWRD LDPRDWP ****more details below****

Data Sources:
Cook County 2 ft topo for XS pulled using
HEC-GeoRAS
Channel information from steady HEC-RAS model from USACE File:
LEV_37_14.DAT
Flow data for direct tributary areas to Lower Des Plaines River
from CBBEL HEC-HMS model
Inflow hydrographs for Cook County sub-watershed from
HEC-RAS output files for individual LDPRDWP Phase B sub-watershed
analyses.

Vertical Datum: NAVD 1988

Des Plaines River alternatives are
modeled.

PLAN DATA

Plan Title: DPR NATIDOT 0917 100
Plan File : n:\Idot\110203.00001\Drain\Model\Des Plaines River MWRD Hydraulic Model\DPR_BL_Deliverable.p13

Geometry Title: DPR NATIDOT 0917
Geometry File : n:\Idot\110203.00001\Drain\Model\Des Plaines River MWRD Hydraulic Model\DPR_BL_Deliverable.g02

Flow Title :
Flow File :

Plan Summary Information:
Number of: Cross Sections = 985 Multiple Openings = 1
Culverts = 0 Inline Structures = 3
Bridges = 49 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20

```
    Maximum difference tolerance         =  0.3
    Flow tolerance factor                =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow



GEOMETRY DATA

Geometry Title: DPR NATIDOT 0917
Geometry File : n:\Idot\110203.00001\Drain\Model\Des Plaines River MWRD Hydraulic
Model\DPR_BL_Deliverable.g02

CROSS SECTION


RIVER: Des Plaines
REACH: 1                 RS: 257312.2

INPUT
Description:
Station Elevation Data    num=     103
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     648   36.24  647.35   36.59     646   37.66  644.31    37.8     644
   38.07  643.75   39.61     642   39.63  641.99   39.65  641.98   39.79  641.91
   43.21   640.2   43.64     640   46.94  638.72   48.84     638   51.53  637.05
   52.76  636.61   54.27  636.08   54.29  636.07    54.5     636   58.31  634.32
      59     634    60.7  633.18   63.19     632      64  631.42      65   631.3
      68  630.85      73  630.15     102  628.88     115  629.03     154   629.4
     170   630.3     183  630.76     186  631.27     187  632.02  207.81  633.73
  208.67     634  209.89   634.6  212.34  635.81  212.77     636  216.01   637.5
  216.67  637.79  216.98  637.93  217.04  637.95  217.05  637.96  217.15     638
  219.15  638.79  220.23  639.17  220.81  639.38  222.48     640  222.89  640.12
  223.78  640.37  224.86  640.69  228.59     642  231.23   642.5  232.44     644
  236.39  644.79  237.05  644.76  238.45  645.73  239.44     646  242.26  646.14
   244.3  647.31   246.2  647.59  246.24  647.61  246.39  647.63  246.66   647.7
  248.21  647.93  248.26  647.94  248.63     648   249.2  648.03  251.34  648.14
  252.06  648.17  253.84  648.24  253.98  648.25  254.67  648.27  254.74  648.28
  254.95  648.29  256.26  648.34  256.53  648.35   256.7  648.36  257.92  648.41
  258.52  648.43  258.73  648.44     260   648.5   260.6  648.52   260.8  648.53
   261.4  648.55  262.54   648.6  263.12  648.62  263.97  648.66  264.42  648.67
   265.4   648.7  265.94  648.72  267.06  648.75  268.06  648.77  268.74  648.78
  269.83  648.79  270.46   648.8  271.13  648.81  271.85  648.82  273.35  648.83
  273.87  648.84   275.2  648.85  276.11  648.86

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .19   63.19    .045     187     .19

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         63.19     187            78.13   75.54   71.49             .1       .3

CROSS SECTION


RIVER: Des Plaines
REACH: 1                 RS: 257236.*

INPUT
Description:
Station Elevation Data    num=     228
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  648.27   11.61  647.99   40.09  647.74   40.62  647.73   81.02  647.25
   81.27  647.25   81.97  647.24   87.31  647.18   87.69  647.18   92.67  647.12
   94.63  647.11  122.38  646.87  286.03  646.22   288.5  646.19  316.94  645.94
     320  645.24  329.36  644.32  330.59  644.15  332.95  644.01  346.42  643.03
```

1150.61	601.43	1150.98	601.42	1151.67	601.41	1152.14	601.4	1179.92	601.62
1184.33	602	1293.84	603.27	1294.39	603.36	1297.96	604	1308.14	604.92
1320.26	606	1342.45	605.31	1342.9	605.29	1343.79	605.26	1378.32	604
1510.51	605.42	1511.07	605.44	1531.24	606	1612.17	607.05	1614.81	607.11
1616.83	607.16	1618.03	607.18						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	235.82	.043	538.53	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
235.82	538.53	641.4	652.34	665.7	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
625	1215	610

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 64250.75

INPUT
Description:
Station Elevation Data num= 225

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	607.09	27.85	606.29	38.22	606	48.98	606.2	54.99	608
58.26	609.25	60.19	610	64.58	611.84	64.96	612	65.44	612.19
70.16	614	73.1	614.88	77.05	616	131.59	616.99	132.01	616.98
212.62	616	230.47	614.23	231.46	614	234.24	613.09	236.59	612.31
236.88	612.22	237.53	612	238.23	611.79	240.67	611.04	243.28	610.25
244.11	610	252.24	608.16	252.93	608	264.84	607.27	268.11	607.07
270.81	606.9	284.89	606.03	285.31	606	285.62	605.94	296.55	604
298.23	603.47	298.33	603.44	298.64	603.34	300.16	602.85	301.06	602.57
302.87	602	308.26	600.21	308.88	600	309.13	599.92	309.29	599.87
310	599.63	310.21	599.56	312.57	598.79	314.97	598	318.9	596.7
321.03	596	321.41	595.89	321.71	595.8	325.63	594.62	327.66	594
333.77	593.21	335.13	593.04	336.79	592.83	341.06	592.32	341.73	592.23
342.11	592.18	342.4	592.15	342.65	592.12	342.66	592.11	343.88	592
345.5	591.75	348.61	591.24	350.97	590.91	355.11	590	355.46	589.75
356.64	588.9	357.87	588	396	586.8	397	586.4	398	586
426	582.4	451	581.6	486	582.9	511	584.4	538	585
539	586	540	586.8	553.16	589.89	553.33	589.97	553.38	590
553.56	590.02	553.65	590.03	553.9	590.05	554.26	590.09	573.69	592
575.36	592.36	582.96	594	588.67	595.36	591.39	596	595.05	596.99
596.59	597.4	598.49	598	599.73	598.11	599.9	598.12	621.47	600
642.39	600.3	643.31	600.32	647.17	600.42	649.09	600.47	652.64	600.56
655.73	600.65	660.05	600.76	661.21	600.79	665.76	600.91	669.51	601.01
671.03	601.05	672.45	601.09	675.09	601.17	680.39	601.28	681.6	601.31
713.66	602	716.1	602.1	718.23	602.38	718.89	602.5	719.95	602.65
720.52	602.74	720.89	602.81	727.1	604	769.7	603.53	779.79	603.26
780.48	603.2	780.81	603.17	781.6	603.1	782.29	603.04	784.55	602.96
785.46	602.87	785.68	602.85	786.56	602.78	787.56	602.69	791.46	602.55
791.66	602.53	793.31	602.37	794.04	602.35	794.53	602.31	796.21	602.17
797.15	602.1	797.71	602.09	798.62	602	851.94	601.69	862.01	602
1039.33	602.08	1041.93	602.2	1043.83	602.27	1044.06	602.28	1046.28	602.35
1050.93	602.42	1053.39	602.39	1054.24	602.43	1055.19	602.41	1056.03	602.39
1057.94	602.38	1058.54	602.37	1059.55	602.4	1060.75	602.41	1069.16	602
1382.04	603.1	1383.17	603.13	1390.7	603.43	1393.66	603.56	1404.02	603.98
1404.06	603.99	1404.39	604	1453.34	603.62	1461.59	602	1512.28	602.98
1514.86	603.29	1516.71	603.53	1517.1	603.58	1517.7	603.65	1518.26	603.72
1518.3	603.73	1518.41	603.74	1518.69	603.78	1518.74	603.79	1518.96	603.82
1519.06	603.84	1519.14	603.85	1522.9	603.71	1523.35	603.66	1537.68	602
1544.83	600.96	1546.21	600.86	1546.51	600.83	1547.18	600.74	1549.37	600.45
1550.82	600.47	1551.43	600.48	1551.93	600.51	1552.19	600.48	1552.32	600.46
1553.22	600.37	1553.53	600.39	1553.76	600.36	1553.96	600.34	1554.65	600.4
1561.12	600.73	1561.85	600.76	1581.88	600.55	1587.27	600.61	1597.82	600.9
1598.42	600.92	1600.32	600.95	1600.73	600.96	1601.71	600.99	1601.9	601
1603.26	601.04	1603.59	601.05	1604.58	601.07	1605.96	601.11	1627.72	602
1635.39	602.41	1637.98	602.61	1639.62	602.74	1642.7	602.98	1646.82	603.3
1649.07	603.48	1655.89	604	1663.13	604.23	1666.95	604.35	1673.98	604.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	308.26	.043	621.47	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
308.26	621.47	140.59	134.11	112.35	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	131.59	616.99	F
727.1	1673.98	604	F

Left Levee Station= 131.59 Elevation= 616.99
Right Levee Station= 727.1 Elevation= 604

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 64116.64

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	617.07	40.36	606.59	79.61	603.88	116.41	593.26	156.16	591.84
163.09	588	192.81	583.91	196.81	584.14	219.81	581.1	226.81	580.77
230.81	580.91	241.81	580.58	250.81	581.35	263.81	581.8	271.81	581.96
282.81	583.23	301.81	583.1	316.81	584.49	327.81	583.42	335.54	587.97
342.18	590.53	353.82	591.89	367.96	595.16	404.8	599.72	421.39	600.51
458.96	600.54	517.82	603.78	666.45	602.39	679.66	603.4	684.09	603.35

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	79.61	.043	404.8	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
79.61	404.8	26.19	25.79	41.05	.1	.3

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 64090.85

INPUT
Description:
Station Elevation Data num= 320

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	608.08	12.9	608.18	13.86	608.12	14.68	608.08	16.12	608
19.13	608.01	19.14	608.02	19.27	608.04	21.66	608.45	22.71	608.66
24.6	609	25.49	609.19	25.61	609.22	29.31	610	29.61	610.1
31.18	610.62	32.16	610.94	34.8	611.82	35.34	612	37.41	612.77
40.69	614	41.67	614.39	45.74	616	48.76	617.1	49.88	617.51
51.23	618	57.99	618.31	58.18	618.32	59.67	618.38	60.76	618.44
104.53	619.11	105.51	619.09	106.8	619.08	107.97	619.06	108.65	619.04
162.85	618	178.69	617.46	180.82	617.33	190.18	616.78	192.13	616.67
202.55	616.05	202.73	616.04	203.32	616	203.65	615.92	211.18	614
213.22	613.38	217.77	612	219.6	611.4	223.8	610	225.61	609.48
230.74	608	233.62	607.78	233.97	607.76	234.59	607.72	235.12	607.69
239.73	607.35	240.73	607.28	242.01	607.21	244.76	607.01	246.92	606.89
248.89	606.75	253.78	606.48	255.77	606.35	262.27	606	267.43	605.6
269.75	605.37	270.51	605.3	271.23	605.23	278.84	604.48	280.51	604.32
281.31	604.24	281.82	604.19	283.6	604	286.72	603.1	290.52	602
293.51	600.85	294.46	600.49	295.76	600	298.67	598.86	300.87	598
301.79	597.64	306.11	596	307.76	595.41	308.35	595.21	309.55	594.79
310.39	594.5	310.72	594.39	311.87	594	317.54	593.52	324.15	592.94
330.91	592.35	333.06	592.16	333.51	592.12	334.82	592	343.36	591.28
351.58	590.59	354.63	590.33	357.64	590.08	358.5	590	358.98	589.81
364.02	588	376	586.8	377	586.4	378	586	406	582.4
431	581.6	466	582.9	491	584.4	518	585	519	586
520	586.8	540.98	588.66	544.59	590	547.48	590.54	548.34	590.65

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   549.6  590.83  552.24  591.26   554.9  591.59  557.41   591.9  558.18     592
  559.02  592.12  559.11  592.13  561.27  592.43  561.78  592.51  562.34   592.6
  563.17  592.72  564.13  592.87  565.74  593.12  566.79  593.29     569  593.65
  570.44  593.89  571.07     594   578.9  595.41  581.97  595.97  582.12     596
  582.31  596.04  583.76  596.39  584.32  596.52   585.4  596.79  590.61     598
  606.32   598.8  609.39  598.95  613.05  599.13  619.66  599.45  628.65  599.89
  630.01  599.95     631     600   655.6  600.34  664.75     602  668.89  603.26
  671.34     604  697.63  602.92  698.12  602.79  701.06     602  731.58  601.28
  746.87  600.92  749.32  600.87  751.46  600.82  754.14  600.76  757.57  600.68
  782.86  600.14  786.24  600.06  789.09     600  882.15  600.27  890.58     602
  951.23  601.42  952.16  601.41  953.37   601.4  953.91  601.39  954.06   601.4
  973.13  601.47  974.34  601.45  983.97  601.19  984.32  601.18  986.16  601.15
  988.17   601.1  989.77  601.06  998.17  600.82  999.88  600.77 1002.61   600.7
 1003.72  600.66 1004.08  600.65 1005.12  600.63 1006.73   600.6 1007.17  600.59
 1014.02  600.36  1014.5  600.34 1015.17  600.33 1021.42  600.16 1027.25  600.12
 1027.96  600.13 1037.82  600.18 1039.55  600.19 1055.36  600.25 1068.92  600.26
 1071.13  600.28 1073.31  600.29 1074.82  600.31 1076.33  600.32 1080.65  600.36
 1081.57  600.37 1082.34  600.38 1187.02  601.32 1189.62  601.34 1222.61  601.62
 1225.53  601.67 1227.33  601.69 1243.73  601.91 1247.88  601.97 1250.44     602
 1367.37  603.35 1371.67  603.52 1373.68  603.59 1374.31  603.61 1384.13     604
 1434.67  603.74 1435.16  603.49 1438.11     602 1444.25  601.51 1444.86  601.47
 1445.67  601.42 1446.57  601.36  1449.1  601.21 1453.04  600.95 1467.41     600
 1506.93  600.03 1512.19  600.48 1512.91  600.54 1516.48  600.85 1520.08  601.17
 1521.14  601.26 1522.17  601.35 1523.49  601.47 1524.59  601.56 1525.08  601.61
 1525.61  601.65 1525.96  601.68 1528.18  601.89 1528.23   601.9 1529.31     602
 1558.62  601.51 1560.19  601.12 1564.57     600 1590.24  600.03 1590.61  600.06
  1597.2  600.54 1598.63  600.66 1599.71  600.75 1602.44  600.95 1604.24  601.08
 1605.35  601.18 1605.98  601.22 1606.48  601.26 1607.84  601.38 1608.88  601.46
 1610.26  601.57 1610.91  601.62 1611.15  601.64 1612.93  601.78 1615.38  601.97
 1615.44  601.98 1615.73     602 1616.86  602.06 1619.61   602.2 1619.97  602.22
 1620.54  602.25 1622.22  602.34 1622.53  602.36 1622.86  602.38 1627.34  602.62
 1628.16  602.67 1629.22  602.73 1631.24  602.84 1632.18  602.89 1634.28  603.01
 1636.27  603.12 1638.06  603.22 1640.02  603.33  1640.8  603.38 1642.71  603.48
 1644.22  603.56 1644.33  603.57 1646.77  603.69 1646.86   603.7 1647.53  603.73
 1648.53  603.78 1650.83  603.89 1650.89   603.9  1652.2  603.96 1653.01     604
 1656.73  604.08 1657.32  604.09 1672.99  604.38 1673.66   604.4 1675.27  604.43
 1677.71  604.47 1679.64   604.5 1680.26  604.51  1683.4  604.56 1684.04  604.57
 1684.81  604.58 1685.97   604.6 1686.69  604.61 1687.63  604.62 1716.14  604.72
 1716.89  604.71    1719  604.72 1742.19   604.7 1743.04  604.69 1743.86  604.68
 1745.46  604.66 1751.34  604.61    1753  604.59 1753.75  604.58 1755.57  604.57
 1756.68  604.55 1758.79  604.54 1760.19  604.53 1761.25  604.52  1763.2  604.52

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  295.76    .043  630.01    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        295.76  630.01             213  203.23  194.62             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0  104.53  619.11       F
  671.34  1763.2     604       F
Left Levee      Station=  104.53      Elevation=  619.11
Right Levee     Station=  671.34      Elevation=     604

CROSS SECTION


RIVER: Des Plaines
REACH: 1                 RS: 63887.62

INPUT
Description:
Station Elevation Data    num=     196
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     622   11.58  621.97   16.09  621.78   16.68  621.76   18.01   621.7
   18.86  621.67   19.17  621.66   23.01   621.5   23.49  621.48   25.11  621.41
   25.78  621.38    26.1  621.37   26.58  621.35   27.26  621.32    29.5  621.23
   30.78  621.18   32.62   621.1    35.2  620.99   36.83  620.92   37.54  620.89
   38.96  620.84   40.35  620.77   41.38  620.73   42.39  620.69   44.12  620.62
   44.94  620.58   46.08  620.53   46.75  620.51   48.83  620.41    49.4  620.39
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    49.8  620.38   52.48  620.26   52.86  620.24   53.29  620.22   58.08  620.02
   58.32  620.01   58.44     620   59.88  619.95   62.07  619.87   64.63  619.79
   66.23  619.73   66.39  619.72   67.95  619.67   74.21  619.45    74.6  619.43
   76.31  619.37   89.25  618.88   93.08  618.74   93.64  618.72   94.39  618.69
   95.78  618.64   96.27  618.62   96.46  618.61   97.29  618.58   99.17  618.52
   99.74  618.49  100.65  618.46  112.19     618  115.55  616.48  116.61     616
  119.86  614.74  121.75     614  123.84  613.18  126.86     612  128.55  611.22
  131.23     610   131.6  609.84  135.74     608  135.97  607.95  145.04     606
  164.21   605.7  174.84     604  176.08  603.75   176.3  603.71  178.51  603.26
     181  602.78  181.64  602.65  182.52  602.47  184.08  602.18  184.98     602
  186.55  601.67  187.14  601.55  187.96  601.37  188.47  601.26  190.21  600.91
  191.03  600.73  194.37     600  195.48   599.6  199.63     598  200.48  597.62
   203.9     596  209.89  594.21  209.98  594.18  210.61     594  216.66  592.79
  217.38  592.65  220.68     592   222.5  591.87   222.6  591.86  228.25  591.45
  228.98   591.4  229.72  591.34  232.45  591.15  234.52  591.01  235.27  590.96
  237.63  590.79  239.97  590.63  242.13  590.49  245.09  590.27  245.38  590.26
  245.89  590.22  248.72     590  250.23   589.3  252.93     588     276   586.8
     277   586.4     278     586     306   582.4     331   581.6     366   582.9
     391   584.4     418     585     419     586     420   586.8  448.14  588.97
  448.36  589.07  450.33     590  453.15  591.28   454.7     592  483.66  593.35
  490.56  593.92   491.4     594  495.04  595.04  498.37     596  501.22  596.99
  504.11     598  507.83  598.24  508.62  598.28  513.51   598.6  518.53  598.92
  519.56  598.99  521.37  599.11  523.91  599.26  524.21  599.28  525.89  599.39
  543.32     600  568.38  601.69  570.12     602  598.72  601.67  609.03  601.09
  609.92  601.05  611.49  600.96  615.81  600.76  621.18  600.47  628.42     600
 1164.93  601.83 1167.04  601.86 1168.84  601.87 1169.97  601.89 1172.73  601.92
 1176.08  601.95 1176.52  601.96 1180.97     602  1231.3  602.54 1255.83  603.21
  1274.3  603.72 1277.58  603.81 1277.98  603.82  1284.6     604 1332.96  603.57
 1333.95  603.26 1338.03     602 1339.88  601.27 1341.38  600.66 1342.99     600
 1465.55  600.04 1466.03  600.08 1467.46  600.22 1467.93  600.27  1468.5  600.32
 1469.03  600.38 1469.62  600.43 1469.83  600.42 1477.97  600.53    1507  600.89
 1507.94  600.95 1509.63  601.09 1512.16  601.34  1512.4  601.36 1513.63  601.47
 1514.25  601.46 1514.54  601.48  1514.9  601.51  1517.5  601.75 1520.58     602
  1636.1     602

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  194.37    .043  543.32    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        194.37  543.32           164.06   232.5  238.77             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  570.12  1231.3     602       F
  1284.6  1636.1     604       F
Right Levee     Station=  1284.6      Elevation=     604

CROSS SECTION


RIVER: Des Plaines
REACH: 1                 RS: 63655.12

INPUT
Description:
Station Elevation Data    num=     434
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     610   26.43  610.12    26.7  610.13   27.97   610.2   31.35  610.37
   31.62  610.39    32.5  610.43    33.3  610.47    33.5  610.48   34.45  610.53
   37.73   610.7    39.5  610.79   42.52  610.94   43.89  611.01   45.83  611.11
   47.77  611.21   50.16  611.32   50.73  611.35    53.4  611.48   54.32  611.52
   54.44  611.53   58.43  611.72   58.53  611.73   61.83  611.89   61.98   611.9
   62.18  611.91   64.04     612   65.99  612.51   67.22  612.85   68.34  613.17
   68.84   613.3   69.41  613.45   70.06  613.63   71.41     614   71.79  614.13
   71.84  614.15   73.14  614.57   73.67  614.75    74.5  615.03   75.76  615.46
    76.4  615.68   76.65  615.76   77.33     616   78.88  616.58   80.08  617.02
   82.72     618   83.14  618.15   83.35  618.22   83.52  618.28   83.64  618.33
   83.94  618.43   85.67  619.03   86.24  619.23   87.63   619.7   87.94  619.81
   88.51     620   89.67  620.36   89.82   620.4   90.78   620.7   93.45  621.52
   94.32  621.79   94.87  621.95   94.98  621.99   95.01     622  100.52  623.12
     104  623.95   104.2     624  156.26  623.61     157  623.58  157.52  623.57
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157.81	623.55	158.43	623.53	159.66	623.51	160.4	623.48	161.23	623.45
161.69	623.44	163.38	623.41	164.37	623.38	165.43	623.34	166.12	623.31
166.96	623.29	168.36	623.24	169.43	623.21	170.68	623.18	171.62	623.15
172.21	623.13	173.45	623.09	173.69	623.08	174.06	623.07	175.62	623.02
176.13	623.01	176.91	622.98	177.62	622.96	178.33	622.93	179.4	622.9
181.47	622.84	182.5	622.8	182.87	622.79	183.41	622.77	184.77	622.73
185.34	622.71	186.18	622.68	187.42	622.64	187.87	622.63	189.01	622.6
190.73	622.54	191.03	622.53	191.91	622.5	192.33	622.48	195.8	622.37
197.83	622.31	198.02	622.3	198.76	622.28	199.02	622.27	200.08	622.24
201.08	622.21	202.4	622.17	204.38	622.12	204.47	622.11	206.27	622.06
207.77	622.01	208.09	622	208.89	621.96	212.27	621.8	212.64	621.78
212.73	621.77	213.53	621.73	213.72	621.72	214.5	621.68	215.06	621.64
215.44	621.62	218.59	621.45	219.08	621.42	219.42	621.4	219.96	621.37
220.37	621.35	222.12	621.24	223.68	621.15	225.36	621.05	225.63	621.04
227.07	620.96	228.4	620.88	229.62	620.81	230.37	620.76	231.53	620.69
231.91	620.67	232.36	620.65	233.17	620.6	235.42	620.47	235.8	620.45
236.2	620.42	239.23	620.25	239.42	620.23	240.41	620.18	240.76	620.16
243.38	620	260.06	619.4	262.95	619.26	263.71	619.25	264.2	619.24
265.22	619.22	265.63	619.19	267.01	619.17	267.37	619.15	267.44	619.14
267.94	619.12	268.92	619.1	269.31	619.09	270.35	619.07	271.07	619.06
275.99	618.76	276.38	618.75	276.92	618.74	277.29	618.73	277.55	618.72
278.14	618.68	278.71	618.67	279.59	618.61	280.25	618.59	282.69	618.42
283.18	618.41	283.5	618.4	283.64	618.39	288.67	618	289.34	617.74
289.4	617.71	289.44	617.69	290.42	617.26	291.37	616.86	291.4	616.85
291.42	616.84	291.62	616.75	292.05	616.56	292.28	616.46	293.32	616
295.2	615.27	296.06	614.94	297.91	614.25	298.34	614.09	298.49	614.04
298.59	614	298.79	613.93	298.82	613.92	301.76	612.98	302.12	612.87
302.22	612.84	302.3	612.81	304.4	612.15	304.87	612	305.39	611.81
306.1	611.57	306.32	611.49	307.17	611.19	308.51	610.7	308.99	610.54
309.93	610.19	310.08	610.14	310.45	610	311.19	609.73	311.63	609.56
313.36	608.92	314.28	608.58	314.88	608.36	315.83	608	315.85	607.99
315.88	607.98	318.55	607.07	319.08	606.88	319.5	606.74	319.81	606.63
320.14	606.52	321.69	606	322.96	605.69	323.17	605.65	323.47	605.58
323.89	605.49	324.46	605.36	324.97	605.24	325.5	605.12	327.08	604.76
328.3	604.5	328.73	604.4	330.32	604.06	330.36	604.05	330.6	604
331.22	603.88	331.38	603.84	332.9	603.54	333.15	603.5	333.46	603.44
334.67	603.2	335.83	602.97	336.36	602.87	337.06	602.73	337.77	602.59
338.64	602.42	338.99	602.35	339.07	602.33	340.78	602	341.31	601.89
341.34	601.88	341.38	601.87	342.49	601.64	343.35	601.46	344.51	601.17
345.86	600.88	346.6	600.69	347.02	600.59	348.5	600.2	348.64	600.17
349.25	600	349.93	599.79	350.58	599.57	352.83	598.85	353.66	598.57
354.29	598.37	355.38	598	356.69	597.61	356.85	597.56	357.85	597.27
359.35	596.85	360.8	596.45	362.27	596.05	362.28	596.04	362.35	596.03
362.45	596	364.24	595.58	364.51	595.52	365.53	595.28	366.17	595.11
366.91	594.94	367.9	594.68	368.56	594.53	370.06	594.14	370.15	594.12
370.56	594	373.95	593.65	374.26	593.62	376.88	593.36	377.79	593.25
378.74	593.14	379.13	593.1	380.62	592.94	383.02	592.66	384.19	592.54
384.65	592.49	386.71	592.26	386.88	592.24	388.36	592.07	388.54	592.05
389.01	592	389.94	591.85	390.05	591.84	391.4	591.63	391.78	591.58
392.94	591.41	393.91	591.29	394.29	591.24	395.18	591.14	395.76	591.07
396.95	590.96	397.56	590.92	397.86	590.9	401.03	591.14	401.77	590.93
401.8	590.92	403.24	590.38	404.05	590	405.38	589.36	405.6	589.25
405.88	589.12	407.07	588.5	407.94	588	426	586.8	427	586.4
428	586	456	582.4	481	581.6	516	582.9	541	584.4
568	585	569	586	570	586.8	608.19	589.47	609.33	590
612.06	591.23	613.77	592	616.89	592.14	618.09	592.19	623.14	592.42
658.92	594	660.6	594.73	663.57	596	664.86	596.76	667.16	598
693.11	598.95	706.49	599.44	721.7	600	723.88	600.47	728.1	601.34
730.91	601.93	731.22	602	731.28	602.03	731.94	602.34	735.49	604
761.04	602.63	762.82	602	766.42	601.09	770.63	600	1366.88	601.64
1384.21	601.77	1388.72	601.8	1414.45	602	1416.42	602.02	1421.76	602.36
1430.91	602.85	1431.95	602.89	1432.75	602.93	1433.38	602.95	1433.67	602.97
1434.2	603	1434.64	603.02	1434.94	603.04	1436.6	603.08	1437.75	603.14
1458.56	603.69	1459.35	603.72	1462.77	603.87	1462.88	603.88	1467.61	603.82
1469.09	603.83	1469.64	603.79	1470.74	603.71	1470.94	603.7	1473.19	603.53
1473.6	603.5	1473.92	603.48	1477.38	603.28	1485.85	602.62	1489.26	602.35
1493.7	602	1494.31	601.47	1494.65	601.17	1495.07	600.81	1495.97	600
1610.97	599.45	1618.08	599.34	1619.05	599.32	1619.93	599.31	1621.79	599.3
1629.8	599.16	1670.08	598.79	1671.19	598.78	1701.29	599.37	1702.02	599.43
1702.88	599.5	1704.07	599.61	1705.1	599.71	1706.28	599.82	1706.58	599.85
1708.01	599.98	1708.21	600	1711.33	600.64	1717.65	602	1722.46	601.95

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 1722.71  601.92 1722.91   601.9 1728.18  601.26 1729.68  601.08 1732.51  600.74
 1734.78  600.46 1736.95  600.21 1738.76     600 1788.43     600

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  354.29    .043  667.16    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        354.29  667.16           50.04   26.24   25.23             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  735.49 1788.43     604       F
Left Levee      Station=     104      Elevation=  623.95
Right Levee     Station= 1462.88      Elevation=  603.88

CROSS SECTION


RIVER: Des Plaines
REACH: 1                  RS: 63628.88

INPUT
Description:
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  619.07    3.19   618.6   30.79  608.58   81.16  591.97   94.99  592.66
   98.71  589.65  105.11  588.22  121.79  584.15  125.79  584.27  155.79   584.4
  191.79  584.48  199.79  584.32  226.79  584.34  246.79  584.45  276.79  582.89
  281.79  583.71  297.57     588  307.61  592.18  349.33  592.67  363.46  598.72
  371.48  599.98  410.69  600.17   421.3  600.73     441  604.02  445.15   603.9
  461.75  602.25  463.98  601.97  530.23  600.75  589.53  601.41  591.63  601.81
  624.53  602.77  646.63  602.79 1116.19 602.857

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075   30.79    .043  363.46    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         30.79  363.46           74.49   81.31  108.73             .1       .3

CROSS SECTION


RIVER: Des Plaines
REACH: 1                  RS: 63547.57

INPUT
Description:
Station Elevation Data    num=     441
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  599.76    1.54     600    3.05  600.69    5.92     602    5.95  602.02
    5.97  602.03    7.72  602.96    9.67     604   10.68  604.55   10.89  604.66
   10.94  604.69   11.03  604.74   12.11  605.32   13.36     606   14.86  606.81
   15.62  607.22    17.1     608    23.3  608.26   25.67  608.36   29.87  608.54
   31.77  608.62   34.23  608.73   36.32  608.81   38.23   608.9   44.52  609.16
    47.3  609.28   53.58  609.56    54.1  609.59   60.73  609.88   61.03  609.89
   61.19   609.9   61.79  609.93   62.23  609.94    63.2  609.99   63.54     610
   70.22  610.28   70.78   610.3   74.94  610.48   75.68  610.51   83.21  610.83
   84.28  610.88   85.86  610.95    88.3  611.06   91.96  611.23   92.48  611.25
   93.47  611.29   95.04  611.37   98.52  611.52  101.09  611.63  101.61  611.65
  101.94  611.67  102.57  611.69  103.11  611.71  103.22  611.72  105.63  611.81
  105.97  611.83  107.84  611.89   107.9   611.9  109.21  611.94   110.8     612
  111.08  612.05  112.25  612.25  112.57  612.32  114.21  612.63  114.84  612.76
  116.95  613.21  117.39   613.3  117.86   613.4  118.58  613.55  120.33  613.96
  120.36  613.97  120.51     614  121.95  614.44  122.15   614.5  122.48   614.6
  123.55  614.92  125.39  615.49  125.86  615.63  126.08   615.7  127.06     616
  128.75   616.5  129.01  616.58  129.61  616.75  129.94  616.85  130.36  616.97
  131.33  617.26  132.33  617.55  133.67  617.94  133.88     618  134.81  618.26
  135.45  618.43  138.21  619.19  138.76  619.35  138.87  619.37  139.47  619.54
  139.54  619.56  141.12     620  141.18  620.02  141.21  620.03  142.93  620.53
   143.2  620.62  143.97  620.84  147.32  621.88  147.54  621.94  147.72     622
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148.11	622.11	148.23	622.14	148.41	622.19	150.45	622.75	151.78	623.16
152.62	623.4	152.64	623.41	152.78	623.44	152.91	623.48	154.65	624
232.77	623.98	233.62	623.95	234.82	623.9	235.56	623.88	235.79	623.87
236.34	623.84	239.43	623.72	239.66	623.71	240.02	623.7	240.07	623.69
242.94	623.58	243.34	623.56	243.79	623.54	244.4	623.52	244.8	623.5
245.01	623.49	246.56	623.43	247.02	623.41	247.83	623.38	248.28	623.36
249.38	623.31	249.85	623.29	250.1	623.28	250.28	623.27	251.28	623.23
252.3	623.18	252.63	623.17	252.99	623.15	254.07	623.11	254.24	623.1
254.49	623.09	255.63	623.04	256.47	623	256.9	622.98	257.46	622.96
257.92	622.93	258.97	622.89	260.26	622.83	260.74	622.81	261.28	622.78
261.9	622.76	262.48	622.73	263.11	622.7	264.52	622.63	265.42	622.59
266.16	622.56	266.85	622.53	267.14	622.52	268.64	622.44	269.07	622.42
269.87	622.38	270.24	622.37	271.05	622.33	271.84	622.29	271.99	622.28
272.77	622.24	273.09	622.23	274.93	622.13	275.77	622.08	276.62	622.04
277.35	622	279.09	621.94	280	621.91	280.85	621.88	281.13	621.87
283.69	621.78	285.17	621.73	286.34	621.69	287.05	621.67	288.29	621.63
288.91	621.61	289.5	621.59	291.76	621.51	292.69	621.48	293.74	621.44
294.59	621.42	295.6	621.39	296.7	621.35	297.47	621.33	298.48	621.29
299.48	621.26	300.04	621.24	301.69	621.19	302.66	621.16	303.67	621.13
303.96	621.12	305.28	621.08	306.04	621.05	307.98	621	308.89	620.97
309.54	620.95	310.21	620.93	311.06	620.91	314.36	620.82	314.84	620.8
315.51	620.78	316.11	620.77	318.58	620.69	319.34	620.67	328.64	620.35
328.85	620.34	329.29	620.33	329.48	620.32	331.22	620.26	333.36	620.18
333.51	620.17	333.89	620.16	334.16	620.15	335.86	620.1	336.3	620.08
338.09	620.02	339.01	620	339.73	619.92	340.93	619.8	341.01	619.79
341.1	619.77	342.66	619.6	342.82	619.58	343.98	619.46	344.85	619.37
345.16	619.34	345.74	619.27	346.43	619.19	353.65	618	353.81	617.92
353.89	617.87	354.28	617.66	355.18	617.19	355.47	617.02	357.27	616
357.44	615.9	357.62	615.8	357.96	615.62	359.81	614.59	360.87	614
362.23	613.4	362.3	613.37	365.34	612	365.37	611.99	365.67	611.87
365.94	611.76	366.39	611.58	367.35	611.18	369.24	610.41	370.2	610
370.35	609.93	370.52	609.86	371.77	609.33	372.03	609.22	372.34	609.09
373.45	608.61	374.85	608	375.02	607.93	375.05	607.91	375.23	607.83
377.27	606.92	377.41	606.85	378.72	606.27	378.97	606.16	379.32	606
379.66	605.84	379.7	605.82	380.43	605.47	381.19	605.12	382.32	604.58
383.61	604	384.08	603.77	384.21	603.71	384.37	603.64	384.64	603.51
385.66	603.03	386.34	602.72	387.77	602.07	387.85	602.03	387.92	602
389.61	601.24	390.79	600.72	390.81	600.71	391.51	600.4	391.65	600.34
392.42	600	394.69	598.99	395.16	598.77	396.86	598	396.95	597.96
397.01	597.93	398.96	597.07	401.38	596	401.61	595.91	401.69	595.88
401.72	595.86	402.66	595.45	405.98	594	406.98	593.65	407.46	593.47
408.04	593.26	408.07	593.25	408.1	593.24	409.69	592.67	411.58	592
414.26	591.71	415.1	591.62	427.56	590	428	586	456	582.4
481	581.6	516	582.9	541	584.4	568	585	569	586
570	586.8	591	587.9	641	587.5	649.98	589.81	650.36	590
664.46	591.77	666.33	591.98	666.49	592	670.69	592.56	670.87	592.58
671.64	592.67	672.53	592.79	674.6	593.02	675.12	593.08	675.79	593.16
677.29	593.35	682.88	594	683.49	594.11	684.17	594.25	685.67	594.55
685.84	594.59	686.82	594.78	686.95	594.81	692.57	596	693.8	596.53
696.52	597.71	696.93	597.88	697.19	598	721.21	598.78	731.38	599.11
758.95	600	760.63	600.51	765.7	602	766.45	602.34	776.82	602
797.63	600.3	798.73	600	1325.7	600.8	1327.04	600.81	1330.08	600.82
1331.8	600.83	1332.91	600.84	1335.08	600.85	1336.34	600.86	1338.35	600.87
1340.35	600.88	1342.33	600.89	1343.39	600.9	1345.2	600.91	1368.59	601.09
1370.53	601.1	1371.27	601.11	1372.88	601.12	1375.46	601.14	1413.48	601.46
1414.83	601.47	1419.29	601.5	1419.77	601.51	1420.92	601.52	1422.26	601.53
1423.83	601.54	1432.67	601.61	1433.64	601.62	1434.57	601.63	1435.85	601.64
1461.1	601.86	1464.14	601.89	1476.82	602	1533.85	600.62	1534.88	600
1541.33	599.94	1546.39	599.9	1576.4	599.62	1579.16	599.6	1590.38	599.49
1607.98	599.34	1631.52	599.13	1699.12	598.53	1705.11	598.47	1715.94	598.38
1719.14	598.35	1725.52	598.29	1728.49	598.26	1739.45	598.17	1741.87	598.15
1742.72	598.14	1745.69	598.12	1746.85	598.11	1750.88	598.07	1752	598.06
1760.16	598	1812.74	598.78	1815.82	599.37	1817.14	599.61	1817.49	599.68
1817.73	599.72	1818.17	599.8	1819.24	600	1820.99	600.28	1826.99	601.34
1827.89	601.5	1828.68	601.63	1828.93	601.67	1829.06	601.7	1829.45	601.76
1829.67	601.8	1830.81	602	1846.51	601.33	1852.92	600.93	1853.47	600.89
1856.02	600.7	1856.69	600.65	1858.57	600.54	1861.74	600.28	1862.78	600.2
1865.07	600.02								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
       0    .075  396.95    .043  696.52    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        396.95  696.52           273.56  251.95  228.94             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0  232.77  623.98       F
  766.45 1865.07  602.34       F
Left Levee      Station=  232.77      Elevation=  623.98

CROSS SECTION


RIVER: Des Plaines
REACH: 1                 RS: 63295.62

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  619.07  28.755     613   66.44  592.62  76.765  588.21  97.825  584.63
 104.325  584.09 113.825  584.42 128.325  583.18 145.325   584.5 162.325  583.82
 188.825  584.34 193.825  583.98 194.325  584.14 207.325  584.49 227.325  584.24
 238.325  584.58 247.825  584.02 268.325   584.5 290.825  583.37 322.565  588.26
   326.1  589.61  328.74  592.31 348.135  597.94   358.9  599.04 363.195  599.09
  419.65  599.57  468.85  599.95 517.295 599.632 569.575  599.77  630.87  600.07
 683.585  599.34  733.32   598.8  750.02  598.99  873.59     600  882.83     601

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  28.755    .043 348.135    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        28.755 348.135           533.48  533.67  533.99             .1       .3

CROSS SECTION


RIVER: Des Plaines
REACH: 1                 RS: 62761.95

INPUT
Description:
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   610.6  49.889  605.73  72.459  595.23  76.538  589.44   78.58  588.32
 104.821  584.37 106.455  584.53 135.321  583.68 147.303  584.13 160.374  583.84
 206.124  584.51 213.749  584.19 221.374  584.47  234.99  584.08 260.043  584.37
 267.668  583.95 283.463  584.25 315.112  588.11 317.111  589.88 320.999  592.87
 328.608   599.2 334.299  600.18 365.061  600.26 726.363 598.048 843.557     600
  1247.4     601

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  49.889    .043 328.608    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        49.889 328.608           249.41  237.05  270.54             .1       .3

CROSS SECTION


RIVER: Des Plaines
REACH: 1                 RS: 62524.89

INPUT
Description:
Station Elevation Data    num=     310
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  609.79    3.06     610   83.31  610.86  136.86     612  146.82   610.6
  147.48  610.46   147.9  610.37  149.38  610.06  149.65     610  149.92  609.94
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159.33	608	164.82	607.44	165.64	607.36	168.39	607.08	168.92	607.04
169.76	606.96	171.02	606.87	172.5	606.72	174.54	606.58	175	606.54
176.19	606.45	176.38	606.43	181.13	606	185.08	605.84	187.35	605.67
188.5	605.57	189.16	605.52	191.35	605.33	191.67	605.31	192.12	605.26
192.77	605.22	193.76	605.15	195.74	604.95	198.1	604.81	199.43	604.72
201.23	604.61	203.73	604.46	204.17	604.42	205.92	604.32	207.32	604.24
211.41	604	213.59	603.87	216.58	603.67	221.08	603.18	224.78	602.86
225.55	602.8	228.58	602.39	229.31	602.32	229.39	602.31	231.49	602
234.31	600.89	236.24	600.13	236.44	600.05	236.56	600	238.9	599.09
239.57	598.83	241.73	598	242.54	597.68	243.63	597.26	245.37	596.58
246.89	596	249.19	595.15	249.5	595.03	250.4	594.7	252.3	594
253.9	593.49	257.55	592.22	257.97	592.08	257.99	592.07	258.02	592.06
258.09	592.04	258.11	592.03	258.21	592	258.56	591.87	263.38	590
264.12	589.63	266.32	588.52	267.12	588.12	267.33	588	267.33	586.4
268	585.5	307	584.3	357	584	397	584.4	451	585.5
452	586.4	483.48	588.31	484.28	588.54	487.01	589.35	489.17	590
494.88	591.24	496.85	591.66	497.47	591.8	498.39	592	499.73	592.44
504.51	594	508.13	595.34	509.9	596	515.38	598	516.5	598.41
520.84	600	634.91	600	635.89	600.29	636.23	600.38	637.3	600.68
637.59	600.76	638.74	601.09	639.61	601.31	639.74	601.35	640.6	601.57
640.64	601.58	640.72	601.6	641.24	601.73	641.51	601.8	642.36	602
643.27	602.24	643.35	602.26	643.62	602.33	645.12	602.72	645.67	602.86
645.99	602.94	646.41	603.05	647.03	603.21	647.58	603.35	648.85	603.68
649	603.72	649.68	603.89	649.75	603.91	650.1	604	650.96	604.24
651.13	604.29	652.21	604.59	652.68	604.72	653.21	604.87	654.08	605.11
655.58	605.53	655.86	605.61	656.05	605.66	656.17	605.7	656.65	605.83
656.73	605.86	657.24	606	658.12	606.26	658.42	606.34	658.93	606.49
659.49	606.65	660.57	606.96	661.26	607.16	661.68	607.28	662.42	607.49
662.73	607.58	664.25	608	664.29	608.01	664.97	608.19	665.34	608.28
665.59	608.35	667.06	608.73	667.12	608.74	668.14	609	669.16	609.26
669.22	609.27	669.26	609.28	669.5	609.34	671.1	609.74	671.31	609.79
671.38	609.81	672.13	610	672.9	610.19	673	610.21	673.55	610.35
673.91	610.44	674.69	610.63	674.88	610.68	675.71	610.88	676.07	610.98
676.5	611.08	677.42	611.31	677.87	611.43	678.63	611.62	680.01	611.98
680.1	612	682.03	612.52	682.18	612.56	682.35	612.61	682.45	612.64
683.2	612.85	683.57	612.96	683.66	612.98	684.31	613.17	684.45	613.21
686.26	613.76	686.35	613.78	686.53	613.84	687.05	614	687.8	614.24
688.08	614.33	689.18	614.68	689.54	614.79	689.79	614.87	691.08	615.28
692.1	615.59	692.14	615.6	692.63	615.75	692.82	615.81	692.98	615.86
693.27	615.95	693.45	616	695.18	616.53	695.61	616.66	696.33	616.87
696.78	617	697.34	617.17	698.44	617.48	699.17	617.69	699.47	617.77
699.88	617.89	699.91	617.9	700.29	618	701.67	618.37	702.15	618.5
702.24	618.53	702.33	618.55	703.84	618.95	704.9	619.23	705.48	619.38
705.81	619.47	706.41	619.63	706.55	619.67	707.79	620	708.16	620.09
708.26	620.11	709.28	620.35	709.37	620.37	709.52	620.41	710.53	620.65
711.19	620.8	712.29	621.05	712.94	621.2	713.13	621.25	713.25	621.27
714.18	621.49	714.64	621.59	714.65	621.6	716.28	621.97	716.41	622
716.85	622.1	717.18	622.17	717.35	622.21	718.98	622.56	719.28	622.63
719.34	622.65	719.87	622.77	721.14	623.06	722.57	623.41	723.04	623.52
723.16	623.55	723.23	623.56	723.57	623.65	723.69	623.67	725.04	624
725.17	624.03	725.51	624.1	725.95	624.2	726.12	624.23	727.63	624.56
728.42	624.74	729.25	624.91	729.27	624.92	729.34	624.93	729.87	625.04
731.25	625.35	731.73	625.45	731.96	625.49	733.31	625.79	733.38	625.81
734.1	625.96	734.12	625.97	734.26	626	735.18	626.2	736.29	626.44
736.78	626.55	737.45	626.7	737.61	626.73	737.87	626.79	738.73	626.98
739.77	627.22	740.56	627.39	741.42	627.59	741.46	627.6	741.61	627.63
742.69	627.88	742.77	627.9	743.2	628	745.06	628.42	745.53	628.52
746.82	628.81	747.09	628.87	747.42	628.94	748.35	629.15	749.11	629.31
749.6	629.42	749.75	629.45	750.38	629.59	750.53	629.62	751.34	629.79
751.49	629.82	751.57	629.84	751.65	629.86	752.35	630	929.26	630

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	231.49	.043	494.88	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
231.49	494.88	161.35	153.11	122.12	.3	.5

Left Levee Station= 136.31 Elevation= 611.99

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 62371.78

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	609.08	53.18	610.77	149.85	611.19	160.84	610.44	203.86	601.72
242.24	599.83	267.02	592.5	284.48	592.64	293.94	588.19	317.32	584.27
349.32	583.58	385.32	584.1	394.32	583.78	405.32	583.48	429.32	583.57
447.32	583.94	467.32	584.18	485.94	588.31	497.38	591.36	514.91	591.44
538.03	600.73	541.91	600.83	544.34	600.61	572.49	600.48	626.83	598.41
653.6	597.52								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	203.86	.043	497.38	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
203.86	497.38	306.24	310.11	335.68	.1	.3

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 62061.6*

INPUT
Description:
Station Elevation Data num= 186

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.1	608.49	4.77	608.66	74.78	609.3	121.49	610.2	130.18	609.02
130.76	608.9	131.12	608.83	132.41	608.57	132.89	608.47	141.09	606.84
149	606.06	150.19	605.96	151.29	605.89	152.58	605.76	154.36	605.64
155.8	605.53	158.65	605.28	160.11	605.13	163.56	604.96	165.54	604.79
166.54	604.69	169.03	604.46	169.7	604.39	171.13	604.28	172.86	604.09
174.92	603.95	176.08	603.86	179.83	603.59	181.74	603.45	182.96	603.37
188.43	602.99	191.04	602.79	194.43	602.39	194.96	602.33	198.19	602.02
198.86	601.96	201.5	601.59	202.14	601.52	204.04	601.23	206.85	600.17
208.77	599.45	208.88	599.4	208.96	599.37	209.08	599.32	209.63	599.12
211.41	598.46	212.08	598.21	214.22	597.42	215.03	597.11	216.01	596.75
216.11	596.71	217.84	596.07	218.56	595.81	219.35	595.52	220.46	595.13
221.16	594.88	221.64	594.71	221.95	594.59	222.84	594.28	223.43	594.07
224.73	593.6	226.32	593.1	229.12	592.14	229.8	591.91	229.84	591.9
229.95	591.86	230.09	591.81	230.37	591.72	230.39	591.71	230.42	591.7
230.49	591.68	230.51	591.67	230.61	591.64	230.96	591.52	235.75	589.71
236.49	589.37	236.62	589.3	237.19	588.79	237.19	588.64	238.67	588.01
239.47	587.67	239.68	587.57	239.68	586.24	240.34	585.48	277.35	584.35
279.12	584.3	328.83	584	349.48	584.21	377.36	584.58	377.87	584.73
378.06	584.74	391.45	585.26	394.27	585.56	396.28	585.77	397.97	585.94
400.3	586.17	402	586.33	425.98	586.63	427.92	586.61	442.55	586.56
444.52	586.64	445.75	587.42	452.11	587.86	452.91	587.94	453.45	587.98
453.49	587.98	454.05	588.06	457.25	588.47	459.2	588.68	459.81	588.75
460.21	588.79	462.44	589.02	484.49	590.08	485.48	590.28	488.84	590.97
491.49	591.53	498.52	592.61	500.29	592.85	500.99	592.95	501.4	593.04
501.98	593.16	502.17	593.21	503.06	593.4	503.41	593.48	503.94	593.59
504.68	593.8	505.45	594.05	505.87	594.19	506.06	594.26	506.43	594.39
506.98	594.59	507.29	594.7	507.52	594.78	508.1	595	508.64	595.2
509.03	595.34	509.21	595.41	510.07	595.73	510.59	595.92	515.41	596.74
515.89	596.83	532.17	600	1000	600	1023.83	624.67	1033.64	624.88
1037.32	625	1050.62	625.33	1149.06	625.34	1151.19	625.4	1154.77	625.49
1192.93	625.88	1194.75	626	1195.48	626.1	1196.33	626.2	1196.84	626.27
1197.26	626.33	1198.43	626.6	1198.75	626.67	1199.47	626.82	1199.98	626.92
1200.36	627	1201.66	627.24	1202.18	627.33	1203.12	627.52	1203.9	627.67
1205.31	627.97	1205.78	628.07	1206.37	628.2	1207	628.33	1207.84	628.52
1208.54	628.67	1210.16	629	1211.06	629.17	1211.96	629.33	1213.22	629.5
1214.55	629.67	1216.82	629.73	1219.2	629.79	1222.31	629.85	1224.8	629.9
1230.71	629.98	1233.8	630.01	1239.01	630.05	1242.18	630.09	1251.49	630
1260.39	630								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2.1	.075	204.04	.043	498.52	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
204.04	498.52	239.73	204.34	186.6	.3	.5

Left Levee Station= 121.59 Elevation= 610.19

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 61857.26

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	609.22	128.29	611.88	179.59	602.68	185.34	602.43	236.64	592.46
251.8	597.89	262.17	589.54	266.16	588.07	294.24	584.45	295.24	584.4
303.24	584.42	339.24	583.31	360.24	584.06	371.24	584.03	413.24	583.9
447.24	584.41	462.07	588.17	469.78	590.96	476.55	592.31	490.27	591.85
507.53	598.42	518.32	601.47	521.55	601.92	524.65	601.51	556.9	601.38
559.79	601.63	577.79	603.54	584.25	603.427	601.69	601.016		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	185.34	.043	476.55	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
185.34	476.55	227.86	258.88	271.2	.1	.3

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 61598.4*

INPUT
Description:
Station Elevation Data num= 238

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4.21	607.19	6.49	607.33	66.25	607.74	106.13	608.39	113.54	607.44
114.03	607.34	115.45	607.07	115.85	606.99	122.86	605.68	126.95	605.3
127.56	605.24	129.61	605.05	131.56	604.9	132.67	604.8	134.19	604.7
135.41	604.61	137.85	604.41	139.09	604.27	142.04	604.07	143.73	603.91
145.07	603.77	146.7	603.59	147.28	603.53	147.93	603.47	149.97	603.24
152.07	603.06	152.72	603	155.92	602.73	163.27	602.11	165.49	601.91
168.39	601.54	168.84	601.48	172.17	601.12	174.43	600.78	174.97	600.72
176.6	600.46	179.38	599.45	181.29	598.76	181.41	598.72	181.49	598.69
181.61	598.65	182.16	598.45	183.92	597.82	184.58	597.59	186.72	596.83
187.52	596.54	188.49	596.2	188.6	596.16	190.32	595.55	191.03	595.31
191.82	595.03	192.92	594.66	193.61	594.42	194.09	594.26	194.4	594.15
195.29	593.85	195.87	593.65	197.17	593.2	198.75	592.71	201.53	591.78
202.2	591.55	202.24	591.53	202.36	591.49	202.5	591.45	202.77	591.36
202.79	591.35	202.82	591.34	202.89	591.32	202.91	591.31	203.01	591.28
203.36	591.16	208.12	589.42	208.85	589.1	208.99	589.04	209.55	588.32
209.55	588.02	211.03	587.5	211.82	587.22	212.03	587.14	212.03	586.08
212.69	585.47	249.48	584.34	251.24	584.3	300.67	584	325.18	584.25
358.28	584.76	358.9	585.07	359.12	585.08	375.02	585.9	378.37	586.45
380.76	586.83	382.77	587.15	385.52	587.57	387.55	587.86	416.02	588.06
418.33	587.99	435.69	587.64	438.04	587.78	439.5	588.45	447.05	589.01
448	589.12	448.65	589.18	448.69	589.19	449.36	589.31	453.15	589.98
455.47	590.31	456.2	590.41	456.67	590.47	459.32	590.82	485.5	591.84
486.67	592.01	490.66	592.6	493.82	593.07	502.16	593.99	503.86	594.16
505.69	594.36	506.27	594.49	507.38	594.73	508.38	594.94	508.66	595
509.15	595.11	509.9	595.27	510.97	595.59	511.58	595.8	512.07	595.96
512.67	596.15	512.94	596.25	513.47	596.45	514.26	596.74	515.03	597.02
516.63	597.65	517.19	597.88	517.44	597.97	519.42	598.74	526.31	599.47
527	599.56	530	600	674.34	600	674.8	599.94	677.27	599.08
678.29	598.72	679.84	598.33	680.79	598.09	681.04	598.02	682.2	597.71

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  682.64  597.61  682.99  597.53  683.54  597.41  685.15  597.05  685.75  596.91
  686.64  596.71  687.45  596.54  688.02  596.41  689.58  596.09  691.42   595.7
  691.71  595.64   692.2  595.49  693.99  594.95  694.55  594.79  695.64  594.35
  696.67     594  699.93  593.34  702.12  593.54   702.5  593.62  703.53  593.83
  704.42  594.02  710.34  594.24  712.67  594.34  722.49  594.72   753.8  594.68
  756.51  594.76  760.35  594.89  764.23  595.02   768.3  595.17  770.28  595.24
  774.27  595.41  778.38  595.59  781.76  595.74  783.12   595.8  787.01     596
  796.66   596.5  798.97  596.61  802.68  596.81  807.44  597.05  808.45  597.11
  809.98  597.19  815.34  597.46  816.67  597.53  817.83   597.6  824.47  597.93
  825.71     598  830.32  598.26  831.72  598.33  832.72  598.39  835.91  598.58
  845.89  599.17  852.29  599.59  853.34  599.66   855.8  599.85  856.65  599.91
  859.33     600    1300     600 1431.87  620.67 1433.48  620.73 1434.82  620.78
 1436.88  620.84  1440.5  620.98 1495.06  621.75 1497.67     622 1499.92  622.41
 1500.65  622.55 1501.25  622.67 1502.92  623.19 1503.38  623.33 1505.15  623.84
 1505.69     624 1507.54  624.47 1510.75  625.33 1512.77  625.93 1512.99     626
 1513.44  626.14 1515.18  626.67 1517.38  627.33  1519.7     628 1522.27  628.67
 1524.19  629.02 1525.98  629.33 1529.22  629.46 1535.23  629.65 1538.68  629.76
 1544.56  629.87 1549.09  629.96 1552.68  630.02 1560.95  630.11 1564.66  630.16
 1568.39  630.22  1578.8     630 1591.53     630

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    4.21    .075   176.6    .043  502.16    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         176.6  502.16           467.59  463.22   457.8             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
     530 1591.53     600       F
Left Levee      Station=  106.13      Elevation=     610
Right Levee     Station=     530      Elevation=     600

CROSS SECTION


RIVER: Des Plaines
REACH: 1                  RS: 61135.2*

INPUT
Description:
Station Elevation Data    num=     184
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    6.31   605.9     8.2  605.99   57.72  606.18   90.76  606.59    96.9  605.86
   97.31  605.79   98.82  605.52  104.62  604.52  108.01  604.22  110.21  604.03
  111.06  603.97  112.75  603.84  114.01  603.76  115.03  603.69  117.04  603.54
  118.08   603.4  120.51  603.19  121.91  603.03  122.62  602.94  124.38  602.72
  124.86  602.66   125.4   602.6  127.09  602.38  128.55  602.23  132.02  601.86
   138.1  601.23  139.95  601.03  142.35  600.68   143.4  600.54  145.01  600.34
  145.48  600.29  147.35  599.98   147.8  599.92  149.15  599.68  151.92  598.73
  153.82  598.08  153.93  598.04  154.01  598.01  154.13  597.97  154.68  597.79
  156.43  597.19  157.09  596.97  159.21  596.25  160.01  595.98  160.98  595.65
  161.08  595.62  162.79  595.04   163.5  594.81  164.28  594.55  165.37   594.2
  166.07  593.97  166.55  593.82  166.85  593.71  167.73  593.43  168.32  593.24
   169.6  592.81  171.17  592.31  173.93  591.41  174.61  591.18  174.65  591.17
  174.76  591.13   174.9  591.09  175.17     591  175.19  590.99  175.22  590.98
  175.29  590.96  175.31  590.95  175.41  590.92  175.75  590.81  180.49  589.13
  181.22  588.84  181.35  588.78  181.91  587.84  181.91  587.39  183.38  586.99
  184.17  586.78  184.37  586.71  184.37  585.91  185.03  585.45  221.61  584.33
  223.36  584.29   272.5     584  300.89  584.28  339.21  584.95  339.92   585.4
  340.18  585.41   358.6  586.54  362.47  587.33  365.24   587.9  367.56  588.36
  370.75  588.96   373.1   589.4  406.06  589.49  408.74  589.37  428.84  588.73
  431.56  588.92  433.25  589.47  441.99  590.16  443.09   590.3  443.84  590.38
  443.89  590.39  444.66  590.55  449.06  591.48  451.75  591.93  452.58  592.07
  453.13  592.15   456.2  592.61  486.52  593.61  487.87  593.75  492.49  594.22
  496.14   594.6   505.8  595.36  508.01  595.55  510.39  595.77  511.15  595.93
  512.59  596.25   513.9  596.53  514.25   596.6  514.89  596.74  515.23  596.81
  515.87  596.95  517.25  597.39  518.06  597.66  519.47  598.11  519.82  598.25
  521.54   598.9  522.11  599.11  522.53  599.27  524.62     600  738.46     600
  739.96  599.78  740.54  599.65     741  599.56  741.71  599.41   743.8  598.95
  745.74  598.53  751.96   597.3  752.33  597.23  752.97  597.04  756.03  596.11
  757.45  595.52  758.78     595  759.37  594.86  760.07   594.7  761.35  594.39
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  763.02  594.01  765.87   594.3  767.71  594.74  768.86  595.01  775.18  595.29
  776.56  595.34   779.6  595.48  781.09  595.54  790.47  595.95  792.36  596.04
  833.09  595.93  841.61  596.07  851.95  596.27  860.75  596.45  869.46  596.65
   878.5   596.9   887.6  597.15  893.76  597.33  896.67   597.4  904.17  597.62
  913.14  597.87  926.62  598.24  932.62  598.44  935.74  598.54  941.12  598.72
  944.03  598.81  961.18  599.44  965.75  599.64  971.29  599.87  973.68  599.98
  974.48     600    1850     600  1873.2  630.04 1882.89  630.17 1885.95  630.21
 1889.95  630.28 1892.97  630.33 1906.11     630 1922.66     630

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    6.31    .075  149.15    .043   505.8    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        149.15   505.8           467.59  463.22   457.8             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  524.62 1922.66     600       F
Left Levee      Station=   90.76      Elevation=     610
Right Levee     Station=  524.62      Elevation=     600

CROSS SECTION


RIVER: Des Plaines
REACH: 1                  RS: 60672.0*

INPUT
Description:
Station Elevation Data    num=     205
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8.41   604.6    9.91  604.65   49.18  604.62   75.39  604.78   80.27  604.28
   80.59  604.23   81.52  604.09   86.39  603.36   91.08     603   92.11  602.94
   92.83  602.88   94.06  602.81   96.24  602.66   97.06  602.54   98.99  602.31
   100.1  602.15  100.66  602.06  102.06  601.85  102.44  601.79  102.87  601.73
  104.21  601.53  106.89  601.16  108.12     601  109.19  600.85  114.41  600.15
  116.61  599.78  117.15   599.7  118.42   599.5  120.28  599.17  120.68  599.11
   121.7  598.91  124.46  598.01  126.34   597.4  126.46  597.36  126.54  597.33
  126.66   597.3   127.2  597.12  128.94  596.56   129.6  596.35  131.71  595.67
   132.5  595.41  133.46   595.1  133.56  595.07  135.26  594.53  135.97  594.31
  136.75  594.06  137.83  593.73  138.52  593.52     139  593.37   139.3  593.27
  140.18  593.01  140.76  592.83  142.04  592.41   143.6  591.92  146.34  591.04
  147.01  590.82  147.05  590.81  147.17  590.77   147.3  590.72  147.58  590.64
   147.6  590.63  147.62  590.62  147.69   590.6  147.71   590.6  147.81  590.56
  148.15  590.45  152.86  588.85  153.58  588.57  153.72  588.52  154.28  587.36
  154.28  586.76  155.73  586.48  156.52  586.33  156.72  586.28  156.72  585.75
  157.38  585.44  193.74  584.32  195.48  584.29  244.33     584  276.59  584.32
  320.14  585.13  320.95  585.73  321.24  585.75  342.17  587.17  346.57  588.22
  349.72  588.97  352.35  589.58  355.98  590.36  358.64  590.93   396.1  590.92
  399.14  590.75  421.99  589.82  425.07  590.05     427  590.49  436.94  591.31
  438.19  591.48  439.03  591.59  439.09  591.59  439.97   591.8  444.96  592.99
  448.02  593.55  448.97  593.72  449.59  593.83  453.07  594.41  487.53  595.38
  489.07  595.48  494.31  595.84  498.47  596.13  509.45  596.74  512.16  596.94
  515.09  597.18  516.03  597.38  517.36  597.68   517.8  597.77  519.41  598.11
  519.85  598.21  520.63  598.37  521.05  598.46  521.84  598.64  523.54  599.19
  524.53  599.52  525.31  599.77  526.27     600  806.13     600  807.06  599.93
   812.5  598.91  812.95  598.82  813.75  598.58  817.51  597.44  817.75  597.37
  819.26   596.7   820.9     596  821.62  595.81  822.48   595.6  824.06  595.19
  826.12  594.67  829.62  595.05  831.88  595.64  832.13  595.71  833.31  596.01
  841.09  596.37  842.79  596.44  862.24  597.36  912.38  597.18  916.72  597.21
  922.86  597.25  929.09   597.3  935.59  597.36  938.77  597.38  946.44  597.46
  951.74  597.51  957.16  597.57  965.55  597.68  968.92  597.72  984.71  597.92
  999.89  598.12 1010.93  598.27 1027.52  598.48 1034.91  598.63 1038.76  598.69
 1048.96  598.87 1062.53  599.13 1070.08  599.28 1077.07  599.45 1083.88  599.61
 1087.15  599.71 1090.64   599.8 1094.62  599.89 1098.27  599.96 1101.13     600
    2000     600 2108.27  615.09 2109.24  615.33 2111.92  616.38 2112.65  616.67
 2115.48  617.69 2116.35     618 2119.31  618.95 2120.51  619.33 2124.45  620.67
 2127.68  621.87 2128.04     622 2128.76  622.27 2130.11  622.79 2135.07  624.67
 2138.79     626 2142.89  627.33 2145.79  627.99 2148.83  628.67 2154.03  628.91
 2156.22  629.01 2159.47  629.14 2162.57  629.27 2165.32  629.37 2169.17  629.51
 2175.52  629.65 2185.84  629.91 2188.85  629.99  2194.1  630.07 2204.84  630.22
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 4998.59   654.8 5000.25  654.73  5011.6  654.91 5012.59  655.04  5014.4  655.14
 5014.91   655.2 5016.06  655.31 5017.45   655.4 5019.64  655.57 5021.96  655.72
 5022.68  655.77 5024.28  655.89 5025.85     656 5026.71  656.07  5027.4  656.13
 5028.91  656.28 5030.03  656.38 5030.65  656.45 5032.49  656.64 5033.21  656.72
 5033.81   656.8 5034.47  656.88 5036.84  657.18 5037.42  657.26 5038.27  657.37
 5039.62  657.56 5040.73  657.72 5042.84     658 5045.53  658.28 5049.88   658.7
  5053.6  659.06 5054.29  659.12 5057.29   659.4 5060.94  659.72 5061.73  659.78
 5064.58  660.02 5066.14  660.17 5066.92  660.23 5069.46  660.44 5070.67  660.56
 5078.32  661.19 5079.68  661.31 5082.58  661.56 5084.61  661.74 5085.57  661.84
 5087.24     662 5268.15  661.83  5270.3  661.57 5271.32  661.46 5272.41  661.33
 5273.99  661.15 5275.13  661.03  5277.5  660.74 5279.06  660.59 5280.19  660.46
 5280.71  660.41 5282.32  660.26 5283.67  660.16 5285.04  660.03 5286.24  659.95
 5287.14  659.87 5288.24   659.8 5288.97  659.73 5290.42  659.67 5291.68  659.57
  5292.9  659.49 5312.39     658 5320.83  657.44  5322.6  657.34 5324.58  657.25
 5326.14  657.19  5328.2   657.1 5330.47  657.02  5331.8  656.97 5333.99  656.88
 5336.29  656.82 5338.46  656.76 5339.88   656.7 5342.64  656.64 5346.24  656.58
 5362.04  656.43 5366.48  656.33 5370.07  656.33 5375.68  656.36 5379.43  656.39
 5383.34  656.44 5386.66  656.47 5390.33   656.5 5394.16  656.54 5397.89   656.6
  5400.4  656.65 5403.51  656.77 5405.14  656.84 5406.71  656.94 5408.26  657.02
  5409.2  657.08 5411.59  657.23 5412.71  657.29 5416.02   657.5 5418.48  657.64
    5421  657.79 5422.07  657.85 5424.58     658 5441.24  658.39 5444.97  658.44
 5448.68  658.49 5479.14  658.24 5481.48  658.16 5484.53     658 5488.11  657.94
 5491.36  657.75  5492.3  657.69 5493.25  657.63 5494.52  657.53 5495.21  657.45
 5496.18  657.33 5496.79  657.25    5499  657.04 5499.84  656.92 5500.91  656.76
 5503.67  656.34 5504.19  656.27 5505.86     656 5507.24  655.76 5507.93  655.65
 5512.23  654.91  5512.6  654.84 5513.43   654.7 5517.49     654  5570.7  654.39
 5572.62  654.59 5579.67  655.31  5580.4  655.38 5586.43     656 5590.15  656.27
 5614.81     658 5617.61  658.25 5618.48  658.33 5621.07  658.54 5622.93  658.71
 5624.02   658.8 5625.58  658.94 5627.91  659.09 5631.96  659.42 5632.59  659.48
 5633.44  659.55 5635.57  659.64  5637.5  659.79 5638.06  659.84  5641.9  659.94
 5643.55  660.05 5646.02  660.13 5647.08   660.2 5648.07  660.27  5650.7  660.34
 5655.24  660.43 5656.69  660.52 5692.08     662 5707.14  662.11 5708.75   662.3
 5711.28  662.56 5712.27  662.62 5715.51  662.95

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .07 2094.12    .038 4550.39     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       2094.12 4550.39          1312.55 1305.66  914.77             .1       .3
Left Levee      Station= 2094.14      Elevation=     610


SUMMARY OF MANNING'S N VALUES

River:Des Plaines

      Reach          River Sta.       n1        n2        n3

 1                    257312.2          .19      .045      .19
 1                    257236.*          .19      .045      .19
 1                    257161.1          .19      .045      .19
 1                    256937.*          .19      .045      .19
 1                    256713.*          .19      .045      .19
 1                    256488.*          .19      .045      .19
 1                    256264.*          .19      .045      .19
 1                    256040.*          .19      .045      .19
 1                    255816.*          .19      .045      .19
 1                    255592.7          .19      .045      .19
 1                    255414.*          .19      .045      .19
 1                    255235.*          .19      .045      .19
 1                    255057.*          .19      .045      .19
 1                    254879.*          .19      .045      .19
 1                    254700.8          .19      .045      .19
 1                    254500.*          .19      .045      .19
 1                    254300.*          .19      .045      .19
 1                    254100.*          .19      .045      .19
 1                    253900.*          .19      .045      .19
 1                    253700.*          .19      .045      .19
 1                    253500.*          .19      .045      .19
```

1	74092.9*	.075	.043	.075
1	73681.42	.075	.043	.075
1	73262.0*	.075	.043	.075
1	72842.5*	.075	.043	.075
1	72423.1*	.075	.043	.075
1	72003.7*	.075	.043	.075
1	71584.3*	.075	.043	.075
1	71164.92	.075	.043	.075
1	71064.93	.075	.043	.075
1	69898.32	.075	.043	.075
1	69647.47	.075	.043	.075
1	69504.5	.075	.043	.075
1	69302.93	.075	.043	.075
1	67372.14	.075	.043	.075
1	66263.53	.075	.043	.075
1	64903.10	.075	.043	.075
1	64250.75	.075	.043	.075
1	64116.64	.075	.043	.075
1	64090.85	.075	.043	.075
1	63887.62	.075	.043	.075
1	63655.12	.075	.043	.075
1	63628.88	.075	.043	.075
1	63547.57	.075	.043	.075
1	63295.62	.075	.043	.075
1	62761.95	.075	.043	.075
1	62524.89	.075	.043	.075
1	62371.78	.075	.043	.075
1	62061.6*	.075	.043	.075
1	61857.26	.075	.043	.075
1	61598.4*	.075	.043	.075
1	61135.2*	.075	.043	.075
1	60672.0*	.075	.043	.075
1	60208.8*	.075	.043	.075
1	59745.58	.075	.043	.075
1	59256.1*	.075	.043	.075
1	58766.7*	.075	.043	.075
1	58277.3*	.075	.043	.075
1	57787.9*	.075	.043	.075
1	57298.5*	.075	.043	.075
1	56809.1*	.075	.043	.075
1	56319.7*	.075	.043	.075
1	55830.2*	.075	.043	.075
1	55340.8*	.075	.043	.075
1	54851.4*	.075	.043	.075
1	54362.0*	.075	.043	.075
1	53872.64	.075	.043	.075
1	53401.9*	.075	.043	.075
1	52931.2*	.075	.043	.075
1	52460.5*	.075	.043	.075
1	51989.8*	.075	.043	.075
1	51519.1*	.075	.043	.075
1	51048.4*	.075	.043	.075
1	50577.7*	.075	.043	.075
1	50107.1*	.075	.043	.075
1	49636.4*	.075	.043	.075
1	49165.7*	.075	.043	.075
1	48695.02	.075	.043	.075
1	48224.2*	.075	.043	.075
1	47753.4*	.075	.043	.075
1	47282.6*	.075	.043	.075
1	46811.8*	.075	.043	.075
1	46341.0*	.075	.043	.075
1	45870.2*	.075	.043	.075
1	45399.4*	.075	.043	.075
1	44928.6*	.075	.043	.075
1	44457.81	.075	.043	.075
1	44052.9*	.075	.043	.075
1	43648.0*	.075	.043	.075
1	43243.1*	.075	.043	.075
1	42838.2*	.075	.043	.075
1	42433.35	.075	.043	.075

1	10647	.07	.038	.07
1	10550	Bridge		
1	10487	.07	.038	.07
1	10108.7*	.07	.038	.07
1	9730.46*	.07	.038	.07
1	9352.193	.07	.038	.07
1	8878.68*	.07	.038	.07
1	8405.17*	.07	.038	.07
1	7931.66*	.07	.038	.07
1	7458.16*	.07	.038	.07
1	6984.65*	.07	.038	.07
1	6511.14*	.07	.038	.07
1	6037.636	.07	.038	.07
1	5564.43*	.07	.038	.07
1	5091.24*	.07	.038	.07
1	4618.04*	.07	.038	.07
1	4144.84*	.07	.038	.07
1	3671.64*	.07	.038	.07
1	3198.45*	.07	.038	.07
1	2725.25*	.07	.038	.07
1	2252.05*	.07	.038	.07
1	1778.85*	.07	.038	.07
1	1305.659	.07	.038	.07

SUMMARY OF REACH LENGTHS

River: Des Plaines

Reach	River Sta.	Left	Channel	Right
1	257312.2	78.13	75.54	71.49
1	257236.*	78.13	75.54	71.49
1	257161.1	205.52	224.06	243.84
1	256937.*	205.52	224.06	243.84
1	256713.*	205.52	224.06	243.84
1	256488.*	205.52	224.06	243.84
1	256264.*	205.52	224.06	243.84
1	256040.*	205.52	224.06	243.84
1	255816.*	205.52	224.06	243.84
1	255592.7	188.33	178.39	171.08
1	255414.*	188.33	178.39	171.08
1	255235.*	188.33	178.39	171.08
1	255057.*	188.33	178.39	171.08
1	254879.*	188.33	178.39	171.08
1	254700.8	214.1	199.99	182.36
1	254500.*	214.1	199.99	182.36
1	254300.*	214.1	199.99	182.36
1	254100.*	214.1	199.99	182.36
1	253900.*	214.1	199.99	182.36
1	253700.*	214.1	199.99	182.36
1	253500.*	214.1	199.99	182.36
1	253300.*	214.1	199.99	182.36
1	253100.*	214.1	199.99	182.36
1	252900.*	214.1	199.99	182.36
1	252701.*	214.1	199.99	182.36
1	252501.*	214.1	199.99	182.36
1	252301.*	214.1	199.99	182.36
1	252101.0	74.77	65.22	76.09
1	252035.7	60.32	63.94	62.56
1	252008	Bridge		
1	251971.8	139.22	180.05	173.65
1	251791.*	139.22	180.05	173.65
1	251611.*	139.22	180.05	173.65
1	251431.7	191.91	332	409.9
1	251099.7	124.63	139.1	166.43
1	250960.6	303.27	495.98	514.22
1	250464.6	1827.9	1840.5	1564.3
1	248624.1	627.88	627.7	584.11

1		94845.81	973.52	969.64	983.36
1		93876.16	133.65	126.97	61.11
1		93749.18	15	15	15
1		93744.18	Inl Struct		
1		93739.18	93.31	105.81	197.38
1		93633.38	342.8	335.08	293.1
1		93298.31	284.25	173	272.46
1		93124.5*	852.75	519	817.38
1		92603.25	3539.83	1617.98	1177.12
1		90981.94	1874.08	1667.68	1204.64
1		89314.28	371.29	359.15	359.5
1		88959.03	957.39	614.05	505.11
1		88344.98	350.87	461.54	486.55
1		87883.4*	350.87	461.54	486.55
1		87421.90	565.05	497.98	424.92
1		86923.9*	565.05	497.98	424.92
1		86425.9*	565.05	497.98	424.92
1		85927.98	57.84	146.95	249.11
1		85781.03	112.54	97.63	95.59
1		85700	Bridge		
1		85683.39	133.41	125.68	107.26
1		85557.71	380.67	339.71	299.9
1		85218.0*	380.67	339.71	299.9
1		84878.3*	380.67	339.71	299.9
1		84538.60	813.76	750.33	700.05
1		83788.26	690.57	761.92	832.47
1		83026.35	308	300.43	309.08
1		82725.92	76.74	74.64	73.32
1		82700	Bridge		
1		82651.28	49.23	46.29	43.41
1		82604.98	243.28	321.03	423.43
1		82283.96	40.44	49.79	69.45
1		82234.17	37.8	34.5	33.24
1		82220	Bridge		
1		82199.67	54.47	57.89	62
1		82141.78	37.67	34.09	38.65
1		82120	Bridge		
1		82107.68	233.49	217.89	161.91
1		81889.79	1483.6	1248.97	947.18
1		80640.82	741.02	739.98	692.13
1		79900.84	315.42	303.62	295.58
1		79597.21	840.45	856.11	870.84
1		78741.10	880.24	919.68	944.78
1		77821.42	187.66	207.1	232.47
1		77614.32	193.58	340.87	525.16
1		77273.46	608.7	535.06	484.25
1		76738.39	129.02	110.47	101.55
1		76627.92	215.64	232.18	238.34
1		76395.75	315.98	328.34	343.01
1		76067.4*	315.98	328.34	343.01
1		75739.06	421.65	411.53	401.83
1		75327.5*	421.65	411.53	401.83
1		74916.0*	421.65	411.53	401.83
1		74504.4*	421.65	411.53	401.83
1		74092.9*	421.65	411.53	401.83
1		73681.42	426.49	419.42	399.98
1		73262.0*	426.49	419.42	399.98
1		72842.5*	426.49	419.42	399.98
1		72423.1*	426.49	419.42	399.98
1		72003.7*	426.49	419.42	399.98
1		71584.3*	426.49	419.42	399.98
1		71164.92	100	100	100
1		71064.93	1178.08	1166.62	1209.65
1		69898.32	246.3	250.85	263.97
1		69647.47	134.48	142.97	159.89
1		69504.5	196.88	201.57	210.73
1		69302.93	1857.62	1930.79	2022.08
1		67372.14	1174.18	1108.61	1019.91
1		66263.53	1368.75	1360.44	1355.65
1		64903.10	641.4	652.34	665.7
1		64250.75	140.59	134.11	112.35

1	64116.64	26.19	25.79	41.05
1	64090.85	213	203.23	194.62
1	63887.62	164.06	232.5	238.77
1	63655.12	50.04	26.24	25.23
1	63628.88	74.49	81.31	108.73
1	63547.57	273.56	251.95	228.94
1	63295.62	533.48	533.67	533.99
1	62761.95	249.41	237.05	270.54
1	62524.89	161.35	153.11	122.12
1	62371.78	306.24	310.11	335.68
1	62061.6*	239.73	204.34	186.6
1	61857.26	227.86	258.88	271.2
1	61598.4*	467.59	463.22	457.8
1	61135.2*	467.59	463.22	457.8
1	60672.0*	467.59	463.22	457.8
1	60208.8*	467.59	463.22	457.8
1	59745.58	490.27	489.41	489.27
1	59256.1*	490.27	489.41	489.27
1	58766.7*	490.27	489.41	489.27
1	58277.3*	490.27	489.41	489.27
1	57787.9*	490.27	489.41	489.27
1	57298.5*	490.27	489.41	489.27
1	56809.1*	490.27	489.41	489.27
1	56319.7*	490.27	489.41	489.27
1	55830.2*	490.27	489.41	489.27
1	55340.8*	490.27	489.41	489.27
1	54851.4*	490.27	489.41	489.27
1	54362.0*	490.27	489.41	489.27
1	53872.64	473.04	470.69	466.08
1	53401.9*	473.04	470.69	466.08
1	52931.2*	473.04	470.69	466.08
1	52460.5*	473.04	470.69	466.08
1	51989.8*	473.04	470.69	466.08
1	51519.1*	473.04	470.69	466.08
1	51048.4*	473.04	470.69	466.08
1	50577.7*	473.04	470.69	466.08
1	50107.1*	473.04	470.69	466.08
1	49636.4*	473.04	470.69	466.08
1	49165.7*	473.04	470.69	466.08
1	48695.02	470.2	470.8	465.05
1	48224.2*	470.2	470.8	465.05
1	47753.4*	470.2	470.8	465.05
1	47282.6*	470.2	470.8	465.05
1	46811.8*	470.2	470.8	465.05
1	46341.0*	470.2	470.8	465.05
1	45870.2*	470.2	470.8	465.05
1	45399.4*	470.2	470.8	465.05
1	44928.6*	470.2	470.8	465.05
1	44457.81	411.21	404.89	395.02
1	44052.9*	411.21	404.89	395.02
1	43648.0*	411.21	404.89	395.02
1	43243.1*	411.21	404.89	395.02
1	42838.2*	411.21	404.89	395.02
1	42433.35	425.56	425.94	427.12
1	42007.4*	425.56	425.94	427.12
1	41581.4*	425.56	425.94	427.12
1	41155.5*	425.56	425.94	427.12
1	40729.5*	425.56	425.94	427.12
1	40303.65	459.4	480.49	493.43
1	39823.1*	459.4	480.49	493.43
1	39342.6*	459.4	480.49	493.43
1	38862.19	373.78	373.78	373.78
1	38488.4*	373.78	373.78	373.78
1	38114.6*	373.78	373.78	373.78
1	37740.86	434.89	474.64	479.96
1	37266.2*	434.89	474.64	479.96
1	36791.5*	434.89	474.64	479.96
1	36316.9*	434.89	474.64	479.96
1	35842.3*	434.89	474.64	479.96
1	35367.6*	434.89	474.64	479.96
1	34893.0*	434.89	474.64	479.96

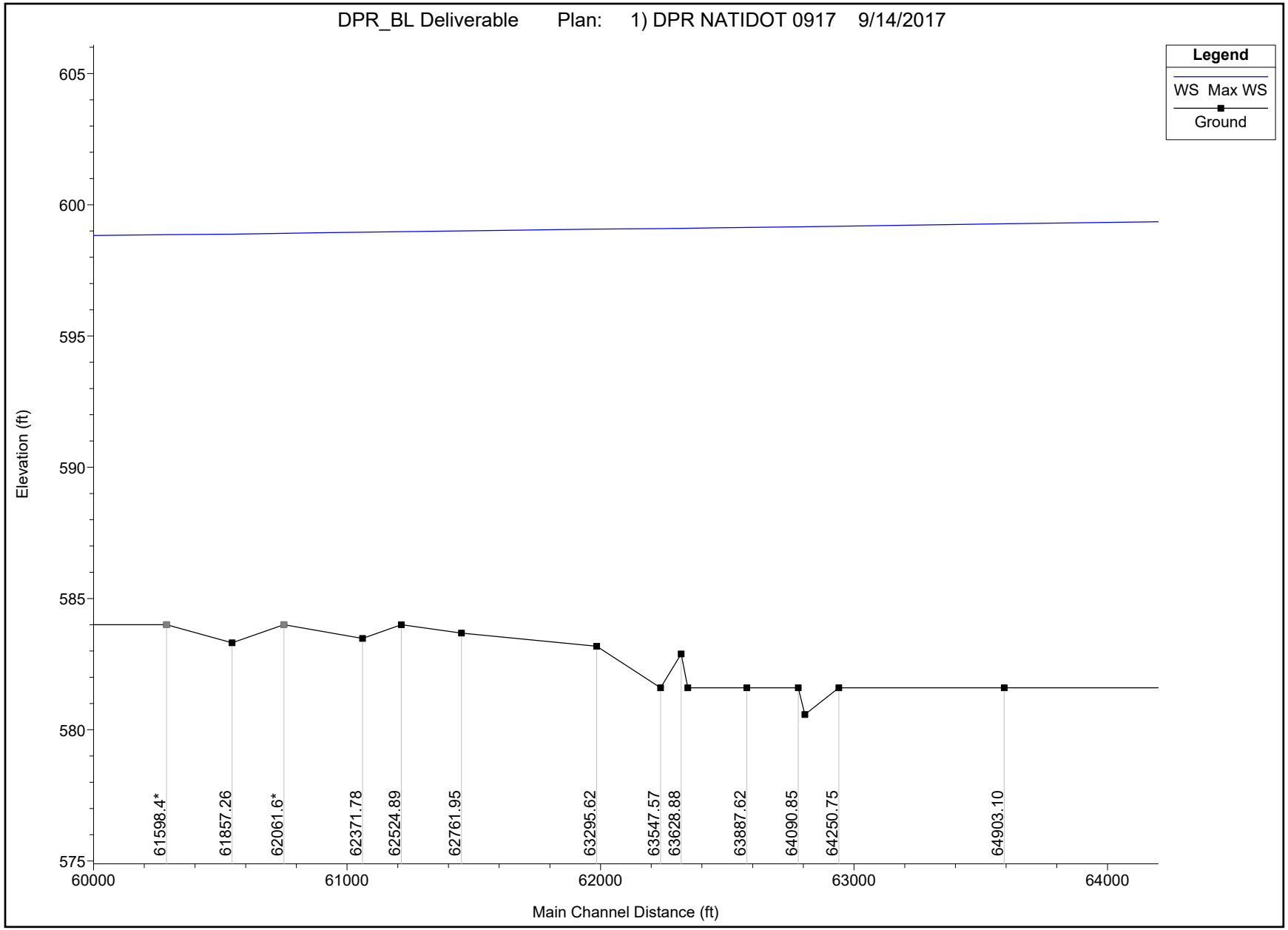
1	3671.64*	466.68	473.2	467.8
1	3198.45*	466.68	473.2	467.8
1	2725.25*	466.68	473.2	467.8
1	2252.05*	466.68	473.2	467.8
1	1778.85*	466.68	473.2	467.8
1	1305.659	1312.55	1305.66	914.77

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Des Plaines

Reach	River Sta.	Contr.	Expan.
1	257312.2	.1	.3
1	257236.*	.1	.3
1	257161.1	.1	.3
1	256937.*	.1	.3
1	256713.*	.1	.3
1	256488.*	.1	.3
1	256264.*	.1	.3
1	256040.*	.1	.3
1	255816.*	.1	.3
1	255592.7	.1	.3
1	255414.*	.1	.3
1	255235.*	.1	.3
1	255057.*	.1	.3
1	254879.*	.1	.3
1	254700.8	.1	.3
1	254500.*	.1	.3
1	254300.*	.1	.3
1	254100.*	.1	.3
1	253900.*	.1	.3
1	253700.*	.1	.3
1	253500.*	.1	.3
1	253300.*	.1	.3
1	253100.*	.1	.3
1	252900.*	.1	.3
1	252701.*	.1	.3
1	252501.*	.1	.3
1	252301.*	.1	.3
1	252101.0	.3	.5
1	252035.7	.3	.5
1	252008 Bridge		
1	251971.8	.3	.5
1	251791.*	.3	.5
1	251611.*	.1	.3
1	251431.7	.1	.3
1	251099.7	.1	.3
1	250960.6	.1	.3
1	250464.6	.1	.3
1	248624.1	.1	.3
1	247996.4	.1	.3
1	247888.5	.1	.3
1	247718.6	.1	.3
1	247621.9	.1	.3
1	247228.4	.1	.3
1	247113.4	.1	.3
1	246632.0	.1	.3
1	245740.2	.1	.3
1	245275.2	.1	.3
1	245145.2	.1	.3
1	245140.2 Inl Struct		
1	245135.2	.1	.3
1	244984.7	.1	.3
1	244813.*	.1	.3
1	244642.*	.1	.3
1	244470.*	.1	.3
1	244299.*	.1	.3

1		85927.98	.1	.3
1		85781.03	.3	.5
1		85700	Bridge	
1		85683.39	.3	.5
1		85557.71	.1	.3
1		85218.0*	.1	.3
1		84878.3*	.1	.3
1		84538.60	.1	.3
1		83788.26	.1	.3
1		83026.35	.1	.3
1		82725.92	.3	.5
1		82700	Bridge	
1		82651.28	.1	.3
1		82604.98	.3	.5
1		82283.96	.3	.5
1		82234.17	.3	.5
1		82220	Bridge	
1		82199.67	.3	.5
1		82141.78	.3	.5
1		82120	Bridge	
1		82107.68	.3	.5
1		81889.79	.3	.5
1		80640.82	.1	.3
1		79900.84	.1	.3
1		79597.21	.1	.3
1		78741.10	.3	.5
1		77821.42	.1	.3
1		77614.32	.3	.5
1		77273.46	.3	.5
1		76738.39	.3	.5
1		76627.92	.3	.5
1		76395.75	.3	.5
1		76067.4*	.1	.3
1		75739.06	.1	.3
1		75327.5*	.1	.3
1		74916.0*	.1	.3
1		74504.4*	.1	.3
1		74092.9*	.1	.3
1		73681.42	.1	.3
1		73262.0*	.1	.3
1		72842.5*	.1	.3
1		72423.1*	.1	.3
1		72003.7*	.1	.3
1		71584.3*	.1	.3
1		71164.92	.1	.3
1		71064.93	.1	.3
1		69898.32	.1	.3
1		69647.47	.1	.3
1		69504.5	.1	.3
1		69302.93	.1	.3
1		67372.14	.1	.3
1		66263.53	.1	.3
1		64903.10	.1	.3
1		64250.75	.1	.3
1		64116.64	.1	.3
1		64090.85	.1	.3
1		63887.62	.1	.3
1		63655.12	.1	.3
1		63628.88	.1	.3
1		63547.57	.1	.3
1		63295.62	.1	.3
1		62761.95	.1	.3
1		62524.89	.3	.5
1		62371.78	.1	.3
1		62061.6*	.3	.5
1		61857.26	.1	.3
1		61598.4*	.3	.5
1		61135.2*	.3	.5
1		60672.0*	.1	.3
1		60208.8*	.1	.3
1		59745.58	.1	.3

10-Year Natural


DPR_BL Deliverable Plan: 1) DPR NATIDOT 0917 9/14/2017
Legend
WS Max WS
Ground
Elevation (ft)
605
600
595
590
585
580
575
61598.4*
61857.26
62061.6*
62371.78
62524.89
62761.95
63295.62
63547.57
63628.88
63887.62
64090.85
64250.75
64903.10
60000
61000
62000
63000
64000
Main Channel Distance (ft)

HEC-RAS Plan: DPR NATIDOT 0917 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Des Plaines	1	64250.75	Max WS	7070.79	581.60	599.18		599.25	0.000144	2.07	3412.70	300.74	0.11
Des Plaines	1	64116.64	Max WS	7068.69	580.58	599.17		599.23	0.000142	2.05	3446.87	304.38	0.11
Des Plaines	1	64090.85	Max WS	7071.13	581.60	599.16		599.23	0.000158	2.09	3380.63	315.75	0.11
Des Plaines	1	63887.62	Max WS	7069.20	581.60	599.14		599.20	0.000138	1.98	3562.23	325.13	0.11
Des Plaines	1	63655.12	Max WS	7069.64	581.60	599.10		599.17	0.000131	1.98	3578.65	345.31	0.10
Des Plaines	1	63628.88	Max WS	7070.90	582.89	599.10		599.16	0.000136	2.03	3489.73	306.33	0.11
Des Plaines	1	63547.57	Max WS	7071.09	581.60	599.09		599.15	0.000118	1.95	3643.45	515.09	0.10
Des Plaines	1	63295.62	Max WS	7071.63	583.18	599.07		599.13	0.000095	1.85	3843.59	359.04	0.09
Des Plaines	1	62761.95	Max WS	7071.61	583.68	599.01		599.07	0.000110	2.00	3630.40	478.65	0.10
Des Plaines	1	62524.89	Max WS	7072.16	584.00	598.97		599.04	0.000131	2.14	3373.50	278.83	0.11
Des Plaines	1	62371.78	Max WS	7072.47	583.48	598.95		599.02	0.000139	2.18	3403.21	329.32	0.11
Des Plaines	1	62061.6*	Max WS	7073.15	584.00	598.92		598.98	0.000121	2.00	3609.16	316.45	0.10
Des Plaines	1	61857.26	Max WS	7073.60	583.31	598.88		598.95	0.000154	2.18	3356.62	305.56	0.11
Des Plaines	1	61598.4*	Max WS	7074.13	584.00	598.86		598.92	0.000119	1.90	3757.77	339.56	0.10

HEC-RAS Plan: DPR NATIDOT 0917 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
				(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Des Plaines	1	64250.75	Max WS	599.25	599.18	0.07	0.02			7070.79		300.74
Des Plaines	1	64116.64	Max WS	599.23	599.17	0.07	0.00			7068.69		304.38
Des Plaines	1	64090.85	Max WS	599.23	599.16	0.07	0.03			7071.13		315.75
Des Plaines	1	63887.62	Max WS	599.20	599.14	0.06	0.03			7069.20		325.13
Des Plaines	1	63655.12	Max WS	599.17	599.10	0.06	0.00		0.09	7067.00	2.55	345.31
Des Plaines	1	63628.88	Max WS	599.16	599.10	0.06	0.01			7070.86	0.03	306.33
Des Plaines	1	63547.57	Max WS	599.15	599.09	0.06	0.03		0.20	7068.08	2.81	515.09
Des Plaines	1	63295.62	Max WS	599.13	599.07	0.05	0.05			7070.56	1.07	359.04
Des Plaines	1	62761.95	Max WS	599.07	599.01	0.06	0.03			7058.45	13.16	478.65
Des Plaines	1	62524.89	Max WS	599.04	598.97	0.07	0.02			7018.04	54.13	278.83
Des Plaines	1	62371.78	Max WS	599.02	598.95	0.07	0.04			6921.79	150.68	329.32
Des Plaines	1	62061.6*	Max WS	598.98	598.92	0.06	0.03			7035.43	37.72	316.45
Des Plaines	1	61857.26	Max WS	598.95	598.88	0.07	0.03			6964.91	108.69	305.56
Des Plaines	1	61598.4*	Max WS	598.92	598.86	0.06	0.06			7052.26	21.87	339.56

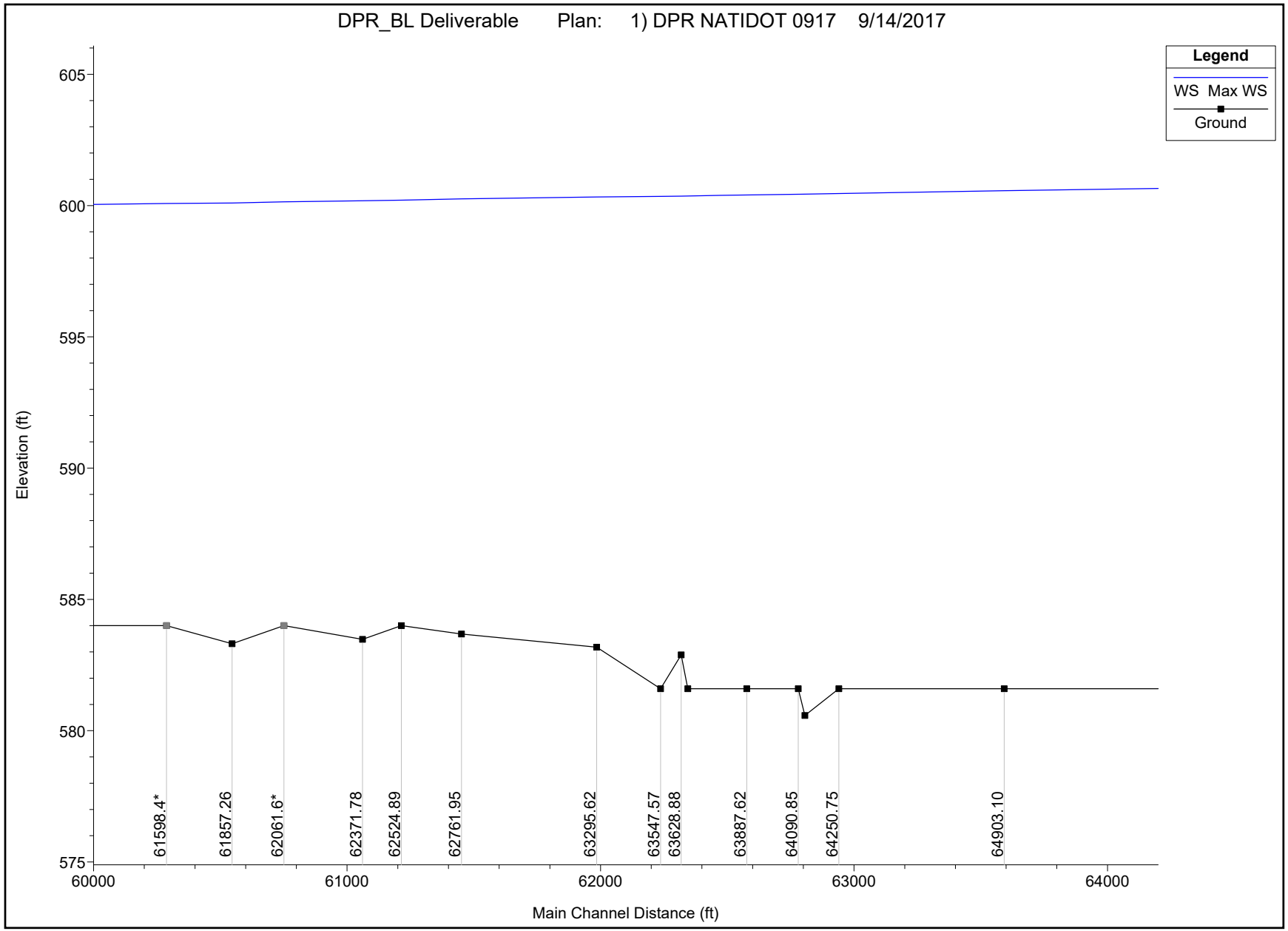
Errors Warnings and Notes for Plan : DPR NATIDOT 0917

Location:	River: Des Plaines Reach: 1 RS: 252501.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252301.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252101.0 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252035.7 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Downstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 251791.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247996.4 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247888.5 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247718.6 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247621.9 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245275.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245145.2 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.
Location:	River: Des Plaines Reach: 1 RS: 245140.2 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.
Location:	River: Des Plaines Reach: 1 RS: 245135.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 244984.7 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 244813.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 244128.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 242992.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.

Errors Warnings and Notes for Plan : DPR NATIDOT 0917 (Continued)

Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 82220 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82141.78 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS
Note:	Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The
	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 77614.32 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 76067.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 75739.06 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 69647.47 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63547.57 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63295.62 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 62761.95 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 62371.78 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 51048.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50577.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50107.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 38488.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 35842.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 35367.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.

50-Year Natural


DPR_BL Deliverable Plan: 1) DPR NATIDOT 0917 9/14/2017
Legend
WS Max WS
Ground
Elevation (ft)
605
600
595
590
585
580
575
61598.4*
61857.26
62061.6*
62371.78
62524.89
62761.95
63295.62
63547.57
63628.88
63887.62
64090.85
64250.75
64903.10
60000
61000
62000
63000
64000
Main Channel Distance (ft)

HEC-RAS Plan: DPR NATIDOT 0917 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Des Plaines	1	64250.75	Max WS	8945.23	581.60	600.46		600.54	0.000169	2.35	3812.87	341.04	0.12
Des Plaines	1	64116.64	Max WS	8944.53	580.58	600.44		600.52	0.000164	2.33	3845.95	328.28	0.12
Des Plaines	1	64090.85	Max WS	8944.59	581.60	600.43		600.52	0.000185	2.36	3804.70	361.47	0.12
Des Plaines	1	63887.62	Max WS	8944.94	581.60	600.40		600.48	0.000166	2.24	3994.16	480.69	0.12
Des Plaines	1	63655.12	Max WS	8946.17	581.60	600.36		600.44	0.000147	2.26	4036.27	509.51	0.11
Des Plaines	1	63628.88	Max WS	8945.34	582.89	600.36		600.44	0.000156	2.31	3893.45	358.50	0.11
Des Plaines	1	63547.57	Max WS	8945.49	581.60	600.35		600.43	0.000136	2.23	4091.04	892.42	0.11
Des Plaines	1	63295.62	Max WS	8945.90	583.18	600.33		600.40	0.000112	2.11	4616.83	824.44	0.10
Des Plaines	1	62761.95	Max WS	8946.76	583.68	600.25		600.33	0.000130	2.29	4416.73	880.98	0.11
Des Plaines	1	62524.89	Max WS	8946.35	584.00	600.20		600.30	0.000158	2.48	3744.72	399.55	0.12
Des Plaines	1	62371.78	Max WS	8946.59	583.48	600.18		600.28	0.000169	2.50	3834.12	374.82	0.12
Des Plaines	1	62061.6*	Max WS	8947.95	584.00	600.14		600.23	0.000144	2.30	4070.19	793.22	0.11
Des Plaines	1	61857.26	Max WS	8947.49	583.31	600.10		600.19	0.000181	2.49	3735.31	316.14	0.12
Des Plaines	1	61598.4*	Max WS	8947.86	584.00	600.08		600.15	0.000132	2.14	4932.19	1122.87	0.11

HEC-RAS Plan: DPR NATIDOT 0917 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
				(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Des Plaines	1	64250.75	Max WS	600.54	600.46	0.09	0.02		0.01	8944.51	0.71	341.04
Des Plaines	1	64116.64	Max WS	600.52	600.44	0.08	0.00			8943.85	0.69	328.28
Des Plaines	1	64090.85	Max WS	600.52	600.43	0.09	0.04		0.02	8943.81	0.76	361.47
Des Plaines	1	63887.62	Max WS	600.48	600.40	0.08	0.04		0.03	8944.80	0.10	480.69
Des Plaines	1	63655.12	Max WS	600.44	600.36	0.08	0.00		1.40	8923.02	21.74	509.51
Des Plaines	1	63628.88	Max WS	600.44	600.36	0.08	0.01			8942.80	2.54	358.50
Des Plaines	1	63547.57	Max WS	600.43	600.35	0.08	0.03		1.54	8920.09	23.86	892.42
Des Plaines	1	63295.62	Max WS	600.40	600.33	0.07	0.06			8871.62	74.27	824.44
Des Plaines	1	62761.95	Max WS	600.33	600.25	0.08	0.03			8824.92	121.84	880.98
Des Plaines	1	62524.89	Max WS	600.30	600.20	0.09	0.02			8907.69	38.66	399.55
Des Plaines	1	62371.78	Max WS	600.28	600.18	0.09	0.05			8702.02	244.57	374.82
Des Plaines	1	62061.6*	Max WS	600.23	600.14	0.08	0.03			8924.28	23.66	793.22
Des Plaines	1	61857.26	Max WS	600.19	600.10	0.09	0.04			8786.46	161.03	316.14
Des Plaines	1	61598.4*	Max WS	600.15	600.08	0.07	0.06			8752.84	195.02	1122.87

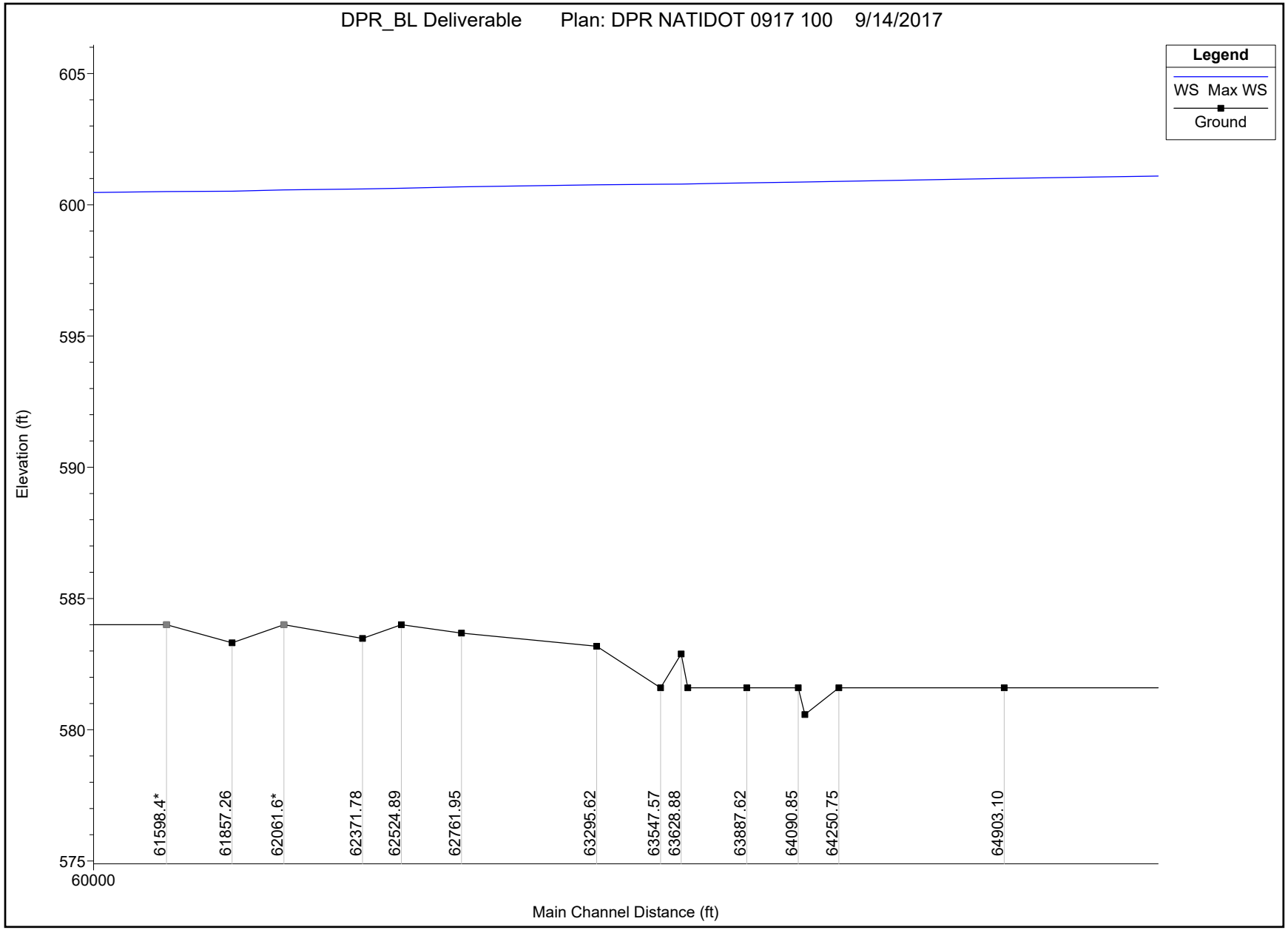
Errors Warnings and Notes for Plan : DPR NATIDOT 0917

Location:	River: Des Plaines Reach: 1 RS: 253700.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 253500.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 253300.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 253100.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252501.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252301.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252101.0 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252035.7 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Upstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 251971.8 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 251791.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247996.4 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247888.5 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247718.6 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247621.9 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245740.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245275.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245145.2 Profile: Max WS

Errors Warnings and Notes for Plan : DPR NATIDOT 0917 (Continued)

Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 82220 Profile: Max WS Upstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Location:	River: Des Plaines Reach: 1 RS: 82220 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82199.67 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 82141.78 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS
Note:	Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The
	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 77614.32 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 76627.92 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 76067.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 75739.06 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 69647.47 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63887.62 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63655.12 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63547.57 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 62761.95 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 62371.78 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 51048.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50577.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.

100-Year Natural


DPR_BL Deliverable Plan: DPR NATIDOT 0917 100 9/14/2017
Legend
WS Max WS
Ground
605
600
595
590
585
580
575
Elevation (ft)
60000
61598.4*
61857.26
62061.6*
62371.78
62524.89
62761.95
63295.62
63547.57
63628.88
63887.62
64090.85
64250.75
64903.10
Main Channel Distance (ft)

HEC-RAS Plan: DPR NATIDOT 0917 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Des Plaines	1	64250.75	Max WS	9649.67	581.60	600.89		600.98	0.000175	2.45	3964.63	358.79	0.12
Des Plaines	1	64116.64	Max WS	9649.86	580.58	600.87		600.96	0.000171	2.43	4002.90	374.88	0.12
Des Plaines	1	64090.85	Max WS	9649.92	581.60	600.86		600.96	0.000190	2.45	3962.00	365.00	0.13
Des Plaines	1	63887.62	Max WS	9650.23	581.60	600.83		600.92	0.000171	2.33	4150.28	623.92	0.12
Des Plaines	1	63655.12	Max WS	9650.19	581.60	600.80		600.88	0.000153	2.35	4198.95	671.66	0.11
Des Plaines	1	63628.88	Max WS	9650.61	582.89	600.79		600.88	0.000163	2.41	4049.89	372.58	0.12
Des Plaines	1	63547.57	Max WS	9650.75	581.60	600.78		600.86	0.000142	2.33	4250.09	1198.99	0.11
Des Plaines	1	63295.62	Max WS	9651.11	583.18	600.76		600.83	0.000116	2.19	4972.82	829.21	0.10
Des Plaines	1	62761.95	Max WS	9651.88	583.68	600.68		600.77	0.000136	2.38	4833.05	1058.39	0.11
Des Plaines	1	62524.89	Max WS	9652.08	584.00	600.63		600.73	0.000167	2.59	3914.73	402.14	0.12
Des Plaines	1	62371.78	Max WS	9652.49	583.48	600.60		600.71	0.000183	2.60	3997.95	418.85	0.13
Des Plaines	1	62061.6*	Max WS	9652.98	584.00	600.56		600.65	0.000150	2.39	4403.51	794.74	0.11
Des Plaines	1	61857.26	Max WS	9653.31	583.31	600.52		600.62	0.000190	2.59	3867.78	319.76	0.13
Des Plaines	1	61598.4*	Max WS	9653.55	584.00	600.50		600.57	0.000135	2.20	5406.64	1126.86	0.11

HEC-RAS Plan: DPR NATIDOT 0917 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
				(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Des Plaines	1	64250.75	Max WS	600.98	600.89	0.09	0.02		0.09	9645.87	3.71	358.79
Des Plaines	1	64116.64	Max WS	600.96	600.87	0.09	0.00			9645.92	3.95	374.88
Des Plaines	1	64090.85	Max WS	600.96	600.86	0.09	0.04		0.15	9645.94	3.84	365.00
Des Plaines	1	63887.62	Max WS	600.92	600.83	0.08	0.04		0.23	9649.26	0.74	623.92
Des Plaines	1	63655.12	Max WS	600.88	600.80	0.09	0.00		2.43	9613.01	34.76	671.66
Des Plaines	1	63628.88	Max WS	600.88	600.79	0.09	0.01			9641.71	8.90	372.58
Des Plaines	1	63547.57	Max WS	600.86	600.78	0.08	0.03		2.45	9609.94	38.36	1198.99
Des Plaines	1	63295.62	Max WS	600.83	600.76	0.07	0.07			9494.79	156.32	829.21
Des Plaines	1	62761.95	Max WS	600.77	600.68	0.09	0.04			9441.75	210.13	1058.39
Des Plaines	1	62524.89	Max WS	600.73	600.63	0.10	0.03			9583.05	69.03	402.14
Des Plaines	1	62371.78	Max WS	600.71	600.60	0.10	0.05			9367.44	285.05	418.85
Des Plaines	1	62061.6*	Max WS	600.65	600.56	0.09	0.03			9569.42	83.57	794.74
Des Plaines	1	61857.26	Max WS	600.62	600.52	0.10	0.04			9470.79	182.52	319.76
Des Plaines	1	61598.4*	Max WS	600.57	600.50	0.07	0.06		0.00	9307.59	345.96	1126.86

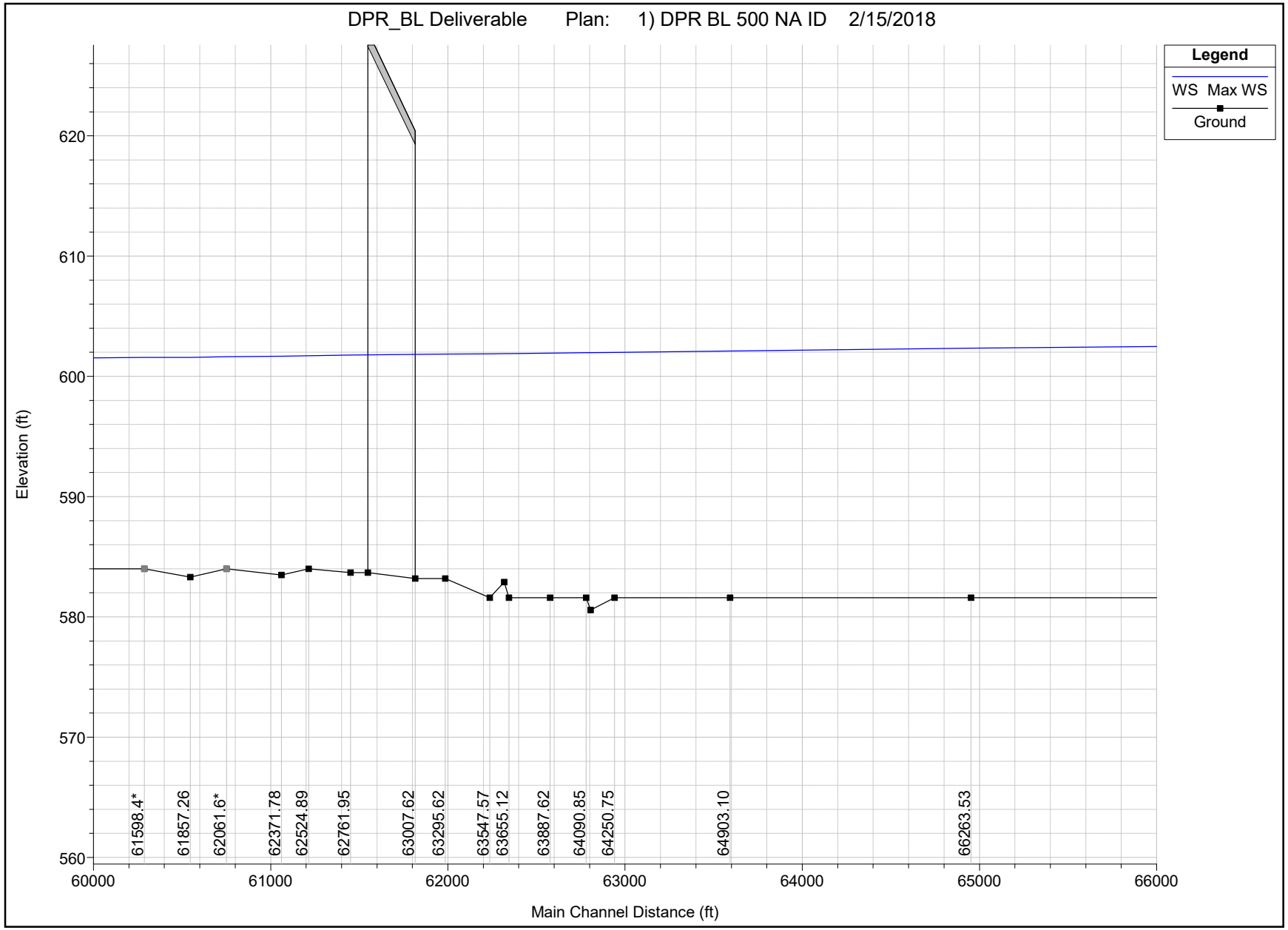
Errors Warnings and Notes for Plan : DPR NATIDOT 0917

Location:	River: Des Plaines Reach: 1 RS: 253300.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 253100.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252900.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252701.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252501.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252301.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252101.0 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252035.7 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 251971.8 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247996.4 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247888.5 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247718.6 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247621.9 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245740.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245275.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245145.2 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.
Location:	River: Des Plaines Reach: 1 RS: 245140.2 Profile: Max WS

Errors Warnings and Notes for Plan : DPR NATIDOT 0917 (Continued)

Location:	River: Des Plaines Reach: 1 RS: 76627.92 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 76067.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 75739.06 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 69647.47 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63887.62 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63655.12 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63628.88 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63547.57 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 62371.78 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 59745.58 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 59256.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 58766.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 51048.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50577.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50107.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 34893.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 34418.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33943.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33469.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32994.46 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32535.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32075.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 31616.2* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 31156.8* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29319.23 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29047.90 Profile: Max WS

500-Year Natural


DPR_BL Deliverable Plan: 1) DPR BL 500 NA ID 2/15/2018
Legend
WS Max WS
Ground
Elevation (ft)
620
610
600
590
580
570
560
61598.4*
61857.26
62061.6*
62371.78
62524.89
62761.95
63007.62
63295.62
63547.57
63655.12
63887.62
64090.85
64250.75
64903.10
66263.53
60000
61000
62000
63000
64000
65000
66000
Main Channel Distance (ft)

HEC-RAS Plan: DPR BL 500 NA ID Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Des Plaines	1	64250.75	Max WS	11558.32	581.60	601.99		602.10	0.000189	2.69	4386.59	410.30	0.13
Des Plaines	1	64116.64	Max WS	11559.79	580.58	601.97		602.08	0.000188	2.67	4427.78	398.64	0.13
Des Plaines	1	64090.85	Max WS	11557.55	581.60	601.96		602.07	0.000202	2.68	4367.92	373.91	0.13
Des Plaines	1	63887.62	Max WS	11560.49	581.60	601.94		602.04	0.000182	2.55	4564.53	983.50	0.12
Des Plaines	1	63655.12	Max WS	11560.01	581.60	601.89		601.99	0.000167	2.59	4619.74	1026.55	0.12
Des Plaines	1	63628.88	Max WS	11560.12	582.89	601.88		601.99	0.000180	2.65	4539.99	502.38	0.13
Des Plaines	1	63547.57	Max WS	11560.39	581.60	601.87		601.98	0.000156	2.57	4658.82	1440.55	0.12
Des Plaines	1	63295.62	Max WS	11561.12	583.18	601.86		601.94	0.000126	2.38	5885.79	833.47	0.11
Des Plaines	1	62761.95	Max WS	11561.51	583.68	601.78		601.87	0.000143	2.55	6113.76	1189.02	0.11
Des Plaines	1	62524.89	Max WS	11563.42	584.00	601.71		601.83	0.000187	2.85	4352.99	408.93	0.13
Des Plaines	1	62371.78	Max WS	11563.84	583.48	601.68		601.80	0.000221	2.87	4469.33	448.95	0.14
Des Plaines	1	62061.6*	Max WS	11564.79	584.00	601.64		601.74	0.000161	2.59	5262.49	800.46	0.12

HEC-RAS Plan: DPR BL 500 NA ID Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
				(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Des Plaines	1	64250.75	Max WS	602.10	601.99	0.11	0.03		1.16	11530.49	26.67	410.30
Des Plaines	1	64116.64	Max WS	602.08	601.97	0.11	0.01			11526.51	33.28	398.64
Des Plaines	1	64090.85	Max WS	602.07	601.96	0.11	0.04		1.35	11536.26	19.95	373.91
Des Plaines	1	63887.62	Max WS	602.04	601.94	0.10	0.04		2.23	11550.72	7.54	983.50
Des Plaines	1	63655.12	Max WS	601.99	601.89	0.10	0.00		7.11	11472.42	80.49	1026.55
Des Plaines	1	63628.88	Max WS	601.99	601.88	0.11	0.01			11501.69	58.43	502.38
Des Plaines	1	63547.57	Max WS	601.98	601.87	0.10	0.04		6.21	11465.05	89.13	1440.55
Des Plaines	1	63295.62	Max WS	601.94	601.86	0.08	0.07			11085.37	475.75	833.47
Des Plaines	1	62761.95	Max WS	601.87	601.78	0.09	0.04			10864.45	697.06	1189.02
Des Plaines	1	62524.89	Max WS	601.83	601.71	0.12	0.03			11382.47	180.95	408.93
Des Plaines	1	62371.78	Max WS	601.80	601.68	0.12	0.06			11177.71	386.13	448.95
Des Plaines	1	62061.6*	Max WS	601.74	601.64	0.10	0.04		0.05	11205.78	358.96	800.46

Errors Warnings and Notes for Plan : DPR BL 500 NA ID

Location:	River: Des Plaines Reach: 1 RS: 252035.7 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Upstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	For the cross section inside the bridge at the upstream end, the water surface and energy have been
	projected from the upstream cross section. The selected bridge modeling method does not compute
	answers inside the bridge.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Downstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	For the cross section inside the bridge at the downstream end, the water surface and energy have
	been projected from the downstream cross section. The selected bridge modeling method does not
	compute answers inside the bridge.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 251971.8 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 251611.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 251099.7 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 250960.6 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247996.4 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247888.5 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247718.6 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247621.9 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245740.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245145.2 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.
Location:	River: Des Plaines Reach: 1 RS: 245140.2 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.
Location:	River: Des Plaines Reach: 1 RS: 244984.7 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 244813.* Profile: Max WS

Errors Warnings and Notes for Plan : DPR BL 500 NA ID (Continued)

Location:	River: Des Plaines Reach: 1 RS: 81889.79 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 80640.82 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 79900.84 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 79597.21 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 77821.42 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 77614.32 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 76067.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 72842.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 67372.14 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63887.62 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63655.12 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63628.88 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63547.57 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 63295.62 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 62761.95 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 62371.78 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 61857.26 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 59745.58 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 59256.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 58766.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 58277.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 57787.9* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 57298.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 51989.8* Profile: Max WS
Warning:	Divided flow computed for this cross-section.

Errors Warnings and Notes for Plan : DPR BL 500 NA ID (Continued)

Location:	River: Des Plaines Reach: 1 RS: 51519.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 51048.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50577.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50107.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 49636.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 49165.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 38114.6* Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 36316.9* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33943.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33469.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32994.46 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32535.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32075.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29047.90 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28549.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28051.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 25180.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 23863.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 23424.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 20577.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 20085.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 19593.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 19101.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 15657.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 15165.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 13689.2* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 12722.4* Profile: Max WS

Errors Warnings and Notes for Plan : DPR BL 500 NA ID (Continued)

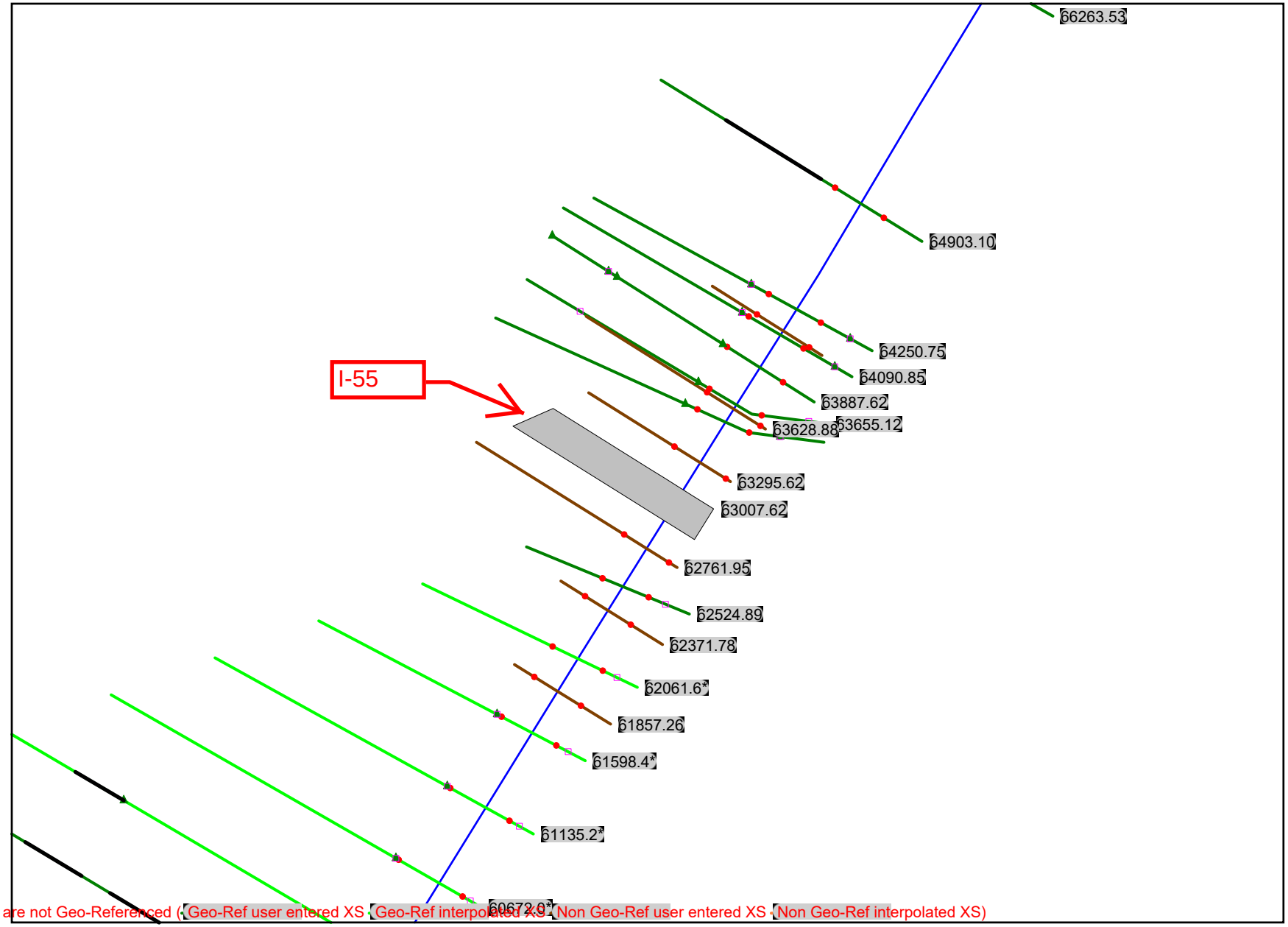
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 12247.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 11772.83 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 11612.58 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 11550 Profile: Max WS
Note:	Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The
	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 11550 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 11550 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 11442.25 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 11147 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 10747 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 10550 Profile: Max WS Downstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Location:	River: Des Plaines Reach: 1 RS: 10487 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 1305.659 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.

TAB I

SECTION 13.I

PROPOSED CONDITIONS
DESIGN MODEL

Proposed Conditions
HEC-RAS Geometry



12 of the 985 XS's are not Geo-Referenced (Geo-Ref user entered XS, Geo-Ref interpolated XS, Non Geo-Ref user entered XS, Non Geo-Ref interpolated XS)

HEC-RAS Version 4.0.0 March 2008
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: DPR_BL Deliverable
Project File : DPR_BL_Deliverable.prj
Run Date and Time: 9/12/2018 2:58:29 PM

Project in English units

Project Description:
Lower Des Plaines River Unsteady HEC-RAS for MWRD LDPRDWP ****more details below****

Data Sources:
Cook County 2 ft topo for XS pulled using
HEC-GeoRAS
Channel information from steady HEC-RAS model from USACE File:
LEV_37_14.DAT
Flow data for direct tributary areas to Lower Des Plaines River
from CBBEL HEC-HMS model
Inflow hydrographs for Cook County sub-watershed from
HEC-RAS output files for individual LDPRDWP Phase B sub-watershed
analyses.

Vertical Datum: NAVD 1988

Des Plaines River alternatives are
modeled.

PLAN DATA

Plan Title: DPR PRIDOT 0218 100
Plan File : n:\Idot\110203.00001\Drain\Model\Des Plaines River MWRD Hydraulic Model 10-100-Year\DPR_BL_Deliverable.p14

Geometry Title: DPR PRIDOT 0218
Geometry File : n:\Idot\110203.00001\Drain\Model\Des Plaines River MWRD Hydraulic Model 10-100-Year\DPR_BL_Deliverable.g03

Flow Title :
Flow File :

Plan Summary Information:
Number of: Cross Sections = 985 Multiple Openings = 1
Culverts = 0 Inline Structures = 3
Bridges = 50 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method: Average Conveyance
    Computational Flow Regime: Subcritical Flow

GEOMETRY DATA

Geometry Title: DPR PRIDOT 0218
Geometry File : n:\Idot\110203.00001\Drain\Model\Des Plaines River MWRD Hydraulic Model 10-100-Year\DPR_BL_Deliverable.g03

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 257312.2

INPUT
Description:
Station Elevation Data num= 103

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	648	36.24	647.35	36.59	646	37.66	644.31	37.8	644
38.07	643.75	39.61	642	39.63	641.99	39.65	641.98	39.79	641.91
43.21	640.2	43.64	640	46.94	638.72	48.84	638	51.53	637.05
52.76	636.61	54.27	636.08	54.29	636.07	54.5	636	58.31	634.32
59	634	60.7	633.18	63.19	632	64	631.42	65	631.3
68	630.85	73	630.15	102	628.88	115	629.03	154	629.4
170	630.3	183	630.76	186	631.27	187	632.02	207.81	633.73
208.67	634	209.89	634.6	212.34	635.81	212.77	636	216.01	637.5
216.67	637.79	216.98	637.93	217.04	637.95	217.05	637.96	217.15	638
219.15	638.79	220.23	639.17	220.81	639.38	222.48	640	222.89	640.12
223.78	640.37	224.86	640.69	228.59	642	231.23	642.5	232.44	644
236.39	644.79	237.05	644.76	238.45	645.73	239.44	646	242.26	646.14
244.3	647.31	246.2	647.59	246.24	647.61	246.39	647.63	246.66	647.7
248.21	647.93	248.26	647.94	248.63	648	249.2	648.03	251.34	648.14
252.06	648.17	253.84	648.24	253.98	648.25	254.67	648.27	254.74	648.28
254.95	648.29	256.26	648.34	256.53	648.35	256.7	648.36	257.92	648.41
258.52	648.43	258.73	648.44	260	648.5	260.6	648.52	260.8	648.53
261.4	648.55	262.54	648.6	263.12	648.62	263.97	648.66	264.42	648.67
265.4	648.7	265.94	648.72	267.06	648.75	268.06	648.77	268.74	648.78
269.83	648.79	270.46	648.8	271.13	648.81	271.85	648.82	273.35	648.83
273.87	648.84	275.2	648.85	276.11	648.86				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.19	63.19	.045	187	.19

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
63.19	187	78.13	75.54	71.49	.1	.3

Some XS omitted for brevity. See model on CD for full input file.

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 64116.64

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	617.07	40.36	606.59	79.61	603.88	116.41	593.26	156.16	591.84
163.09	588	192.81	583.91	196.81	584.14	219.81	581.1	226.81	580.77
230.81	580.91	241.81	580.58	250.81	581.35	263.81	581.8	271.81	581.96
282.81	583.23	301.81	583.1	316.81	584.49	327.81	583.42	335.54	587.97
342.18	590.53	353.82	591.89	367.96	595.16	404.8	599.72	421.39	600.51
458.96	600.54	517.82	603.78	666.45	602.39	679.66	603.4	684.09	603.35

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	79.61	.043	404.8	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
79.61	404.8	26.19	25.79	41.05	.1	.3

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 64090.85

INPUT
Description:
Station Elevation Data num= 320

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	608.08	12.9	608.18	13.86	608.12	14.68	608.08	16.12	608
19.13	608.01	19.14	608.02	19.27	608.04	21.66	608.45	22.71	608.66
24.6	609	25.49	609.19	25.61	609.22	29.31	610	29.61	610.1
31.18	610.62	32.16	610.94	34.8	611.82	35.34	612	37.41	612.77
40.69	614	41.67	614.39	45.74	616	48.76	617.1	49.88	617.51
51.23	618	57.99	618.31	58.18	618.32	59.67	618.38	60.76	618.44
104.53	619.11	105.51	619.09	106.8	619.08	107.97	619.06	108.65	619.04
162.85	618	178.69	617.46	180.82	617.33	190.18	616.78	192.13	616.67
202.55	616.05	202.73	616.04	203.32	616	203.65	615.92	211.18	614
213.22	613.38	217.77	612	219.6	611.4	223.8	610	225.61	609.48
230.74	608	233.62	607.78	233.97	607.76	234.59	607.72	235.12	607.69
239.73	607.35	240.73	607.28	242.01	607.21	244.76	607.01	246.92	606.89
248.89	606.75	253.78	606.48	255.77	606.35	262.27	606	267.43	605.6
269.75	605.37	270.51	605.3	271.23	605.23	278.84	604.48	280.51	604.32
281.31	604.24	281.82	604.19	283.6	604	286.72	603.1	290.52	602
293.51	600.85	294.46	600.49	295.76	600	298.67	598.86	300.87	598
301.79	597.64	306.11	596	307.76	595.41	308.35	595.21	309.55	594.79
310.39	594.5	310.72	594.39	311.87	594	317.54	593.52	324.15	592.94
330.91	592.35	333.06	592.16	333.51	592.12	334.82	592	343.36	591.28
351.58	590.59	354.63	590.33	357.64	590.08	358.5	590	358.98	589.81
364.02	588	376	586.8	377	586.4	378	586	406	582.4
431	581.6	466	582.9	491	584.4	518	585	519	586
520	586.8	540.98	588.66	544.59	590	547.48	590.54	548.34	590.65
549.6	590.83	552.24	591.26	554.9	591.59	557.41	591.9	558.18	592
559.02	592.12	559.11	592.13	561.27	592.43	561.78	592.51	562.34	592.6
563.17	592.72	564.13	592.87	565.74	593.12	566.79	593.29	569	593.65
570.44	593.89	571.07	594	578.9	595.41	581.97	595.97	582.12	596
582.31	596.04	583.76	596.39	584.32	596.52	585.4	596.79	590.61	598
606.32	598.8	609.39	598.95	613.05	599.13	619.66	599.45	628.65	599.89
630.01	599.95	631	600	655.6	600.34	664.75	602	668.89	603.26
671.34	604	697.63	602.92	698.12	602.79	701.06	602	731.58	601.28
746.87	600.92	749.32	600.87	751.46	600.82	754.14	600.76	757.57	600.68
782.86	600.14	786.24	600.06	789.09	600	882.15	600.27	890.58	602
951.23	601.42	952.16	601.41	953.37	601.4	953.91	601.39	954.06	601.4
973.13	601.47	974.34	601.45	983.97	601.19	984.32	601.18	986.16	601.15
988.17	601.1	989.77	601.06	998.17	600.82	999.88	600.77	1002.61	600.7
1003.72	600.66	1004.08	600.65	1005.12	600.63	1006.73	600.6	1007.17	600.59

1014.02	600.36	1014.5	600.34	1015.17	600.33	1021.42	600.16	1027.25	600.12
1027.96	600.13	1037.82	600.18	1039.55	600.19	1055.36	600.25	1068.92	600.26
1071.13	600.28	1073.31	600.29	1074.82	600.31	1076.33	600.32	1080.65	600.36
1081.57	600.37	1082.34	600.38	1187.02	601.32	1189.62	601.34	1222.61	601.62
1225.53	601.67	1227.33	601.69	1243.73	601.91	1247.88	601.97	1250.44	602
1367.37	603.35	1371.67	603.52	1373.68	603.59	1374.31	603.61	1384.13	604
1434.67	603.74	1435.16	603.49	1438.11	602	1444.25	601.51	1444.86	601.47
1445.67	601.42	1446.57	601.36	1449.1	601.21	1453.04	600.95	1467.41	600
1506.93	600.03	1512.19	600.48	1512.91	600.54	1516.48	600.85	1520.08	601.17
1521.14	601.26	1522.17	601.35	1523.49	601.47	1524.59	601.56	1525.08	601.61
1525.61	601.65	1525.96	601.68	1528.18	601.89	1528.23	601.9	1529.31	602
1558.62	601.51	1560.19	601.12	1564.57	600	1590.24	600.03	1590.61	600.06
1597.2	600.54	1598.63	600.66	1599.71	600.75	1602.44	600.95	1604.24	601.08
1605.35	601.18	1605.98	601.22	1606.48	601.26	1607.84	601.38	1608.88	601.46
1610.26	601.57	1610.91	601.62	1611.15	601.64	1612.93	601.78	1615.38	601.97
1615.44	601.98	1615.73	602	1616.86	602.06	1619.61	602.2	1619.97	602.22
1620.54	602.25	1622.22	602.34	1622.53	602.36	1622.86	602.38	1627.34	602.62
1628.16	602.67	1629.22	602.73	1631.24	602.84	1632.18	602.89	1634.28	603.01
1636.27	603.12	1638.06	603.22	1640.02	603.33	1640.8	603.38	1642.71	603.48
1644.22	603.56	1644.33	603.57	1646.77	603.69	1646.86	603.7	1647.53	603.73
1648.53	603.78	1650.83	603.89	1650.89	603.9	1652.2	603.96	1653.01	604
1656.73	604.08	1657.32	604.09	1672.99	604.38	1673.66	604.4	1675.27	604.43
1677.71	604.47	1679.64	604.5	1680.26	604.51	1683.4	604.56	1684.04	604.57
1684.81	604.58	1685.97	604.6	1686.69	604.61	1687.63	604.62	1716.14	604.72
1716.89	604.71	1719	604.72	1742.19	604.7	1743.04	604.69	1743.86	604.68
1745.46	604.66	1751.34	604.61	1753	604.59	1753.75	604.58	1755.57	604.57
1756.68	604.55	1758.79	604.54	1760.19	604.53	1761.25	604.52	1763.2	604.52

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	295.76	.043	630.01	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
295.76	630.01	213	203.23	194.62	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	104.53	619.11	F
671.34	1763.2	604	F

Left Levee Station= 104.53 Elevation= 619.11
Right Levee Station= 671.34 Elevation= 604

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 63887.62

INPUT
Description:
Station Elevation Data num= 196

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	622	11.58	621.97	16.09	621.78	16.68	621.76	18.01	621.7
18.86	621.67	19.17	621.66	23.01	621.5	23.49	621.48	25.11	621.41
25.78	621.38	26.1	621.37	26.58	621.35	27.26	621.32	29.5	621.23
30.78	621.18	32.62	621.1	35.2	620.99	36.83	620.92	37.54	620.89
38.96	620.84	40.35	620.77	41.38	620.73	42.39	620.69	44.12	620.62
44.94	620.58	46.08	620.53	46.75	620.51	48.83	620.41	49.4	620.39
49.8	620.38	52.48	620.26	52.86	620.24	53.29	620.22	58.08	620.02
58.32	620.01	58.44	620	59.88	619.95	62.07	619.87	64.63	619.79
66.23	619.73	66.39	619.72	67.95	619.67	74.21	619.45	74.6	619.43
76.31	619.37	89.25	618.88	93.08	618.74	93.64	618.72	94.39	618.69
95.78	618.64	96.27	618.62	96.46	618.61	97.29	618.58	99.17	618.52
99.74	618.49	100.65	618.46	112.19	618	115.55	616.48	116.61	616
119.86	614.74	121.75	614	123.84	613.18	126.86	612	128.55	611.22
131.23	610	131.6	609.84	135.74	608	135.97	607.95	145.04	606
164.21	605.7	174.84	604	176.08	603.75	176.3	603.71	178.51	603.26
181	602.78	181.64	602.65	182.52	602.47	184.08	602.18	184.98	602
186.55	601.67	187.14	601.55	187.96	601.37	188.47	601.26	190.21	600.91
191.03	600.73	194.37	600	195.48	599.6	199.63	598	200.48	597.62
203.9	596	209.89	594.21	209.98	594.18	210.61	594	216.66	592.79
217.38	592.65	220.68	592	222.5	591.87	222.6	591.86	228.25	591.45

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  228.98   591.4  229.72  591.34  232.45  591.15  234.52  591.01  235.27  590.96
  237.63  590.79  239.97  590.63  242.13  590.49  245.09  590.27  245.38  590.26
  245.89  590.22  248.72     590  250.23   589.3  252.93     588     276   586.8
     277   586.4     278     586     306   582.4     331   581.6     366   582.9
     391   584.4     418     585     419     586     420   586.8  448.14  588.97
  448.36  589.07  450.33     590  453.15  591.28   454.7     592  483.66  593.35
  490.56  593.92   491.4     594  495.04  595.04  498.37     596  501.22  596.99
  504.11     598  507.83  598.24  508.62  598.28  513.51   598.6  518.53  598.92
  519.56  598.99  521.37  599.11  523.91  599.26  524.21  599.28  525.89  599.39
  543.32     600  568.38  601.69  570.12     602  598.72  601.67  609.03  601.09
  609.92  601.05  611.49  600.96  615.81  600.76  621.18  600.47  628.42     600
 1164.93  601.83 1167.04  601.86 1168.84  601.87 1169.97  601.89 1172.73  601.92
 1176.08  601.95 1176.52  601.96 1180.97     602  1231.3  602.54 1255.83  603.21
  1274.3  603.72 1277.58  603.81 1277.98  603.82  1284.6     604 1332.96  603.57
 1333.95  603.26 1338.03     602 1339.88  601.27 1341.38  600.66 1342.99     600
 1465.55  600.04 1466.03  600.08 1467.46  600.22 1467.93  600.27  1468.5  600.32
 1469.03  600.38 1469.62  600.43 1469.83  600.42 1477.97  600.53    1507  600.89
 1507.94  600.95 1509.63  601.09 1512.16  601.34  1512.4  601.36 1513.63  601.47
 1514.25  601.46 1514.54  601.48  1514.9  601.51  1517.5  601.75 1520.58     602
  1636.1     602

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  194.37    .043  543.32    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        194.37  543.32           164.06   232.5  238.77             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  570.12  1231.3     602       F
  1284.6  1636.1     604       F
Right Levee     Station=  1284.6      Elevation=     604

CROSS SECTION


RIVER: Des Plaines
REACH: 1                  RS: 63655.12

INPUT
Description:
Station Elevation Data    num=     434
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     610   26.43  610.12    26.7  610.13   27.97   610.2   31.35  610.37
   31.62  610.39    32.5  610.43    33.3  610.47    33.5  610.48   34.45  610.53
   37.73   610.7    39.5  610.79   42.52  610.94   43.89  611.01   45.83  611.11
   47.77  611.21   50.16  611.32   50.73  611.35    53.4  611.48   54.32  611.52
   54.44  611.53   58.43  611.72   58.53  611.73   61.83  611.89   61.98   611.9
   62.18  611.91   64.04     612   65.99  612.51   67.22  612.85   68.34  613.17
   68.84   613.3   69.41  613.45   70.06  613.63   71.41     614   71.79  614.13
   71.84  614.15   73.14  614.57   73.67  614.75    74.5  615.03   75.76  615.46
    76.4  615.68   76.65  615.76   77.33     616   78.88  616.58   80.08  617.02
   82.72     618   83.14  618.15   83.35  618.22   83.52  618.28   83.64  618.33
   83.94  618.43   85.67  619.03   86.24  619.23   87.63   619.7   87.94  619.81
   88.51     620   89.67  620.36   89.82   620.4   90.78   620.7   93.45  621.52
   94.32  621.79   94.87  621.95   94.98  621.99   95.01     622  100.52  623.12
     104  623.95   104.2     624  156.26  623.61     157  623.58  157.52  623.57
  157.81  623.55  158.43  623.53  159.66  623.51   160.4  623.48  161.23  623.45
  161.69  623.44  163.38  623.41  164.37  623.38  165.43  623.34  166.12  623.31
  166.96  623.29  168.36  623.24  169.43  623.21  170.68  623.18  171.62  623.15
  172.21  623.13  173.45  623.09  173.69  623.08  174.06  623.07  175.62  623.02
  176.13  623.01  176.91  622.98  177.62  622.96  178.33  622.93   179.4   622.9
  181.47  622.84   182.5   622.8  182.87  622.79  183.41  622.77  184.77  622.73
  185.34  622.71  186.18  622.68  187.42  622.64  187.87  622.63  189.01   622.6
  190.73  622.54  191.03  622.53  191.91   622.5  192.33  622.48   195.8  622.37
  197.83  622.31  198.02   622.3  198.76  622.28  199.02  622.27  200.08  622.24
  201.08  622.21   202.4  622.17  204.38  622.12  204.47  622.11  206.27  622.06
  207.77  622.01  208.09     622  208.89  621.96  212.27   621.8  212.64  621.78
  212.73  621.77  213.53  621.73  213.72  621.72   214.5  621.68  215.06  621.64
  215.44  621.62  218.59  621.45  219.08  621.42  219.42   621.4  219.96  621.37
  220.37  621.35  222.12  621.24  223.68  621.15  225.36  621.05  225.63  621.04
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  227.07  620.96   228.4  620.88  229.62  620.81  230.37  620.76  231.53  620.69
  231.91  620.67  232.36  620.65  233.17   620.6  235.42  620.47   235.8  620.45
   236.2  620.42  239.23  620.25  239.42  620.23  240.41  620.18  240.76  620.16
  243.38     620  260.06   619.4  262.95  619.26  263.71  619.25   264.2  619.24
  265.22  619.22  265.63  619.19  267.01  619.17  267.37  619.15  267.44  619.14
  267.94  619.12  268.92   619.1  269.31  619.09  270.35  619.07  271.07  619.06
  275.99  618.76  276.38  618.75  276.92  618.74  277.29  618.73  277.55  618.72
  278.14  618.68  278.71  618.67  279.59  618.61  280.25  618.59  282.69  618.42
  283.18  618.41   283.5   618.4  283.64  618.39  288.67     618  289.34  617.74
   289.4  617.71  289.44  617.69  290.42  617.26  291.37  616.86   291.4  616.85
  291.42  616.84  291.62  616.75  292.05  616.56  292.28  616.46  293.32     616
   295.2  615.27  296.06  614.94  297.91  614.25  298.34  614.09  298.49  614.04
  298.59     614  298.79  613.93  298.82  613.92  301.76  612.98  302.12  612.87
  302.22  612.84   302.3  612.81   304.4  612.15  304.87     612  305.39  611.81
   306.1  611.57  306.32  611.49  307.17  611.19  308.51   610.7  308.99  610.54
  309.93  610.19  310.08  610.14  310.45     610  311.19  609.73  311.63  609.56
  313.36  608.92  314.28  608.58  314.88  608.36  315.83     608  315.85  607.99
  315.88  607.98  318.55  607.07  319.08  606.88   319.5  606.74  319.81  606.63
  320.14  606.52  321.69     606  322.96  605.69  323.17  605.65  323.47  605.58
  323.89  605.49  324.46  605.36  324.97  605.24   325.5  605.12  327.08  604.76
   328.3   604.5  328.73   604.4  330.32  604.06  330.36  604.05   330.6     604
  331.22  603.88  331.38  603.84   332.9  603.54  333.15   603.5  333.46  603.44
  334.67   603.2  335.83  602.97  336.36  602.87  337.06  602.73  337.77  602.59
  338.64  602.42  338.99  602.35  339.07  602.33  340.78     602  341.31  601.89
  341.34  601.88  341.38  601.87  342.49  601.64  343.35  601.46  344.51  601.17
  345.86  600.88   346.6  600.69  347.02  600.59   348.5   600.2  348.64  600.17
  349.25     600  349.93  599.79  350.58  599.57  352.83  598.85  353.66  598.57
  354.29  598.37  355.38     598  356.69  597.61  356.85  597.56  357.85  597.27
  359.35  596.85   360.8  596.45  362.27  596.05  362.28  596.04  362.35  596.03
  362.45     596  364.24  595.58  364.51  595.52  365.53  595.28  366.17  595.11
  366.91  594.94   367.9  594.68  368.56  594.53  370.06  594.14  370.15  594.12
  370.56     594  373.95  593.65  374.26  593.62  376.88  593.36  377.79  593.25
  378.74  593.14  379.13   593.1  380.62  592.94  383.02  592.66  384.19  592.54
  384.65  592.49  386.71  592.26  386.88  592.24  388.36  592.07  388.54  592.05
  389.01     592  389.94  591.85  390.05  591.84   391.4  591.63  391.78  591.58
  392.94  591.41  393.91  591.29  394.29  591.24  395.18  591.14  395.76  591.07
  396.95  590.96  397.56  590.92  397.86   590.9  401.03  591.14  401.77  590.93
   401.8  590.92  403.24  590.38  404.05     590  405.38  589.36   405.6  589.25
  405.88  589.12  407.07   588.5  407.94     588     426   586.8     427   586.4
     428     586     456   582.4     481   581.6     516   582.9     541   584.4
     568     585     569     586     570   586.8  608.19  589.47  609.33     590
  612.06  591.23  613.77     592  616.89  592.14  618.09  592.19  623.14  592.42
  658.92     594   660.6  594.73  663.57     596  664.86  596.76  667.16     598
  693.11  598.95  706.49  599.44   721.7     600  723.88  600.47   728.1  601.34
  730.91  601.93  731.22     602  731.28  602.03  731.94  602.34  735.49     604
  761.04  602.63  762.82     602  766.42  601.09  770.63     600 1366.88  601.64
 1384.21  601.77 1388.72   601.8 1414.45     602 1416.42  602.02 1421.76  602.36
 1430.91  602.85 1431.95  602.89 1432.75  602.93 1433.38  602.95 1433.67  602.97
  1434.2     603 1434.64  603.02 1434.94  603.04  1436.6  603.08 1437.75  603.14
 1458.56  603.69 1459.35  603.72 1462.77  603.87 1462.88  603.88 1467.61  603.82
 1469.09  603.83 1469.64  603.79 1470.74  603.71 1470.94   603.7 1473.19  603.53
  1473.6   603.5 1473.92  603.48 1477.38  603.28 1485.85  602.62 1489.26  602.35
  1493.7     602 1494.31  601.47 1494.65  601.17 1495.07  600.81 1495.97     600
 1610.97  599.45 1618.08  599.34 1619.05  599.32 1619.93  599.31 1621.79   599.3
  1629.8  599.16 1670.08  598.79 1671.19  598.78 1701.29  599.37 1702.02  599.43
 1702.88   599.5 1704.07  599.61  1705.1  599.71 1706.28  599.82 1706.58  599.85
 1708.01  599.98 1708.21     600 1711.33  600.64 1717.65     602 1722.46  601.95
 1722.71  601.92 1722.91   601.9 1728.18  601.26 1729.68  601.08 1732.51  600.74
 1734.78  600.46 1736.95  600.21 1738.76     600 1788.43     600

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  354.29    .043  667.16    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        354.29  667.16             50.04   26.24   25.23             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  735.49 1788.43     604       F
Left Levee      Station=     104      Elevation=  623.95
Right Levee     Station= 1462.88      Elevation=  603.88
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CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 63628.88

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	619.07	3.19	618.6	30.79	608.58	81.16	591.97	94.99	592.66
98.71	589.65	105.11	588.22	121.79	584.15	125.79	584.27	155.79	584.4
191.79	584.48	199.79	584.32	226.79	584.34	246.79	584.45	276.79	582.89
281.79	583.71	297.57	588	307.61	592.18	349.33	592.67	363.46	598.72
371.48	599.98	410.69	600.17	421.3	600.73	441	604.02	445.15	603.9
461.75	602.25	463.98	601.97	530.23	600.75	589.53	601.41	591.63	601.81
624.53	602.77	646.63	602.79	1116.19	602.857				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	30.79	.043	363.46	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
30.79	363.46	74.49	81.31	108.73	.1	.3

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 63547.57

INPUT
Description:
Station Elevation Data num= 441

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	599.76	1.54	600	3.05	600.69	5.92	602	5.95	602.02
5.97	602.03	7.72	602.96	9.67	604	10.68	604.55	10.89	604.66
10.94	604.69	11.03	604.74	12.11	605.32	13.36	606	14.86	606.81
15.62	607.22	17.1	608	23.3	608.26	25.67	608.36	29.87	608.54
31.77	608.62	34.23	608.73	36.32	608.81	38.23	608.9	44.52	609.16
47.3	609.28	53.58	609.56	54.1	609.59	60.73	609.88	61.03	609.89
61.19	609.9	61.79	609.93	62.23	609.94	63.2	609.99	63.54	610
70.22	610.28	70.78	610.3	74.94	610.48	75.68	610.51	83.21	610.83
84.28	610.88	85.86	610.95	88.3	611.06	91.96	611.23	92.48	611.25
93.47	611.29	95.04	611.37	98.52	611.52	101.09	611.63	101.61	611.65
101.94	611.67	102.57	611.69	103.11	611.71	103.22	611.72	105.63	611.81
105.97	611.83	107.84	611.89	107.9	611.9	109.21	611.94	110.8	612
111.08	612.05	112.25	612.25	112.57	612.32	114.21	612.63	114.84	612.76
116.95	613.21	117.39	613.3	117.86	613.4	118.58	613.55	120.33	613.96
120.36	613.97	120.51	614	121.95	614.44	122.15	614.5	122.48	614.6
123.55	614.92	125.39	615.49	125.86	615.63	126.08	615.7	127.06	616
128.75	616.5	129.01	616.58	129.61	616.75	129.94	616.85	130.36	616.97
131.33	617.26	132.33	617.55	133.67	617.94	133.88	618	134.81	618.26
135.45	618.43	138.21	619.19	138.76	619.35	138.87	619.37	139.47	619.54
139.54	619.56	141.12	620	141.18	620.02	141.21	620.03	142.93	620.53
143.2	620.62	143.97	620.84	147.32	621.88	147.54	621.94	147.72	622
148.11	622.11	148.23	622.14	148.41	622.19	150.45	622.75	151.78	623.16
152.62	623.4	152.64	623.41	152.78	623.44	152.91	623.48	154.65	624
232.77	623.98	233.62	623.95	234.82	623.9	235.56	623.88	235.79	623.87
236.34	623.84	239.43	623.72	239.66	623.71	240.02	623.7	240.07	623.69
242.94	623.58	243.34	623.56	243.79	623.54	244.4	623.52	244.8	623.5
245.01	623.49	246.56	623.43	247.02	623.41	247.83	623.38	248.28	623.36
249.38	623.31	249.85	623.29	250.1	623.28	250.28	623.27	251.28	623.23
252.3	623.18	252.63	623.17	252.99	623.15	254.07	623.11	254.24	623.1
254.49	623.09	255.63	623.04	256.47	623	256.9	622.98	257.46	622.96
257.92	622.93	258.97	622.89	260.26	622.83	260.74	622.81	261.28	622.78
261.9	622.76	262.48	622.73	263.11	622.7	264.52	622.63	265.42	622.59
266.16	622.56	266.85	622.53	267.14	622.52	268.64	622.44	269.07	622.42
269.87	622.38	270.24	622.37	271.05	622.33	271.84	622.29	271.99	622.28
272.77	622.24	273.09	622.23	274.93	622.13	275.77	622.08	276.62	622.04

```
  277.35     622  279.09  621.94     280  621.91  280.85  621.88  281.13  621.87
  283.69  621.78  285.17  621.73  286.34  621.69  287.05  621.67  288.29  621.63
  288.91  621.61   289.5  621.59  291.76  621.51  292.69  621.48  293.74  621.44
  294.59  621.42   295.6  621.39   296.7  621.35  297.47  621.33  298.48  621.29
  299.48  621.26  300.04  621.24  301.69  621.19  302.66  621.16  303.67  621.13
  303.96  621.12  305.28  621.08  306.04  621.05  307.98     621  308.89  620.97
  309.54  620.95  310.21  620.93  311.06  620.91  314.36  620.82  314.84   620.8
  315.51  620.78  316.11  620.77  318.58  620.69  319.34  620.67  328.64  620.35
  328.85  620.34  329.29  620.33  329.48  620.32  331.22  620.26  333.36  620.18
  333.51  620.17  333.89  620.16  334.16  620.15  335.86   620.1   336.3  620.08
  338.09  620.02  339.01     620  339.73  619.92  340.93   619.8  341.01  619.79
   341.1  619.77  342.66   619.6  342.82  619.58  343.98  619.46  344.85  619.37
  345.16  619.34  345.74  619.27  346.43  619.19  353.65     618  353.81  617.92
  353.89  617.87  354.28  617.66  355.18  617.19  355.47  617.02  357.27     616
  357.44   615.9  357.62   615.8  357.96  615.62  359.81  614.59  360.87     614
  362.23   613.4   362.3  613.37  365.34     612  365.37  611.99  365.67  611.87
  365.94  611.76  366.39  611.58  367.35  611.18  369.24  610.41   370.2     610
  370.35  609.93  370.52  609.86  371.77  609.33  372.03  609.22  372.34  609.09
  373.45  608.61  374.85     608  375.02  607.93  375.05  607.91  375.23  607.83
  377.27  606.92  377.41  606.85  378.72  606.27  378.97  606.16  379.32     606
  379.66  605.84   379.7  605.82  380.43  605.47  381.19  605.12  382.32  604.58
  383.61     604  384.08  603.77  384.21  603.71  384.37  603.64  384.64  603.51
  385.66  603.03  386.34  602.72  387.77  602.07  387.85  602.03  387.92     602
  389.61  601.24  390.79  600.72  390.81  600.71  391.51   600.4  391.65  600.34
  392.42     600  394.69  598.99  395.16  598.77  396.86     598  396.95  597.96
  397.01  597.93  398.96  597.07  401.38     596  401.61  595.91  401.69  595.88
  401.72  595.86  402.66  595.45  405.98     594  406.98  593.65  407.46  593.47
  408.04  593.26  408.07  593.25   408.1  593.24  409.69  592.67  411.58     592
  414.26  591.71   415.1  591.62  427.56     590     428     586     456   582.4
     481   581.6     516   582.9     541   584.4     568     585     569     586
     570   586.8     591   587.9     641   587.5  649.98  589.81  650.36     590
  664.46  591.77  666.33  591.98  666.49     592  670.69  592.56  670.87  592.58
  671.64  592.67  672.53  592.79   674.6  593.02  675.12  593.08  675.79  593.16
  677.29  593.35  682.88     594  683.49  594.11  684.17  594.25  685.67  594.55
  685.84  594.59  686.82  594.78  686.95  594.81  692.57     596   693.8  596.53
  696.52  597.71  696.93  597.88  697.19     598  721.21  598.78  731.38  599.11
  758.95     600  760.63  600.51   765.7     602  766.45  602.34  776.82     602
  797.63   600.3  798.73     600  1325.7   600.8 1327.04  600.81 1330.08  600.82
  1331.8  600.83 1332.91  600.84 1335.08  600.85 1336.34  600.86 1338.35  600.87
 1340.35  600.88 1342.33  600.89 1343.39   600.9  1345.2  600.91 1368.59  601.09
 1370.53   601.1 1371.27  601.11 1372.88  601.12 1375.46  601.14 1413.48  601.46
 1414.83  601.47 1419.29   601.5 1419.77  601.51 1420.92  601.52 1422.26  601.53
 1423.83  601.54 1432.67  601.61 1433.64  601.62 1434.57  601.63 1435.85  601.64
  1461.1  601.86 1464.14  601.89 1476.82     602 1533.85  600.62 1534.88     600
 1541.33  599.94 1546.39   599.9  1576.4  599.62 1579.16   599.6 1590.38  599.49
 1607.98  599.34 1631.52  599.13 1699.12  598.53 1705.11  598.47 1715.94  598.38
 1719.14  598.35 1725.52  598.29 1728.49  598.26 1739.45  598.17 1741.87  598.15
 1742.72  598.14 1745.69  598.12 1746.85  598.11 1750.88  598.07    1752  598.06
 1760.16     598 1812.74  598.78 1815.82  599.37 1817.14  599.61 1817.49  599.68
 1817.73  599.72 1818.17   599.8 1819.24     600 1820.99  600.28 1826.99  601.34
 1827.89   601.5 1828.68  601.63 1828.93  601.67 1829.06   601.7 1829.45  601.76
 1829.67   601.8 1830.81     602 1846.51  601.33 1852.92  600.93 1853.47  600.89
 1856.02   600.7 1856.69  600.65 1858.57  600.54 1861.74  600.28 1862.78   600.2
 1865.07  600.02

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  396.95    .043  696.52    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        396.95  696.52           273.56  251.95  228.94             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0  232.77  623.98       F
  766.45 1865.07  602.34       F
Left Levee      Station=  232.77      Elevation=  623.98

CROSS SECTION


RIVER: Des Plaines
```

REACH: 1 RS: 63295.62

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	619.07	28.755	613	66.44	592.62	76.765	588.21	97.825	584.63
104.325	584.09	113.825	584.42	128.325	583.18	145.325	584.5	162.325	583.82
188.825	584.34	193.825	583.98	194.325	584.14	207.325	584.49	227.325	584.24
238.325	584.58	247.825	584.02	268.325	584.5	290.825	583.37	322.565	588.26
326.1	589.61	328.74	592.31	348.135	597.94	358.9	599.04	363.195	599.09
419.65	599.57	468.85	599.95	517.295	599.632	569.575	599.77	630.87	600.07
683.585	599.34	733.32	598.8	750.02	598.99	873.59	600	882.83	601

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	28.755	.043	348.135	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28.755	348.135	533.48	533.67	533.99	.1	.3

BRIDGE

RIVER: Des Plaines
REACH: 1 RS: 63007.62

INPUT
Description: I-55 Proposed widened bridge per Stantec BCR
Distance from Upstream XS = 157.11
Deck/Roadway Width = 290.78
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 10

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-159.12	619.62		27.81	620.12		27.81	620.12	614.84
67.29	620.87	615.26	136.93	621.62	616.01	226.56	622.62	617.11
308.75	623.47	617.87	402.9	624.37	618.91	402.9	624.37	
1305.68	628.63							

Upstream Bridge Cross Section Data
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	619.07	28.755	613	66.44	592.62	76.765	588.21	97.825	584.63
104.325	584.09	113.825	584.42	128.325	583.18	145.325	584.5	162.325	583.82
188.825	584.34	193.825	583.98	194.325	584.14	207.325	584.49	227.325	584.24
238.325	584.58	247.825	584.02	268.325	584.5	290.825	583.37	322.565	588.26
326.1	589.61	328.74	592.31	348.135	597.94	358.9	599.04	363.195	599.09
419.65	599.57	468.85	599.95	517.295	599.632	569.575	599.77	630.87	600.07
683.585	599.34	733.32	598.8	750.02	598.99	873.59	600	882.83	601

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	28.755	.043	348.135	.075

Bank Sta: Left	Right	Coeff Contr.	Expan.
28.755	348.135	.1	.3

Downstream Deck/Roadway Coordinates
num= 10

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-172.34	626.23		39.61	629.83		39.61	629.83	624.81
79.09	630.43	625.09	148.73	630.93	625.66	238.36	631.68	626.47
320.55	632.43	627.08	414.7	632.83	627.86	414.7	632.83	
1161.32	629.41							

Downstream Bridge Cross Section Data
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	610.6	49.889	605.73	72.459	595.23	76.538	589.44	78.58	588.32
104.821	584.37	106.455	584.53	135.321	583.68	147.303	584.13	160.374	583.84

```
 206.124  584.51 213.749  584.19 221.374  584.47  234.99  584.08 260.043  584.37
 267.668  583.95 283.463  584.25 315.112  588.11 317.111  589.88 320.999  592.87
 328.608   599.2 334.299  600.18 365.061  600.26 726.363 598.048 843.557     600
  1247.4     601

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  49.889    .043 328.608    .075

Bank Sta: Left   Right    Coeff Contr.   Expan.
        49.889 328.608             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  4

Pier Data
Pier Station     Upstream=   67.29    Downstream=   79.09
Upstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.72    5.25  615.64
Downstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.75    5.25  625.09

Pier Data
Pier Station     Upstream=  136.93    Downstream=  148.73
Upstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.72    5.25  616.39
Downstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.75    5.25  625.66

Pier Data
Pier Station     Upstream=  226.56    Downstream=  238.36
Upstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.72    5.25  617.49
Downstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.75    5.25  626.47

Pier Data
Pier Station     Upstream=  308.75    Downstream=  320.55
Upstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.72    5.25  618.25
Downstream     num=       2
    Width   Elev    Width   Elev
    5.25  578.75    5.25  627.08

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum              Cd   =     1.2
       Yarnell               KVal =      .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
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       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Des Plaines
REACH: 1                  RS: 62761.95

INPUT
Description:
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   610.6  49.889  605.73  72.459  595.23  76.538  589.44   78.58  588.32
 104.821  584.37 106.455  584.53 135.321  583.68 147.303  584.13 160.374  583.84
 206.124  584.51 213.749  584.19 221.374  584.47  234.99  584.08 260.043  584.37
 267.668  583.95 283.463  584.25 315.112  588.11 317.111  589.88 320.999  592.87
 328.608   599.2 334.299  600.18 365.061  600.26 726.363 598.048 843.557     600
  1247.4     601

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  49.889    .043 328.608    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        49.889 328.608           249.41  237.05  270.54             .1       .3

CROSS SECTION


RIVER: Des Plaines
REACH: 1                  RS: 62524.89

INPUT
Description:
Station Elevation Data    num=     310
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  609.79    3.06     610   83.31  610.86  136.86     612  146.82   610.6
  147.48  610.46   147.9  610.37  149.38  610.06  149.65     610  149.92  609.94
  159.33     608  164.82  607.44  165.64  607.36  168.39  607.08  168.92  607.04
  169.76  606.96  171.02  606.87   172.5  606.72  174.54  606.58     175  606.54
  176.19  606.45  176.38  606.43  181.13     606  185.08  605.84  187.35  605.67
   188.5  605.57  189.16  605.52  191.35  605.33  191.67  605.31  192.12  605.26
  192.77  605.22  193.76  605.15  195.74  604.95   198.1  604.81  199.43  604.72
  201.23  604.61  203.73  604.46  204.17  604.42  205.92  604.32  207.32  604.24
  211.41     604  213.59  603.87  216.58  603.67  221.08  603.18  224.78  602.86
  225.55   602.8  228.58  602.39  229.31  602.32  229.39  602.31  231.49     602
  234.31  600.89  236.24  600.13  236.44  600.05  236.56     600   238.9  599.09
  239.57  598.83  241.73     598  242.54  597.68  243.63  597.26  245.37  596.58
  246.89     596  249.19  595.15   249.5  595.03   250.4   594.7   252.3     594
   253.9  593.49  257.55  592.22  257.97  592.08  257.99  592.07  258.02  592.06
  258.09  592.04  258.11  592.03  258.21     592  258.56  591.87  263.38     590
  264.12  589.63  266.32  588.52  267.12  588.12  267.33     588  267.33   586.4
     268   585.5     307   584.3     357     584     397   584.4     451   585.5
     452   586.4  483.48  588.31  484.28  588.54  487.01  589.35  489.17     590
  494.88  591.24  496.85  591.66  497.47   591.8  498.39     592  499.73  592.44
  504.51     594  508.13  595.34   509.9     596  515.38     598   516.5  598.41
  520.84     600  634.91     600  635.89  600.29  636.23  600.38   637.3  600.68
  637.59  600.76  638.74  601.09  639.61  601.31  639.74  601.35   640.6  601.57
  640.64  601.58  640.72   601.6  641.24  601.73  641.51   601.8  642.36     602
  643.27  602.24  643.35  602.26  643.62  602.33  645.12  602.72  645.67  602.86
  645.99  602.94  646.41  603.05  647.03  603.21  647.58  603.35  648.85  603.68
     649  603.72  649.68  603.89  649.75  603.91   650.1     604  650.96  604.24
  651.13  604.29  652.21  604.59  652.68  604.72  653.21  604.87  654.08  605.11
  655.58  605.53  655.86  605.61  656.05  605.66  656.17   605.7  656.65  605.83
  656.73  605.86  657.24     606  658.12  606.26  658.42  606.34  658.93  606.49
  659.49  606.65  660.57  606.96  661.26  607.16  661.68  607.28  662.42  607.49
  662.73  607.58  664.25     608  664.29  608.01  664.97  608.19  665.34  608.28
  665.59  608.35  667.06  608.73  667.12  608.74  668.14     609  669.16  609.26
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  669.22  609.27  669.26  609.28   669.5  609.34   671.1  609.74  671.31  609.79
  671.38  609.81  672.13     610   672.9  610.19     673  610.21  673.55  610.35
  673.91  610.44  674.69  610.63  674.88  610.68  675.71  610.88  676.07  610.98
   676.5  611.08  677.42  611.31  677.87  611.43  678.63  611.62  680.01  611.98
   680.1     612  682.03  612.52  682.18  612.56  682.35  612.61  682.45  612.64
   683.2  612.85  683.57  612.96  683.66  612.98  684.31  613.17  684.45  613.21
  686.26  613.76  686.35  613.78  686.53  613.84  687.05     614   687.8  614.24
  688.08  614.33  689.18  614.68  689.54  614.79  689.79  614.87  691.08  615.28
   692.1  615.59  692.14   615.6  692.63  615.75  692.82  615.81  692.98  615.86
  693.27  615.95  693.45     616  695.18  616.53  695.61  616.66  696.33  616.87
  696.78     617  697.34  617.17  698.44  617.48  699.17  617.69  699.47  617.77
  699.88  617.89  699.91   617.9  700.29     618  701.67  618.37  702.15   618.5
  702.24  618.53  702.33  618.55  703.84  618.95   704.9  619.23  705.48  619.38
  705.81  619.47  706.41  619.63  706.55  619.67  707.79     620  708.16  620.09
  708.26  620.11  709.28  620.35  709.37  620.37  709.52  620.41  710.53  620.65
  711.19   620.8  712.29  621.05  712.94   621.2  713.13  621.25  713.25  621.27
  714.18  621.49  714.64  621.59  714.65   621.6  716.28  621.97  716.41     622
  716.85   622.1  717.18  622.17  717.35  622.21  718.98  622.56  719.28  622.63
  719.34  622.65  719.87  622.77  721.14  623.06  722.57  623.41  723.04  623.52
  723.16  623.55  723.23  623.56  723.57  623.65  723.69  623.67  725.04     624
  725.17  624.03  725.51   624.1  725.95   624.2  726.12  624.23  727.63  624.56
  728.42  624.74  729.25  624.91  729.27  624.92  729.34  624.93  729.87  625.04
  731.25  625.35  731.73  625.45  731.96  625.49  733.31  625.79  733.38  625.81
   734.1  625.96  734.12  625.97  734.26     626  735.18   626.2  736.29  626.44
  736.78  626.55  737.45   626.7  737.61  626.73  737.87  626.79  738.73  626.98
  739.77  627.22  740.56  627.39  741.42  627.59  741.46   627.6  741.61  627.63
  742.69  627.88  742.77   627.9   743.2     628  745.06  628.42  745.53  628.52
  746.82  628.81  747.09  628.87  747.42  628.94  748.35  629.15  749.11  629.31
   749.6  629.42  749.75  629.45  750.38  629.59  750.53  629.62  751.34  629.79
  751.49  629.82  751.57  629.84  751.65  629.86  752.35     630  929.26     630

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  231.49    .043  494.88    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        231.49  494.88           161.35  153.11  122.12             .3       .5
Left Levee      Station=  136.31      Elevation=  611.99

CROSS SECTION


RIVER: Des Plaines
REACH: 1                  RS: 62371.78

INPUT
Description:
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  609.08   53.18  610.77  149.85  611.19  160.84  610.44  203.86  601.72
  242.24  599.83  267.02   592.5  284.48  592.64  293.94  588.19  317.32  584.27
  349.32  583.58  385.32   584.1  394.32  583.78  405.32  583.48  429.32  583.57
  447.32  583.94  467.32  584.18  485.94  588.31  497.38  591.36  514.91  591.44
  538.03  600.73  541.91  600.83  544.34  600.61  572.49  600.48  626.83  598.41
   653.6  597.52

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .075  203.86    .043  497.38    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        203.86  497.38           306.24  310.11  335.68             .1       .3

CROSS SECTION


RIVER: Des Plaines
REACH: 1                  RS: 62061.6*

INPUT
Description:
```

Station Elevation Data num= 186

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.1	608.49	4.77	608.66	74.78	609.3	121.49	610.2	130.18	609.02
130.76	608.9	131.12	608.83	132.41	608.57	132.89	608.47	141.09	606.84
149	606.06	150.19	605.96	151.29	605.89	152.58	605.76	154.36	605.64
155.8	605.53	158.65	605.28	160.11	605.13	163.56	604.96	165.54	604.79
166.54	604.69	169.03	604.46	169.7	604.39	171.13	604.28	172.86	604.09
174.92	603.95	176.08	603.86	179.83	603.59	181.74	603.45	182.96	603.37
188.43	602.99	191.04	602.79	194.43	602.39	194.96	602.33	198.19	602.02
198.86	601.96	201.5	601.59	202.14	601.52	204.04	601.23	206.85	600.17
208.77	599.45	208.88	599.4	208.96	599.37	209.08	599.32	209.63	599.12
211.41	598.46	212.08	598.21	214.22	597.42	215.03	597.11	216.01	596.75
216.11	596.71	217.84	596.07	218.56	595.81	219.35	595.52	220.46	595.13
221.16	594.88	221.64	594.71	221.95	594.59	222.84	594.28	223.43	594.07
224.73	593.6	226.32	593.1	229.12	592.14	229.8	591.91	229.84	591.9
229.95	591.86	230.09	591.81	230.37	591.72	230.39	591.71	230.42	591.7
230.49	591.68	230.51	591.67	230.61	591.64	230.96	591.52	235.75	589.71
236.49	589.37	236.62	589.3	237.19	588.79	237.19	588.64	238.67	588.01
239.47	587.67	239.68	587.57	239.68	586.24	240.34	585.48	277.35	584.35
279.12	584.3	328.83	584	349.48	584.21	377.36	584.58	377.87	584.73
378.06	584.74	391.45	585.26	394.27	585.56	396.28	585.77	397.97	585.94
400.3	586.17	402	586.33	425.98	586.63	427.92	586.61	442.55	586.56
444.52	586.64	445.75	587.42	452.11	587.86	452.91	587.94	453.45	587.98
453.49	587.98	454.05	588.06	457.25	588.47	459.2	588.68	459.81	588.75
460.21	588.79	462.44	589.02	484.49	590.08	485.48	590.28	488.84	590.97
491.49	591.53	498.52	592.61	500.29	592.85	500.99	592.95	501.4	593.04
501.98	593.16	502.17	593.21	503.06	593.4	503.41	593.48	503.94	593.59
504.68	593.8	505.45	594.05	505.87	594.19	506.06	594.26	506.43	594.39
506.98	594.59	507.29	594.7	507.52	594.78	508.1	595	508.64	595.2
509.03	595.34	509.21	595.41	510.07	595.73	510.59	595.92	515.41	596.74
515.89	596.83	532.17	600	1000	600	1023.83	624.67	1033.64	624.88
1037.32	625	1050.62	625.33	1149.06	625.34	1151.19	625.4	1154.77	625.49
1192.93	625.88	1194.75	626	1195.48	626.1	1196.33	626.2	1196.84	626.27
1197.26	626.33	1198.43	626.6	1198.75	626.67	1199.47	626.82	1199.98	626.92
1200.36	627	1201.66	627.24	1202.18	627.33	1203.12	627.52	1203.9	627.67
1205.31	627.97	1205.78	628.07	1206.37	628.2	1207	628.33	1207.84	628.52
1208.54	628.67	1210.16	629	1211.06	629.17	1211.96	629.33	1213.22	629.5
1214.55	629.67	1216.82	629.73	1219.2	629.79	1222.31	629.85	1224.8	629.9
1230.71	629.98	1233.8	630.01	1239.01	630.05	1242.18	630.09	1251.49	630
1260.39	630								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2.1	.075	204.04	.043	498.52	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
204.04	498.52	239.73	204.34	186.6	.3	.5

Left Levee Station= 121.59 Elevation= 610.19

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 61857.26

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	609.22	128.29	611.88	179.59	602.68	185.34	602.43	236.64	592.46
251.8	597.89	262.17	589.54	266.16	588.07	294.24	584.45	295.24	584.4
303.24	584.42	339.24	583.31	360.24	584.06	371.24	584.03	413.24	583.9
447.24	584.41	462.07	588.17	469.78	590.96	476.55	592.31	490.27	591.85
507.53	598.42	518.32	601.47	521.55	601.92	524.65	601.51	556.9	601.38
559.79	601.63	577.79	603.54	584.25	603.427	601.69	601.016		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	185.34	.043	476.55	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.

```
        185.34  476.55           227.86  258.88   271.2             .1       .3

CROSS SECTION


RIVER: Des Plaines
REACH: 1                 RS: 61598.4*

INPUT
Description:
Station Elevation Data    num=     238
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4.21  607.19    6.49  607.33   66.25  607.74  106.13  608.39  113.54  607.44
  114.03  607.34  115.45  607.07  115.85  606.99  122.86  605.68  126.95   605.3
  127.56  605.24  129.61  605.05  131.56   604.9  132.67   604.8  134.19   604.7
  135.41  604.61  137.85  604.41  139.09  604.27  142.04  604.07  143.73  603.91
  145.07  603.77   146.7  603.59  147.28  603.53  147.93  603.47  149.97  603.24
  152.07  603.06  152.72     603  155.92  602.73  163.27  602.11  165.49  601.91
  168.39  601.54  168.84  601.48  172.17  601.12  174.43  600.78  174.97  600.72
   176.6  600.46  179.38  599.45  181.29  598.76  181.41  598.72  181.49  598.69
  181.61  598.65  182.16  598.45  183.92  597.82  184.58  597.59  186.72  596.83
  187.52  596.54  188.49   596.2   188.6  596.16  190.32  595.55  191.03  595.31
  191.82  595.03  192.92  594.66  193.61  594.42  194.09  594.26   194.4  594.15
  195.29  593.85  195.87  593.65  197.17   593.2  198.75  592.71  201.53  591.78
   202.2  591.55  202.24  591.53  202.36  591.49   202.5  591.45  202.77  591.36
  202.79  591.35  202.82  591.34  202.89  591.32  202.91  591.31  203.01  591.28
  203.36  591.16  208.12  589.42  208.85   589.1  208.99  589.04  209.55  588.32
  209.55  588.02  211.03   587.5  211.82  587.22  212.03  587.14  212.03  586.08
  212.69  585.47  249.48  584.34  251.24   584.3  300.67     584  325.18  584.25
  358.28  584.76   358.9  585.07  359.12  585.08  375.02   585.9  378.37  586.45
  380.76  586.83  382.77  587.15  385.52  587.57  387.55  587.86  416.02  588.06
  418.33  587.99  435.69  587.64  438.04  587.78   439.5  588.45  447.05  589.01
     448  589.12  448.65  589.18  448.69  589.19  449.36  589.31  453.15  589.98
  455.47  590.31   456.2  590.41  456.67  590.47  459.32  590.82   485.5  591.84
  486.67  592.01  490.66   592.6  493.82  593.07  502.16  593.99  503.86  594.16
  505.69  594.36  506.27  594.49  507.38  594.73  508.38  594.94  508.66     595
  509.15  595.11   509.9  595.27  510.97  595.59  511.58   595.8  512.07  595.96
  512.67  596.15  512.94  596.25  513.47  596.45  514.26  596.74  515.03  597.02
  516.63  597.65  517.19  597.88  517.44  597.97  519.42  598.74  526.31  599.47
     527  599.56     530     600  674.34     600   674.8  599.94  677.27  599.08
  678.29  598.72  679.84  598.33  680.79  598.09  681.04  598.02   682.2  597.71
  682.64  597.61  682.99  597.53  683.54  597.41  685.15  597.05  685.75  596.91
  686.64  596.71  687.45  596.54  688.02  596.41  689.58  596.09  691.42   595.7
  691.71  595.64   692.2  595.49  693.99  594.95  694.55  594.79  695.64  594.35
  696.67     594  699.93  593.34  702.12  593.54   702.5  593.62  703.53  593.83
  704.42  594.02  710.34  594.24  712.67  594.34  722.49  594.72   753.8  594.68
  756.51  594.76  760.35  594.89  764.23  595.02   768.3  595.17  770.28  595.24
  774.27  595.41  778.38  595.59  781.76  595.74  783.12   595.8  787.01     596
  796.66   596.5  798.97  596.61  802.68  596.81  807.44  597.05  808.45  597.11
  809.98  597.19  815.34  597.46  816.67  597.53  817.83   597.6  824.47  597.93
  825.71     598  830.32  598.26  831.72  598.33  832.72  598.39  835.91  598.58
  845.89  599.17  852.29  599.59  853.34  599.66   855.8  599.85  856.65  599.91
  859.33     600    1300     600 1431.87  620.67 1433.48  620.73 1434.82  620.78
 1436.88  620.84  1440.5  620.98 1495.06  621.75 1497.67     622 1499.92  622.41
 1500.65  622.55 1501.25  622.67 1502.92  623.19 1503.38  623.33 1505.15  623.84
 1505.69     624 1507.54  624.47 1510.75  625.33 1512.77  625.93 1512.99     626
 1513.44  626.14 1515.18  626.67 1517.38  627.33  1519.7     628 1522.27  628.67
 1524.19  629.02 1525.98  629.33 1529.22  629.46 1535.23  629.65 1538.68  629.76
 1544.56  629.87 1549.09  629.96 1552.68  630.02 1560.95  630.11 1564.66  630.16
 1568.39  630.22  1578.8     630 1591.53     630

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    4.21    .075   176.6    .043  502.16    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         176.6  502.16           467.59  463.22   457.8             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
     530 1591.53     600       F
Left Levee      Station=  106.13      Elevation=     610
```

Right Levee Station= 530 Elevation= 600

CROSS SECTION

RIVER: Des Plaines
REACH: 1 RS: 61135.2*

INPUT
Description:
Station Elevation Data num= 184

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
6.31	605.9	8.2	605.99	57.72	606.18	90.76	606.59	96.9	605.86
97.31	605.79	98.82	605.52	104.62	604.52	108.01	604.22	110.21	604.03
111.06	603.97	112.75	603.84	114.01	603.76	115.03	603.69	117.04	603.54
118.08	603.4	120.51	603.19	121.91	603.03	122.62	602.94	124.38	602.72
124.86	602.66	125.4	602.6	127.09	602.38	128.55	602.23	132.02	601.86
138.1	601.23	139.95	601.03	142.35	600.68	143.4	600.54	145.01	600.34
145.48	600.29	147.35	599.98	147.8	599.92	149.15	599.68	151.92	598.73
153.82	598.08	153.93	598.04	154.01	598.01	154.13	597.97	154.68	597.79
156.43	597.19	157.09	596.97	159.21	596.25	160.01	595.98	160.98	595.65
161.08	595.62	162.79	595.04	163.5	594.81	164.28	594.55	165.37	594.2
166.07	593.97	166.55	593.82	166.85	593.71	167.73	593.43	168.32	593.24
169.6	592.81	171.17	592.31	173.93	591.41	174.61	591.18	174.65	591.17
174.76	591.13	174.9	591.09	175.17	591	175.19	590.99	175.22	590.98
175.29	590.96	175.31	590.95	175.41	590.92	175.75	590.81	180.49	589.13
181.22	588.84	181.35	588.78	181.91	587.84	181.91	587.39	183.38	586.99
184.17	586.78	184.37	586.71	184.37	585.91	185.03	585.45	221.61	584.33
223.36	584.29	272.5	584	300.89	584.28	339.21	584.95	339.92	585.4
340.18	585.41	358.6	586.54	362.47	587.33	365.24	587.9	367.56	588.36
370.75	588.96	373.1	589.4	406.06	589.49	408.74	589.37	428.84	588.73
431.56	588.92	433.25	589.47	441.99	590.16	443.09	590.3	443.84	590.38
443.89	590.39	444.66	590.55	449.06	591.48	451.75	591.93	452.58	592.07
453.13	592.15	456.2	592.61	486.52	593.61	487.87	593.75	492.49	594.22
496.14	594.6	505.8	595.36	508.01	595.55	510.39	595.77	511.15	595.93
512.59	596.25	513.9	596.53	514.25	596.6	514.89	596.74	515.23	596.81
515.87	596.95	517.25	597.39	518.06	597.66	519.47	598.11	519.82	598.25
521.54	598.9	522.11	599.11	522.53	599.27	524.62	600	738.46	600
739.96	599.78	740.54	599.65	741	599.56	741.71	599.41	743.8	598.95
745.74	598.53	751.96	597.3	752.33	597.23	752.97	597.04	756.03	596.11
757.45	595.52	758.78	595	759.37	594.86	760.07	594.7	761.35	594.39
763.02	594.01	765.87	594.3	767.71	594.74	768.86	595.01	775.18	595.29
776.56	595.34	779.6	595.48	781.09	595.54	790.47	595.95	792.36	596.04
833.09	595.93	841.61	596.07	851.95	596.27	860.75	596.45	869.46	596.65
878.5	596.9	887.6	597.15	893.76	597.33	896.67	597.4	904.17	597.62
913.14	597.87	926.62	598.24	932.62	598.44	935.74	598.54	941.12	598.72
944.03	598.81	961.18	599.44	965.75	599.64	971.29	599.87	973.68	599.98
974.48	600	1850	600	1873.2	630.04	1882.89	630.17	1885.95	630.21
1889.95	630.28	1892.97	630.33	1906.11	630	1922.66	630		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
6.31	.075	149.15	.043	505.8	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
149.15	505.8	467.59	463.22	457.8	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
524.62	1922.66	600	F

Left Levee Station= 90.76 Elevation= 610
Right Levee Station= 524.62 Elevation= 600

SUMMARY OF MANNING'S N VALUES

River:Des Plaines

Reach	River Sta.	n1	n2	n3
1	257312.2	.19	.045	.19
1	72003.7*	.075	.043	.075
1	71584.3*	.075	.043	.075
1	71164.92	.075	.043	.075
1	71064.93	.075	.043	.075
1	69898.32	.075	.043	.075
1	69647.47	.075	.043	.075
1	69504.5	.075	.043	.075
1	69302.93	.075	.043	.075
1	67372.14	.075	.043	.075
1	66263.53	.075	.043	.075
1	64903.10	.075	.043	.075
1	64250.75	.075	.043	.075
1	64116.64	.075	.043	.075
1	64090.85	.075	.043	.075
1	63887.62	.075	.043	.075
1	63655.12	.075	.043	.075
1	63628.88	.075	.043	.075
1	63547.57	.075	.043	.075
1	63295.62	.075	.043	.075
1	63007.62	Bridge		
1	62761.95	.075	.043	.075
1	62524.89	.075	.043	.075
1	62371.78	.075	.043	.075
1	62061.6*	.075	.043	.075
1	61857.26	.075	.043	.075
1	61598.4*	.075	.043	.075
1	61135.2*	.075	.043	.075
1	60672.0*	.075	.043	.075
1	60208.8*	.075	.043	.075
1	59745.58	.075	.043	.075
1	59256.1*	.075	.043	.075
1	58766.7*	.075	.043	.075
1	58277.3*	.075	.043	.075
1	57787.9*	.075	.043	.075
1	57298.5*	.075	.043	.075
1	56809.1*	.075	.043	.075
1	56319.7*	.075	.043	.075
1	55830.2*	.075	.043	.075
1	55340.8*	.075	.043	.075

SUMMARY OF REACH LENGTHS

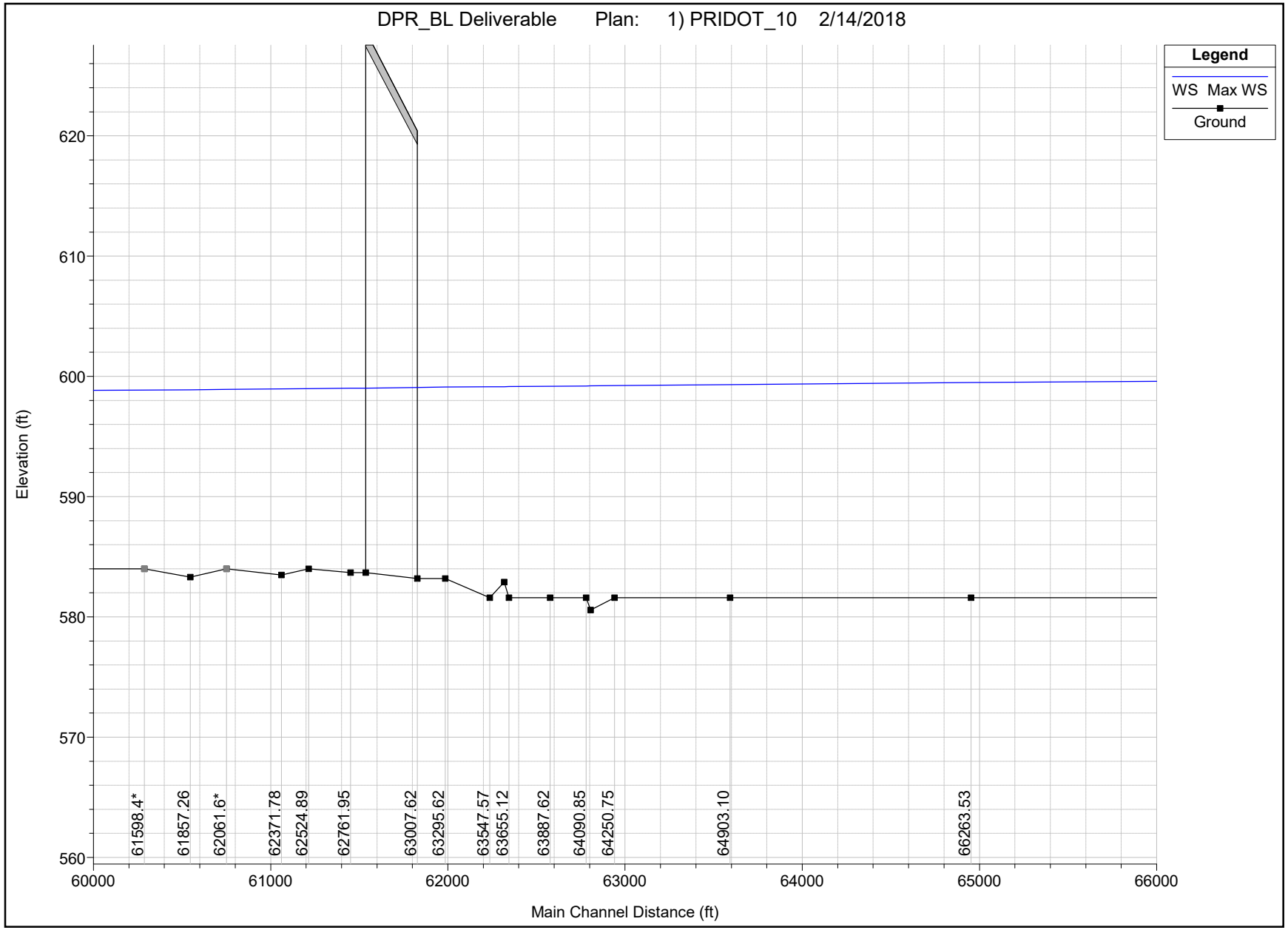
River: Des Plaines

Reach	River Sta.	Left	Channel	Right
1	257312.2	78.13	75.54	71.49
1	72003.7*	426.49	419.42	399.98
1	71584.3*	426.49	419.42	399.98
1	71164.92	100	100	100
1	71064.93	1178.08	1166.62	1209.65
1	69898.32	246.3	250.85	263.97
1	69647.47	134.48	142.97	159.89
1	69504.5	196.88	201.57	210.73
1	69302.93	1857.62	1930.79	2022.08
1	67372.14	1174.18	1108.61	1019.91
1	66263.53	1368.75	1360.44	1355.65
1	64903.10	641.4	652.34	665.7
1	64250.75	140.59	134.11	112.35
1	64116.64	26.19	25.79	41.05
1	64090.85	213	203.23	194.62
1	63887.62	164.06	232.5	238.77
1	63655.12	50.04	26.24	25.23
1	63628.88	74.49	81.31	108.73
1	63547.57	273.56	251.95	228.94
1	63295.62	533.48	533.67	533.99
1	63007.62	Bridge		
1	62761.95	249.41	237.05	270.54
1	62524.89	161.35	153.11	122.12
1	62371.78	306.24	310.11	335.68
1	62061.6*	239.73	204.34	186.6
1	61857.26	227.86	258.88	271.2
1	61598.4*	467.59	463.22	457.8
1	61135.2*	467.59	463.22	457.8
1	60672.0*	467.59	463.22	457.8
1	60208.8*	467.59	463.22	457.8
1	59745.58	490.27	489.41	489.27
1	59256.1*	490.27	489.41	489.27
1	58766.7*	490.27	489.41	489.27
1	58277.3*	490.27	489.41	489.27
1	57787.9*	490.27	489.41	489.27
1	57298.5*	490.27	489.41	489.27
1	56809.1*	490.27	489.41	489.27
1	56319.7*	490.27	489.41	489.27
1	55830.2*	490.27	489.41	489.27
1	55340.8*	490.27	489.41	489.27

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Des Plaines

Reach	River Sta.	Contr.	Expan.
1	257312.2	.1	.3
1	72003.7*	.1	.3
1	71584.3*	.1	.3
1	71164.92	.1	.3
1	71064.93	.1	.3
1	69898.32	.1	.3
1	69647.47	.1	.3
1	69504.5	.1	.3
1	69302.93	.1	.3
1	67372.14	.1	.3
1	66263.53	.1	.3
1	64903.10	.1	.3
1	64250.75	.1	.3
1	64116.64	.1	.3
1	64090.85	.1	.3
1	63887.62	.1	.3
1	63655.12	.1	.3
1	63628.88	.1	.3
1	63547.57	.1	.3
1	63295.62	.1	.3
1	63007.62 Bridge		
1	62761.95	.1	.3
1	62524.89	.3	.5
1	62371.78	.1	.3
1	62061.6*	.3	.5
1	61857.26	.1	.3
1	61598.4*	.3	.5
1	61135.2*	.3	.5
1	60672.0*	.1	.3
1	60208.8*	.1	.3
1	59745.58	.1	.3
1	59256.1*	.1	.3
1	58766.7*	.1	.3
1	58277.3*	.1	.3
1	57787.9*	.1	.3
1	57298.5*	.1	.3
1	56809.1*	.1	.3
1	56319.7*	.1	.3
1	55830.2*	.1	.3
1	55340.8*	.1	.3

10-Year Proposed


DPR_BL Deliverable Plan: 1) PRIDOT_10 2/14/2018
Legend
WS Max WS
Ground
Elevation (ft)
620
610
600
590
580
570
560
61598.4*
61857.26
62061.6*
62371.78
62524.89
62761.95
63007.62
63295.62
63547.57
63655.12
63887.62
64090.85
64250.75
64903.10
66263.53
60000
61000
62000
63000
64000
65000
66000
Main Channel Distance (ft)

HEC-RAS Plan: PRIDOT_10 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Des Plaines	1	64250.75	Max WS	7072.88	581.60	599.23		599.29	0.000142	2.06	3425.62	301.36	0.11
Des Plaines	1	64116.64	Max WS	7073.16	580.58	599.21		599.27	0.000140	2.04	3460.01	304.88	0.11
Des Plaines	1	64090.85	Max WS	7073.23	581.60	599.20		599.27	0.000156	2.08	3394.28	316.75	0.11
Des Plaines	1	63887.62	Max WS	7074.77	581.60	599.18		599.24	0.000137	1.98	3576.32	325.97	0.11
Des Plaines	1	63655.12	Max WS	7074.12	581.60	599.15		599.21	0.000130	1.98	3593.73	346.63	0.10
Des Plaines	1	63628.88	Max WS	7074.20	582.89	599.14		599.21	0.000135	2.02	3503.16	306.74	0.10
Des Plaines	1	63547.57	Max WS	7074.40	581.60	599.14		599.20	0.000117	1.94	3658.18	521.69	0.10
Des Plaines	1	63295.62	Max WS	7074.95	583.18	599.12	587.43	599.17	0.000094	1.84	3859.69	373.17	0.09
Des Plaines	1	63007.62		Bridge									
Des Plaines	1	62761.95	Max WS	7072.52	583.68	599.01		599.07	0.000110	2.00	3630.87	478.87	0.10
Des Plaines	1	62524.89	Max WS	7074.38	584.00	598.97		599.04	0.000131	2.14	3373.75	278.83	0.11
Des Plaines	1	62371.78	Max WS	7073.39	583.48	598.95		599.02	0.000139	2.18	3403.51	329.35	0.11
Des Plaines	1	62061.6*	Max WS	7074.09	584.00	598.92		598.98	0.000121	2.00	3609.47	316.46	0.10

HEC-RAS Plan: PRIDOT_10 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
				(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Des Plaines	1	64250.75	Max WS	599.29	599.23	0.07	0.02			7072.88		301.36
Des Plaines	1	64116.64	Max WS	599.27	599.21	0.06	0.00			7073.16		304.88
Des Plaines	1	64090.85	Max WS	599.27	599.20	0.07	0.03			7073.23		316.75
Des Plaines	1	63887.62	Max WS	599.24	599.18	0.06	0.03			7074.77		325.97
Des Plaines	1	63655.12	Max WS	599.21	599.15	0.06	0.00		0.11	7071.21	2.81	346.63
Des Plaines	1	63628.88	Max WS	599.21	599.14	0.06	0.01			7074.16	0.05	306.74
Des Plaines	1	63547.57	Max WS	599.20	599.14	0.06	0.03		0.22	7071.09	3.10	521.69
Des Plaines	1	63295.62	Max WS	599.17	599.12	0.05	0.02	0.00		7073.73	1.22	373.17
Des Plaines	1	63007.62		Bridge								
Des Plaines	1	62761.95	Max WS	599.07	599.01	0.06	0.03			7059.32	13.20	478.87
Des Plaines	1	62524.89	Max WS	599.04	598.97	0.07	0.02			7020.23	54.16	278.83
Des Plaines	1	62371.78	Max WS	599.02	598.95	0.07	0.04			6922.67	150.72	329.35
Des Plaines	1	62061.6*	Max WS	598.98	598.92	0.06	0.03			7036.35	37.73	316.46

Errors Warnings and Notes for Plan : PRIDOT_10

Location:	River: Des Plaines Reach: 1 RS: 252501.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252301.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252101.0 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252035.7 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Downstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 251791.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247996.4 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247888.5 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247718.6 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247621.9 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245275.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245145.2 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.
Location:	River: Des Plaines Reach: 1 RS: 245140.2 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.
Location:	River: Des Plaines Reach: 1 RS: 245135.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 244984.7 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 244813.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 244128.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 242992.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.

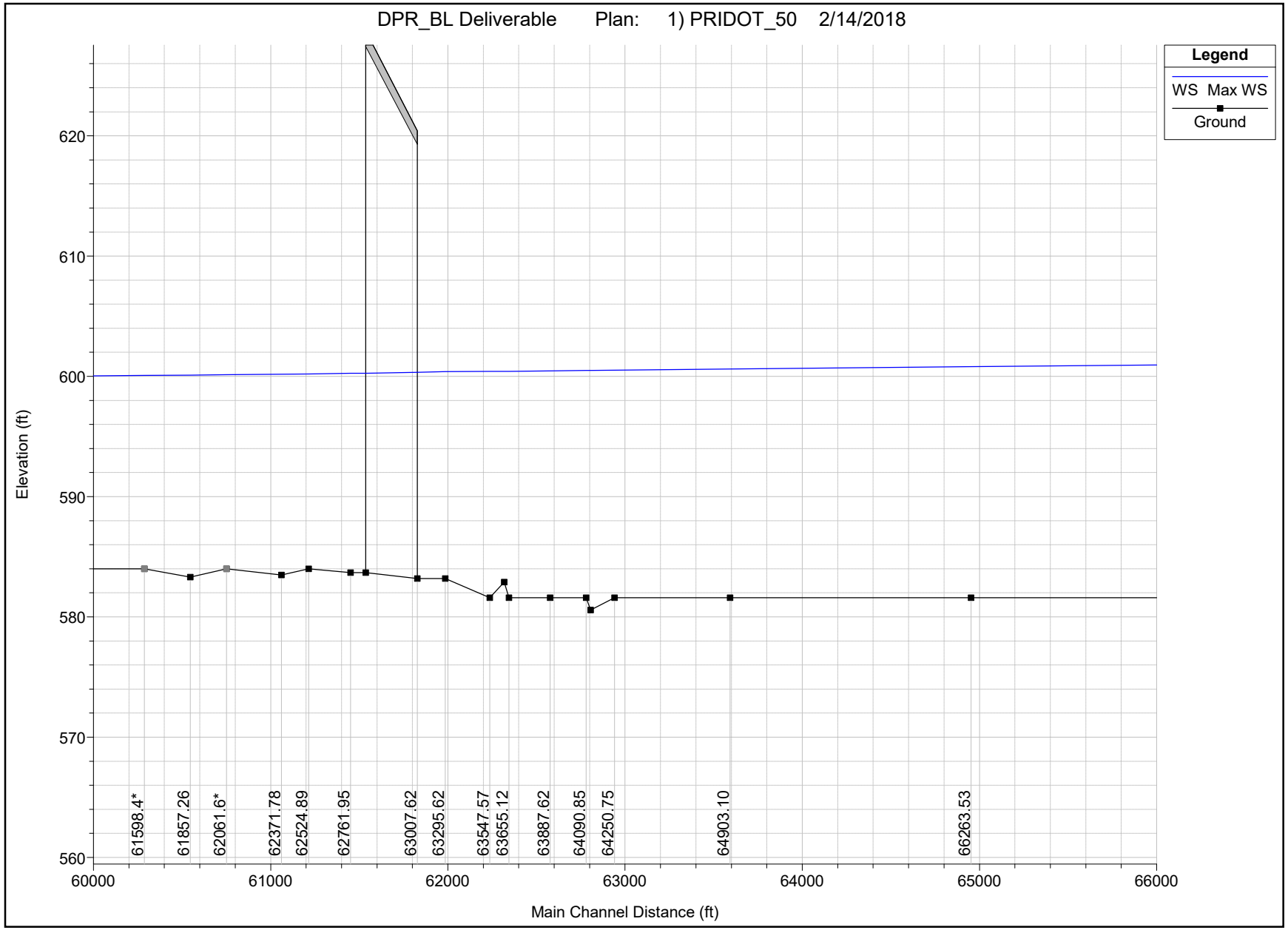
Errors Warnings and Notes for Plan : PRIDOT_10 (Continued)

Location:	River: Des Plaines Reach: 1 RS: 82283.96 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 82234.17 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82220 Profile: Max WS
Note:	Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The
	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 82220 Profile: Max WS Upstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Location:	River: Des Plaines Reach: 1 RS: 82220 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82141.78 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS
Note:	Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The
	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 77614.32 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 76067.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 75739.06 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 69647.47 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63547.57 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63295.62 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63007.62 Profile: Max WS
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream
	energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was
	the only one selected, the program will default to an energy based solution.
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the

Errors Warnings and Notes for Plan : PRIDOT_10 (Continued)

	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 62761.95 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 62371.78 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 51048.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50577.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50107.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 38488.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 35842.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 35367.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 34893.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 34418.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33943.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33469.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32994.46 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32535.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32075.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 31616.2* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 31156.8* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 30697.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 30238.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29778.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29319.23 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 29047.90 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28549.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28051.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 27553.3* Profile: Max WS

50-Year Proposed


DPR_BL Deliverable Plan: 1) PRIDOT_50 2/14/2018
Legend
WS Max WS
Ground
Elevation (ft)
620
610
600
590
580
570
560
61598.4*
61857.26
62061.6*
62371.78
62524.89
62761.95
63007.62
63295.62
63547.57
63655.12
63887.62
64090.85
64250.75
64903.10
66263.53
60000
61000
62000
63000
64000
65000
66000
Main Channel Distance (ft)

HEC-RAS Plan: PRIDOT_50 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Des Plaines	1	64250.75	Max WS	8947.18	581.60	600.51		600.60	0.000166	2.34	3832.32	343.44	0.12
Des Plaines	1	64116.64	Max WS	8947.40	580.58	600.49		600.58	0.000162	2.32	3864.75	329.68	0.12
Des Plaines	1	64090.85	Max WS	8947.46	581.60	600.49		600.57	0.000182	2.34	3825.41	361.94	0.12
Des Plaines	1	63887.62	Max WS	8948.48	581.60	600.46		600.54	0.000163	2.23	4014.79	499.63	0.12
Des Plaines	1	63655.12	Max WS	8947.34	581.60	600.42		600.50	0.000145	2.25	4058.17	531.42	0.11
Des Plaines	1	63628.88	Max WS	8948.23	582.89	600.42		600.50	0.000154	2.30	3914.39	359.78	0.11
Des Plaines	1	63547.57	Max WS	8949.01	581.60	600.41		600.49	0.000134	2.22	4112.57	933.08	0.11
Des Plaines	1	63295.62	Max WS	8948.82	583.18	600.39	587.97	600.46	0.000110	2.10	4665.41	825.09	0.10
Des Plaines	1	63007.62		Bridge									
Des Plaines	1	62761.95	Max WS	8948.01	583.68	600.26		600.34	0.000130	2.29	4417.91	882.26	0.11
Des Plaines	1	62524.89	Max WS	8948.45	584.00	600.21		600.30	0.000158	2.48	3745.28	399.56	0.12
Des Plaines	1	62371.78	Max WS	8947.82	583.48	600.18		600.28	0.000169	2.50	3834.65	374.89	0.12
Des Plaines	1	62061.6*	Max WS	8949.23	584.00	600.15		600.23	0.000144	2.30	4071.26	793.23	0.11

HEC-RAS Plan: PRIDOT_50 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
				(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Des Plaines	1	64250.75	Max WS	600.60	600.51	0.08	0.02		0.01	8946.22	0.95	343.44
Des Plaines	1	64116.64	Max WS	600.58	600.49	0.08	0.00			8946.56	0.84	329.68
Des Plaines	1	64090.85	Max WS	600.57	600.49	0.09	0.03		0.03	8946.40	1.03	361.94
Des Plaines	1	63887.62	Max WS	600.54	600.46	0.08	0.04		0.05	8948.28	0.15	499.63
Des Plaines	1	63655.12	Max WS	600.50	600.42	0.08	0.00		1.51	8922.73	23.10	531.42
Des Plaines	1	63628.88	Max WS	600.50	600.42	0.08	0.01			8945.07	3.15	359.78
Des Plaines	1	63547.57	Max WS	600.49	600.41	0.08	0.03		1.63	8921.99	25.39	933.08
Des Plaines	1	63295.62	Max WS	600.46	600.39	0.07	0.02	0.00		8865.72	83.10	825.09
Des Plaines	1	63007.62		Bridge								
Des Plaines	1	62761.95	Max WS	600.34	600.26	0.08	0.03			8826.00	122.01	882.26
Des Plaines	1	62524.89	Max WS	600.30	600.21	0.09	0.02			8909.70	38.75	399.56
Des Plaines	1	62371.78	Max WS	600.28	600.18	0.09	0.05			8703.14	244.68	374.89
Des Plaines	1	62061.6*	Max WS	600.23	600.15	0.08	0.03			8925.42	23.80	793.23

Errors Warnings and Notes for Plan : PRIDOT_50

Location:	River: Des Plaines Reach: 1 RS: 253700.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 253500.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 253300.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 253100.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252501.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252301.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252101.0 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252035.7 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Upstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 251971.8 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 251791.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247996.4 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247888.5 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247718.6 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247621.9 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245740.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245275.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245145.2 Profile: Max WS

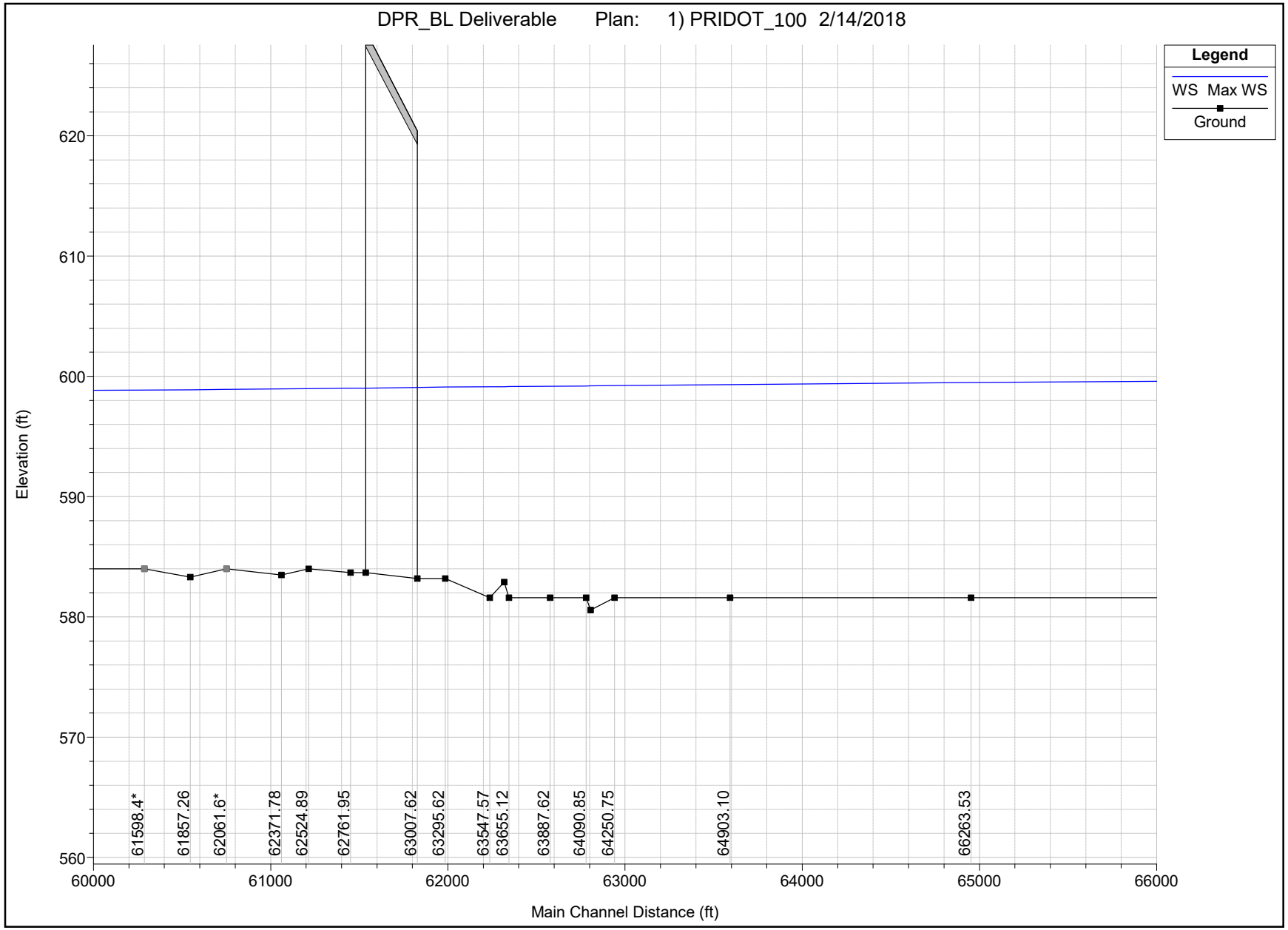
Errors Warnings and Notes for Plan : PRIDOT_50 (Continued)

	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 82220 Profile: Max WS Upstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Location:	River: Des Plaines Reach: 1 RS: 82220 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82199.67 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 82141.78 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS
Note:	Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The
	Yarnell answer has been disregarded.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 77614.32 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 76627.92 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 76067.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 75739.06 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 74504.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 69647.47 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63887.62 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63655.12 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63547.57 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 63007.62 Profile: Max WS
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream
	energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was
	the only one selected, the program will default to an energy based solution.

Errors Warnings and Notes for Plan : PRIDOT_50 (Continued)

Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 62761.95 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 62371.78 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 51048.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50577.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50107.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 36316.9* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 34893.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 34418.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33943.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33469.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32994.46 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32535.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32075.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 31616.2* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 31156.8* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 30697.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29778.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29319.23 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29047.90 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28549.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28051.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 27553.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 27055.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 25619.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 19101.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.

100-Year Proposed


DPR_BL Deliverable Plan: 1) PRIDOT_100 2/14/2018
Legend
WS Max WS
Ground
Elevation (ft)
620
610
600
590
580
570
560
61598.4*
61857.26
62061.6*
62371.78
62524.89
62761.95
63007.62
63295.62
63547.57
63655.12
63887.62
64090.85
64250.75
64903.10
66263.53
60000
61000
62000
63000
64000
65000
66000
Main Channel Distance (ft)

HEC-RAS Plan: PRIDOT_100 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Des Plaines	1	64250.75	Max WS	9659.44	581.60	600.96		601.05	0.000172	2.44	3988.39	361.47	0.12
Des Plaines	1	64116.64	Max WS	9659.34	580.58	600.93		601.03	0.000169	2.42	4027.84	376.32	0.12
Des Plaines	1	64090.85	Max WS	9659.39	581.60	600.93		601.02	0.000186	2.44	3986.28	365.54	0.12
Des Plaines	1	63887.62	Max WS	9660.03	581.60	600.90		600.98	0.000168	2.32	4174.77	646.29	0.12
Des Plaines	1	63655.12	Max WS	9660.34	581.60	600.86		600.95	0.000151	2.34	4224.57	697.05	0.11
Des Plaines	1	63628.88	Max WS	9660.40	582.89	600.85		600.94	0.000161	2.40	4075.49	382.96	0.12
Des Plaines	1	63547.57	Max WS	9660.28	581.60	600.85		600.93	0.000140	2.32	4275.23	1225.99	0.11
Des Plaines	1	63295.62	Max WS	9660.24	583.18	600.83	588.16	600.90	0.000114	2.18	5029.63	829.97	0.10
Des Plaines	1	63007.62		Bridge									
Des Plaines	1	62761.95	Max WS	9660.68	583.68	600.69		600.77	0.000136	2.38	4837.77	1060.20	0.11
Des Plaines	1	62524.89	Max WS	9661.09	584.00	600.63		600.74	0.000167	2.59	3916.45	402.17	0.12
Des Plaines	1	62371.78	Max WS	9660.89	583.48	600.61		600.71	0.000184	2.61	3999.79	419.90	0.13
Des Plaines	1	62061.6*	Max WS	9661.83	584.00	600.57		600.66	0.000150	2.39	4406.95	794.76	0.11

HEC-RAS Plan: PRIDOT_100 Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
				(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Des Plaines	1	64250.75	Max WS	601.05	600.96	0.09	0.02		0.11	9654.97	4.37	361.47
Des Plaines	1	64116.64	Max WS	601.03	600.93	0.09	0.00			9654.44	4.90	376.32
Des Plaines	1	64090.85	Max WS	601.02	600.93	0.09	0.04		0.18	9654.78	4.43	365.54
Des Plaines	1	63887.62	Max WS	600.98	600.90	0.08	0.04		0.28	9658.85	0.91	646.29
Des Plaines	1	63655.12	Max WS	600.95	600.86	0.08	0.00		2.60	9621.08	36.67	697.05
Des Plaines	1	63628.88	Max WS	600.94	600.85	0.09	0.01			9650.19	10.21	382.96
Des Plaines	1	63547.57	Max WS	600.93	600.85	0.08	0.03		2.60	9617.19	40.49	1225.99
Des Plaines	1	63295.62	Max WS	600.90	600.83	0.07	0.02	0.00		9490.39	169.85	829.97
Des Plaines	1	63007.62		Bridge								
Des Plaines	1	62761.95	Max WS	600.77	600.69	0.09	0.04			9449.36	211.32	1060.20
Des Plaines	1	62524.89	Max WS	600.74	600.63	0.10	0.03			9591.70	69.39	402.17
Des Plaines	1	62371.78	Max WS	600.71	600.61	0.10	0.05			9375.46	285.43	419.90
Des Plaines	1	62061.6*	Max WS	600.66	600.57	0.09	0.03			9577.48	84.35	794.76

Errors Warnings and Notes for Plan : PRIDOT_100

Location:	River: Des Plaines Reach: 1 RS: 253300.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 253100.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252900.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252701.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252501.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252301.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252101.0 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 252035.7 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Upstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 251971.8 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247996.4 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247888.5 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247718.6 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247621.9 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245740.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245275.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245145.2 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water

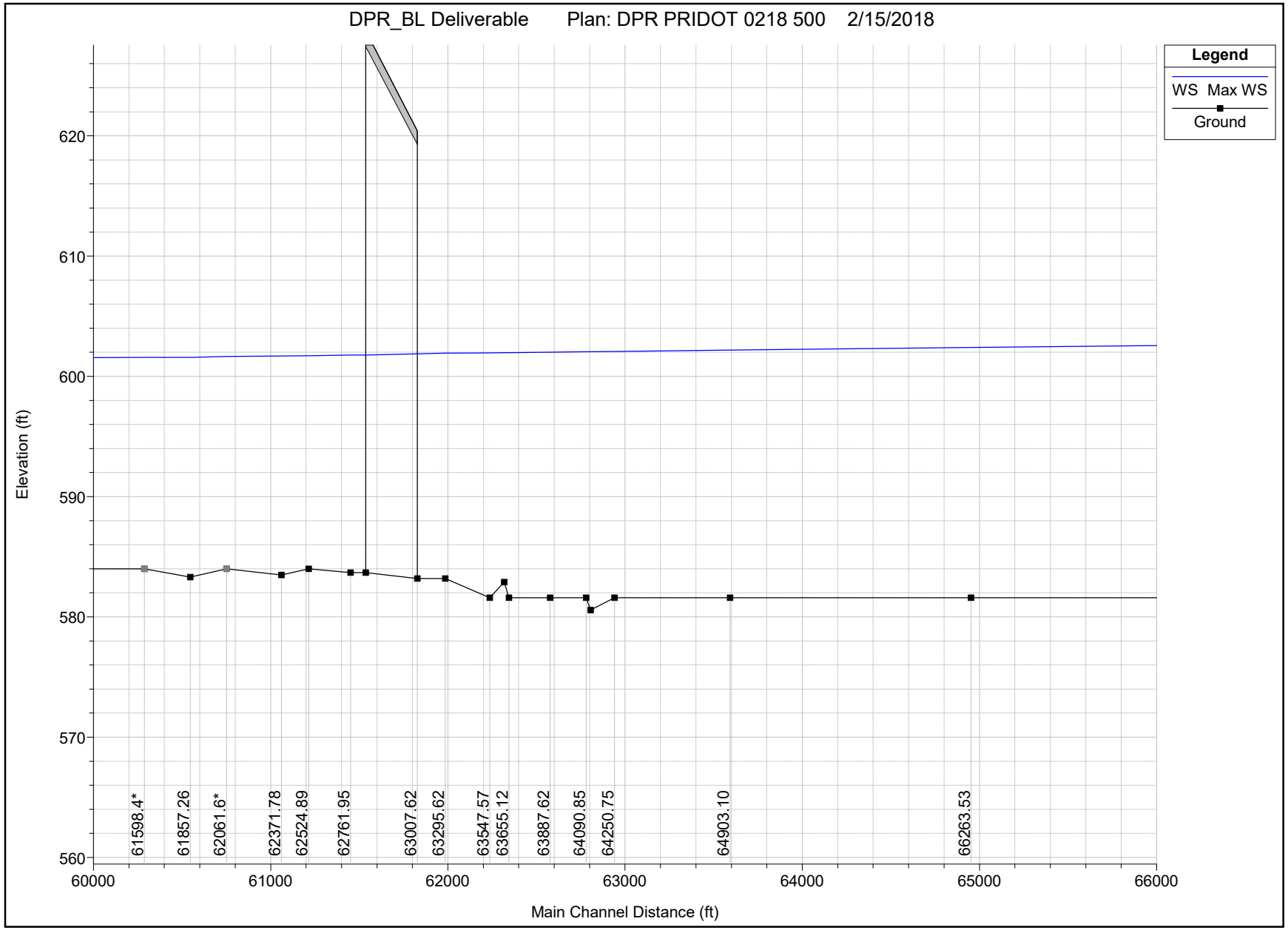
Errors Warnings and Notes for Plan : PRIDOT_100 (Continued)

Location:	River: Des Plaines Reach: 1 RS: 82120 Profile: Max WS Downstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82107.68 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 77614.32 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 76627.92 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 76067.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 75739.06 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 69647.47 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63887.62 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63655.12 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63628.88 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63547.57 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 63007.62 Profile: Max WS
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream
	energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was
	the only one selected, the program will default to an energy based solution.
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 63007.62 Profile: Max WS Downstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Location:	River: Des Plaines Reach: 1 RS: 62371.78 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 59745.58 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 59256.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 58766.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 58277.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 51048.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50577.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50107.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.

Errors Warnings and Notes for Plan : PRIDOT_100 (Continued)

Location:	River: Des Plaines Reach: 1 RS: 34893.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 34418.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33943.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33469.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32994.46 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32535.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32075.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 31616.2* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 31156.8* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29319.23 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29047.90 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28549.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28051.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 27553.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 27055.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 25619.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 24302.2* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 19593.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 19101.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 18609.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 18117.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 17133.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 16641.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 16149.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 13197.18 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 12722.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 12247.6* Profile: Max WS

500-Year Proposed


DPR_BL Deliverable Plan: DPR PRIDOT 0218 500 2/15/2018
Legend
WS Max WS
Ground
Elevation (ft)
620
610
600
590
580
570
560
61598.4*
61857.26
62061.6*
62371.78
62524.89
62761.95
63007.62
63295.62
63547.57
63655.12
63887.62
64090.85
64250.75
64903.10
66263.53
60000
61000
62000
63000
64000
65000
66000
Main Channel Distance (ft)

HEC-RAS Plan: DPR BL 500 PR ID Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Des Plaines	1	64250.75	Max WS	11568.25	581.60	602.07		602.18	0.000185	2.68	4419.60	412.73	0.13
Des Plaines	1	64116.64	Max WS	11568.64	580.58	602.05		602.16	0.000185	2.65	4460.07	400.39	0.13
Des Plaines	1	64090.85	Max WS	11568.75	581.60	602.04		602.15	0.000198	2.66	4398.16	374.51	0.13
Des Plaines	1	63887.62	Max WS	11569.37	581.60	602.02		602.11	0.000173	2.50	5229.45	997.82	0.12
Des Plaines	1	63655.12	Max WS	11569.98	581.60	601.97		602.08	0.000164	2.57	4651.83	1038.24	0.12
Des Plaines	1	63628.88	Max WS	11570.09	582.89	601.96		602.07	0.000177	2.63	4581.78	510.44	0.12
Des Plaines	1	63547.57	Max WS	11570.36	581.60	601.96		602.06	0.000154	2.56	4689.93	1457.11	0.12
Des Plaines	1	63295.62	Max WS	11571.11	583.18	601.94	588.67	602.02	0.000123	2.37	5955.33	833.62	0.11
Des Plaines	1	63007.62		Bridge									
Des Plaines	1	62761.95	Max WS	11569.82	583.68	601.78		601.88	0.000143	2.55	6118.40	1189.02	0.11
Des Plaines	1	62524.89	Max WS	11570.59	584.00	601.71		601.84	0.000187	2.86	4354.53	408.96	0.13
Des Plaines	1	62371.78	Max WS	11569.78	583.48	601.69		601.81	0.000221	2.87	4471.03	449.03	0.14
Des Plaines	1	62061.6*	Max WS	11570.75	584.00	601.65		601.75	0.000161	2.59	5265.52	800.49	0.12

HEC-RAS Plan: DPR BL 500 PR ID Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
				(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Des Plaines	1	64250.75	Max WS	602.18	602.07	0.11	0.02		1.29	11537.46	29.50	412.73
Des Plaines	1	64116.64	Max WS	602.16	602.05	0.11	0.00			11532.54	36.10	400.39
Des Plaines	1	64090.85	Max WS	602.15	602.04	0.11	0.04		1.48	11545.90	21.37	374.51
Des Plaines	1	63887.62	Max WS	602.11	602.02	0.10	0.04		2.43	11389.86	177.08	997.82
Des Plaines	1	63655.12	Max WS	602.08	601.97	0.10	0.00		7.52	11478.80	83.66	1038.24
Des Plaines	1	63628.88	Max WS	602.07	601.96	0.11	0.01			11506.06	64.03	510.44
Des Plaines	1	63547.57	Max WS	602.06	601.96	0.10	0.03		6.51	11471.21	92.64	1457.11
Des Plaines	1	63295.62	Max WS	602.02	601.94	0.08	0.03	0.00		11071.25	499.86	833.62
Des Plaines	1	63007.62		Bridge								
Des Plaines	1	62761.95	Max WS	601.88	601.78	0.09	0.04			10870.39	699.43	1189.02
Des Plaines	1	62524.89	Max WS	601.84	601.71	0.12	0.03			11389.16	181.43	408.96
Des Plaines	1	62371.78	Max WS	601.81	601.69	0.12	0.06			11182.92	386.86	449.03
Des Plaines	1	62061.6*	Max WS	601.75	601.65	0.10	0.04		0.05	11210.53	360.17	800.49

Errors Warnings and Notes for Plan : DPR BL 500 PR ID

Location:	River: Des Plaines Reach: 1 RS: 252035.7 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Note:	The downstream water surface is above the minimum elevation required for orifice flow. The orifice
	flow equation was used for pressure flow.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Upstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	For the cross section inside the bridge at the upstream end, the water surface and energy have been
	projected from the upstream cross section. The selected bridge modeling method does not compute
	answers inside the bridge.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 252008 Profile: Max WS Downstream
Warning:	Critical depth could not be determined within the specified number of iterations. The program used
	the iteration with the lowest energy.
Note:	For the cross section inside the bridge at the downstream end, the water surface and energy have
	been projected from the downstream cross section. The selected bridge modeling method does not
	compute answers inside the bridge.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 251971.8 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 251611.* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 251099.7 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 250960.6 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247996.4 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247888.5 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 247718.6 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 247621.9 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245740.2 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 245145.2 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.
Location:	River: Des Plaines Reach: 1 RS: 245140.2 Profile: Max WS
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.
Location:	River: Des Plaines Reach: 1 RS: 244984.7 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 244813.* Profile: Max WS

Errors Warnings and Notes for Plan : DPR BL 500 PR ID (Continued)

Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Des Plaines Reach: 1 RS: 82107.68 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 81889.79 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 80640.82 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 79900.84 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 79597.21 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 77821.42 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 77614.32 Profile: Max WS
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 76067.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 72842.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 67372.14 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63655.12 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63628.88 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 63547.57 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 63295.62 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 63007.62 Profile: Max WS
Warning:	The Yarnell method gave an invalid answer. The upstream energy was less than the downstream
	energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was
	the only one selected, the program will default to an energy based solution.
Warning:	For the final momentum answer at the bridge, the upstream energy was computed lower than the
	downstream energy. This is not physically possible, the momentum answer has been disregarded.
Location:	River: Des Plaines Reach: 1 RS: 63007.62 Profile: Max WS Downstream
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Des Plaines Reach: 1 RS: 62761.95 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 62371.78 Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 61857.26 Profile: Max WS

Errors Warnings and Notes for Plan : DPR BL 500 PR ID (Continued)

Warning:	Divided flow computed for this cross-section.
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 59745.58 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 59256.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 58766.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 58277.3* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 57787.9* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 57298.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 51989.8* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 51519.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 51048.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50577.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 50107.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 49636.4* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 49165.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 38114.6* Profile: Max WS
Warning:	The cross-section end points had to be extended vertically for the computed water surface.
Location:	River: Des Plaines Reach: 1 RS: 36316.9* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33943.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 33469.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32994.46 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32535.0* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 32075.6* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 29047.90 Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28549.7* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 28051.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 25180.5* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 23863.1* Profile: Max WS
Warning:	Divided flow computed for this cross-section.
Location:	River: Des Plaines Reach: 1 RS: 23424.0* Profile: Max WS

Structure Tables

HEC-RAS Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Plan	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
					(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Des Plaines	1	64250.75	Max WS	PRIDOT_10	601.05	600.96		0.02		361.47	0.11	9654.97	4.37	2.44
Des Plaines	1	64250.75	Max WS	PRIDOT_50	600.60	600.51		0.02		343.44	0.01	8946.22	0.95	2.34
Des Plaines	1	64250.75	Max WS	PRIDOT_10	599.29	599.23		0.02		301.36		7072.88		2.06
Des Plaines	1	64250.75	Max WS	DPR BL 500 PR ID	602.18	602.07		0.02		412.73	1.29	11537.46	29.50	2.68
Des Plaines	1	64116.64	Max WS	PRIDOT_10	601.03	600.93		0.00		376.32		9654.44	4.90	2.42
Des Plaines	1	64116.64	Max WS	PRIDOT_50	600.58	600.49		0.00		329.68		8946.56	0.84	2.32
Des Plaines	1	64116.64	Max WS	PRIDOT_10	599.27	599.21		0.00		304.88		7073.16		2.04
Des Plaines	1	64116.64	Max WS	DPR BL 500 PR ID	602.16	602.05		0.00		400.39		11532.54	36.10	2.65
Des Plaines	1	64090.85	Max WS	PRIDOT_10	601.02	600.93		0.04		365.54	0.18	9654.78	4.43	2.44
Des Plaines	1	64090.85	Max WS	PRIDOT_50	600.57	600.49		0.03		361.94	0.03	8946.40	1.03	2.34
Des Plaines	1	64090.85	Max WS	PRIDOT_10	599.27	599.20		0.03		316.75		7073.23		2.08
Des Plaines	1	64090.85	Max WS	DPR BL 500 PR ID	602.15	602.04		0.04		374.51	1.48	11545.90	21.37	2.66
Des Plaines	1	63887.62	Max WS	PRIDOT_10	600.98	600.90		0.04		646.29	0.28	9658.85	0.91	2.32
Des Plaines	1	63887.62	Max WS	PRIDOT_50	600.54	600.46		0.04		499.63	0.05	8948.28	0.15	2.23
Des Plaines	1	63887.62	Max WS	PRIDOT_10	599.24	599.18		0.03		325.97		7074.77		1.98
Des Plaines	1	63887.62	Max WS	DPR BL 500 PR ID	602.11	602.02		0.04		997.82	2.43	11389.86	177.08	2.50
Des Plaines	1	63655.12	Max WS	PRIDOT_10	600.95	600.86		0.00		697.05	2.60	9621.08	36.67	2.34
Des Plaines	1	63655.12	Max WS	PRIDOT_50	600.50	600.42		0.00		531.42	1.51	8922.73	23.10	2.25
Des Plaines	1	63655.12	Max WS	PRIDOT_10	599.21	599.15		0.00		346.63	0.11	7071.21	2.81	1.98
Des Plaines	1	63655.12	Max WS	DPR BL 500 PR ID	602.08	601.97		0.00		1038.24	7.52	11478.80	83.66	2.57
Des Plaines	1	63628.88	Max WS	PRIDOT_10	600.94	600.85		0.01		382.96		9650.19	10.21	2.40
Des Plaines	1	63628.88	Max WS	PRIDOT_50	600.50	600.42		0.01		359.78		8945.07	3.15	2.30
Des Plaines	1	63628.88	Max WS	PRIDOT_10	599.21	599.14		0.01		306.74		7074.16	0.05	2.02
Des Plaines	1	63628.88	Max WS	DPR BL 500 PR ID	602.07	601.96		0.01		510.44		11506.06	64.03	2.63
Des Plaines	1	63547.57	Max WS	PRIDOT_10	600.93	600.85		0.03		1225.99	2.60	9617.19	40.49	2.32
Des Plaines	1	63547.57	Max WS	PRIDOT_50	600.49	600.41		0.03		933.08	1.63	8921.99	25.39	2.22
Des Plaines	1	63547.57	Max WS	PRIDOT_10	599.20	599.14		0.03		521.69	0.22	7071.09	3.10	1.94
Des Plaines	1	63547.57	Max WS	DPR BL 500 PR ID	602.06	601.96		0.03		1457.11	6.51	11471.21	92.64	2.56
Des Plaines	1	63295.62	Max WS	PRIDOT_10	600.90	600.83	588.16	0.02	0.00	829.97		9490.39	169.85	2.18
Des Plaines	1	63295.62	Max WS	PRIDOT_50	600.46	600.39	587.97	0.02	0.00	825.09		8865.72	83.10	2.10
Des Plaines	1	63295.62	Max WS	PRIDOT_10	599.17	599.12	587.43	0.02	0.00	373.17		7073.73	1.22	1.84
Des Plaines	1	63295.62	Max WS	DPR BL 500 PR ID	602.02	601.94	588.67	0.03	0.00	833.62		11071.25	499.86	2.37
Des Plaines	1	63007.62BR U	Max WS	PRIDOT_10	600.86	600.78	588.34	0.07	0.00	330.54		9622.43	37.81	2.38
Des Plaines	1	63007.62BR U	Max WS	PRIDOT_50	600.42	600.34	588.14	0.06	0.00	329.73		8926.62	22.20	2.28
Des Plaines	1	63007.62BR U	Max WS	PRIDOT_10	599.14	599.08	587.58	0.05	0.00	286.72		7073.99	0.96	1.98
Des Plaines	1	63007.62BR U	Max WS	DPR BL 500 PR ID	601.99	601.88	588.84	0.08	0.00	332.58		11476.97	94.14	2.64
Des Plaines	1	63007.62BR D	Max WS	PRIDOT_10	600.79	600.69	588.53	0.02	0.01	332.97		9649.58	10.65	2.61
Des Plaines	1	63007.62BR D	Max WS	PRIDOT_50	600.36	600.26	588.34	0.01	0.00	331.21		8947.83	0.99	2.49
Des Plaines	1	63007.62BR D	Max WS	PRIDOT_10	599.09	599.02	587.79	0.01	0.00	243.06		7074.95		2.16

HEC-RAS Locations: User Defined Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
					(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Des Plaines	1	63007.62BR D	Max WS	DPR BL 500 PR ID	601.90	601.77	589.03	0.02	0.01	335.31		11502.71	68.40	2.90
Des Plaines	1	62761.95	Max WS	PRIDOT_10	600.77	600.69		0.04		1060.20		9449.36	211.32	2.38
Des Plaines	1	62761.95	Max WS	PRIDOT_50	600.34	600.26		0.03		882.26		8826.00	122.01	2.29
Des Plaines	1	62761.95	Max WS	PRIDOT_10	599.07	599.01		0.03		478.87		7059.32	13.20	2.00
Des Plaines	1	62761.95	Max WS	DPR BL 500 PR ID	601.88	601.78		0.04		1189.02		10870.39	699.43	2.55
Des Plaines	1	62524.89	Max WS	PRIDOT_10	600.74	600.63		0.03		402.17		9591.70	69.39	2.59
Des Plaines	1	62524.89	Max WS	PRIDOT_50	600.30	600.21		0.02		399.56		8909.70	38.75	2.48
Des Plaines	1	62524.89	Max WS	PRIDOT_10	599.04	598.97		0.02		278.83		7020.23	54.16	2.14
Des Plaines	1	62524.89	Max WS	DPR BL 500 PR ID	601.84	601.71		0.03		408.96		11389.16	181.43	2.86
Des Plaines	1	62371.78	Max WS	PRIDOT_10	600.71	600.61		0.05		419.90		9375.46	285.43	2.61
Des Plaines	1	62371.78	Max WS	PRIDOT_50	600.28	600.18		0.05		374.89		8703.14	244.68	2.50
Des Plaines	1	62371.78	Max WS	PRIDOT_10	599.02	598.95		0.04		329.35		6922.67	150.72	2.18
Des Plaines	1	62371.78	Max WS	DPR BL 500 PR ID	601.81	601.69		0.06		449.03		11182.92	386.86	2.87
Des Plaines	1	62061.6*	Max WS	PRIDOT_10	600.66	600.57		0.03		794.76		9577.48	84.35	2.39
Des Plaines	1	62061.6*	Max WS	PRIDOT_50	600.23	600.15		0.03		793.23		8925.42	23.80	2.30
Des Plaines	1	62061.6*	Max WS	PRIDOT_10	598.98	598.92		0.03		316.46		7036.35	37.73	2.00
Des Plaines	1	62061.6*	Max WS	DPR BL 500 PR ID	601.75	601.65		0.04		800.49	0.05	11210.53	360.17	2.59

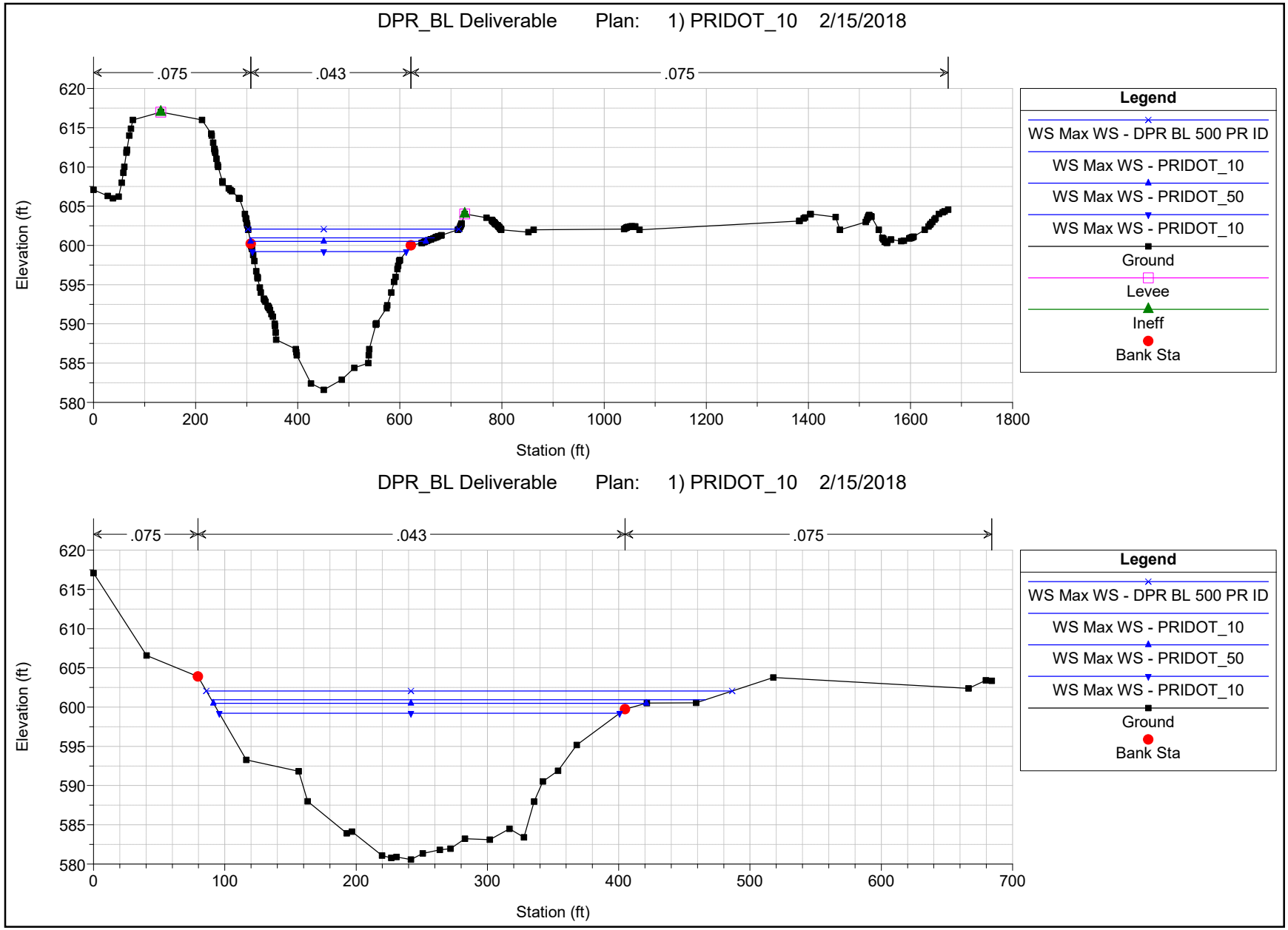
HEC-RAS Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Plan	E.G. US.	W.S. US.	Br Sel Method	Energy EG	Momen. EG	Yarnell EG	WSPRO EG	Prs O EG	Prs/Wr EG	Energy/Wr EG
					(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Des Plaines	1	63007.62	Max WS	PRIDOT_10	600.90	600.83	Energy only	600.89						
Des Plaines	1	63007.62	Max WS	PRIDOT_50	600.46	600.39	Energy only	600.44						
Des Plaines	1	63007.62	Max WS	PRIDOT_10	599.17	599.12	Energy only	599.16						
Des Plaines	1	63007.62	Max WS	DPR BL 500 PR ID	602.02	601.94	Energy only	602.01						

HEC-RAS Locations: User Defined Profile: Max WS

River	Reach	River Sta	Profile	Plan	E.G. US.	Min El Prs	BR Open Area	Prs O WS	Q Total	Min El Weir Flow	Q Weir	Delta EG
					(ft)	(ft)	(sq ft)	(ft)	(cfs)	(ft)	(cfs)	(ft)
Des Plaines	1	63007.62	Max WS	PRIDOT_10	600.90	619.29	9827.10		9660.24	628.74		0.12
Des Plaines	1	63007.62	Max WS	PRIDOT_50	600.46	619.29	9827.10		8948.82	628.74		0.11
Des Plaines	1	63007.62	Max WS	PRIDOT_10	599.17	619.29	9827.10		7074.95	628.74		0.09
Des Plaines	1	63007.62	Max WS	DPR BL 500 PR ID	602.02	619.29	9827.10		11571.11	628.74		0.14

HEC-RAS Plotted Cross Sections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Elevation (ft)
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Ground
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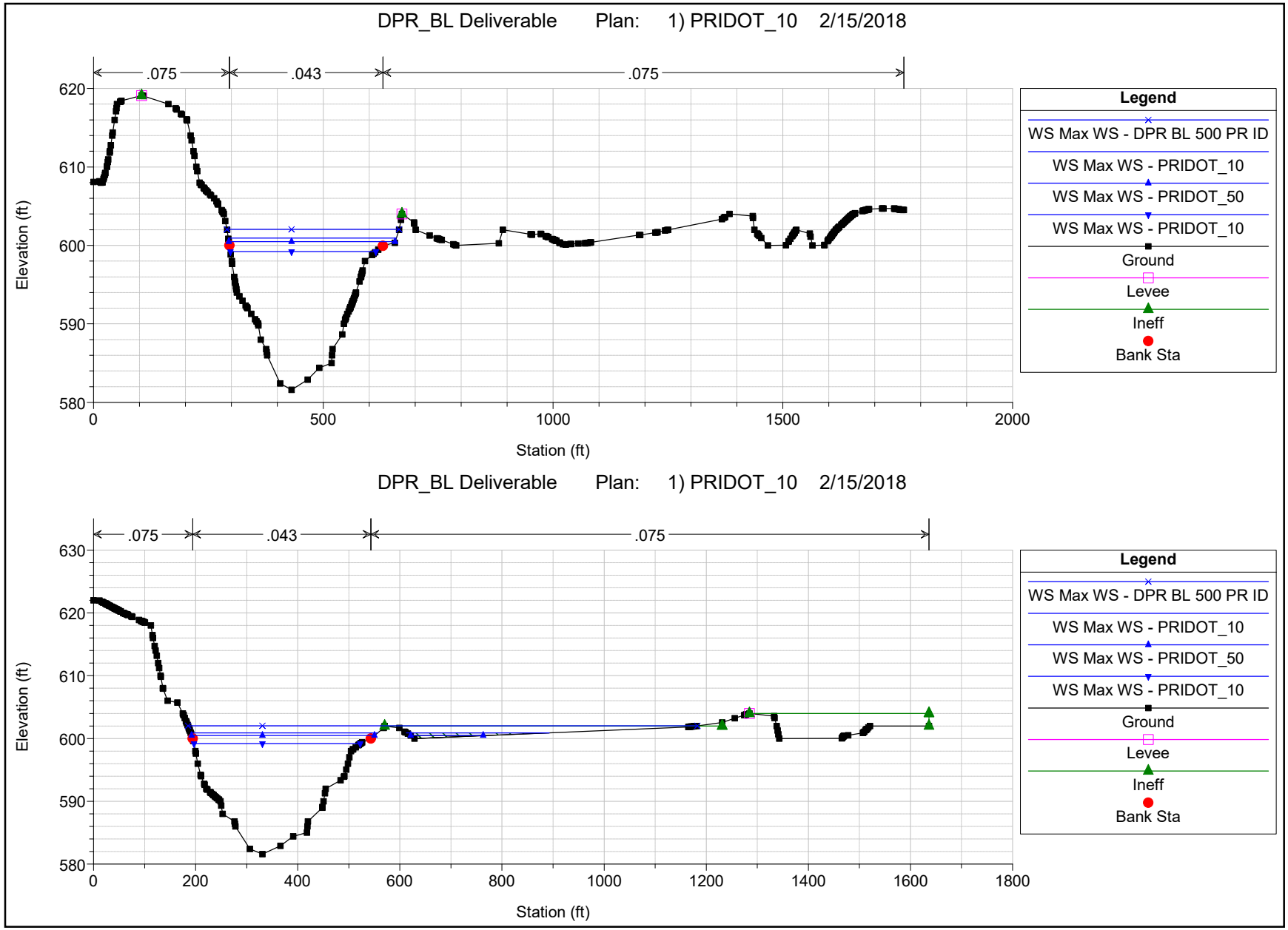
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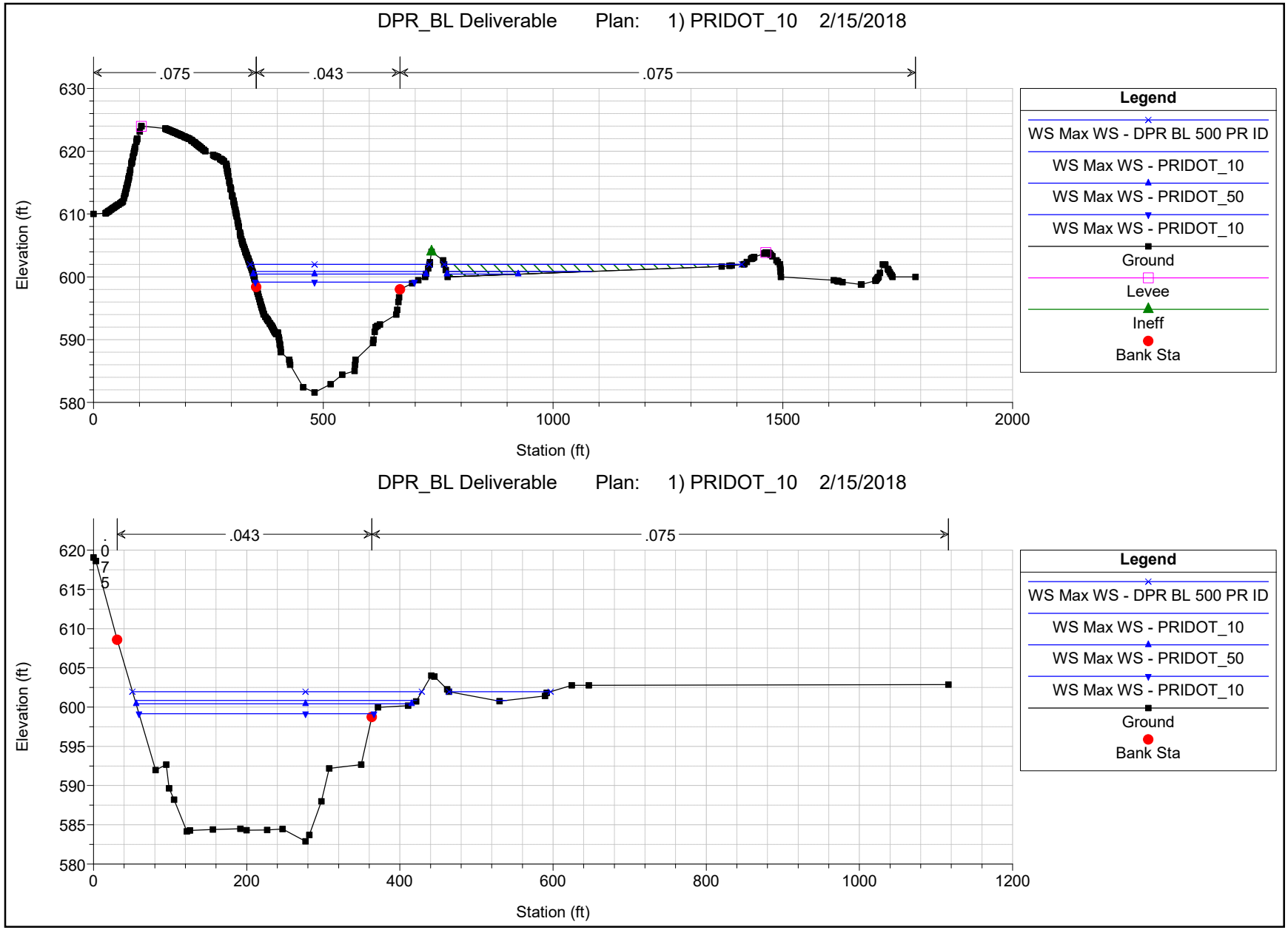
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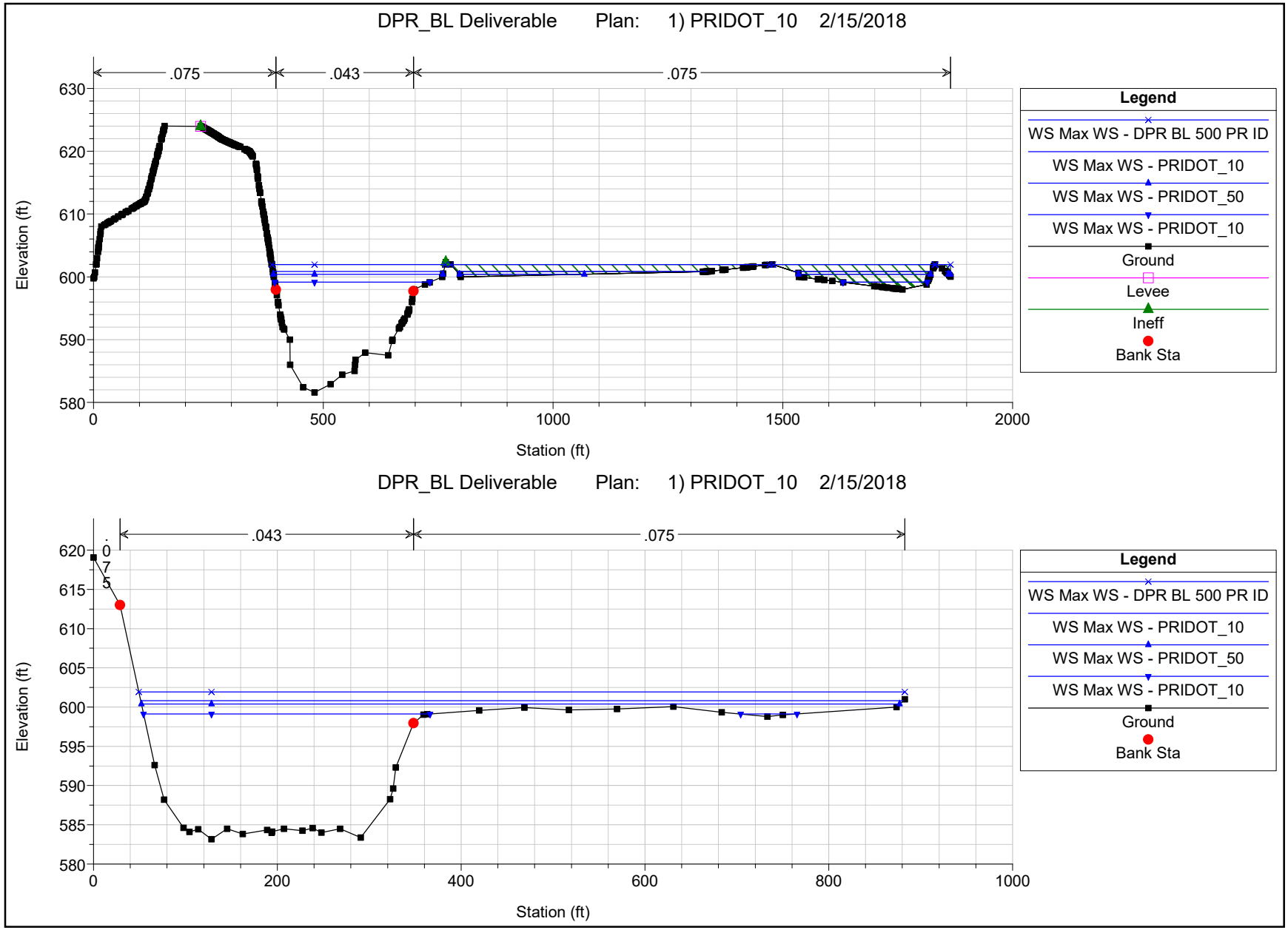
Bank Sta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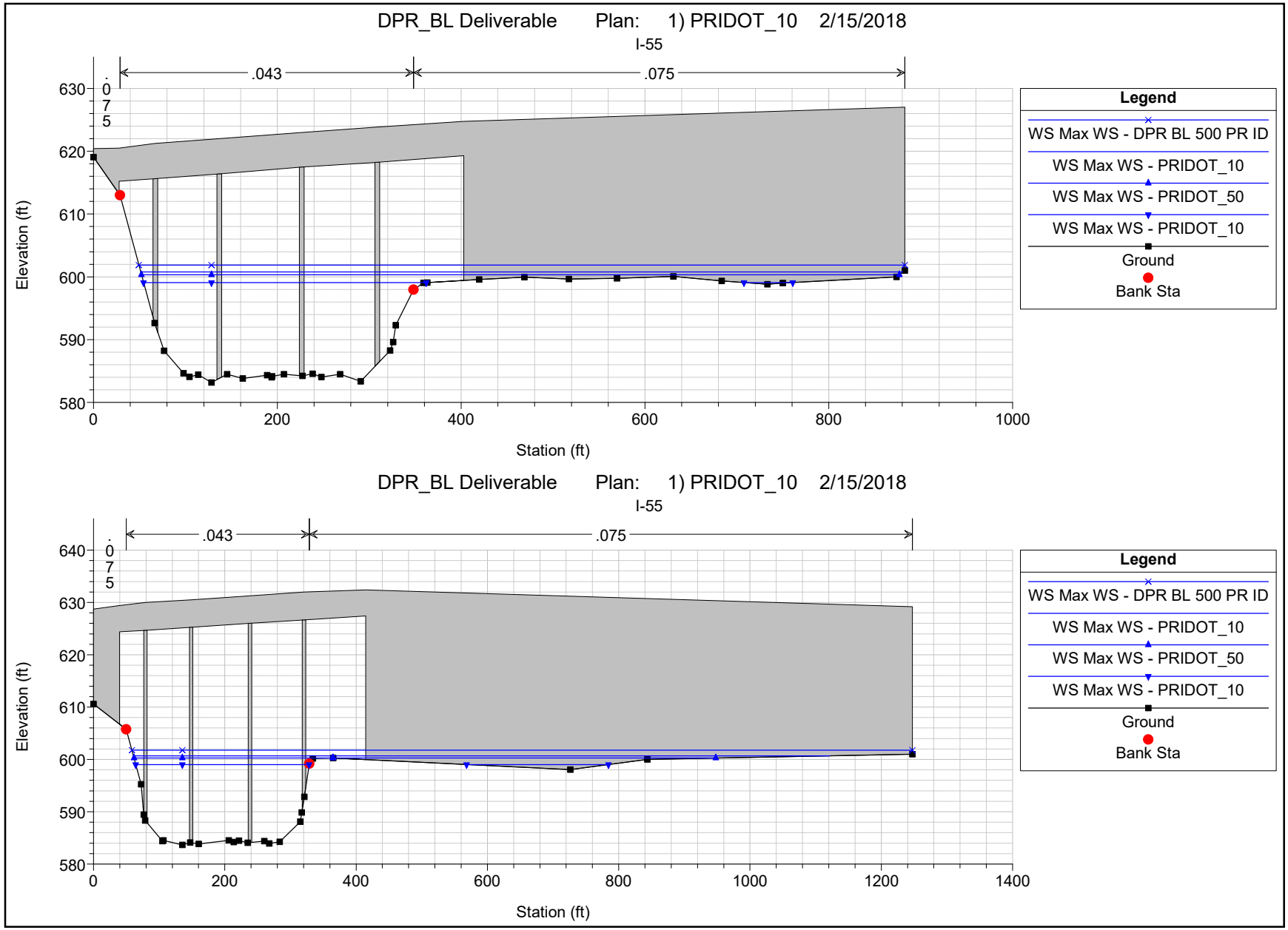
Bank Sta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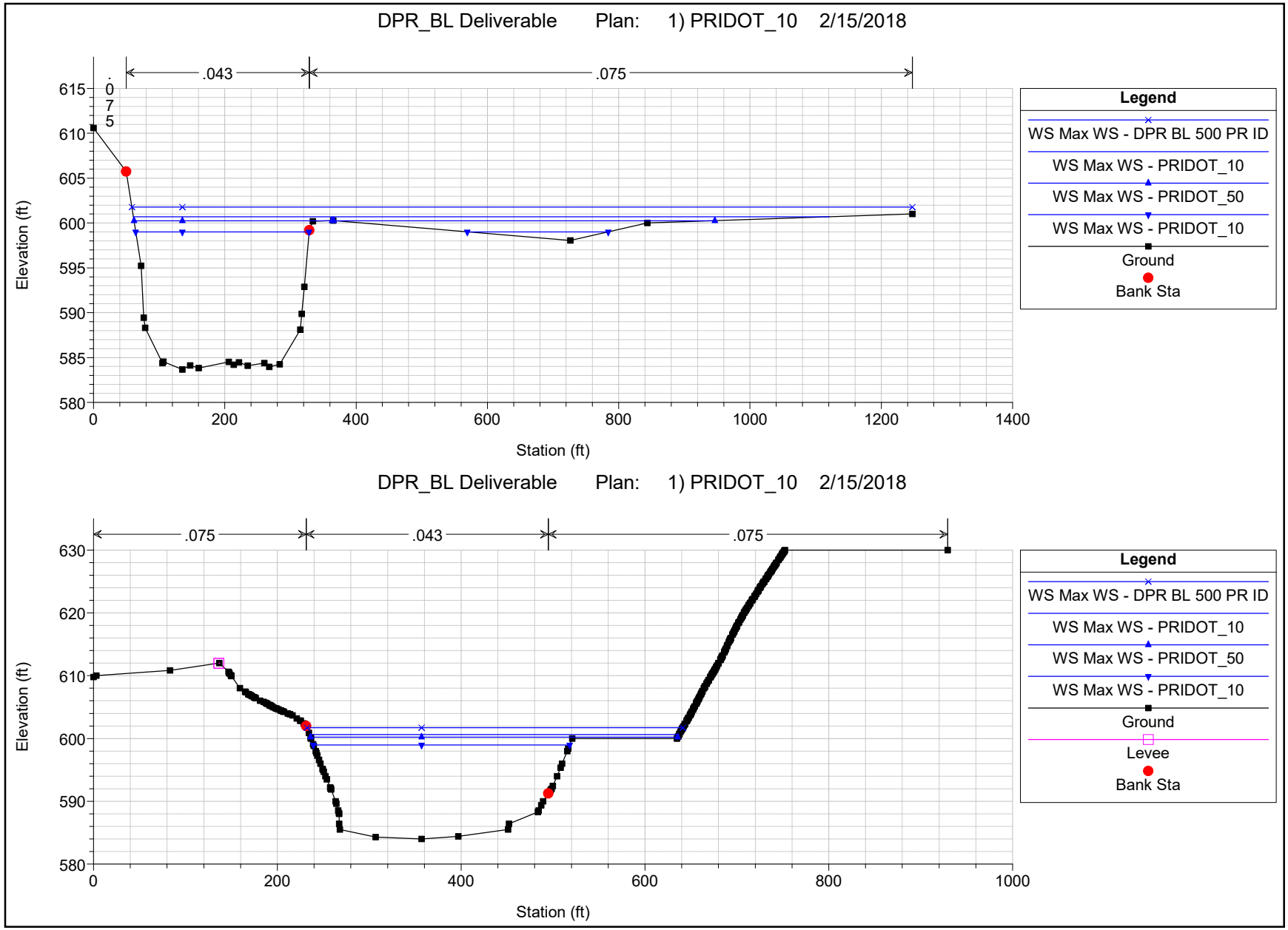
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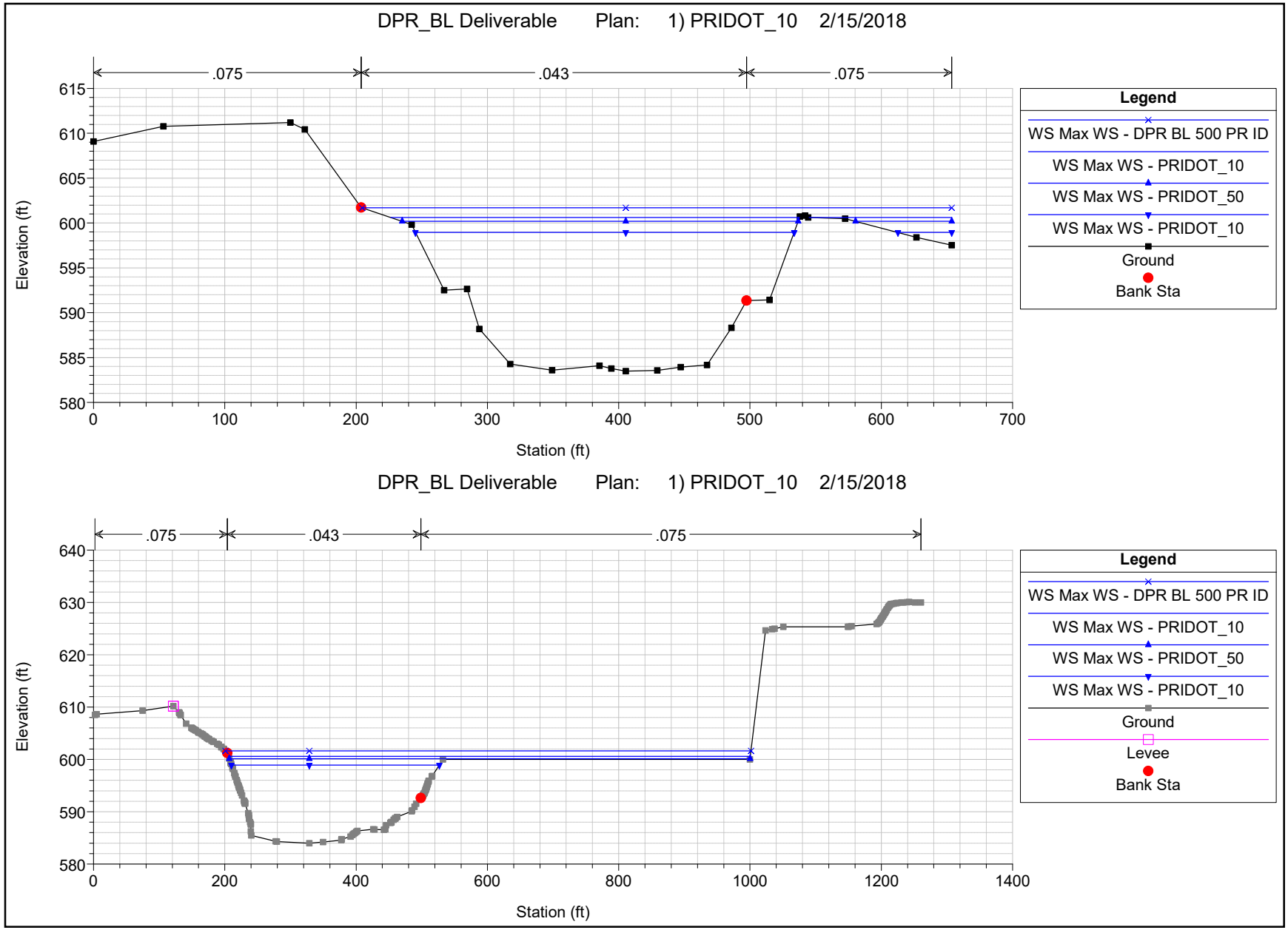
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DPR_BL Deliverable Plan: 1) PRIDOT_10 2/15/2018
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WS Max WS - DPR BL 500 PR ID
WS Max WS - PRIDOT_10
WS Max WS - PRIDOT_50
WS Max WS - PRIDOT_10
Ground
Levee
Bank Sta

TAB 14

SECTION 14

SCOUR ANALYSIS

SECTION 14.A

EXISTING CONDITIONS
SCOUR ANALYSIS

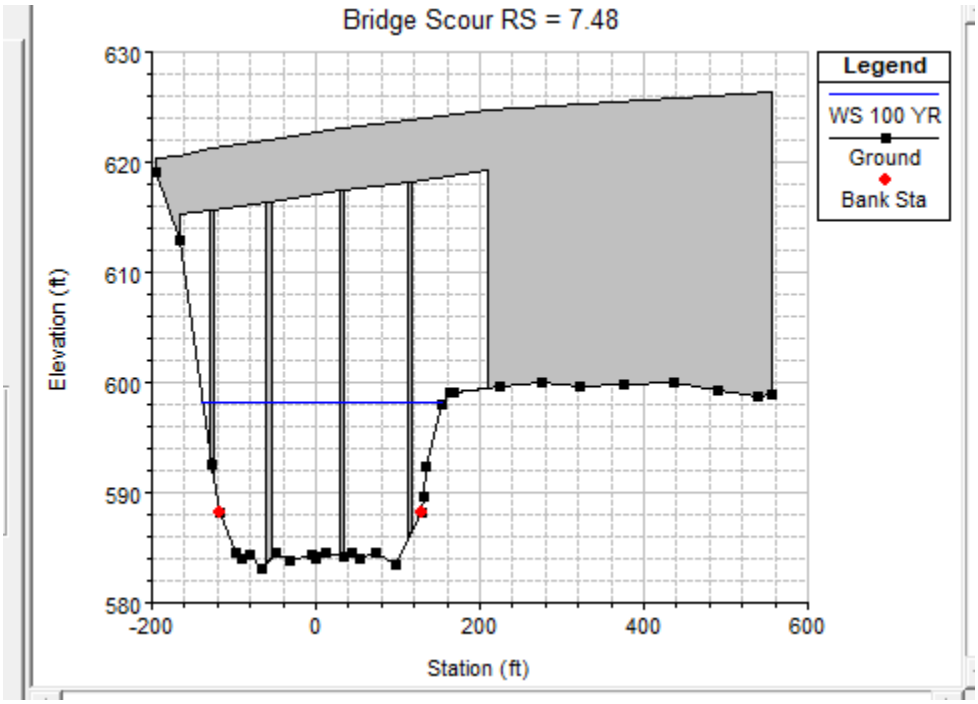
Stream:	**Des Plaines River**	**By:**	EMB 2/15/2018
Route \ County:	**I-55\Cook**	**Checked:**	FDM 2/19/2018

I-55 Over the Des Plaines River Scour Summary
Existing Conditions
August 2018 Submittal

Event	Abutment/ Contraction Scour[1]	Pier Scour	Contraction Scour	Total Pier Scour Depth[2]
Q_{100}	N/A	6.39	0.0	6.39
Q_{200}	N/A	6.46	0.0	6.46

Note 1. Abutments are above and outside of flood limits.
Note 2. Include only Pier Scour. Per IDOT Drainage Manual Section 10-006, aggradation is not considered in the cumulative calculated scour depth.

100-YR EXISTING HEC RAS OUTPUT



Contraction | Pier | Abutment

	LOB	Channel	ROB
Y1:	5.31	13.75	5.59
V1:	1.20	2.91	1.20
Y0:	5.08	13.68	3.97
Q2:	70.27	8199.98	129.75
W2:	15.42	230.05	28.27
D50:	0.20	0.20	0.20
Equation:	Defau	Defau	Defau

Live Bed Specific Data

Q1:	273.62	7690.74	435.64
W1:	43.05	192.46	64.84
K1: K1 ...	0.690	0.690	0.690

Approach XS River Sta.: 7.7

Contraction | Pier | Abutment

Maximum V1 Y1 | Local V1 Y1

Pier #: Apply to All Piers

Shape: Round nose

a: 5.25 D50:

Y1: 13.70 V1: 2.43 Fr1: 0.116

Method: CSU equation

CSU's Eqn. Specific Data

K1: 1.00

Angle: 0 L: 290.78

K2: 1.00

K3: 1.1 - Clear-Water Scour

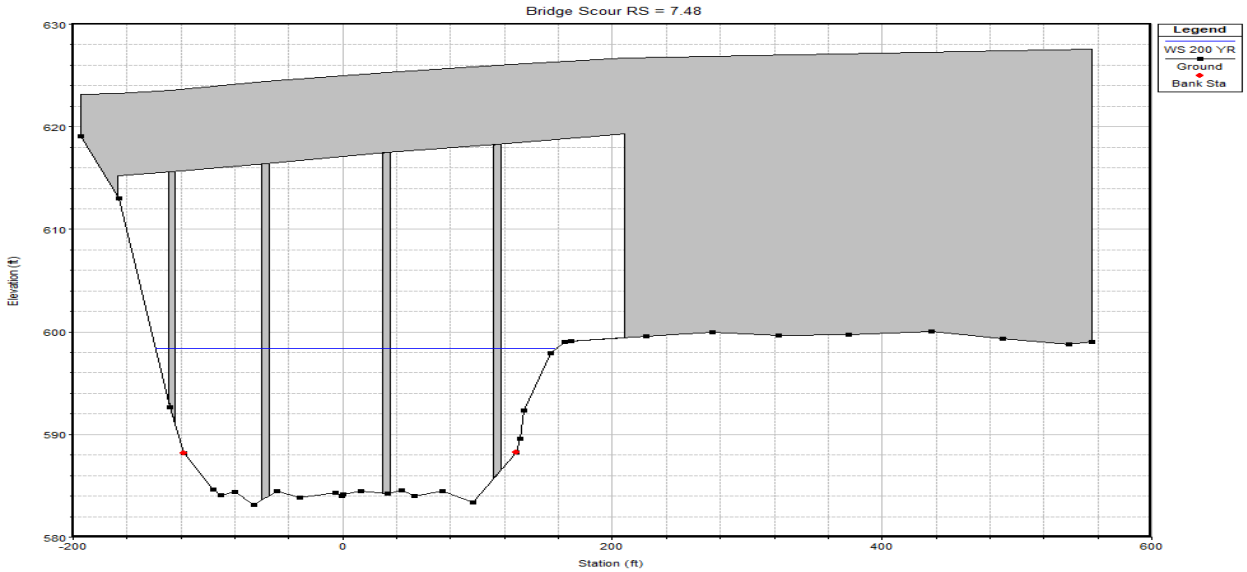
D95: K4: 1.00

Froelich's Eqn. Specific Data

a': Phi: 1.00

Reach-1	7.7	100 YR	8400.00	582.89	598.27		598.39	0.000143	2.91	3238.30	300.35	0.14
Reach-1	7.55	100 YR	8400.00	583.18	598.25	587.83	598.34	0.000101	2.43	3590.19	295.14	0.12
Reach-1	7.48		Bridge									
Reach-1	7.40	100 YR	8400.00	583.68	598.14		598.25	0.000118	2.60	3300.76	276.69	0.13

200-YR EXISTING HEC RAS OUTPUT



Contraction | Pier | Abutment

	LOB	Channel	ROB
Y1:	5.44	13.96	5.75
V1:	1.22	2.96	1.23
Y0:	5.16	13.88	3.91
Q2:	74.14	8477.64	140.22
W2:	15.80	230.05	30.24
D50:	0.20	0.20	0.20
Equation:	Defau	Defau	Defau

Live Bed Specific Data

Q1:		290.54	7937.89	463.56
W1:		43.67	192.46	65.31
K1:	K1 ...	0.690	0.690	0.690

Approach XS River Sta.: 7.7

Contraction | Pier | Abutment

Maximum V1 Y1 | Local V1 Y1

Pier # Apply to All Piers

Shape: Round nose

a: 5.25 D50:

Y1: 13.90 V1: 2.48 Fr1: 0.117

Method CSU equation

CSU's Eqn. Specific Data

K1: 1.00

Angle: L: 290.78

K2:

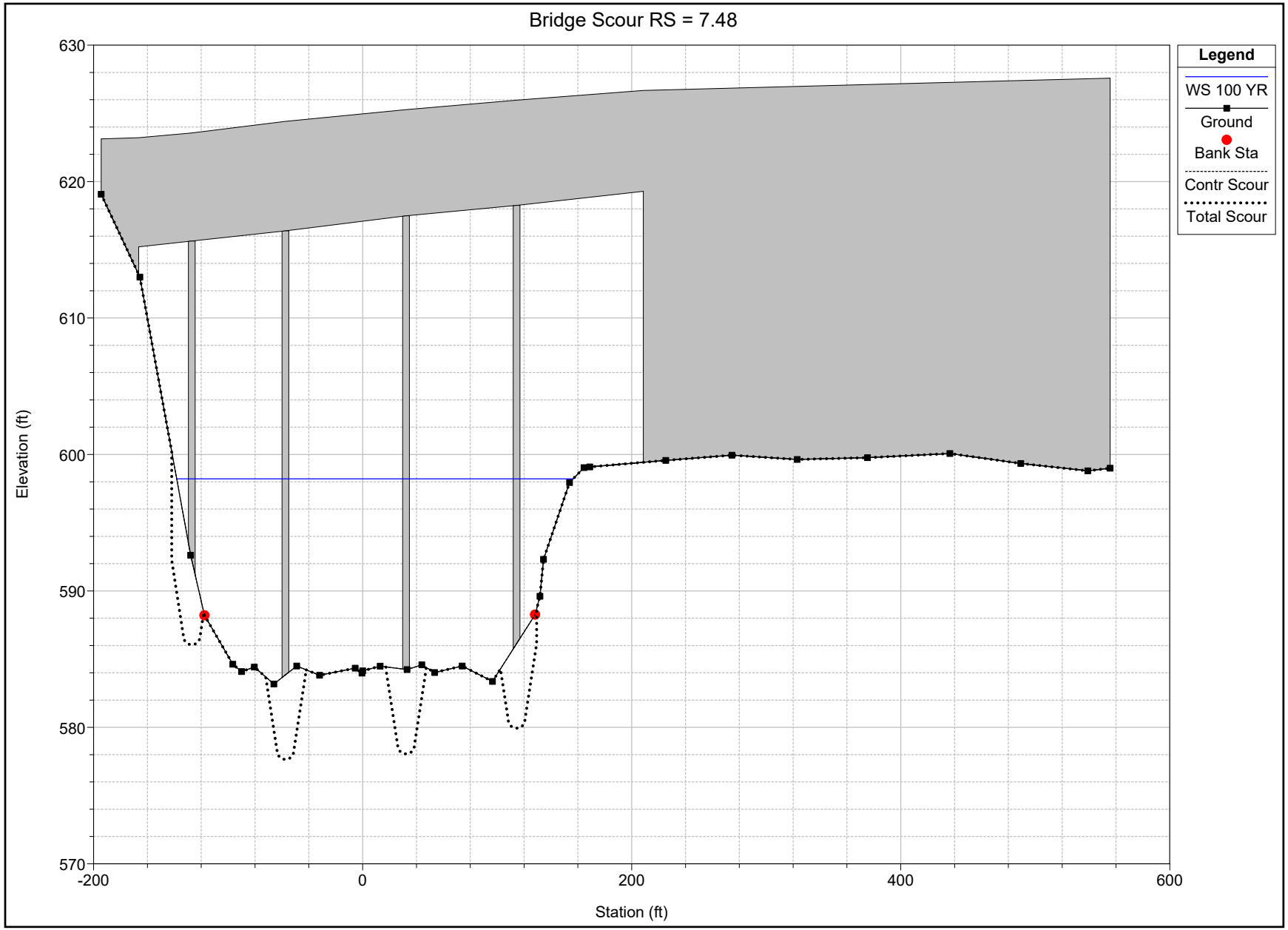
K3: 1.1 - Clear-Water Scour

D95: K4: 1.00

Froelich's Eqn. Specific Data

a': Phi: 1.00

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9	200 YR	8692.00	583.02	599.14		599.18	0.000050	1.83	5548.16	444.98	0.08
Reach-1	8	200 YR	8692.00	581.62	598.87		598.94	0.000078	2.32	4154.59	344.84	0.10
Reach-1	7.85	200 YR	8692.00	580.58	598.54		598.67	0.000134	3.02	3257.36	297.10	0.14
Reach-1	7.7	200 YR	8692.00	582.89	598.47		598.60	0.000145	2.96	3299.40	301.44	0.14
Reach-1	7.55	200 YR	8692.00	583.18	598.45	587.92	598.55	0.000102	2.48	3650.29	297.50	0.12
Reach-1	7.48		Bridge									
Reach-1	7.40	200 YR	8692.00	583.68	598.34		598.45	0.000120	2.65	3359.44	310.03	0.13
Reach-1	7.25	200 YR	8692.00	583.48	598.26		598.40	0.000152	3.02	3184.97	306.74	0.14
Reach-1	7	200 YR	8692.00	582.92	598.24		598.35	0.000126	2.74	3617.26	341.39	0.13
Reach-1	6.8	200 YR	8692.00	583.31	598.16		598.30	0.000159	3.05	3138.83	299.54	0.15
Reach-1	6	200 YR	8692.00	584.02	597.57	588.71	597.71	0.000185	3.18	3244.68	459.03	0.16


Bridge Scour RS = 7.48
Legend
WS 100 YR
Ground
Bank Sta
Contr Scour
Total Scour
Elevation (ft)
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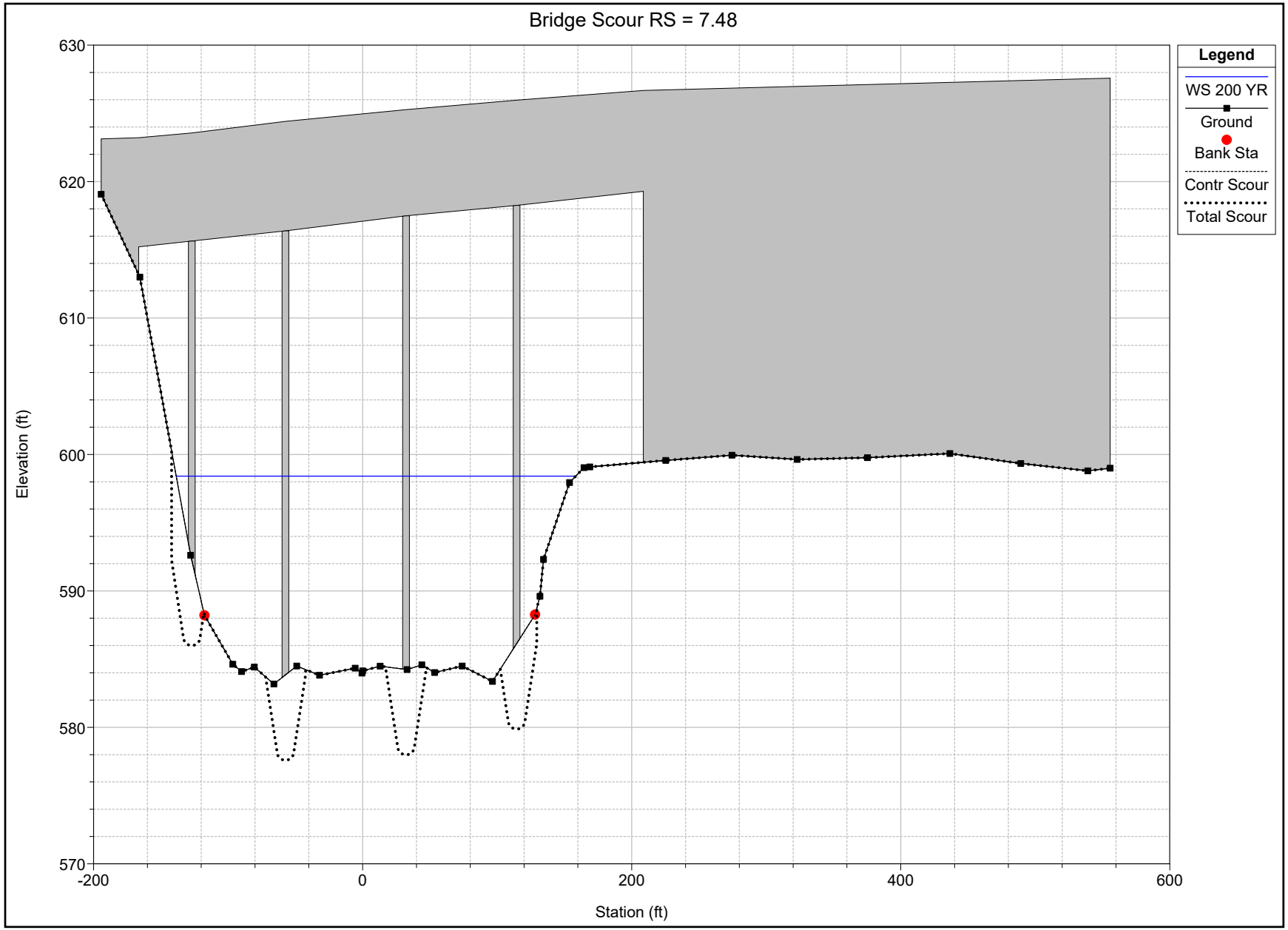
Station (ft)


Bridge Scour RS = 7.48
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WS 200 YR
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Contr Scour
Total Scour
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Station (ft)

FHWA HEC-18, "Evaluating Scour at Bridges", Fifth Edition, April 2012

Chapter 6.2.1 Critical Velocity for Clear Water vs. Live Bed Contraction Scour

Stream: **Des Plaines River** **By:** EMB 2/15/18
Route \ County: **I-55\Cook** **Checked:** FDM 2/19/18
S.N.: **016-2704**

$$V_c = K_u \, y^{1/6} \, D^{1/3}$$ Eq. 6.1

K_u =	11.17	English units
y =	13.75	Average depth of flow upstream of the bridge, ft
D_{50} =	0.2	Grain size, mm
V_{100} =	2.91	Mean velocity, channel or overbank, fps

V_c =	1.50	ft/s

100-Year channel or overbank

If $V_c > V_{100}$, clear water scour exists.

If $V_{100} > V_c$, live bed scour exists.

FHWA HEC-18, "Evaluating Scour at Bridges", Fifth Edition, April 2012

Chapter 6.2.1 Critical Velocity for Clear Water vs. Live Bed Contraction Scour

Stream: Des Plaines River
Route \ County: I-55\Cook
S.N.: 016-2704

By: EMB 2.15.18
Checked: FDM 2.19.18

$$V_c = K_u \, y^{1/6} \, D^{1/3}$$ Eq. 6.1

K_u =	11.17	English units
y =	13.96	Average depth of flow upstream of the bridge, ft
D_{50} =	0.2	Grain size, mm
V_{200} =	2.96	Mean velocity, channel or overbank, fps

V_c =	1.51	ft/s

200-Year channel or overbank

If $V_c > V_{200}$, clear water scour exists.

If $V_{200} > V_c$, live bed scour exists.

Contraction Scour

Stream: Des Plaines River

Route \ County: I-55\ Cook

S.N. : 016-2704

By: EMB 2/15/2018

Checked: FDM 2/15/2018

			Q_{100}	Q_{200}
Hydraulic Depth @ APPR XS 7.7	(y_1)	ft	13.75	13.96
Channel TopWidth @ APPR XS 7.7	(W_1)	ft	192.46	192.46
Channel Top Width @ BRIDG XS 7.48U	(W_2)	ft	230.05	230.05
Contracted Channel Flow @ BRIDG XS 7.48U	(Q_2)	cfs	8199.98	8477.64
Main Channel Flow @ APPR XS 7.7	(Q_1)	cfs	7690.74	7937.89
Slope of Energy Grade line @ APPR XS 7.7	(S_1)		0.000143	0.000146
	V_*		0.252	0.256
Vratio; ShearV/FallV			2.5	2.5
	k_1	=	0.69	0.69
	k_2	=	0.37	0.37
	y_2	=	12.8	13.1
Depth of Contraction Scour,	$y_{(scour)}$	=	**-0.9**	**-0.9**
			{ft}	{ft} {ft}

$$\frac{y_2}{y_1} = \left(\frac{Q_2}{Q_1}\right)^{6/7} \left(\frac{W_1}{W_2}\right)^{k_1}$$

$$y_{(scour)} = y_2 - y_o$$

Vratio; V_*/ω	k_1	k_2	Mode of Bed Material Transport
<0.50	0.59	0.066	Mostly contact bed material discharge
0.50 to 2.0	0.64	0.21	Some suspended bed material discharge
>2.0	0.69	0.37	Mostly suspended bed material discharge

$$V_* = (g y_1 S_1)^{\frac{1}{2}}$$

V_* = Shear velocity (ShearV) in upstream section, (fps)

ω = Median fall velocity (FallV) of bed material based on the D_{50}, (fps)

g = Acceleration of gravity, (32.2 ft/s^2)

S_1 = Slope of energy grade line of main channel, (ft/ft)

D_{50} = median diameter of the bed material, (ft)

assumptions \ directions:

* **$y_o = y_1$ (y_o = existing depth at bridge section before scour)**
* **To be conservative, V_*/ω can be assumed to be 2.5**

Based on HEC-18; Evaluating Scour at Bridges
April 2012 5th Edition
Eq. 6.2 (Live bed scour)

Pier Scour

Pier # **1 through 4**

Stream: **Des Plaines River** **By:** EMB 2/15/2018

Route \ County: **I-55\Cook** **Checked:** FDM 2/19/2018

S.N.: **016-2704**

				Q_{100}	Q_{200}
Attack angle of flow	(theta)	deg.		0	0
Length of pier	(L)	ft		268	268
Width of pier	(a)	ft		5.25	5.25
Average Velocity	(V)	fps		2.43	2.48
Depth of flow at pier	(y_1)	ft		13.7	13.9
Pier type code		(1 thru 5)		2	2
(maximum = 12)			L/a =	12	12
			K_1 =	1.0	1.0
			K_2 =	1.0	1.0
			K_3 =	1.1	1.1
			Fr =	0.116	0.117
Depth of Pier Scour, y_s =				**6.39**	**6.46**
				{ft}	{ft}

$$\frac{y_s}{a} = 2.0 K_1 K_2 K_3 \left(\frac{y_1}{a}\right)^{0.35} Fr^{0.43}$$

$$Fr = \frac{V}{(g y_1)^{\frac{1}{2}}}$$

assumptions \ directions:

- **The correction factor for pier nose shape is taken from HEC-18 Table 7.1. However, for an attack angle > 5 degrees, K_1 is equal to unity. In that case, use pier type code 2.**
- **K_2 is computed with the formula located below Table 7.2.**
- **K_3 is set at 1.1, which represents the absence of dunes or a dune bed configuration with crest heights under 10 feet. (See Table 7.3 from HEC-18.) Adjust this accordingly for dune heights > 10 feet.**

NOTE: This spreadsheet computes pier scour under the assumption the footing or pile cap is not exposed by some combination of contraction scour, long-term degradation or stream migration. If that is not the case, then scour due to the footing or pile cap may control. See Ch. 6 of HEC-18.

SECTION 14.B

PROPOSED CONDITIONS
SCOUR ANALYSIS

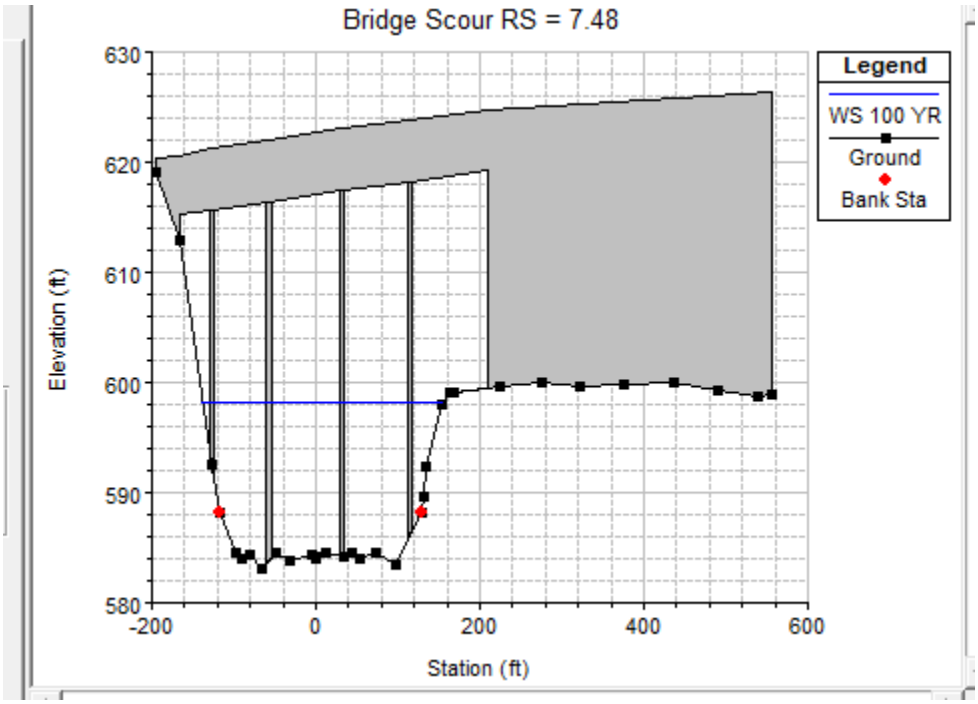
Stream:	**Des Plaines River**	**By:**	EMB 2/15/2018
Route \ County:	**I-55\Cook**	**Checked:**	FDM 2/19/2018

I-55 Over the Des Plaines River Scour Summary
Proposed Conditions
August 2018 Submittal

Event	Abutment/ Contraction Scour[1]	Pier Scour	Contraction Scour	Total Pier Scour Depth[2]
Q_{100}	N/A	6.39	0.0	6.39
Q_{200}	N/A	6.46	0.0	6.46

Note 1. Abutments are above and outside of flood limits.
Note 2. Include only Pier Scour. Per IDOT Drainage Manual Section 10-006, aggradation is not considered in the cumulative calculated scour depth.

100-YR PROPOSED HEC RAS OUTPUT



Contraction | Pier | Abutment

	LOB	Channel	ROB
Y1:	5.31	13.75	5.59
V1:	1.20	2.91	1.20
Y0:	5.08	13.68	3.97
Q2:	70.27	8199.98	129.75
W2:	15.42	230.05	28.27
D50:	0.20	0.20	0.20
Equation:	Defau	Defau	Defau

Live Bed Specific Data

Q1:	273.62	7690.74	435.64
W1:	43.05	192.46	64.84
K1: K1 ...	0.690	0.690	0.690

Approach XS River Sta.: 7.7

Contraction | Pier | Abutment

Maximum V1 Y1 | Local V1 Y1

Pier # Apply to All Piers

Shape: Round nose

a: 5.25 D50:

Y1: 13.70 V1: 2.43 Fr1: 0.116

Method CSU equation

CSU's Eqn. Specific Data

K1: 1.00

Angle: 0.00 L: 290.78

K2: 1.00

K3: 1.1 - Clear-Water Scour

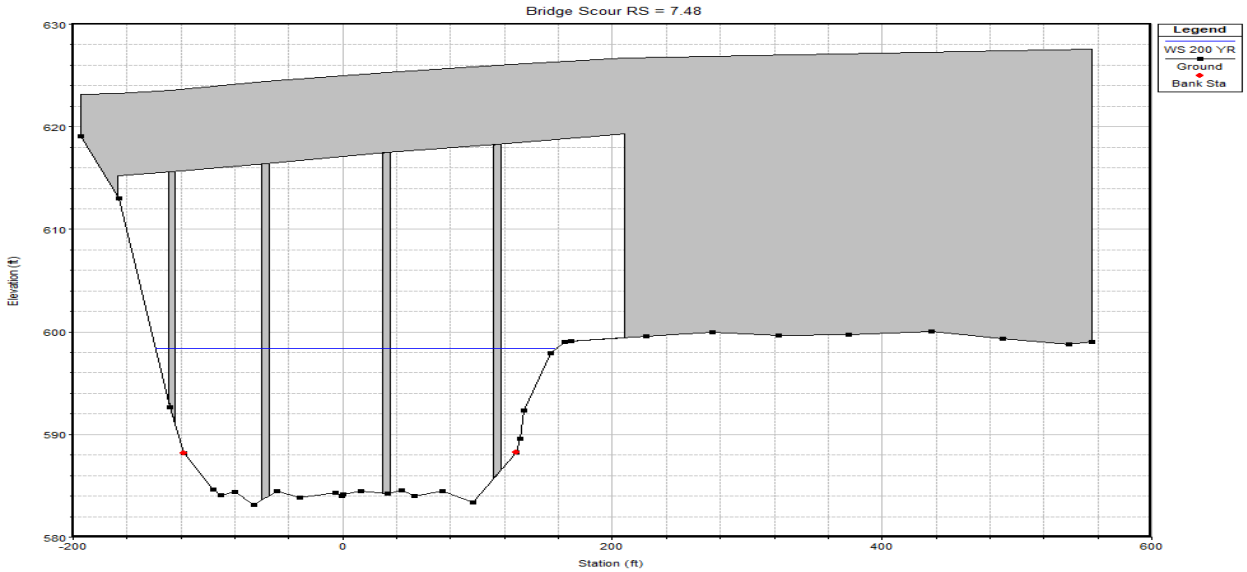
D95: K4: 1.00

Froelich's Eqn. Specific Data

a': Phi: 1.00

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9	100 YR	8400.00	583.02	598.92		598.96	0.000049	1.80	5452.85	444.03	0.08
Reach-1	8	100 YR	8400.00	581.62	598.66		598.73	0.000077	2.28	4082.19	344.06	0.10
Reach-1	7.85	100 YR	8400.00	580.58	598.33		598.46	0.000132	2.96	3197.04	294.75	0.13
Reach-1	7.7	100 YR	8400.00	582.89	598.27		598.39	0.000143	2.91	3238.30	300.35	0.14
Reach-1	7.55	100 YR	8400.00	583.18	598.25	587.83	598.34	0.000101	2.43	3590.19	295.14	0.12
Reach-1	7.48		Bridge									
Reach-1	7.40	100 YR	8400.00	583.68	598.14		598.25	0.000118	2.60	3300.76	276.69	0.13
Reach-1	7.25	100 YR	8400.00	583.48	598.07		598.19	0.000149	2.96	3124.76	299.60	0.14
Reach-1	7	100 YR	8400.00	582.92	598.04		598.14	0.000124	2.70	3549.65	339.24	0.13
Reach-1	6.8	100 YR	8400.00	583.31	597.96		598.10	0.000156	3.00	3080.01	298.01	0.14
Reach-1	6	100 YR	8400.00	584.02	597.38	588.60	597.52	0.000183	3.13	3159.70	436.08	0.15

200-YR PROPOSED HEC RAS OUTPUT



Contraction | Pier | Abutment

	LOB	Channel	ROB
Y1:	5.44	13.96	5.75
V1:	1.22	2.96	1.23
Y0:	5.16	13.88	3.91
Q2:	74.14	8477.64	140.22
W2:	15.80	230.05	30.24
D50:	0.20	0.20	0.20
Equation:	Defau	Defau	Defau

Live Bed Specific Data

Q1:	290.54	7937.89	463.56
W1:	43.67	192.46	65.31
K1: K1 ...	0.690	0.690	0.690

Approach XS River Sta.: 7.7

Contraction | Pier | Abutment

Maximum V1 Y1 | Local V1 Y1

Pier #: Apply to All Piers

Shape: Round nose

a: 5.25 D50:

Y1: 13.90 V1: 2.48 Fr1: 0.117

Method: CSU equation

CSU's Eqn. Specific Data

K1: 1.00

Angle: L: 290.78

K2:

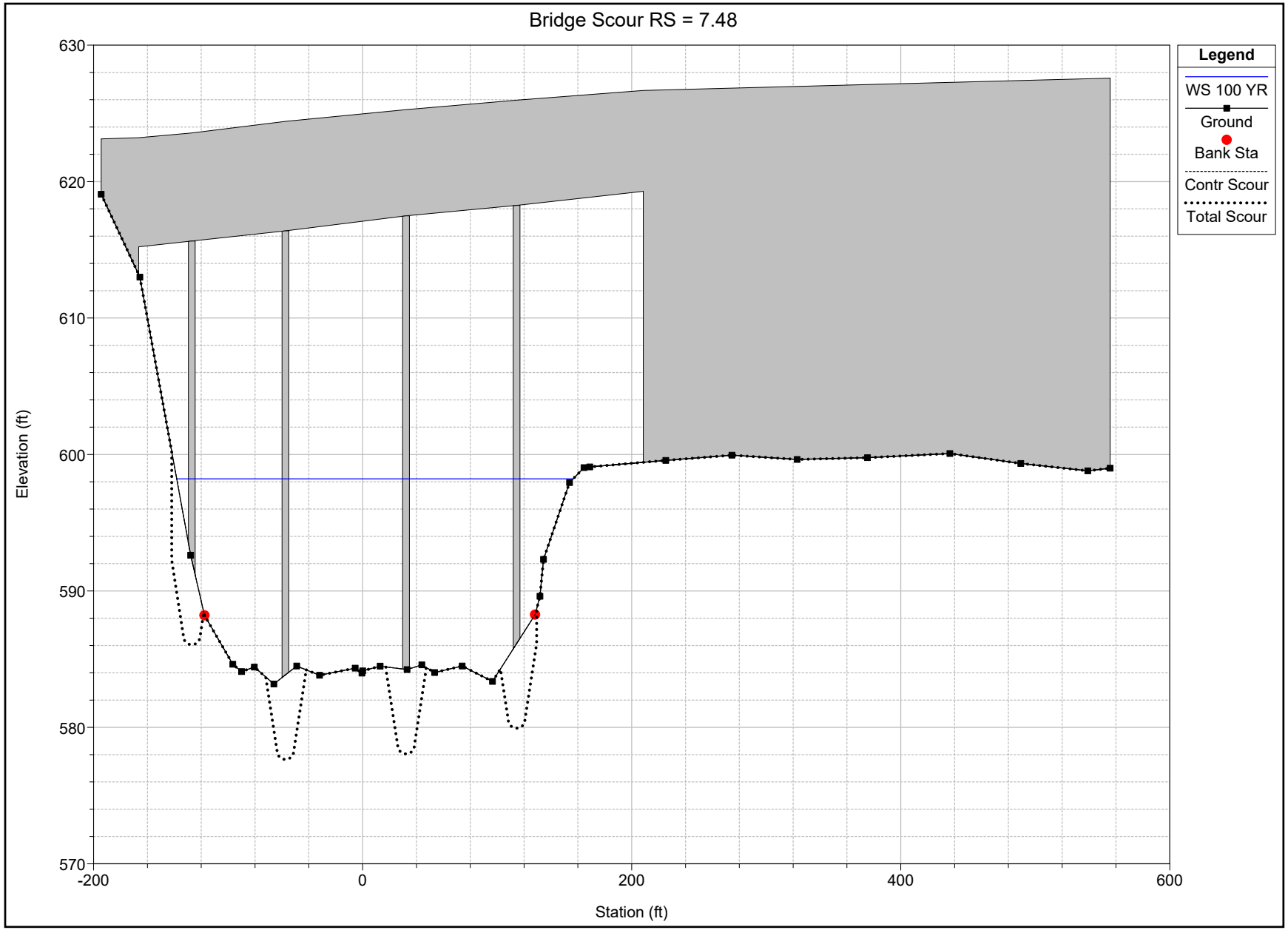
K3: 1.1 - Clear-Water Scour

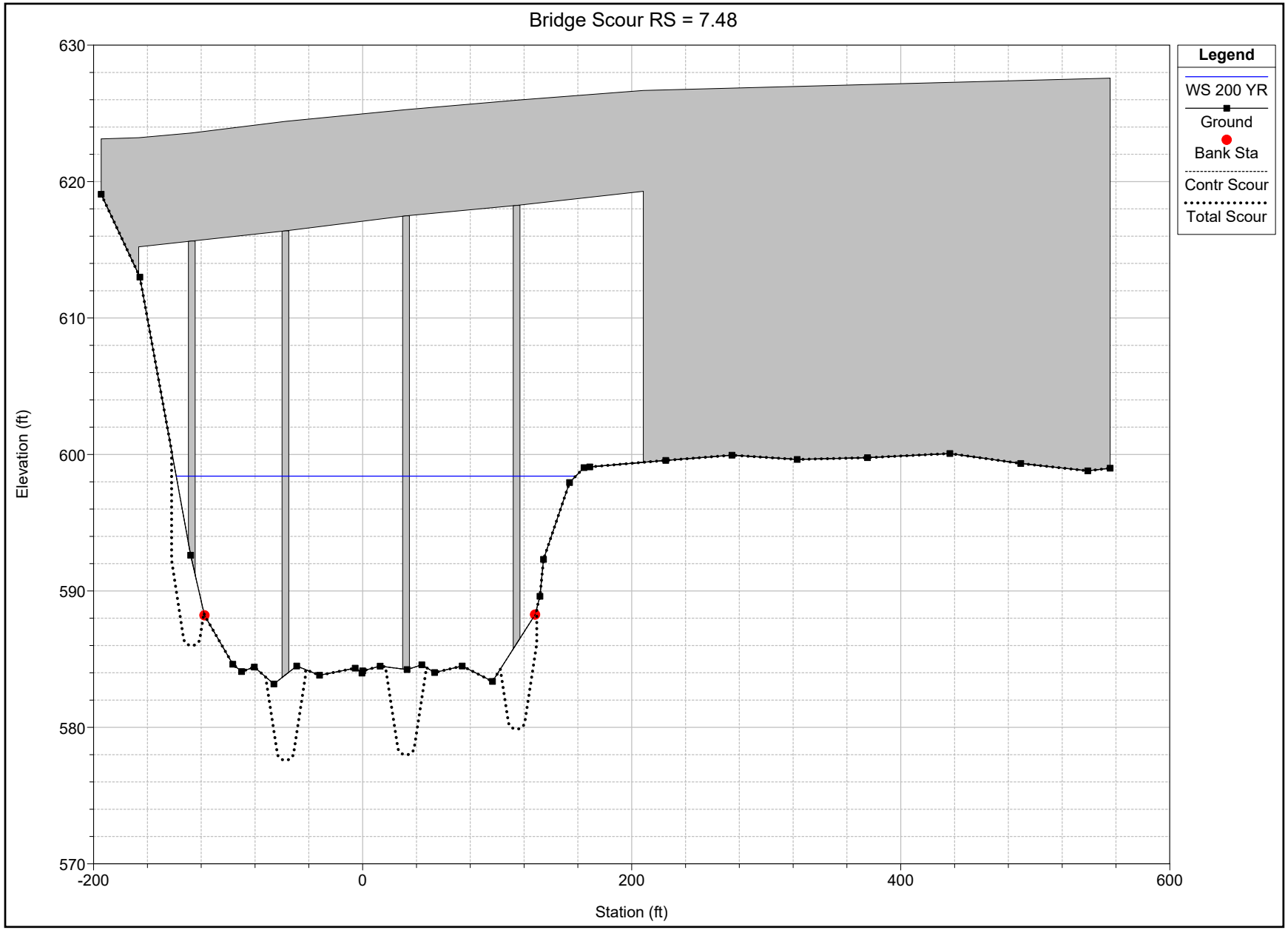
D95: K4: 1.00

Froelich's Eqn. Specific Data

a': Phi: 1.00

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9	200 YR	8692.00	583.02	599.14		599.18	0.000050	1.83	5548.16	444.98	0.08
Reach-1	8	200 YR	8692.00	581.62	598.87		598.94	0.000078	2.32	4154.59	344.84	0.10
Reach-1	7.85	200 YR	8692.00	580.58	598.54		598.67	0.000134	3.02	3257.36	297.10	0.14
Reach-1	7.7	200 YR	8692.00	582.89	598.47		598.60	0.000145	2.96	3299.40	301.44	0.14
Reach-1	7.55	200 YR	8692.00	583.18	598.45	587.92	598.55	0.000102	2.48	3650.29	297.50	0.12
Reach-1	7.48		Bridge									
Reach-1	7.40	200 YR	8692.00	583.68	598.34		598.45	0.000120	2.65	3359.44	310.03	0.13
Reach-1	7.25	200 YR	8692.00	583.48	598.26		598.40	0.000152	3.02	3184.97	306.74	0.14
Reach-1	7	200 YR	8692.00	582.92	598.24		598.35	0.000126	2.74	3617.26	341.39	0.13
Reach-1	6.8	200 YR	8692.00	583.31	598.16		598.30	0.000159	3.05	3138.83	299.54	0.15
Reach-1	6	200 YR	8692.00	584.02	597.57	588.71	597.71	0.000185	3.18	3244.68	459.03	0.16


Bridge Scour RS = 7.48
Legend
WS 100 YR
Ground
Bank Sta
Contr Scour
Total Scour
Elevation (ft)
630
620
610
600
590
580
570
-200
0
200
400
600
Station (ft)


Bridge Scour RS = 7.48
Legend
WS 200 YR
Ground
Bank Sta
Contr Scour
Total Scour
Elevation (ft)
630
620
610
600
590
580
570
-200
0
200
400
600
Station (ft)

FHWA HEC-18, "Evaluating Scour at Bridges", Fifth Edition, April 2012

Chapter 6.2.1 Critical Velocity for Clear Water vs. Live Bed Contraction Scour

Stream: Des Plaines River
Route \ County: I-55\Cook
S.N.: 016-2704

By: EMB 2/15/18
Checked: FDM 2/18/2018

$$V_c = K_u \, y^{1/6} \, D^{1/3}$$ Eq. 6.1

K_u =	11.17	English units
y =	13.75	Average depth of flow upstream of the bridge, ft
D_{50} =	0.2	Grain size, mm
V_{100} =	2.91	Mean velocity, channel or overbank, fps

V_c =	1.50	ft/s

100-Year channel or overbank

If $V_c > V_{100}$, clear water scour exists.

If $V_{100} > V_c$, live bed scour exists.

FHWA HEC-18, "Evaluating Scour at Bridges", Fifth Edition, April 2012

Chapter 6.2.1 Critical Velocity for Clear Water vs. Live Bed Contraction Scour

Stream: Des Plaines River
Route \ County: I-55\Cook
S.N.: 016-2704

By: EMB 2.15.18
Checked: FDM 2.18.18

$$V_c = K_u \, y^{1/6} \, D^{1/3}$$ Eq. 6.1

K_u =	11.17	English units
y =	13.96	Average depth of flow upstream of the bridge, ft
D_{50} =	0.2	Grain size, mm
V_{200} =	2.96	Mean velocity, channel or overbank, fps

V_c =	1.51	ft/s

200-Year channel or overbank

If $V_c > V_{200}$, clear water scour exists.

If $V_{200} > V_c$, live bed scour exists.

Contraction Scour

Stream: Des Plaines River

Route \ County: I-55\ Cook

S.N. : 016-2704

By: EMB2/15/2018

Checked: FDM 2/18/2018

			Q_{100}	Q_{200}
Hydraulic Depth @ APPR XS 7.7	(y_1)	ft	13.75	13.96
Channel TopWidth @ APPR XS 7.7	(W_1)	ft	192.46	192.46
Channel Top Width @ BRIDG XS 7.48U	(W_2)	ft	230.05	230.05
Contracted Channel Flow @ BRIDG XS 7.48U	(Q_2)	cfs	8199.98	8477.64
Main Channel Flow @ APPR XS 7.7	(Q_1)	cfs	7690.74	7937.89
Slope of Energy Grade line @ APPR XS 7.7	(S_1)		0.000143	0.000146
	V_*		0.252	0.256
Vratio; ShearV/FallV			2.5	2.5
	k_1	=	0.69	0.69
	k_2	=	0.37	0.37
	y_2	=	12.8	13.1
Depth of Contraction Scour,	$y_{(scour)}$	=	**-0.9**	**-0.9**
			{ft}	{ft} {ft}

$$\frac{y_2}{y_1} = \left(\frac{Q_2}{Q_1}\right)^{6/7} \left(\frac{W_1}{W_2}\right)^{k_1}$$

$$y_{(scour)} = y_2 - y_o$$

Vratio; V_*/ω	k_1	k_2	Mode of Bed Material Transport
<0.50	0.59	0.066	Mostly contact bed material discharge
0.50 to 2.0	0.64	0.21	Some suspended bed material discharge
>2.0	0.69	0.37	Mostly suspended bed material discharge

$$V_* = (g y_1 S_1)^{\frac{1}{2}}$$

V_* = Shear velocity (ShearV) in upstream section, (fps)

ω = Median fall velocity (FallV) of bed material based on the D_{50}, (fps)

g = Acceleration of gravity, (32.2 ft/s^2)

S_1 = Slope of energy grade line of main channel, (ft/ft)

D_{50} = median diameter of the bed material, (ft)

assumptions \ directions:

* **$y_o = y_1$ (y_o = existing depth at bridge section before scour)**
* **To be conservative, V_*/ω can be assumed to be 2.5**

Based on HEC-18; Evaluating Scour at Bridges
April 2012 5th Edition
Eq. 6.2 (Live bed scour)

Pier Scour

Pier # **1 through 4**

Stream: **Des Plaines River** **By:** EMB 2/15/2018

Route \ County: **I-55\Cook** **Checked:** FDM 2/19/2018

S.N.: **016-2704**

				Q_{100}	Q_{200}
Attack angle of flow	(theta)	deg.		0	0
Length of pier	(L)	ft		290.78	290.78
Width of pier	(a)	ft		5.25	5.25
Average Velocity	(V)	fps		2.43	2.48
Depth of flow at pier	(y_1)	ft		13.7	13.9
Pier type code		(1 thru 5)		2	2
(maximum = 12)		L/a =		12	12
		K_1 =		1.0	1.0
		K_2 =		1.0	1.0
		K_3 =		1.1	1.1
		Fr =		0.116	0.117
Depth of Pier Scour, y_s =				**6.39**	**6.46**
				{ft}	{ft}

$$\frac{y_s}{a} = 2.0 K_1 K_2 K_3 \left(\frac{y_1}{a}\right)^{0.35} Fr^{0.43}$$

$$Fr = \frac{V}{(g y_1)^{\frac{1}{2}}}$$

assumptions \ directions:

- **The correction factor for pier nose shape is taken from HEC-18 Table 7.1. However, for an attack angle > 5 degrees, K_1 is equal to unity. In that case, use pier type code 2.**
- **K_2 is computed with the formula located below Table 7.2.**
- **K_3 is set at 1.1, which represents the absence of dunes or a dune bed configuration with crest heights under 10 feet. (See Table 7.3 from HEC-18.) Adjust this accordingly for dune heights > 10 feet.**

NOTE: This spreadsheet computes pier scour under the assumption the footing or pile cap is not exposed by some combination of contraction scour, long-term degradation or stream migration. If that is not the case, then scour due to the footing or pile cap may control. See Ch. 6 of HEC-18.

SECTION 14.C

2013 COLLINS ENGINEERING HYDROGRAPHIC SCOUR STUDY

ILLINOIS DEPARTMENT OF TRANSPORTATION

I-55 HYDROGRAPHIC SURVEYS

OVER THE SOUTH FORK OF THE CHICAGO RIVER,
THE CHICAGO SANITARY AND SHIP CANAL AND
THE DES PLANES RIVER
COOK COUNTY, IL

CLIENT:
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CHICAGO, IL 60603
312-262-2400
JOHN.OHOLLERAN@STANTEC.COM

CIVIL ENGINEER/SURVEYOR:
COLLINS ENGINEERS, INC.
NICHOLAS R. TRIANDAFILOU, P.E., S.E.
123 N WACKER DR.
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CHICAGO, IL 60606
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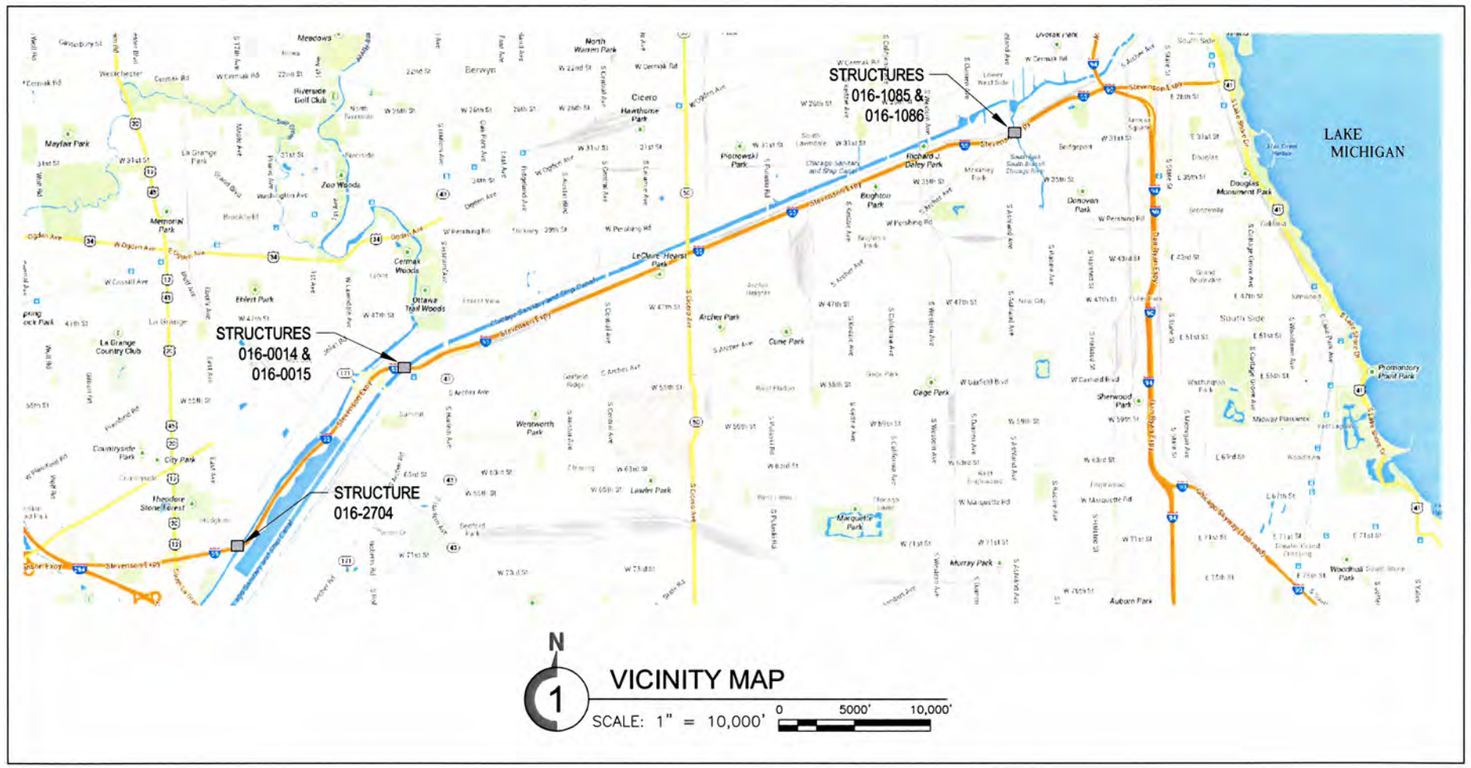
NTRIANDAFILOU@COLLINSENGR.COM

Nicholas R. Triandafilou
062-060449
LICENSED PROFESSIONAL ENGINEER OF ILLINOIS
EXP. 11-30-2013

INDEX OF DRAWINGS



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Chicago, IL 60606
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Illinois Department of Transportation

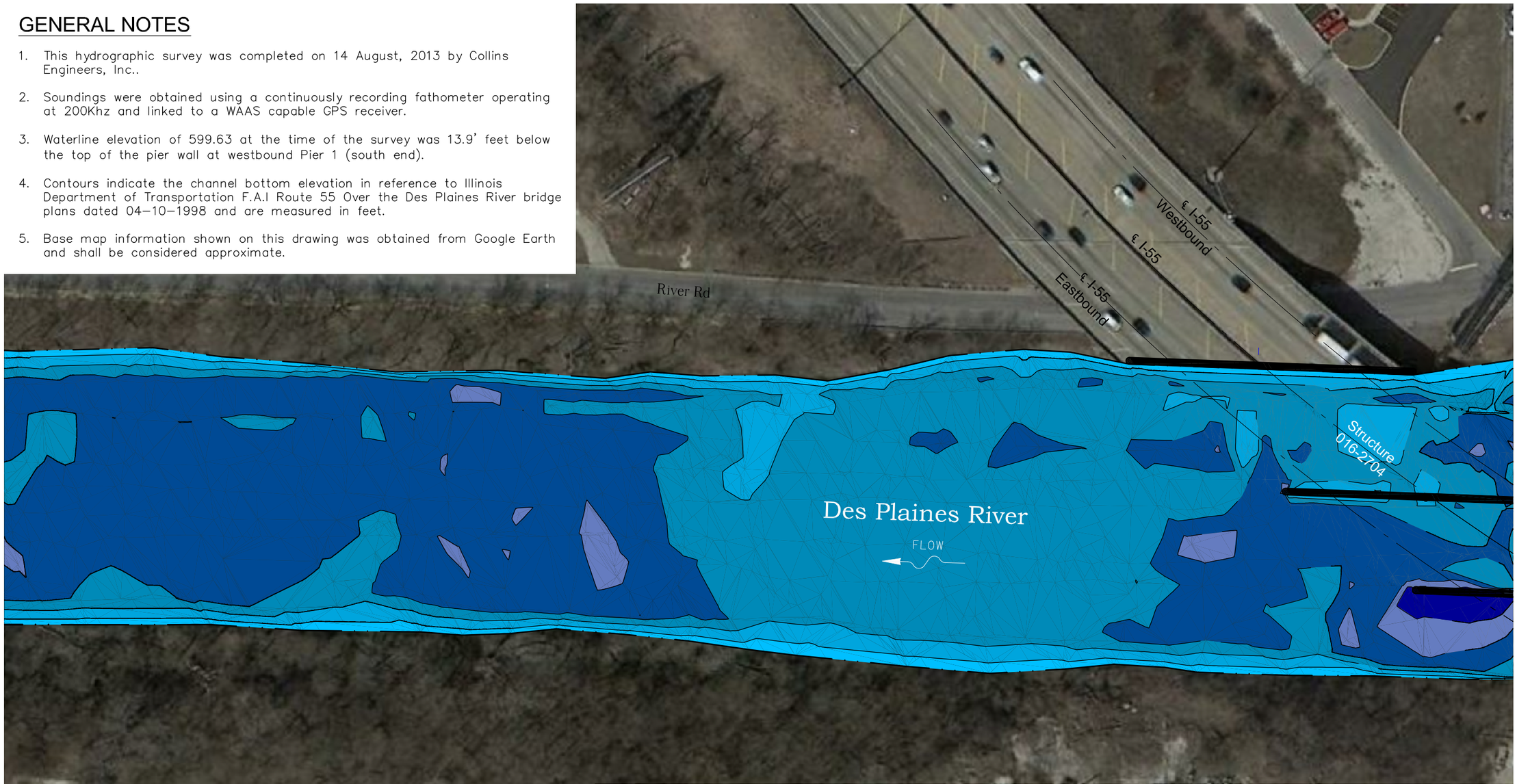
I-55 Hydrographic Surveys
Title Sheet
Cook County, IL

CEI PROJECT	10-08095
SURVEYED BY:	CSH
DRAWN BY:	CSH
CHECKED BY:	NRT
DATE:	13 AUG 2013
SHEET NO:	H-01

G:\8095-10 I-55 CHANNEL SURVEYS\CAD\SHEET DRAWINGS\8095 - TITLE.DWG 09/30/2013 03:22:25 PM

GENERAL NOTES

1. This hydrographic survey was completed on 14 August, 2013 by Collins Engineers, Inc..
2. Soundings were obtained using a continuously recording fathometer operating at 200Khz and linked to a WAAS capable GPS receiver.
3. Waterline elevation of 599.63 at the time of the survey was 13.9' feet below the top of the pier wall at westbound Pier 1 (south end).
4. Contours indicate the channel bottom elevation in reference to Illinois Department of Transportation F.A.I Route 55 Over the Des Plaines River bridge plans dated 04–10–1998 and are measured in feet.
5. Base map information shown on this drawing was obtained from Google Earth and shall be considered approximate.



1 HYDROGRAPHIC SURVEY - SOUTH HALF

SCALE: 1" = 80' 0 40' 80'

ELEVATION KEY		
Max. Elev.	Min. Elev.	Color
599.6	599.0	
599.0	598.0	
598.0	597.0	
597.0	596.0	
596.0	595.0	
595.0	594.0	
594.0	593.0	

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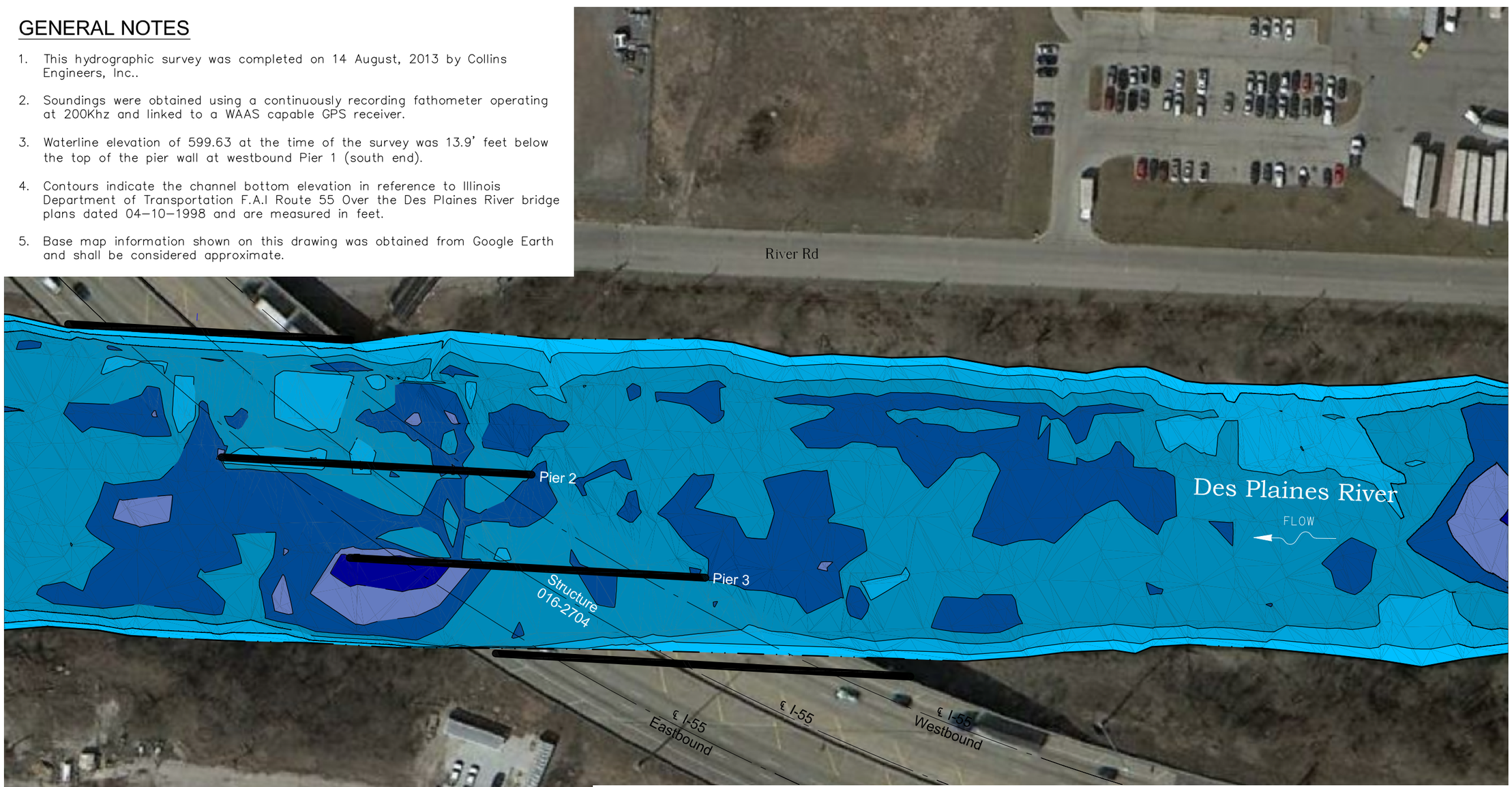
Illinois Department of Transportation

I-55 Hydrographic Surveys
Structure 016-2704
Overall - South Half
Cook County, IL

CEI PROJECT	10–08095
SURVEYED BY:	CSH
DRAWN BY:	CSH
CHECKED BY:	NRT
DATE:	14 AUG 2013
SHEET NO:	H-14

GENERAL NOTES

1. This hydrographic survey was completed on 14 August, 2013 by Collins Engineers, Inc..
2. Soundings were obtained using a continuously recording fathometer operating at 200Khz and linked to a WAAS capable GPS receiver.
3. Waterline elevation of 599.63 at the time of the survey was 13.9' feet below the top of the pier wall at westbound Pier 1 (south end).
4. Contours indicate the channel bottom elevation in reference to Illinois Department of Transportation F.A.I Route 55 Over the Des Plaines River bridge plans dated 04–10–1998 and are measured in feet.
5. Base map information shown on this drawing was obtained from Google Earth and shall be considered approximate.



1 HYDROGRAPHIC SURVEY - NORTH HALF

SCALE: 1" = 80' 0 40' 80'

ELEVATION KEY		
Max. Elev.	Min. Elev.	Color
599.6	599.0	
599.0	598.0	
598.0	597.0	
597.0	596.0	
596.0	595.0	
595.0	594.0	
594.0	593.0	

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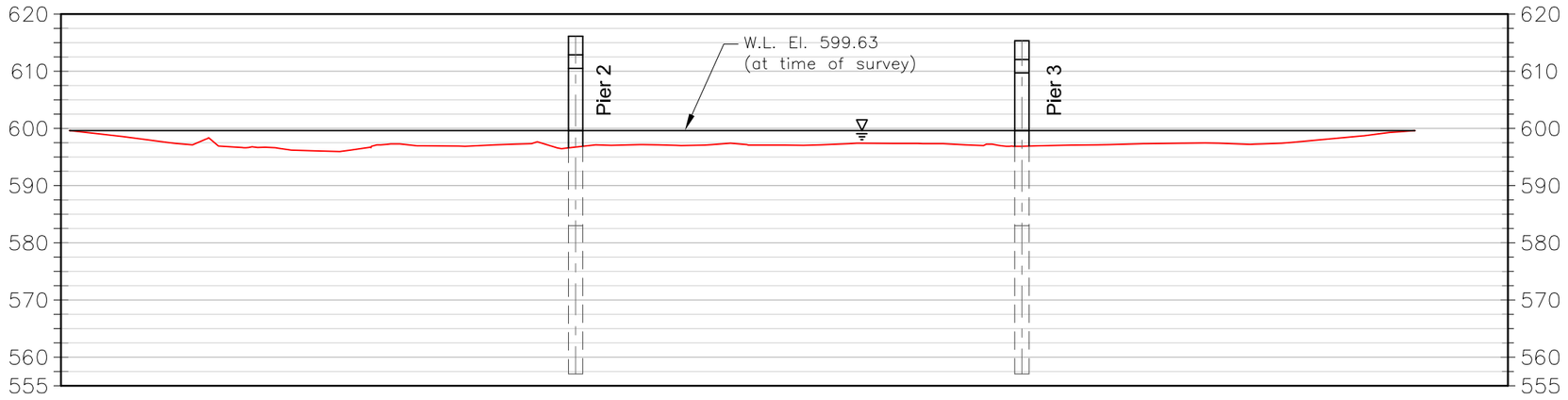
I-55 Hydrographic Surveys
Structure 016-2704
Overall - North Half
Cook County, IL

CEI PROJECT	10–08095
SURVEYED BY:	CSH
DRAWN BY:	CSH
CHECKED BY:	NRT
DATE:	14 AUG 2013
SHEET NO:	H-15



UPSTREAM FASCIA
CHANNEL CROSS SECTION
(LOOKING NORTH)

1

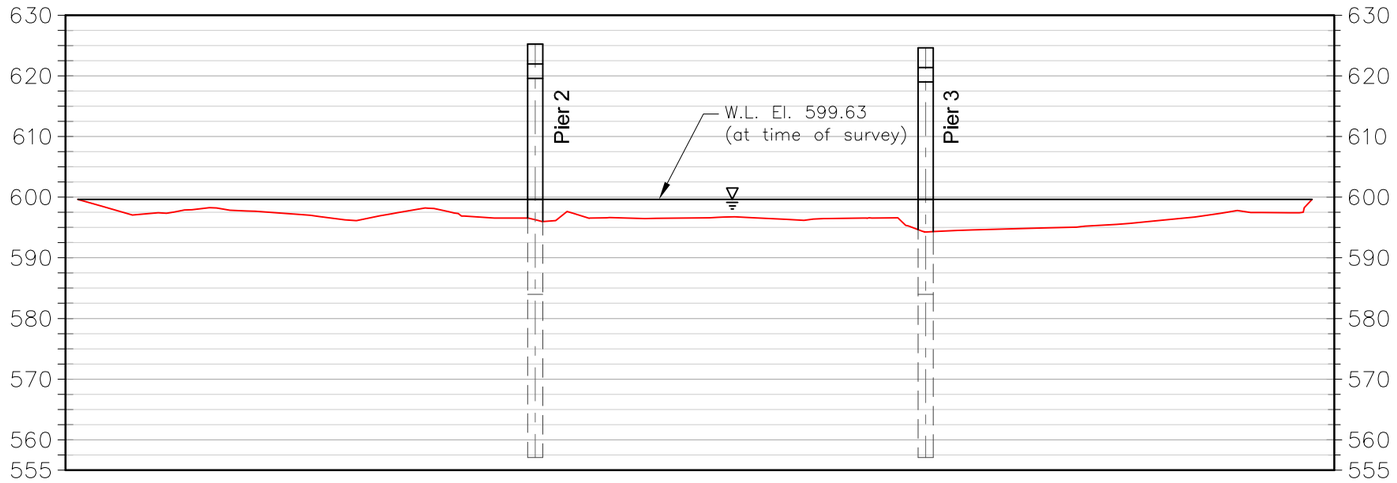
SCALE: H:1" = 50' V:1" = 25'

LEGEND

— 2013 Channel Bottom

GENERAL NOTES

1. This hydrographic survey was completed on 14 August, 2013 by Collins Engineers, Inc..
2. Soundings were obtained using a continuously recording fathometer operating at 200Khz and linked to a WAAS capable GPS receiver.
3. Waterline elevation of 599.63 at the time of the survey was 13.9' feet below the top of the pier wall at westbound Pier 1 (south end).
4. Previous channel bottom data not available.



DOWNSTREAM FASCIA
CHANNEL CROSS SECTION
(LOOKING NORTH)

2

SCALE: H:1" = 50' V:1" = 25'

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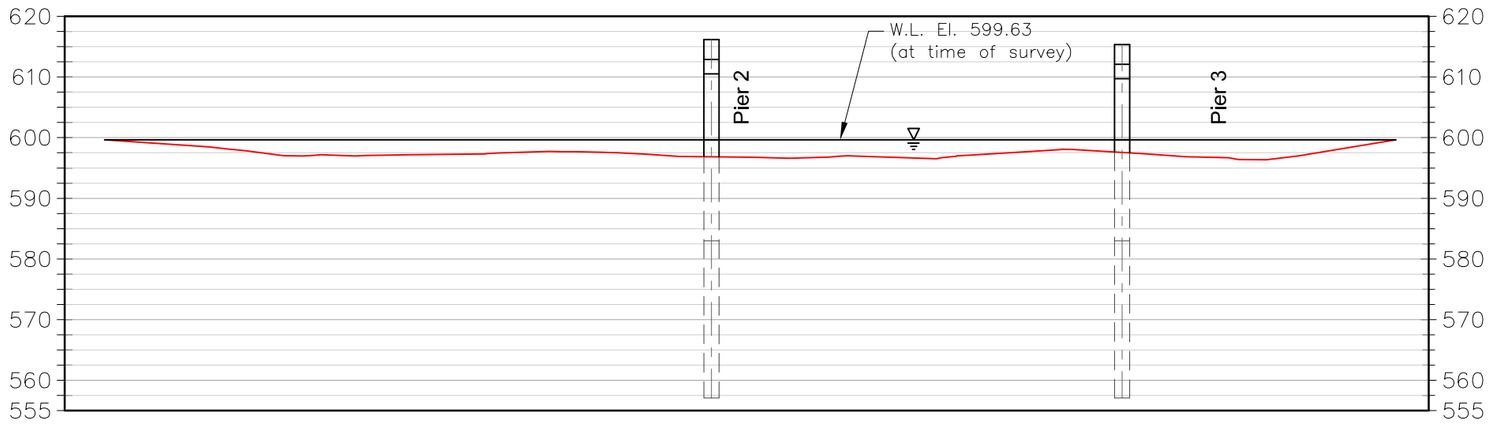
I-55 Hydrographic Surveys
Structure 016-2704
Channel Cross Sections
Cook County, IL

CEI PROJECT 10–08095
SURVEYED BY: CSH
DRAWN BY: CSH
CHECKED BY: NRT
DATE: 14 AUG 2013
SHEET NO: H-16



100' UPSTREAM CHANNEL
CROSS SECTION
(LOOKING NORTH)

1

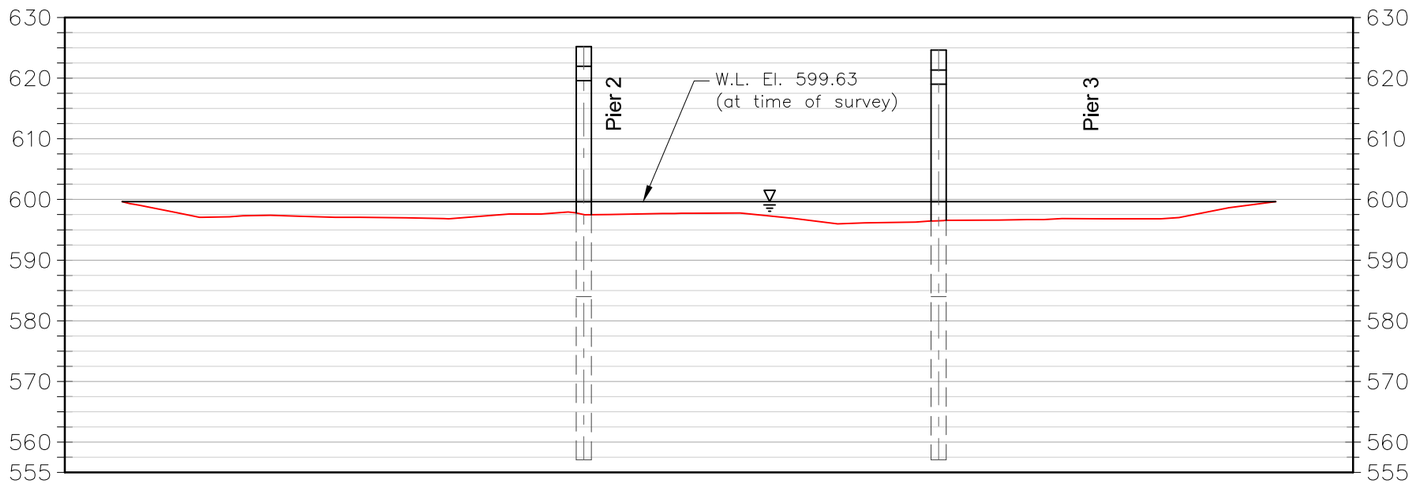
SCALE: H:1" = 50' V:1" = 25'

LEGEND

— 2013 Channel Bottom

GENERAL NOTES

1. This hydrographic survey was completed on 14 August, 2013 by Collins Engineers, Inc..
2. Soundings were obtained using a continuously recording fathometer operating at 200Khz and linked to a WAAS capable GPS receiver.
3. Waterline elevation of 599.63 at the time of the survey was 13.9' feet below the top of the pier wall at westbound Pier 1 (south end).
4. Previous channel bottom data not available.



100' DOWNSTREAM
CHANNEL CROSS SECTION
(LOOKING NORTH)

2

SCALE: H:1" = 50' V:1" = 25'

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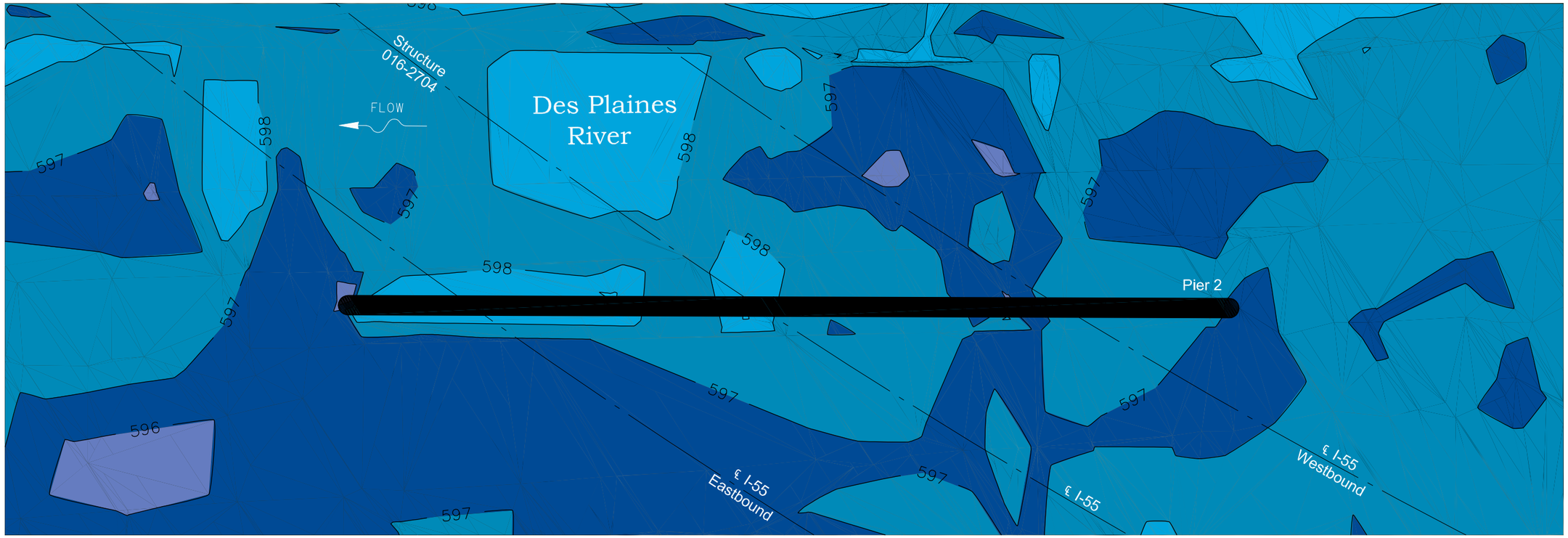
Illinois Department of Transportation

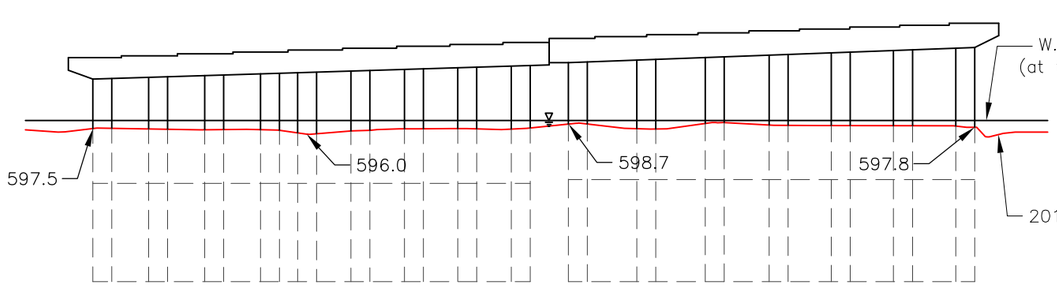
I-55 Hydrographic Surveys
Structure 016-2704
Channel Cross Sections
Cook County, IL

CEI PROJECT	10–08095
SURVEYED BY:	CSH
DRAWN BY:	CSH
CHECKED BY:	NRT
DATE:	14 AUG 2013
SHEET NO:	H-17



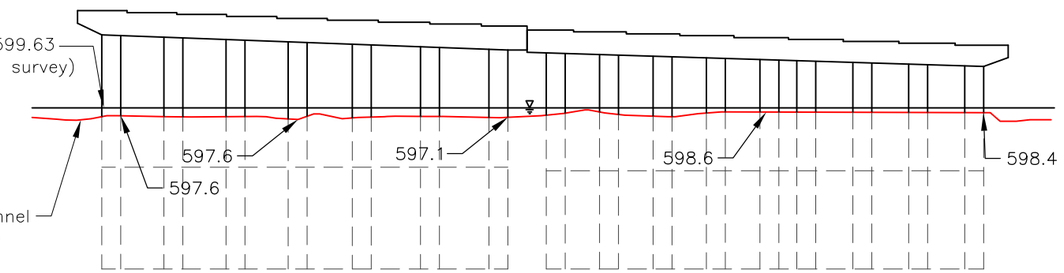
1 PIER 2 PLAN VIEW

SCALE: 1" = 30' 0 15' 30'



2 PIER 2 WEST FACE

SCALE: 1" = 40' 0 20' 40'



3 PIER 2 EAST FACE

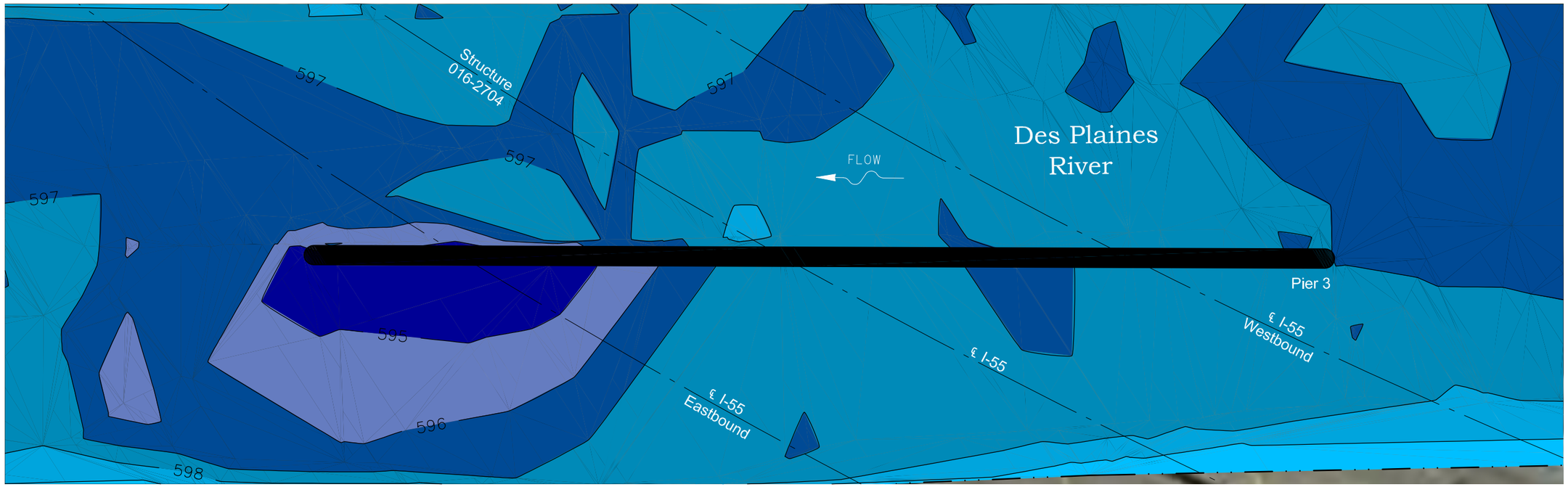
SCALE: 1" = 40' 0 20' 40'

COLLINS ENGINEERS
123 N Wacker Dr.
Suite. 900
Chicago, IL 60606
www.collinsengr.com

Illinois Department of Transportation

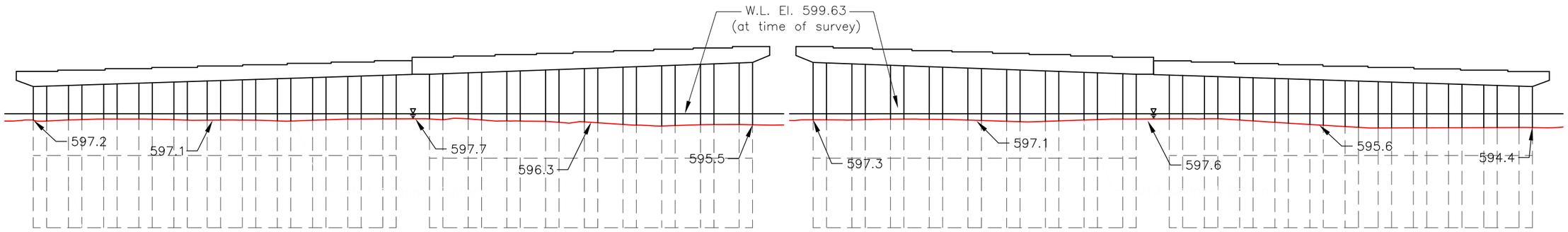
I-55 Hydrographic Surveys
Structure 016-2704
Pier 2 Details
Cook County, IL

CEI PROJECT 10–08095
SURVEYED BY: CSH
DRAWN BY: CSH
CHECKED BY: NRT
DATE: 14 AUG 2013
SHEET NO: H-18



1 PIER 3 PLAN VIEW

SCALE: 1" = 30' 0 15' 30'



2 PIER 3 WEST FACE

SCALE: 1" = 40' 0 20' 40'

3 PIER 3 EAST FACE

SCALE: 1" = 40' 0 20' 40'

COLLINS ENGINEERS
123 N Wacker Dr.
Suite. 900
Chicago, IL 60606
www.collinsengr.com

Illinois Department of Transportation

I-55 Hydrographic Surveys
Structures 016-2704
Pier 3 Details
Cook County, IL

CEI PROJECT	10-08095
SURVEYED BY:	CSH
DRAWN BY:	CSH
CHECKED BY:	NRT
DATE:	14 AUG 2013
SHEET NO:	H-19

G:\8095-10 I-55 CHANNEL SURVEYS\CAD\SHEET DRAWINGS\8095 - SECTIONS 016-2704.DWG 09/30/2013 01:54:26 PM

SECTION 14.D

1998 IDOT SOIL BORING LOGS

ROUTE No.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I 55	*	COOK	368	1
F.H.W.A. REGION		ILLINOIS	PROJECT	

* 0404-640R & 0404 (ETC; 676B) R-1

D-91-168-93 & D-91-295-92

FOR INDEX OF SHEETS, SEE SHEET NO. 2

PROJECT LOCATED IN:
VILLAGE OF HODGKINS
VILLAGE OF WILLOW SPRINGS

TRAFFIC DATA
US 12/20/45 (LAGRANGE ROAD):
1990 ADT: 14,700 – 36,000 VEHICLES
2010 ADT: 15,000 – 38,000 VEHICLES
INTERSTATE 55:
1990 ADT: 57,400 – 58,700 VEHICLES
2010 ADT: 74,000 – 77,000 VEHICLES

POSTED SPEED LIMIT
US 12/20/45: 45 MPH
INTERSTATE 55 : 55 MPH

DESIGN DESIGNATION
6900 (10) MAJOR 12.85 (COMPOSITE – 20)

SCALES				
	PLAN	1m = 500m	
	PROFILE	1m = 500m	HORIZ.
	PROFILE	1m = 100m	VERT.
	CROSS SECTIONS	1m = 100m	HORIZ.
		1m = 50m	VERT.

METRIC RATIOS

1 m 0 2 m
1 : 50

0 5 m 10 m
1 : 100

10 m 0 20 m
1 : 250

5 m 0 20 m
1 : 500

0 50 m 100 m
1 : 1000

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

CONTRACT NO. 82979 (EB)

DISTRICT ONE DESIGN ENGINEER: RICK YOUNG (847) 705-4232

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLANS FOR PROPOSED FEDERAL AID HIGHWAY

016-2904

F.A.I. 55 (STEVENSON EXPRESSWAY)

SECTION: 0404–640R & 0404 (ETC; 676B) R–1

NOTE: WHEREVER IN THESE PLANS THE SECTION IS REFERENCED IT SHALL MEAN 0404-640R & 0404 (ETC; 676B) R-1

US ROUTE 45 (LAGRANGE ROAD) TO EAST OF DESPLAINES RIVER EASTBOUND WIDENING, RESURFACING & BRIDGE REHABILITATION

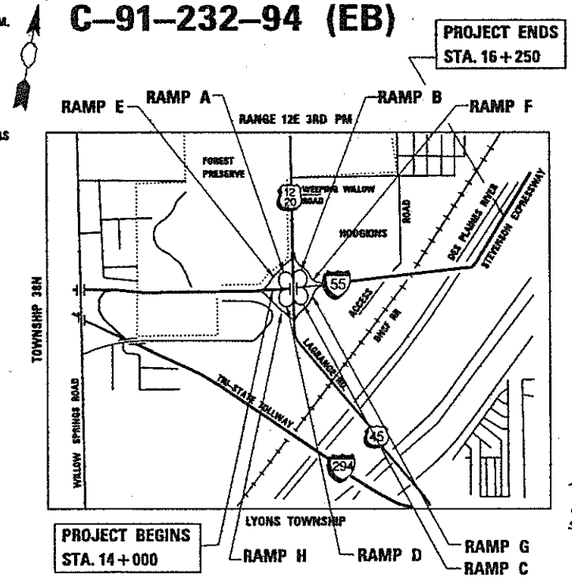
PROJECT: IM–55–7 (208) 278
COOK COUNTY
C–91–232–94 (EB)

ROADWAY:

EASTBOUND

- SCARIFY AND RESURFACE BITUMINOUS CONCRETE ALONG I-55 MAINLINE AND OUTSIDE SHOULDERS.
- CONSTRUCT CLOSED MEDIAN INCLUDING BITUMINOUS SHOULDERS, CONCRETE BARRIER AND DRAINAGE SYSTEM.
- REMOVE AND REPLACE EXISTING OUTSIDE STABILIZED SHOULDERS ALONG I-55 MAINLINE WITH TIED P.C.C. SHOULDERS INCLUDING SINGLE FACE CONCRETE BARRIERS EAST OF LAGRANGE ROAD INTERCHANGE.
- SCARIFY, PATCH AND RESURFACE RAMP D
- REMOVE AND REPLACE EXISTING STABILIZED SHOULDERS ALONG RAMP D WITH BITUMINOUS SHOULDERS.

SET 1 – STA 14+000 TO 15+110
SET 2 – STA 15+110 TO STA 16+250



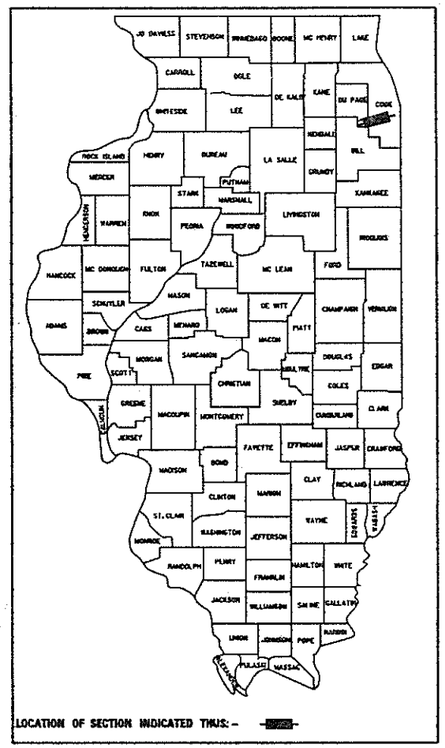
BRIDGES:

1. STRUCTURE NOS. 016-0004 ~~AND 016-0005~~ (4 SPAN CONTINUOUS NON-COMPOSITE PLATE GIRDER BRIDGES)
2. STRUCTURE NOS. 016-0006 ~~AND 016-0007~~ (3 SPAN CONTINUOUS NON-COMPOSITE PLATE GIRDER BRIDGES)
3. STRUCTURE NOS. 016-0008 ~~AND 016-0009~~ (3 SPAN CONTINUOUS NON-COMPOSITE PLATE GIRDER BRIDGES)

STRUCTURE NOS. 016-0010 AND 016-0011 (5 SPAN; 4 SPAN CONTINUOUS AND 1 SIMPLE SPAN, NON-COMPOSITE CURVED PLATE GIRDER BRIDGES).

EASTBOUND

- REMOVE EXISTING DECK, BARRIERS, AND LIGHTING.
- REPAIR SUBSTRUCTURES AND REPLACE SLOPEWALLS.
- REMOVE AND REPLACE EXISTING ABUTMENT BACKWALLS.
- CONSTRUCT COMPOSITE DECK AND BARRIERS INCLUDING MEDIAN WIDENING TO CL I-55.
- REPLACE BRIDGE OVER DESPLAINES RIVER.



LOCATION OF SECTION INDICATED THUS: –

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED July 6 19 98
DISTRICT ENGINEER
19
ENGINEER OF PROJECT DEVELOPMENT AND IMPLEMENTATION
August 14 19 98
ENGINEER OF DESIGN AND ENVIRONMENT
August 14 19 98
DIRECTOR, DIVISION OF HIGHWAYS

M. MICHAEL OKRENT 082-36705 REGISTERED PROFESSIONAL ENGINEER ILLINOIS
EXP 11/30/99
SET 1

ROBERT RASKIN 17899 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS
expires 11-30-99
SET 2

PRINTED BY THE AUTHORITY OF THE STATE OF ILLINOIS

REVISED PLAN SHEETS
1 Rev. 11-2-98

alfred benesch & company
CONSULTING ENGINEERS
205 NORTH MICHIGAN AVENUE, CHICAGO, ILLINOIS 60601
JOB NO. 2975

MAP SCALE
0 500m 1000m 1500m
1cm: 200m

GROSS AND NET LENGTH OF PROJECT = 2250.000 METERS = 2.250 KM

Bench Mark: Brass plug located at the south east corner of westbound DesPlaines River Bridge median-Elev. 189.093

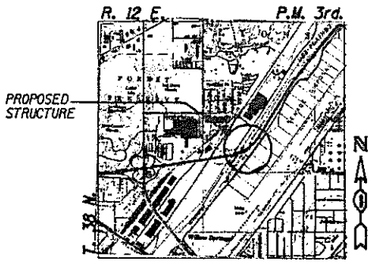
Existing Structures: S.N. 016-0010 (E.B.) & 016-0011 (W.B.) are twin deck five span structures having one simple span and four continuous spans with two curved welded plate girders, transverse plate girder floor beams, and rolled steel beam stringers. The out to out width of each deck is 18.123m. The structure is approximately 217.0m back to back of abutments, and the skew of piers and abutments to a tangent line to I-55 at Station 15+281.981 is 42°-48'-30". The bridge was constructed in 1964 at Sta. 15+455.08 and the deck was patched, waterproofed and resurfaced in 1978.

The existing structure will be removed and replaced with concrete deck on five span continuous multiple curved steel plate girders. The bridges will be widened to the center line of I-55. Pier #3 will be multiple columns with crash wall in between and a cap beam with spread footings. Other Piers will have cap beam supported on drilled shaft columns. New abutments will be supported on the existing steel piles with additional piles added.

Two stage construction will be used to keep the traffic open. One deck will be replaced in each stage.

No salvage.

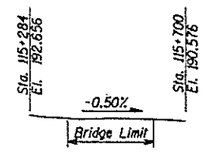
Note: All dimensions are in millimeters(mm) except as noted.



LOCATION SKETCH

SHEET NO. 1 OF 36 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
155	0404-6768	COOK	368	313
STA.		TO STA.		
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT		



PROFILE GRADE
(Along P.G.L. East Bound)

CURVE DATA
℄ F.A.I. ROUTE 55

P.I. Sta. 15+583.901 — θ_s = 3°-08'-42.577"
T.S. Sta. 15+281.98 — Δ_s = 43°-22'-44.486"
S.C. Sta. 15+345.98 — L_c = 441.353m
C.S. Sta. 15+787.333 — X = 63.981m
S.T. Sta. 15+851.333 — Y = 1.171m
Δ = 49°-40'-9.64" — K = 31.998m
D_c = 2°-59'-44.78" — P = 0.293m
R_c = 582.948m — Es = 59.725m
T_s = 301.921m
L_s = 64.0m

SEISMIC DATA

Seismic Performance Category (SPC) = A
Bedrock Acceleration Coefficient (A) = 0.04g
Site Coefficient (S) = 1.0

DESIGN SPECIFICATIONS

AASHTO 1996 and 1997 Interim
1993 AASHTO Guide Specifications for Horizontally Curved Highway Bridges

LOADING MS18 & ALT.

Allow 1.2 kN/m2 for future wearing surface

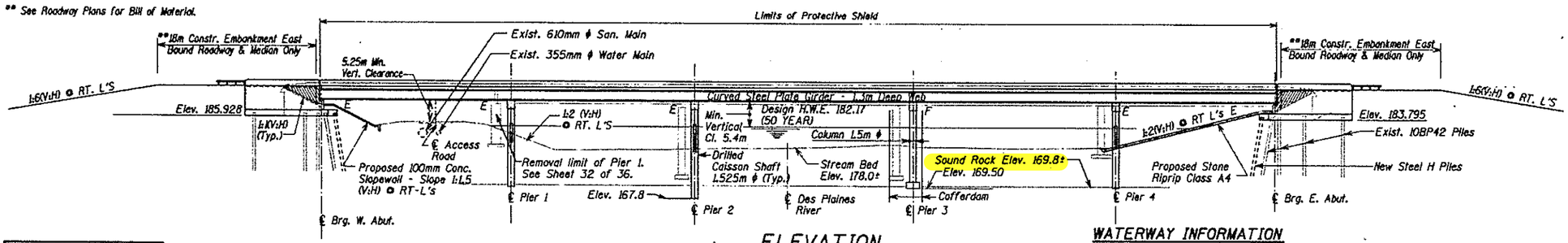
DESIGN STRESSES

FIELD UNITS
f'c = 24 MPa
fy = 400 MPa (Reinf.)
fy = 345 MPa Structural Steel (M-270M Grade 345)

CAISSON SHAFTS
f'c = 27.5 MPa
fy = 400 MPa

NOTES:
1. This contract includes eastbound bridge structure only.
2. Hatched portion of Embankment Backfill by Bridge Contractor after Abutment is in place.

** See Roadway Plans for Bill of Material.



ELEVATION

Note:
Existing concrete slope wall at East abutment to be replaced with riprap. Existing concrete slopewall at West abutment to be replaced with new concrete slopewall.

WATERWAY INFORMATION

Drainage Area = 1683.5 km² Low Grade Elev. 189.58 m ○ Sta. 215+603

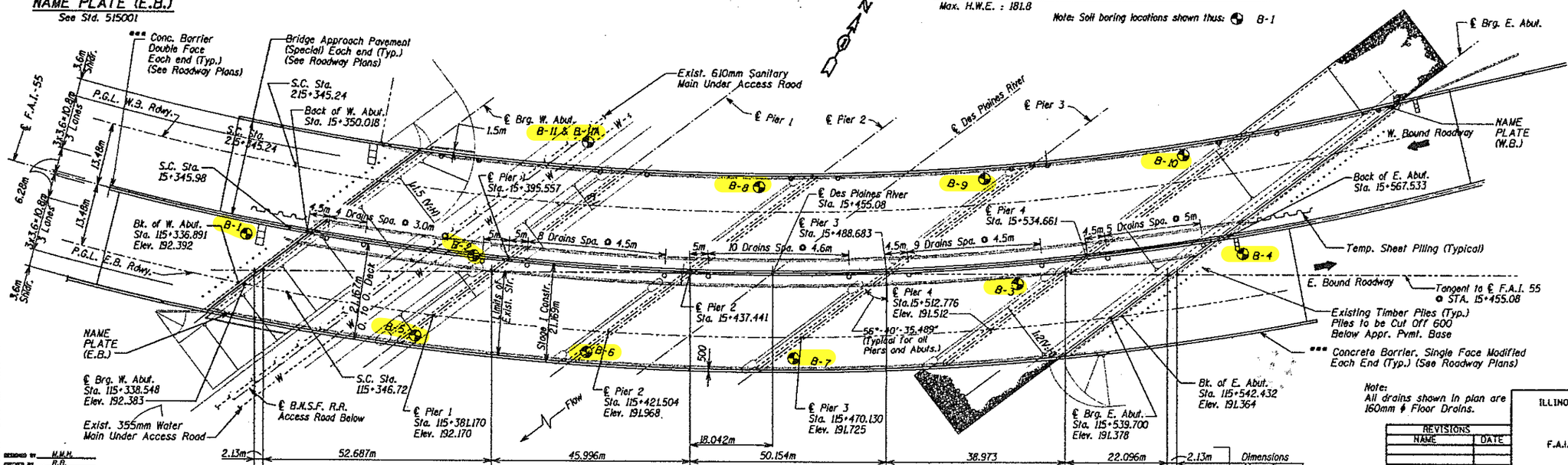
Flood	Freq. Yr.	Q cms	Opening Sq. m Exist.	Opening Sq. m Prop.	Mat. H.W.E. m	Head - m Exist.	Head - m Prop.	Headwater Elev. - m Exist.	Headwater Elev. - m Prop.
Design	50	212.0	248.0	318.0	182.17	0.00	0.00	182.17	182.17
Base	100	238.0	263.0	337.0	182.35	0.00	0.00	182.35	182.35
Overtopping	10	170.0	216.0	277.0	181.77	0.00	0.00	181.77	181.77
Max. Calc.	500	263.0	281.0	360.0	182.56	0.00	0.00	182.56	182.56

Max. H.W.E. = 181.8

Note: Soft boring locations shown thus: ⊕ B-1

STATION 115+455.08
BUILT 199 BY
STATE OF ILLINOIS
F.A.I. RTE. 55 SEC. 0404-6768
F.A. PROJ. IM-55-7 (208) 278
LOADING MS18 & ALT.
STR. NO. 016-2704

NAME PLATE (E.B.)
See Std. 515001



PLAN

*** Barrier width on the bridge will be matched with a transition. See Roadway Plans.

Note:
All drains shown in plan are 160mm ϕ Floor Drains.

6-10-98
date

STATE OF ILLINOIS
ROBERT BASKIN
No. 3031
STRUCTURAL ENGINEER
expires 11-30-98
Signature

REVISIONS NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION

GENERAL PLAN AND ELEVATION
F.A.I. ROUTE 55 OVER DES PLAINES RIVER
COOK COUNTY

F.A.I. RTE. 55 — SECTION 0404-6768
STA. 15+455.08 — STRUCTURE NO. 016-2704(E.B.)

SCALE: VERT. HORIZ.
DATE 06/10/98

DESIGNED BY M.M.H.
CHECKED BY R.B.
DRAWN BY W.R.A.
CHECKED BY M.M.H.

NELSON OSTROM BASKIN BERMAN & ASSOC., INC.
CONSULTING ENGINEERS PARK RIDGE, ILLINOIS

J:\96\e01.dgn 6/12/98

⚠ Rev. 11-2-98

SHEET NO. 33 OF 36 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
155	0404-6768	COOK	368	345
STA.		TO STA.		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		

MIRZA ENGINEERING, INC. — CHICAGO, ILLINOIS

BORING LOG

JOB NO: 9504 CLIENT: NELSON, OSTROM, BASKIN, BERMAN & ASSOC., INC. BORING NO: 1
PROJECT: F.A.I. 55 over the Des Plaines River STATION: 15+787.035
LOCATION: Cook County, Illinois OFFSET: 4.877 Rt
BORING RIG & METHOD: Mobile B-57 w/Solid Flight Augers - Wash Method below 1.5m SURF ELEV: 191.23

DEPTH	SAMPLE FROM - TO	ELEV.	SOIL DESCRIPTION	REC. mm	BLOWS/ 152mm	q_u kPa	STRAIN %	WATER CONTENT %
			89mm Bituminous Concrete 254mm P.C. Concrete (Approach Slab)					
	0.30-0.76	190.62	254mm Crushed Limestone	356	2 2-3	239 •	--	23
	1.07-1.52			457	2 2-4	278	20	22
2	1.83-2.29		FILL: Br & Gr Loam A-4; Organic matter noted	457	3 5-5	153	20	22
	2.59-3.05			457	2 3-5	211	20	24
	3.35-3.81			457	3 5-9	450	20	21
4	4.11-4.57			457	4 6-9	594	20	19
	4.88-5.33		Coarse Gravel noted @ 4.9m	457	27 8-22	555	20	24
6	5.64-6.10			0	4 5-6			--
	6.40-6.86		Coarse Gravel noted @ 6.6m	254	23 15-15	297	20	23
	7.16-7.62	183.82 183.61	FILL: Black Organic Clay A-7-6	460	4 9-6	383	20	19 34
8	7.92-8.38			457	4 8-12	393	20	20
	8.69-9.14		FILL: Intermixed Br. Gr & Black Loam A-4; Organic matter noted	457	5 7-8	383	20	22
	9.45-9.91			457	5 6-8	373	20	23
10	0.21-10.67	180.56	FILL: Intermixed Br, Gr & Black Loam A-4; Organic matter noted	0	5 4-4			
	0.97-11.43	179.80	Hard Br Clay Loam A-6	457	4 6-16	555	20	15
12	1.73-12.19			51	12 13-16			10
	2.50-12.95		Hard Gr Clay Loam A-4(4)	0	13 9-12			
	3.26-13.72	177.52	Coarse Gravel noted @ 13.3m	432	34 18-25	402	13	7
14	4.02-14.48		Coarse Gravel noted @ 14m & 14.2m	254	17 54-34			11
	4.78-15.24	175.99	Extremely Dense Gr Silty Loam A-4; Cobbles noted Boring terminated @ 15.2m	457	37 55-55			9

REMARKS Drilling water introduced into borehole below 1.5m • Denotes Calibrated Penetrometer Estimate

WATER Dry to 1.5 m ELEV 189.71 DURING DRILLING ▽ CORE SIZE mm DATE: FEB 21 95
WATER m ELEV. AT COMPLETION ▽ CASING LENGTH 1.5 m DRILLER: Roesel
WATER m ELEV. AFTER HRS. ▽ CASING DIAMETER 102 mm INSPECTOR: Chang

MON. 9504 2/8/95

MIRZA ENGINEERING, INC. — CHICAGO, ILLINOIS

BORING LOG

JOB NO: 9504 CLIENT: NELSON, OSTROM, BASKIN, BERMAN & ASSOC., INC. BORING NO: 2
PROJECT: F.A.I. 55 over the Des Plaines River STATION: 15+830.148
LOCATION: Cook County, Illinois OFFSET: Center Line
BORING RIG & METHOD: Mobile B-57 w/Solid Flight Augers-Wash Method below 3.7m SURF ELEV: 182.7

DEPTH	SAMPLE FROM - TO	ELEV.	SOIL DESCRIPTION	REC. mm	BLOWS/ 152mm	q_u kPa	STRAIN %	WATER CONTENT %
		182.55	152mm Crushed Limestone					
	0.30-0.76			356	5 8-15	431+ •		18
	1.07-1.52		FILL: Intermixed Br & Dark Br Loam A-4; brick fragments & Organic matter noted	305	13 6-7	239 •		9
2	1.83-2.29			457	5 6-7	192 •		16
	2.59-3.05	179.50		152	5 5-16	144 •		13
	3.35-3.81	179.10	Extremely Dense Gr Silty Loam A-4	254	37 63/102			7
4	3.81-4.42			203	Core 100/51			
	4.42-4.48		Extremely Dense Gr Loam A-4(4); Clay seams noted Cored thru Granite & Limestone cobbles from 3.8m - 4.1m; core barrel blocked by Silt after 610mm run.	51		431+ •		8
	4.88-5.33			457	30 73-63			9
	5.64-5.94	176.75	Boring terminated @ 5.9m	305	3 100			12

REMARKS Drilling water introduced into borehole below 1.5m • Denotes Calibrated Penetrometer Estimate

WATER Dry to 3.7 m ELEV. 182.27 DURING DRILLING ▽ CORE SIZE NX=54 mm DATE: FEB 21 95
WATER m ELEV. AT COMPLETION ▽ CASING LENGTH 3.7 m DRILLER: Roesel
WATER m ELEV. AFTER HRS. ▽ CASING DIAMETER 102 mm INSPECTOR: Chang

MON. 9504 2/8/95

MIRZA ENGINEERING, INC. — CHICAGO, ILLINOIS

BORING LOG

JOB NO: 9504 CLIENT: NELSON, OSTROM, BASKIN, BERMAN & ASSOC., INC. BORING NO: 3
PROJECT: F.A.I. 55 over the Des Plaines River STATION: 15+963.011
LOCATION: Cook County, Illinois OFFSET: 4.877 Rt
BORING RIG & METHOD: CME-55 w/Solid Flight Augers - Wash Method DECK SURF ELEV: 190.36

DEPTH	SAMPLE FROM - TO	ELEV.	SOIL DESCRIPTION	REC. mm	BLOWS/ 152mm	q_u kPa	STRAIN %	WATER CONTENT %
			T/Bridge Deck (Elev 190.36)					
			Top of Bridge Deck to Bottom of River = 11.6m					
11.59		178.77	River Bottom					
	0.30-0.76	178.01	Black & Gr-Br Clay A-6 (river sediment)	152	9 7-3			26
	1.07-1.52			457	26 86 100/127			10
2	1.83-2.29			457	28 64 100/127			11
	2.59-3.05		Extremely Dense to Very Dense Gr Loam A-4; cobbles noted	305	76 100			10
	3.35-3.81			457	47 84-62			10
4	4.11-4.57			279	4 100/127			9
	4.88-5.33			457	50 61-80			10
6	5.64-6.10			305	69 100			10
	6.40-6.71	171.91	Boring terminated @ 6.7m	457	23 45-27			18

REMARKS • Denotes Calibrated Penetrometer Estimate

WATER m ELEV. DURING DRILLING ▽ CORE SIZE mm DATE: FEB 28 95
WATER m ELEV. AT COMPLETION ▼ CASING LENGTH 13.7 m DRILLER: Thomasson
WATER m ELEV. AFTER HRS. ▽ CASING DIAMETER 102 mm INSPECTOR: Chang

MON. 9504 2/8/95

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION
SOIL BORINGS
F.A.I. ROUTE 55 OVER DES PLAINES RIVER
COOK COUNTY
F.A.I. RTE. 55 SECTION 0404-6768
STA. 15+455.08 STRUCTURE NO. 016-2704

SCALE: VERT. HORIZ. DATE 8/20/97

DESIGNED BY M.M.H.
CHECKED BY R.R.
DRAWN BY A.P.M.
CHECKED BY M.M.H.

NELSON OSTROM BASKIN BERMAN & ASSOC., INC.
CONSULTING ENGINEERS PARK RIDGE, ILLINOIS

1996/desplain/ab33.dgn

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
155	0404-6768	COOK	368	346
STA.		TO STA.		
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT		

MIRZA ENGINEERING, INC. — CHICAGO, ILLINOIS

BORING LOG

JOB NO: 9504 CLIENT: NELSON, OSTROM, BASKIN, BERMAN & ASSOC., INC. BORING NO: 4
PROJECT: F.A.I. 55 over the Des Plaines River STATION: 16+013.964
LOCATION: Cook County, Illinois OFFSET: 4.877 Rt
BORING RIG & METHOD: Mobile B-57 w/Solid Flight Augers - Wash Method below 1.5m SURF ELEV:

DEPTH	SAMPLE FROM - TO	ELEV.	SOIL DESCRIPTION	REC. mm	BLOWS/ 152mm	q_u kPa	STRAIN %	WATER CONTENT %
		189.52	114mm Bituminous Concrete (Shoulder) 470mm Crushed Stone					
	0.30-0.76			381	6 7-9	239 •		11
	1.07-1.52		▽	406	5 6-8	220	9	16
2	1.83-2.29		FILL: Gr Loam A-4(4); Organic matter noted	279	4 3-6	144 •		17
	2.59-3.05			406	4 6-7	450	20	20
	3.35-3.81	186.29		457	5 6-6	278	20	21
4	4.11-4.57	185.53	FILL: Br-Gr Silty Loam A-4	457	6 6-8			22
	4.88-5.33		Coarse Gravel noted @ 4.9m	406	5 8-8	239 •		16
6	5.64-6.10		FILL: Intermixed Br & Gr and Dark Br Loam A-4	457	4 3-4	172	20	21
	6.40-6.86			0	4 4-5			
	7.16-7.62		Losing drilling water below 7.6m	0	5 5-6			
8	7.92-8.38	181.72	Coarse Gravel noted @ 7.9m	0	8 9-18			
	8.69-9.14	180.96	Medium Stiff Br Clay Loam A-6	457	4 4-8	77	20	14
	9.45-9.91		Very Dense to Dense Br to Gr Loam A-4; Cobbles noted	457	13 22-35			11
10	10.21-10.22		Cobble noted @ 10.3m	102	100/102			11
	10.97-11.43	178.52	Very Dense to Dense Br to Gr Loam A-4; cobbles noted	457	9 18-29			10
12	11.73-12.19	177.91	Extremely Dense Gr Loam A-4; Cobbles noted Boring terminated @ 12.2m		22 31-53			9

REMARKS Drilling water introduced into borehole below 1.5m. • Denotes Calibrated Penetrometer Estimate

WATER	Dry to 1.5	m ELEV.	188.58	DURING DRILLING ▽ CORE SIZE	mm DATE:	FEB 22 95
WATER		m ELEV.		AT COMPLETION ▽ CASING LENGTH 9.1	m DRILLER:	Roesel
WATER		m ELEV.		AFTER HRS. ▽ CASING DIAMETER 102	mm INSPECTOR:	Chang

MIRZA ENGINEERING, INC. — CHICAGO, ILLINOIS

BORING LOG

JOB NO: 9504A CLIENT: NELSON, OSTROM, BASKIN, BERMAN & ASSOC., INC. BORING NO: 5
PROJECT: F.A.I. 55 over the Des Plaines River STATION: 15+372.850
LOCATION: Cook County, Illinois OFFSET: 18.510 Rt
BORING RIG & METHOD Mobile B-57 w/Rotary Wash Method DECK SURF ELEV: 190.95

SOIL DESCRIPTION	ELEV.	DEPTH	SAMPLE FROM - TO	REC. mm	BLOWS/ 150mm	q_u kpa	STRAIN %	WATER CONTENT %
T/Bridge Deck (Elev 190.95)								
Top of Bridge Deck to Bottom of River = 11.58m								
River Bottom	179.36	11.58						
Coarse Gravel noted @ 300mm			0.30-0.76	25	3 2-6	96 •		34
Stiff to Very Stiff Gr Clay Loam A-4			1.07-1.52	457	13 23-20	354	15	10
Cobble noted @ 2.2m	177.08	2	1.83-2.29	330	13 24 100/25	287	15	10
			2.59-3.05	203	40 100/102			9
Extremely Dense Gr Clay Loam A-4		4	3.35-3.81	457	30 50-88			10
			4.11-4.57	457	30 65 100/102			10
	174.03		4.88-5.33	483	42 65-80			10

Boring terminated @ 5.3m

REMARKS • Denotes Calibrated Penetrometer Estimate

WATER		m ELEV.		DURING DRILLING ▽ CORE SIZE	mm DATE:	NOV 1 96
WATER		m ELEV.		AT COMPLETION ▽ CASING LENGTH 15.2	m DRILLER:	Thomasson
WATER		m ELEV.		AFTER HRS. ▽ CASING DIAMETER 102	mm INSPECTOR:	Chang

MIRZA ENGINEERING, INC. — CHICAGO, ILLINOIS

BORING LOG

JOB NO: 9504A CLIENT: NELSON, OSTROM, BASKIN, BERMAN & ASSOC., INC. BORING NO: 6
PROJECT: F.A.I. 55 over the Des Plaines River STATION: 15+411.569
LOCATION: Cook County, Illinois OFFSET: 18.510 Rt
BORING RIG & METHOD Mobile B-57 w/Rotary Wash Method DECK SURF ELEV: 190.75

SOIL DESCRIPTION	ELEV.	DEPTH	SAMPLE FROM - TO	REC. mm	BLOWS/ 150mm	q_u kpa	STRAIN %	WATER CONTENT %
T/Bridge Deck (Elev 190.75)								
Top of Bridge Deck to Bottom of River = 12.65 m								
River Bottom	178.10	12.65						
			0.30-0.76	0	4 7-5			
			1.07-1.52	152	18 15-10	67	15	12
		2	1.83-2.29	203	5 5-3	19 •		15
Medium Stiff to Soft Gr Clay Loam A-4(6)			2.59-3.05	178	1 1-2	29	15	21
			3.35-3.81	152	4 3-2	19 •		18
Coarse Gravel noted @ 4.1m		4	4.11-4.57	0	1 3-3			
			4.88-5.33	102	2 2-1	19 •		17
	171.85	6	5.64-6.10	152	1 1-2	57	15	13
Stiff Gr Clay Loam A-4	171.55		6.40-6.86	152	100/152	1.0 •		8
Gr Dolomitic Limestone (weathered)			7.16-7.62	0	100/25			
	170.18			0	100/0			

Boring terminated @ 7.9m

REMARKS • Denotes Calibrated Penetrometer Estimate

WATER		m ELEV.		DURING DRILLING ▽ CORE SIZE	mm DATE:	NOV 4 96
WATER		m ELEV.		AT COMPLETION ▽ CASING LENGTH 19.4	m DRILLER:	Thomasson
WATER		m ELEV.		AFTER HRS. ▽ CASING DIAMETER 102	mm INSPECTOR:	Chang

DESIGNED BY M.N.H.
CHECKED BY R.B.
DRAWN BY A.P.M.
CHECKED BY M.N.H.

NELSON OSTROM BASKIN BERMAN & ASSOC., INC.
CONSULTING ENGINEERS PARK RIDGE, ILLINOIS

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION
SOIL BORINGS
F.A.I. ROUTE 55 OVER DES PLAINES RIVER
COOK COUNTY
F.A.I. RTE. 55 SECTION 0404-6768
STA. 15+455.08 STRUCTURE NO. 016-2704

SCALE: VERT. HORIZ. DATE 8/20/97

SHEET NO. 35 OF 36 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
155	0404-6768	COOK	368	347
STA.	TO STA.			
FED. ROAD DIST. NO. 9	ILLINOIS	FED. AID PROJECT		

MIRZA ENGINEERING, INC. CHICAGO, ILLINOIS

BORING LOG

JOB NO: 9504A CLIENT: NELSON, OSTROM, BASKIN, BERMAN & ASSOC., INC. BORING NO: 7
PROJECT: F.A.I. 55 over the Des Plaines River STATION: 15+458.142
LOCATION: Cook County, Illinois OFFSET: 18.510 Rt
BORING RIG & METHOD Mobile B-57 w/Rotary Wash Method DECK SURF ELEV 190.52

SOIL DESCRIPTION	ELEV.	DEPTH	SAMPLE FROM - TO	REC. mm	BLOWS/ 150mm	q_u kpa	STRAIN %	WATER CONTENT %
T/Bridge Deck (Elev 190.52)								
Top of Bridge Deck to Bottom of River = 12.34 m								
River Bottom	178.17	12.34						
Soft Br, Gr & Black Clay A-6; wood fragments noted	177.41		0.30-0.76	305	9 9-7	38	15	26
Stiff Gr Clay Loam A-4	176.65		1.07-1.52	406	6 6-9	115	15	12
		2	1.83-2.29	203	3 2-3	57	15	14
			2.59-3.05	254	3 3-4	67	15	13
Medium Stiff to Soft Br-Gr Clay Loam A-4; trace organic matter noted		4	3.35-3.81	152	2 1-2	29	15	13
			4.11-4.57	127	2 1-1	19	15	16
			4.88-5.33	254	2 1-1	29	15	15
	171.71	6	5.64-6.10	0	2 2-1			
Cobble noted @ 6.5m			6.40-6.86	76	100/76			16
Extremely Dense Gr Clay Loam A-4	170.74		7.16-7.62	279	100/127			16
Gr Dolomitic Limestone (weathered)	169.94	8		0	100/25			
Boring terminated @ 8.2m								

REMARKS * Denotes Calibrated Penetrometer Estimate

WATER m ELEV. DURING DRILLING ▽CORE SIZE mm DATE: NOV 5 96
WATER m ELEV. AT COMPLETION ▽CASING LENGTH 19.4 m DRILLER: Thomasson
WATER m ELEV. AFTER HRS. ▽CASING DIAMETER 102 mm INSPECTOR: Chang

MIRZA ENGINEERING, INC. CHICAGO, ILLINOIS

BORING LOG

JOB NO: 9504A CLIENT: NELSON, OSTROM, BASKIN, BERMAN & ASSOC., INC. BORING NO: 8
PROJECT: F.A.I. 55 over the Des Plaines River STATION: 15+452.925
LOCATION: Cook County, Illinois OFFSET: 18.510 Lt
BORING RIG & METHOD Mobile B-57 w/Rotary Wash Method DECK SURF ELEV 190.06

SOIL DESCRIPTION	ELEV.	DEPTH	SAMPLE FROM - TO	REC. mm	BLOWS/ 150mm	q_u kpa	STRAIN %	WATER CONTENT %
T/Bridge Deck (Elev 190.06)								
Top of Bridge Deck to Bottom of River = 11.58 m								
River Bottom	178.48	11.58						
Medium Dense Gr Silty Loam A-4	177.72		0.30-0.76	203	13 5-6			16
			1.07-1.52	51	1 2-3	48 *		18
		2	1.83-2.29	51	1 2-2	96 *		17
			2.59-3.05	51	2 2-2	96 *		13
Medium Stiff to Stiff Gr Loam A-4(5)		4	3.35-3.81	25	4 5-6	144 *		13
			4.11-4.57	0	12 6-8			
Wood fragments noted @ 4.9m			4.88-5.33	51	2 2-2	96 *		20
		6	5.64-6.10	51	2 1-1	48 *		17
	171.62		6.40-6.86	25	2 1-1	96 *		16
Very Dense Gr Silty Loam A-4	170.86		7.16-7.62	305	37 7-50			14
Gr Dolomitic Limestone (weathered); Silt seams noted	170.10	8	7.92-8.38	457	75 42-80			9
Light Gr to Gr Dolomitic Limestone Dry Density=2550 kg/m3 Light Gr to Gr very fine to medium-grained Dolomitic Limestone; stylolites noted, crinoids present, chert nodules noted Dry Density=2,574 kg/m3 Recovery = 2.99m Core Run = 3.05m Percent Recovery = 98% RQD = 85%	167.05	10	8.38-11.43	2997	134159 83886 Core			
Boring terminated @ 11.4m								

REMARKS * Denotes Calibrated Penetrometer Estimate

WATER m ELEV. DURING DRILLING ▽CORE SIZE NX=55 mm DATE: OCT 29 96
WATER m ELEV. AT COMPLETION ▽CASING LENGTH 18.3 m DRILLER: Thomasson
WATER m ELEV. AFTER HRS. ▽CASING DIAMETER 102 mm INSPECTOR: Chang

MIRZA ENGINEERING, INC. CHICAGO, ILLINOIS

BORING LOG

JOB NO: 9504A CLIENT: NELSON, OSTROM, BASKIN, BERMAN & ASSOC., INC. BORING NO: 9
PROJECT: F.A.I. 55 over the Des Plaines River STATION: 15+510.675
LOCATION: Cook County, Illinois OFFSET: 18.510 Lt
BORING RIG & METHOD Mobile B-57 w/Rotary Wash Method DECK SURF ELEV 189.77

SOIL DESCRIPTION	ELEV.	DEPTH	SAMPLE FROM - TO	REC. mm	BLOWS/ 150mm	q_u kpa	STRAIN %	WATER CONTENT %
T/Bridge Deck (Elev 189.77)								
Top of Bridge Deck to Bottom of River = 11.73 m								
River Bottom	178.04	11.73						
			0.30-0.76	152	8 6-6	239 *		10
			1.07-1.52	102	28 10-17	192 *		16
Very Stiff to Stiff Gr Loam A-4(6)		2	1.83-2.29	152	30 12-12	192 *		13
			2.59-3.05	152	5 5-11	96	15	11
Coarse Gravel noted @ 3.4m			3.35-3.81	25	2 2-6	96 *		12
	173.46	4	4.11-4.57	0	6 4-3			
Very Soft Gr Clay Loam A-4			4.88-5.33	0	1 1-1			
		6	5.64-6.10	152	1 2-2	19 *		13
	171.18		6.40-6.86	0	1 1-1			
Extremely Dense Gr Silty Loam A-4	170.60		7.16-7.62	254	56 100/127			9
Gr Dolomitic Limestone (weathered)	169.81	8	7.92-8.23	0	100/0			
Boring terminated @ 8.2m								

REMARKS * Denotes Calibrated Penetrometer Estimate

WATER m ELEV. DURING DRILLING ▽CORE SIZE mm DATE: OCT 31 96
WATER m ELEV. AT COMPLETION ▽CASING LENGTH 19.2 m DRILLER: Thomasson
WATER m ELEV. AFTER HRS. ▽CASING DIAMETER 102 mm INSPECTOR: Chang

DESIGNED BY M.M.H.
CHECKED BY R.B.
DRAWN BY A.P.W.
CHECKED BY M.M.H.

NELSON OSTROM BASKIN BERMAN & ASSOC., INC.
CONSULTING ENGINEERS PARK RIDGE, ILLINOIS

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION
SOIL BORINGS
F.A.I. ROUTE 55 OVER DES PLAINES RIVER
COOK COUNTY
F.A.I. RTE. 55 SECTION 0404-6768
STA. 15+455.08 STRUCTURE NO. 016-2704

SCALE: VERT.
HORIZ.
DATE 8/20/97

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
155	0404-6768	COOK	368	348
STA.		TO STA.		

MIRZA ENGINEERING, INC. CHICAGO, ILLINOIS

BORING LOG

JOB NO: 9504A CLIENT: NELSON, OSTROM, BASKIN, BERMAN & ASSOC., INC. BORING NO: 10
PROJECT: F.A.I. 55 over the Des Plaines River STATION: 15+560.917
LOCATION: Cook County, Illinois OFFSET: 18.510 Lt
BORING RIG & METHOD Mobile B-57 w/Rotary Wash Method DECK SURF ELEV 189.52

SOIL DESCRIPTION	ELEV.	DEPTH	SAMPLE FROM - TO	REC. mm	BLOWS/ 150mm	q_u kpa	STRAIN %	WATER CONTENT %
T/Bridge Deck (Elev 189.52)								
Top of Bridge Deck to Bottom of River = 10.76 m								
River Bottom	178.76	10.76						
Black to Dark Gr Clay A-6	178.00		0.30-0.76	457	I 1-5	48 *		18
Stiff Gr-Br Loam A-4	176.47	2	1.07-1.52	152	8 4-3	144 *		12
			1.83-2.29	305	2 1-3	96 *		14
Extremely Dense Gr Silty Loam A-4			2.59-3.05	457	II 30-70			9
		4	3.35-3.81	457	39 50-60			10
	174.19		4.11-4.57	457	37 45-45			10
Dense Gr Silty Loam A-4	173.43		4.88-5.33	457	33 27-22			10
Extremely Dense Gr Clay Loam A-4		6	5.64-6.10		60 57-60			9
			6.40-6.86	457	33 50-78			9
	171.14		7.16-7.62	254	23 100/127			9

Boring terminated @ 7.6m

REMARKS

* Denotes Calibrated Penetrometer Estimate

WATER m ELEV. DURING DRILLING ▽CORE SIZE mm DATE: OCT 28 96
WATER m ELEV. AT COMPLETION ▽CASING LENGTH 15.2 m DRILLER: Thomasson
WATER m ELEV. AFTER HRS. ▽CASING DIAMETER 102 mm INSPECTOR: Chang

9504LB.GPJ 1/21/96

ILLINOIS DEPARTMENT OF TRANSPORTATION
STRUCTURE BORING LOG
Page 1 of 1
Date 6-18-97

ROUTE FAI 55 DESCR. I-55 over Des Plaines River
SECT. STRUCT. NO. 016-2704 DRILLED BY John Kim
COUNTY Cook LOCAT. SW 1/4, Sec. 22, T.38.N, R.12.E, 3rd PM

Boring No. 11
Station 215+411
Offset 26.0 m Lt
Surface El. 182.84 m

Surf. Wat. El. –
Groundwater Elev.:
when drilling –
at Completion –
after – Hrs. –

DEPTH	BLOWS	Qu kPa	W %
182.69 GRAVEL			
Hard, black SAND LOAM very pebbly	25 P		
	26	>430	11
	12		
-1.5			
grades to stiff poor recovery	3 P		
	8	168	22
	22		
180.71 Mottled CLAY Pebble in shoe poor recovery	10		
	39		13
	12		
179.94			
-3.0 V Dense, Lt brown & white disintegrated dolomite rock 179.49			
Very hard, dark gray SILTY CLAY LOAM, very pebbly, till	40		
	100/ 6		
	125 mm		
	78 P		
	30	>430	4
	73		
-4.5			
	68 P		
	48	>430	7
	54		
	30 P		
	44	>430	7
	40		
-6.0			
	30		
	53		8
	60		
	84		
	100/		8
	100 mm		
-7.5			

DEPTH	BLOWS	Qu kPa	W %
	50		
	76		8
	100/ 100 mm		
	55 S		
	100/ 200		8
	140mm 6%		
-9.0			
	63 S		
	67	163	8
	100/ 6%		
	90 mm		
	63		
	100/		8
	115 mm		
172.27			
-10.5 END OF BORING			
Broke Drill Rod			
CME 750 Drill Rig 83 mm ID Hollow Stem Augers			
-12.0			
-13.5			
-15.0			

SPT.(N)=Sum of last two blow values in samp.(Qu)B=Bulge S=Shear P=Penet.Test
Stations, Depths, Offset, and Elevations are in Meters

ILLINOIS DEPARTMENT OF TRANSPORTATION
STRUCTURE BORING LOG
Page 1 of 2
Date 6-23-97

ROUTE FAI 55 DESCR. I-55 over Des Plaines River
SECT. STRUCT. NO. 016-2704 DRILLED BY John Kim
COUNTY Cook LOCAT. SW 1/4, Sec. 22, T.38.N, R.12.E, 3rd PM

Boring No. 11A
Station 215+411
Offset 26.0 m Lt
Surface El. 182.84 m

Surf. Wat. El. –
Groundwater Elev.:
when drilling –
at Completion –
after – Hrs. –

DEPTH	BLOWS	Qu kPa	W %
Drilled to 10.5 m without sampling. B-11A 1 m from B-11.			
-1.5			
-3.0			
172.17 V Dense, gray silty dolomite SAND & GRAVEL pieces, weathered rock	37		
	100/125 mm		9
171.41	100/0 mm		
Dolomite, light gray, slightly weathered, occasional horizontal fractures	Run 1 11.58 to 13.11 m 95% Rec 88 RQD		
-4.5			
-6.0			
Grades to darker Gray, very many tiny vugs	Run 2 13.11 to 14.02 m 94% Rec 92 RQD		
-7.5			
	Run 3 14.02 to 15.54 m 95% Rec 93 RQD		
-9.0			
-10.5			
-12.0			
-13.5			
-15.0			
167.30 END OF BORING			
CME 750 Drill Rig. 83 mm ID Hollow stem augers. NX rock core.			
-16.5			

SPT.(N)=Sum of last two blow values in samp.(Qu)B=Bulge S=Shear P=Penet.Test
Stations, Depths, Offset, and Elevations are in Meters

DESIGNED BY M.M.H.
CHECKED BY R.B.
DRAWN BY A.P.M.
CHECKED BY M.M.H.

NELSON OSTROM BASKIN BERMAN & ASSOC., INC.
CONSULTING ENGINEERS PARK RIDGE, ILLINOIS

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION
SOIL BORINGS
F.A.I. ROUTE 55 OVER DES PLAINES RIVER
COOK COUNTY
F.A.I. RTE. 55 SECTION 0404-676B
STA. 15+455.08 STRUCTURE NO. 016-2704

SCALE: VERT. HORIZ. DATE 7/30/97

TAB 15

SECTION 15

RIPRAP SIZING

RIPRAP SIZING

No disturbance of the existing bank armoring is proposed. Riprap sizing will be investigated further in Phase II.

Tab 16

SECTION 16

PERMIT SUMMARY FORM (DISTRICT 1) – RELATED EXHIBITS AND CALCULATIONS

Illinois Department of Transportation

Permit Summary for Floodway Construction in Northeast Illinois

Applicant Agency:	IDOT	County:	Cook
Route:	I-55	Stream:	Des Plaines River
Section:	I-355 to I-94	SN:	016-2704

General Description: The existing 5-span steel bridge carries I-55 over the Des Plaines River at a 57° skew.
Existing Facility: The existing bridge was built in 1999-2000 and has a width of 139' and length of 689'.
Proposed Improvement: I-55 will be widened to the outside. One additional column supported on a drilled shaft will be provided at the outsides of each pier in each direction. The proposed width is 153.17' with 14.2' of widening.

1. Is the proposed work classified as repairs such as deck replacement, pavement resurfacing, or the armoring or filling of a scour hole? ☐ Yes ☒ No

2. Does the proposed work only consist of modifications to the existing structure which will occur above the regulatory 100-year flood profile? ☐ Yes ☒ No

Note: If the answer to question 1 or 2 is yes, no permit is required and questions 3 through 12 may be omitted.

3. Does the proposed work below the regulatory 100-year flood profile consist of widening of the existing structure by 12 feet or less? ☐ Yes ☒ No

Note: If yes, Regional Permit No. 2 applies and questions 4 through 9 may be omitted.

4. Is the proposed improvement, including the approach roadway, more restrictive to normal and flood flows than the existing structure? ☐ Yes ☒ No

5. Is a Channel Modification proposed? ☐ Yes ☒ No

6. Are there any buildings or structures located upstream in the 100-year floodplain within the influence of the structure backwater? ☐ Yes ☒ No

   6a. If no, does the backwater of the proposed improvement exceed the backwater of the existing structure by more than 0.1 foot? ☐ Yes ☒ No

   6b. If yes, does the proposed backwater exceed the natural high water elevation by more than 0.1 foot? ☐ Yes ☐ No

7. Are transitions required for this project? ☐ Yes ☒ No

8. Is the flood profile at the project site impacted by backwater from a downstream receiving stream? ☐ Yes ☒ No

   If yes, list frequency of starting elevation for analysis:

9. Is backwater from a downstream structure affecting the flood profile at the project site? ☐ Yes ☒ No

9a. Was the existing downstream structure used in the analysis for determining flood profile at the project site? years? (Attach documentation) ☐ Yes ☐ No

9b. Is the downstream structure scheduled for improvement in the next 5 years? ☐ Yes ☐ No

9c. Was the proposed downstream improvement used in the analysis? ☐ Yes ☐ No

10. Is a floodway map change required due to the proposed project? ☐ Yes ☒ No

11. Will fill or material be placed in the floodway due to the proposed work? ☒ Yes ☐ No

11a. If yes, is compensatory storage provided at the project location? (Attach a copy of completed Attachment A) *(TBD – Proposed design in development.)* ☒ Yes ☐ No

11b. If the answer to 11a is no, is compensatory storage provided at another location? If yes, give location and attach a copy of completed Attachment A. ☐ Yes ☐ No

11c. Has compensatory storage relief been granted? (Attach Documentation.) ☐ Yes ☒ No

12. Coordination based on Memorandum of Agreement has occurred with Agency(ies) (Attach documentation.) ☐ Yes ☒ No

---

All engineering analysis has been performed by me or under my direct supervision.

Signature: Renee A Dailey IL/P.E. #: 062-47420

Date: 08/30/18 P.E. Expiration Date: 11/30/2019

FOR DEPARTMENTAL USE ONLY

Is a permit required for this project? ☐ Yes ☐ No

If yes, specify type of permit: ☐ Floodway, ☐ Regional 1, ☐ Regional 2

Permit Summary
(Attachment A - Compensatory Storage)

Part of Permit Summary for Floodway Construction in Northeast Illinois:

☒ Phase I (Preliminary) ☐ Phase II (Final)

Applicant Agency:	IDOT	County:	Cook
Route:	I-55	Stream:	Des Plaines River
Section:	I-355 to I-94	SN:	016-2407

Provide the following information for Item 11:

a. Flood Water Elevations (Natural): 100-year 598.2 ft. 10-year 596.3 ft.
Normal 588.2 ft.

b. Determine the amount of fill or material being placed in the floodway:

1. Between the 100-year and 10-year flood elevation 30.0 cu. yds.
2. Between the 10-year and normal water elevation 122.4 cu. yds.

c. Determine the volume being provided to compensate for above item b:
(i.e. from structures removal, excavation, etc.)

1. Between the 100-year and 10-year flood elevation 35.6 cu. yds.
2. Between the 10-year and normal water elevation 148.2 cu. yds.

d. Mark on the exhibits the location and amount of compensatory storage to be excavated. Also show the location of floodway and floodplain boundaries. (Include a set of plans and cross sections)

Attach copy of calculations and Exhibit(s) reflecting the above finding.

All engineering analysis has been performed by me or under my direct supervision.

Signature:	Steven A Dailey	IL/P.E. #:	062-47420
Date:	08/30/18	P.E. Expiration Date:	11/30/2019

Floodway Fill Summary for I-55 over Des Plaines River

By: EMB 2/15/2018
Checked: FDM 2/19/2018

100-Yr	598.22
10-Yr	596.25
NWL	588.21

Pier#	Extenstion Length (ft)	Width (Ft)	Area (ft^2)	Description
1	26.89	5.25	141.17	2 Piers and Crash Wall Included
2	5.25	5.25	43.30	2-Piers Only
3	5.25	5.25	43.30	2-Piers Only
4	34.9	5.25	183.23	2 Piers and Crash Wall Included
		Total Area	410.99	

Event	Depth (ft) [1]	Volume of Fill (ft^3)	Volume of Fill (ac-ft)	Volume of Fill (cu.yds)
NWL-10	8.04	3304.34	0.08	122.36
10-Year to 100-Year	1.97	809.65	0.02	29.98

Notes:

1. To be conservative, crash wall height is assumed to extend from NWL up to 100-year flood elevation as worst-case fill condition.
2. See Sheet G-2 in Tab 12 for schematic of piers and crash wall extensions.

Tab 17

SECTION 17

COMPENSATORY STORAGE

50 0 50

SCALE IN FEET

N

DES PLAINES RIVER

10-YEAR - 100-YEAR COMP
50 LF - 10'(W)x2'(H) RCBC

HEADWALL
INV.=596.25

INV.=588.85

XS 7.55

HEADWALL
INV.=588.75

FLOODWAY/
FLOODPLAIN

EX ROW

NWL - 10-YEAR COMP
100 LF - 10'(W)x4'(H) RCBC

INV.=596.35

750+00

5200+00

3200+00

745+00

℄ I-55

I-55

3195+00

FLOODWAY

FLOODPLAIN

XS 7.4

EX ROW

NWL =588.21
10-YEAR =596.25
100-YEAR =598.22

REQUIRED COMPENSATORY STORAGE
NWL - 10-YEAR = 122.36 CU.YDS
10 - 100-YEAR= 29.98 CU.YDS

PROVIDED COMPENSATORY STORAGE
NWL - 10-YEAR = 148.15 CU.YDS
10 - 100-YEAR= 35.56 CU.YDS

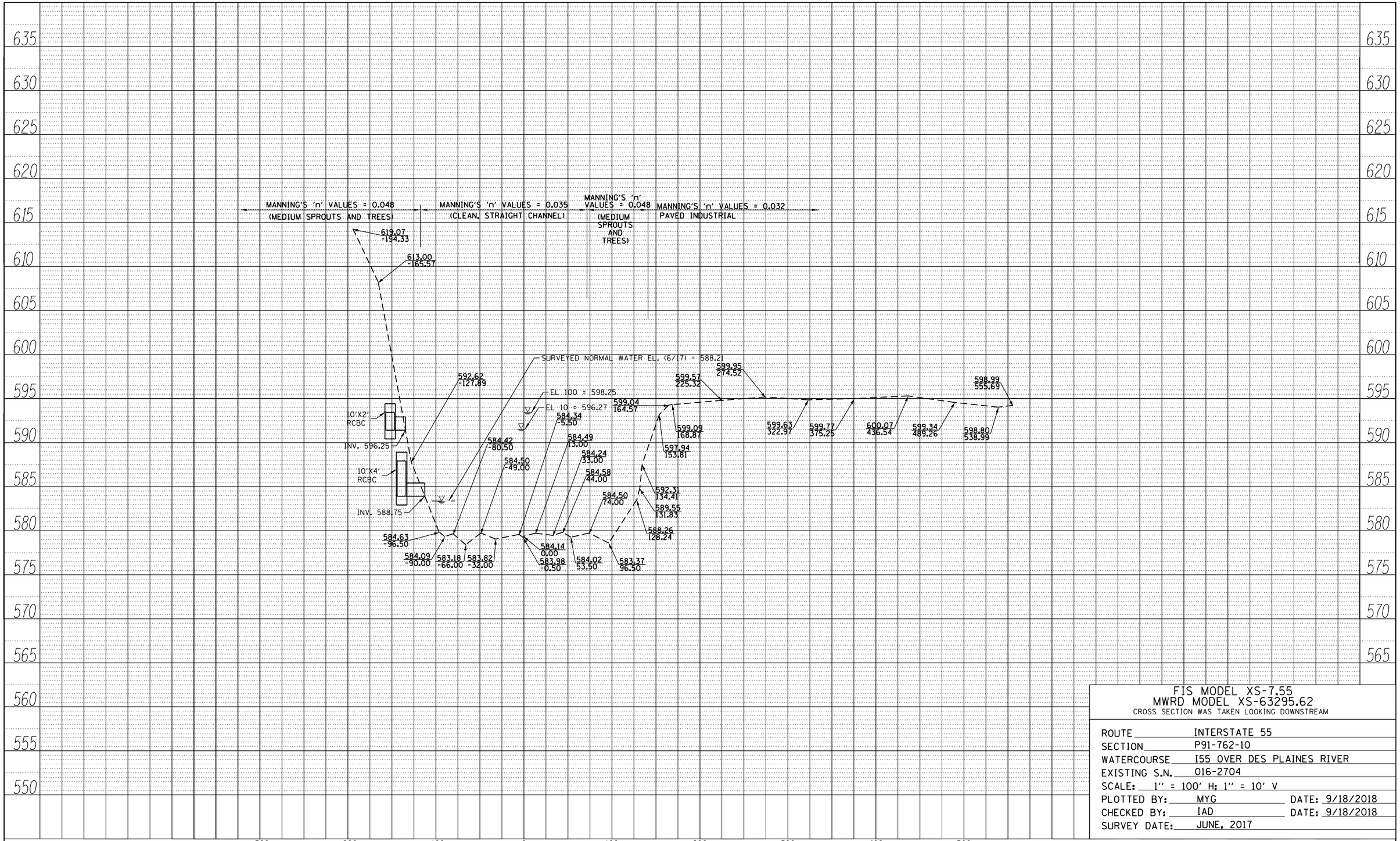
FILE NAME = N:\Idot\110203.00001\CADD_Sheets\P1110203 sht-detail_Desplaines_Comp.dgn Default	USER NAME = mgoldenberg	DESIGNED - EMB	REVISED -
		DRAWN - MYG	REVISED -
	PLOT SCALE = 25'	CHECKED - IAD	REVISED -
	PLOT DATE = 9/18/2018	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I-55 OVER DES PLAINES
COMPENSATORY STORAGE

SCALE: 1" =100' | SHEET OF SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			



PLAN

SURVEYED	
PLOTTED	
DRAWN	
CHECKED	
R/T. OF WAY CHECKED	
CADD FILE NAME	
NOTE BOOK	
NO.	

BY	DATE

PROFILE

SURVEYED	
PLOTTED	
DRAWN	
CHECKED	
BAR. NOTED	
STRUCTURE NO(TA)TNS CHKD	
NOTE BOOK	
NO.	

BY	DATE

FIS MODEL XS-7.55
MWRD MODEL XS-63295.62
CROSS SECTION WAS TAKEN LOOKING DOWNSTREAM

ROUTE INTERSTATE 55
SECTION P91-762-10
WATERCOURSE I55 OVER DES PLAINES RIVER
EXISTING S.N. 016-2704
SCALE: 1'' = 100' H: 1'' = 10' V
PLOTTED BY: MYG DATE: 9/18/2018
CHECKED BY: IAD DATE: 9/18/2018
SURVEY DATE: JUNE, 2017

FILE NAME = N:\Idot\110203.0001\CADD_Sheets\P1110203-sht-Prop_xs7.55.dgn	USER NAME = mgoldenberg	DESIGNED - FDM	REVISED -
	DRAWN - MYG		REVISED -
	PLOT SCALE = 100'	CHECKED - IAD	REVISED -
Default	PLOT DATE = 9/18/2018	DATE - 9/18/2018	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

APPROXIMATE PROPOSED COMPENSATORY STORAGE CROSS SECTION
DES PLAINES RIVER

SCALE: | SHEET 1 OF 8 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CONTRACT NO.		
	ILLINOIS	FED. AID PROJECT		

Floodway Comp Summary for I-55 over Des Plaines River

By: EMB 8/21/2018
Checked: IAD 8/30/2018

100-Yr	598.22
10-Yr	596.25
NWL	588.21
Inverts of NWL to 10-year RCBC	588.75 to 588.85
10-Year Size	10.0'(W)x4.0'(H)
Inverts of 10- to 100-year RCBC	596.25 to 596.35
100-Year Size	10.0'(W)x2.0'(H)

Range	Avg Depth in RCBC (Ft)	Area (ft^2)	Length(ft)	Provided Volume (ft^3)	Required Volume (ft^3)	Volume of Comp (ac-ft)	Volume of Comp (cu.yds)
NWL-10-year	4	40	100	4000	3304.34	0.09	148.15
10-Year to 100-Year	1.92	19.2	50	960	809.65	0.02	35.56

Tab 18

SECTION 18

SURVEY NOTES

Questions concerning the VERTCON process may be mailed to NGS

Latitude: 41 45 52.42079

Longitude: 087 51 05.63614

NGVD 29 height: 0.00 FT

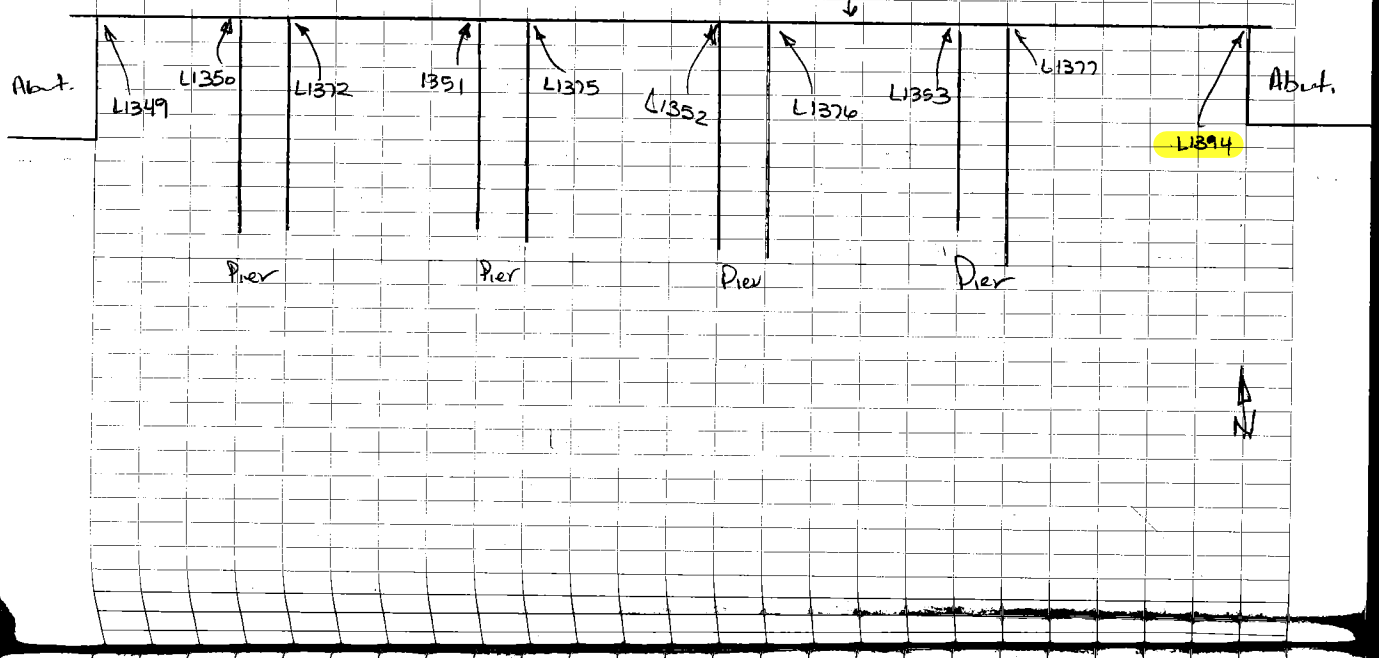
Datum shift(NAVD 88 minus NGVD 29): -0.282 feet

Converted to NAVD 88 height: -0.282 feet

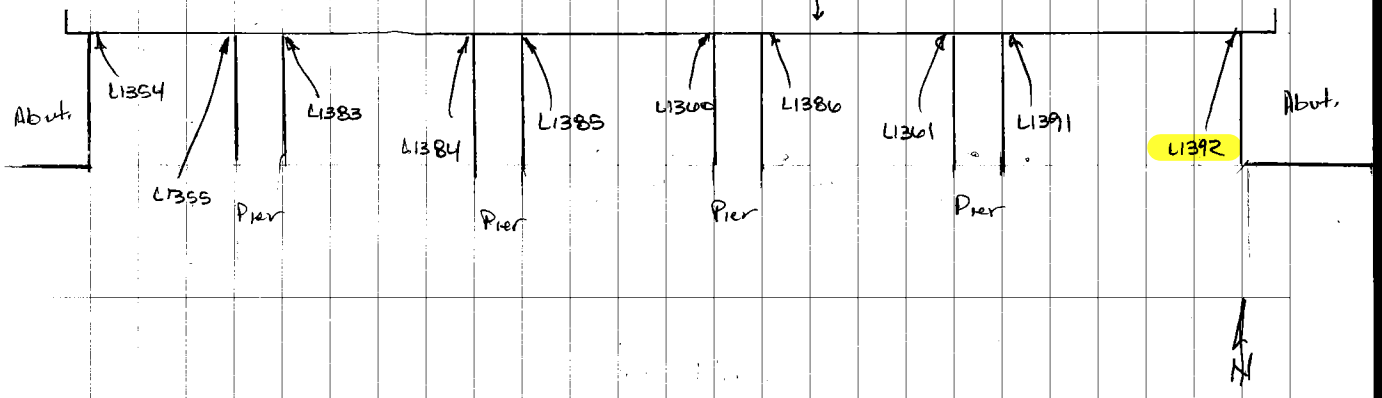
Lin Engineering
Bridge Sketches,
06/09/2017

36

North Face I-55 Bridge over Des Plaines River



South Face I-55 Bridge over Des Plaines River



NO FACE I55 @Des Plains River.txt

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L1351,1857070.6200,1115621.9390,617.4880,627
L1352,1857160.2130,1115784.7820,616.3910,627
L1353,1857259.9670,1115930.0030,615.6440,627
L1372,1857013.2060,1115489.9540,618.2520,627
L1375,1857072.7780,1115624.9480,617.4860,627
L1376,1857162.4070,1115787.2890,616.3890,627
L1377,1857262.6490,1115932.7770,615.6370,627
L1394,1857337.9550,1116025.4560,615.2160,627

L1354,1856798.5530,1115243.3610,627.4280,6271
L1355,1856832.3110,1115372.7590,626.6490,6271
L1360,1856933.1020,1115642.6030,625.2690,6271
L1361,1856993.9580,1115763.5190,624.7290,6271
L1383,1856834.1610,1115380.0600,626.6510,627
L1384,1856872.1770,1115494.5870,626.0380,627
L1385,1856882.3280,1115498.2550,626.9480,627
L1386,1856935.0550,1115646.4170,625.2300,627
L1391,1856996.7990,1115769.2700,624.6630,627
L1392,1857036.0830,1115836.8720,624.3790,627

Collins Engineering
Survey Notes,
06/27/2017

HYDROSURVEY STEPS

RAW DATA FILE WAS SETUP IN THE NUMBERED FORMAT AND POSITIVE VALUES FOR THE LONGITUDE FIELD AND WAS CONVERTED TO NE COORDINATES USING CORPSCON SOFTWARE.

RAW DEPTH MEASUREMENTS WERE ADJUSTED BY ADDING 0.5' (6") TO ACCOUNT FOR SUBMERGENCE OF THE SONAR HEAD.

WATER SURFACE ELEVATION AT TIME OF INSPECTION AT I-55 OVER DESPLAINES RIVER WAS ESTIMATED BY USING PIER 1 BOTTOM OF PIER CAP ELEVATION OF 186.335m = 611.335 ft AND THE MEASURED DISTANCE OF 23.42 ft FROM WATER SURFACE (AT TIME OF INSPECTION) TO PIER 1 BOTTOM OF PIER CAP. WSE AT TIME OF INSPECTION WAS 611.335 FT - 23.42 FT = 587.915 FT.

WATER SURFACE ELEVATION AT TIME OF INSPECTION AT I-55 OVER SANITARY AND SHIP CANAL WAS ESTIMATED BY USING TOP OF PIER WALL ELEVATION OF 178.951 m = 587.109 ft AND THE measured distance of 9.5 ft FROM WATER SURFACE (AT TIME OF INSPECTION) TO TOP OF WALL AT PIER 2. WSE AT TIME OF INSPECTION WAS 587.109 ft - 9.50 ft = 577.61 ft

Tab 19

SECTION 19

EWSE DATA

ESTIMATED WATER SURFACE ELEVATION (EWSE) DATA

Date of CBBEL Overbank Survey: June 5 thru June 7, 2017

Surveyed Water Surface at XS 7.55 = 588.21

Top of Bank at XS 7.55 Rt. = 599.04

Tab 20

SECTION 20

CORRESPONDENCE NOTES

TAB A

SECTION 20.A

2011 MWRD LOWER DES PLAINES RIVER REPORT EXCERPTS

Final Report

Detailed Watershed Plan for the Lower Des Plaines River Watershed: Volume 1

Prepared for

Metropolitan Water Reclamation District of Greater Chicago

February 28, 2011

Christopher B. Burke Engineering, Ltd.

3.6 Mainstem Lower Des Plaines River

The headwaters of the Des Plaines River begin in Racine County, Wisconsin and flow south through Kenosha County, Wisconsin before entering Lake County, Illinois just east of Interstate 94 at the Wisconsin/Illinois state line. The Des Plaines River continues to flow south through Lake County and into Cook County before flowing southwest parallel to the Chicago Sanitary and Ship Canal and entering into Will County. There is roughly 700 square miles of tributary area from Illinois and Wisconsin to the Des Plaines River at the Cook County/Will County border. The Mainstem Lower Des Plaines River (MLDPR) Watershed is defined for the purposes of this study as the portion of the Des Plaines River Watershed located in Cook County north of the Chicago Sanitary and Ship Canal extending north to the Cook County limits at Lake-Cook Road. There are sixteen subwatersheds included in the MLDPR Watershed for which hydrologic and hydraulic modeling was completed independently for Phase B of the Lower Des Plaines River DWP. These subwatersheds are the 67th Street Ditch, Addison Creek, Buffalo Creek, Chicago Sanitary and Ship Canal, Crystal Creek, Des Plaines River Tributary A, East Avenue Ditch, Farmers-Prairie Creek, Feehanville Ditch, Flagg Creek, Golf Course Tributary, McDonald Creek, Salt Creek, Silver Creek, Weller Creek, and Willow Creek Subwatersheds.

TABLE 3.6.1

Communities Draining to the Mainstem Lower Des Plaines River

Community	Tributary Area (mi^2)
Bedford Park	0.11
Bellwood	0.03
Berwyn	0.04
Broadview	0.70
Brookfield	0.48
Buffalo Grove	<0.1
Chicago	6.89
Countryside	1.16
Des Plaines	7.28
Elmwood Park	1.55
Forest Park	2.39
Forest View	<0.1
Franklin Park	1.25
Glenview	1.29
Harwood Heights	1.20
Hodgkins	1.70
Indian head Park	0.01
Justice	0.04
La Grange	<0.1
Lemont	0.11
Lyons	1.99
Maywood	2.61
McCook	0.13
Melrose Park	0.61
Mount Prospect	0.59
Niles	0.27
Norridge	1.25
North Riverside	1.27
Northbrook	1.55
Oak Park	1.12
Park Ridge	6.51
Prospect Heights	1.05
River Forest	2.52
River Grove	2.19
Riverside	1.97
Riverwoods	<0.1
Rosemont	0.76

The portion of the Des Plaines River upstream of the Lake County Border was included in the hydrologic portion of this study but was not studied in detail through hydraulic modeling. All references to MLDPR and the MLDPR Subwatershed from this point forward refer to the areas direct tributary within study area in Cook County, unless otherwise noted.

The MLDPR Subwatershed drains areas within numerous municipalities. There are no flood control reservoirs within the MLDPR Subwatershed; however, multiple flood control projects have been implemented along the MLDPR including Levee 37, Levee 50, McCook Levee and the Groveland Avenue Levee. The MLDPR also receives diversion outflows from control structures within the Addison Creek, Buffalo Creek, Salt Creek, and Weller Creek Subwatersheds.

Figure 3.6.1 shows the areas directly tributary to the MLDPR (but does not include tributary areas in DuPage County or areas north of Lake-Cook Road. Table 3.6.1 lists the communities located in areas directly tributary to the MLSPR Subwatershed. Reported stormwater problem areas, flood inundation areas, and proposed alternative projects are also shown and discussed in the following subsections. Table 3.6.2 lists the land use breakdown by area within the MLDPR Subwatershed.

TABLE 3.6.1 (continued)

Communities Draining to the Mainstem Lower Des Plaines River

Community	Tributary Area (mi^2)
Schiller Park	1.08
Stickney	0.09
Summit	0.35
Unincorporated	11.40
Wheeling	2.94
Willow Springs	1.42
TOTAL	69.9

Note: This list includes community areas located within the direct tributary area to the MLDPR within Cook County and does not include the area tributary to the Summit Conduit. It does not include tributary areas in DuPage County, Lake County, or Will County, Illinois or Kenosha County or Racine County, Wisconsin.

TABLE 3.6.2

Land Use Distribution for the Mainstem Lower Des Plaines River

Land Use Category	Area (acres)	%
Residential	19,988	45
Commercial/Industrial	6,330	14
Forest/Open Land	10,059	22
Institutional	3,644	8
Transportation/Utility	2,396	5
Water/Wetland	2,246	5
Agricultural	56	0

Source: Chicago Metropolitan Agency for Planning's 2005 Land Use Inventory for Cook, DuPage, Kane, Kendall, Lake, McHenry and Will Counties, Illinois. Version 1.0. Published January 2009

3.6.1 Sources of Data

3.6.1.1 Previous Studies

Many studies of the MLDPR Subwatershed have been prepared by various consulting engineers and governmental agencies over the years. The USACE has released studies in 1955, 1966, 1974, 1981, 1990, 1995, 1999, and 2007. The SCS also issued studies in 1976, 1985, and 1987. Portions of the subwatersheds tributary to the MLDPR were also addressed in the Upper Des Plaines River Tributary Watershed Plan prepared by DuPage County which was updated in 2004.

The USACE performed HEC-1 hydrologic and HEC-2 hydraulic analyses of the entire Des Plaines River Watershed. The models were part of the 2007 Des Plaines River Phase I study and included the latest proposed improvements to the Watershed including Levee 37 and Levee 50 projects. The USACE HEC-1 hydrologic model was obtained from the USACE in October 2009 for the 2-, 5-, 10-, 25-, 50-, 100-, and 500-year storm events and includes the portion of the watershed that extends into Lake County, Illinois and Kenosha and Racine Counties in Wisconsin.

The 2008 Cook County FIS states that log-Pearson Type III was utilized to determine the hydrology except for in the area of Wheeling which used HEC-1 and the hydraulic modeling was HEC-2 except for in Brookfield.

3.6.1.2 Water Quality Data

Water quality for the Des Plaines River is monitored by the District or the IEPA The District monitors the water quality of the streams and canals within its jurisdiction, and has seven water quality monitoring stations on of the Des Plaines River within the DWP study area as listed in Table 3.6.3. Annual water quality summaries have been published by the District from 1970 through the present for the Des Plaines River monitoring stations.

TABLE 3.6.3

District Water Quality Monitoring Stations in the Mainstem Lower Des Plaines River Watershed

Station ID	Waterbody	Location	Start Date
WW_13	Des Plaines River	Lake-Cook Road	1970
WW_17	Des Plaines River	Oakton Street, Des Plaines	1970
WW_19	Des Plaines River	Belmont Avenue	1970
WW_20	Des Plaines River	Roosevelt Road	1970
WW_21	Des Plaines River	Near Salt Creek Confluence	1970
WW_22	Des Plaines River	Ogden Avenue	1970
WW_23	Des Plaines River	Willow Springs Road	1970

The IEPA monitors water quality data at two locations in the DWP study area for the Des Plaines River subwatershed. Table 3.6.4 provides the locations of the water quality monitoring station.

TABLE 3.6.4

IEPA Water Quality Monitoring Stations in the Mainstem Lower Des Plaines River Watershed

Station ID	Waterbody	Location
G-22	Des Plaines River	Des Plaines
G-15	Des Plaines River	Schiller Park
G-39	Des Plaines River	Riverside

IEPA's 2010 *Integrated Water Quality Report*, which includes the CWA 303(d) and 305(b) lists, lists three segments within the DWP study area of the Des Plaines River subwatershed as impaired. Table 3.6.5 lists the 303(d) listed impairments. TMDLs have been investigated for the Des Plaines River in the *Des Plaines River/Higgins Creek Watershed TMDL Stage 1 Report*, March 2009. The development of TMDLs is ongoing.

TABLE 3.6.5

IEPA Use Support Categorization and 303(d) Impairments in the Mainstem Lower Des Plaines River Watershed

Station ID	Waterbody	Impaired Designated Use	Potential Cause	Potential Source
IL_G-36	Des Plaines River (upstream of Buffalo Creek confluence)	Aquatic Life	pH, Phosphorus (Total)	Urban Runoff/Storm Sewers, Combined Sewer Overflow, Municipal Point Source Discharge
		Fish Consumption	Mercury, Polychlorinated biphenyls	Cause Unknown
		Primary Contact Recreation	Fecal Coliform	Urban Runoff/Storm Sewers, Combined Sewer Overflow, Municipal Point Source Discharge
IL_G-22	Des Plaines River (upstream of McDonald Creek confluence)	Aquatic Life	Arsenic, Chloride, Methoxychlor, Total Suspended Solids (TSS), Phosphorus (Total)	Urban Runoff/Storm Sewers, Combined Sewer Overflow, Contaminated Sediments, Municipal Point Source Discharge
		Fish Consumption	Mercury, Polychlorinated biphenyls	Cause Unknown
		Primary Contact Recreation	Fecal Coliform	Urban Runoff/Storm Sewers, Combined Sewer Overflow, Municipal Point Source Discharge
IL_G-28	Des Plaines River (near Weller Creek confluence)	Aquatic Life	Chloride, Phosphorus (Total)	Urban Runoff/Storm Sewers, Combined Sewer Overflow, Municipal Point Source Discharge
		Fish Consumption	Mercury, Polychlorinated biphenyls	Cause Unknown

TABLE 3.6.5

IEPA Use Support Categorization and 303(d) Impairments in the Mainstem Lower Des Plaines River Watershed

Station ID	Waterbody	Impaired Designated Use	Potential Cause	Potential Source
		Primary Contact Recreation	Fecal Coliform	Urban Runoff/Storm Sewers, Combined Sewer Overflow, Municipal Point Source Discharge
IL_G-15	Des Plaines River (near Silver Creek confluence)	Aquatic Life	Chloride, Sedimentation/Siltation, Phosphorus (Total)	Urban Runoff/Storm Sewers, Combined Sewer Overflow, Contaminated Sediments, Municipal Point Source Discharge
		Fish Consumption	Mercury, Polychlorinated biphenyls	Cause Unknown
		Primary Contact Recreation	Fecal Coliform	Urban Runoff/Storm Sewers, Combined Sewer Overflow, Municipal Point Source Discharge
IL_G-30	Des Plaines River (downstream of Crystal Creek confluence)	Aquatic Life	Chloride, Total Suspended Solids (TSS), Phosphorus (Total)	Urban Runoff/Storm Sewers, Combined Sewer Overflow, Contaminated Sediments, Municipal Point Source Discharge
		Fish Consumption	Mercury, Polychlorinated biphenyls	Cause Unknown
		Primary Contact Recreation	Fecal Coliform	Urban Runoff/Storm Sewers, Combined Sewer Overflow, Municipal Point Source Discharge
IL_G-32	Des Plaines River (upstream of Salt Creek confluence)	Aquatic Life	Chloride, Phosphorus (Total)	Urban Runoff/Storm Sewers, Combined Sewer Overflow, Municipal Point Source Discharge
		Fish Consumption	Mercury, Polychlorinated biphenyls	Cause Unknown
		Primary Contact Recreation	Fecal Coliform	Urban Runoff/Storm Sewers, Combined Sewer Overflow, Municipal Point Source Discharge
IL_G-39	Des Plaines River (upstream of Flagg Creek confluence)	Aquatic Life	Aldrin, Arsenic, Chloride, Lindane, Methoxychlor, pH, Phosphorus (Total)	Urban Runoff/Storm Sewers, Combined Sewer Overflow, Contaminated Sediments, Municipal Point Source Discharge
		Fish Consumption	Mercury, Polychlorinated biphenyls	Cause Unknown

TABLE 3.6.5
IEPA Use Support Categorization and 303(d) Impairments in the Mainstem Lower Des Plaines River Watershed

Station ID	Waterbody	Impaired Designated Use	Potential Cause	Potential Source
		Primary Contact Recreation	Fecal Coliform	Urban Runoff/Storm Sewers, Combined Sewer Overflow, Municipal Point Source Discharge
RGE*	Beck Lake	Aesthetic Quality	Phosphorus (total)	Source Unknown
RGL*	Big Bend Lake	Aesthetic Quality	Phosphorus (total)	Source Unknown

* Des Plaines River subwatershed lake with impairments as identified in the *Des Plaines River/Higgins Creek Watershed TMDL Stage 1 Report*, March 2009.

NPDES point source discharges within the Des Plaines River subwatershed are listed in Table 3.6.6. In addition to the point source discharges listed, municipalities discharging to the Des Plaines River subwatershed are regulated by IEPA's NPDES Phase II Stormwater Permit Program, which was created to improve the water quality of stormwater runoff from urban areas, and requires that municipalities obtain permits for discharging stormwater and implement the six minimum control measures for limiting runoff pollution to receiving systems.

TABLE 3.6.6
Point Source Discharges in the Mainstem Lower Des Plaines River Watershed

Name	NPDES	Community	Receiving Waterway
Union Pacific Railroad-Melrose	IL0002127	Melrose Park	Des Plaines River
Vulcan Materials-McCook Lime	IL0035785	McCook	Des Plaines River
Vulcan Materials-McCook Quarry	IL0037737	McCook	Des Plaines River
Chicago CSOS	IL0045012	Chicago	Des Plaines River
Fox Point Mhp Stp-Wheeling	IL0049930	Wheeling	Des Plaines River
Commonwealth Edison-Maywood-Sw	IL0059064	Maywood	Des Plaines River
Ashland Distribution-Willow Sp	IL0064408	Willow Springs	Des Plaines River
Leider Greenhouse	IL0067881	Buffalo Grove	Des Plaines River
Comdisco-Rosemont	IL0069086	Rosemont	Des Plaines River
Illinois Tool Works	IL0070971	Harwood Heights	Des Plaines River
Western Springs CSOS	IL0045039	Western Springs	Des Plaines River/ Flagg Creek/ Salt Creek

Note: NPDES facilities were identified from the IEPA website at http://www.epa.state.il.us/water/permits/wastewater/npdes-statewide.pdf, and from the USEPA website at http://www.epa.gov/r5water/weca/pcs.htm.

3.6.1.3 Wetland and Riparian Areas

Figures 2.3.6 and 2.3.7 contain mapping of wetland and riparian areas in the Lower Des Plaines River Watershed. Wetland areas were identified using NWI mapping. NWI data includes roughly 2,391 acres of wetland areas in the MLDPR Subwatershed. Riparian areas are defined as vegetated areas between aquatic and upland ecosystems adjacent to a waterway or body of water that provides flood management, habitat, and water quality enhancement. Identified riparian environments offer potential opportunities for restoration.

3.6.1.4 Floodplain Mapping

Flood inundation areas supporting the NFIP were revised in 2008 as part of the FEMA's Map Modernization Program. As part of the new mapping, floodplain boundaries were revised based upon updated Cook County topographic information; however, the hydrologic and hydraulic computer models, which are used to estimate flood levels, were not updated. LOMRs were incorporated into revised floodplain areas. The MLDPR is mapped in detail in the DFIRM mapping update with Zone AE and Zone X floodplain shown across the length of the MLDPR. The original hydrologic and hydraulic analyses were completed in 1978. Appendix A includes a comparison of FEMA's effective floodplain mapping from updated DFIRM panels with inundation areas developed for the DWP.

3.6.1.5 Stormwater Problem Data

Starting in the 3rd quarter of 2007, communities, agencies (e.g., IDOT, CCHD), and stakeholders submitted Form B questionnaire response data to the District summarizing known stormwater problems within their jurisdictions. The questionnaires were requested again by the District following the September 2008 storm event. Table 3.6.7 summarizes reported problem areas reviewed as a part of the DWP development. Problems are classified in Table 3.6.7 as regional or local. This classification is based on a process described in Section 1 of this report. The Problem Area ID naming convention was found in Technical Memorandum entitled, "Proposed Naming Conventions for Database Elements" dated August 3, 2007.

TABLE 3.6.7
Community Response Data for Mainstem Lower Des Plaines River Watershed

Problem Area ID[1,3]	Municipality	Problems Reported by Local Agency	Location	Problem Description	Local/ Regional	Resolution in DWP
CH-FL-01	Chicago	Pavement flooding	Interstate Route 90 at Canfield Avenue to Oriole Avenue	Drainage Investigation completed not implemented	Local	This is a local problem.[2]
CH-FL-02	Chicago	Pavement flooding	Interstate Route 90 at Des Plaines River	Reported by IDOT	Local	This is a local problem.[2]
CS-FL-01	Countryside	Pavement flooding	Bobolink Drive between LaGrange Road & 7th Avenue	City storm sewer discharges into IDOT storm sewer on 55th Street, which occasionally surcharges causing street ponding	Local	This is a local problem.[2]
CS-FL-02	Countryside	Pavement flooding	5400 block of Madison Avenue	IDOT 55th Street storm sewer surcharge	Local	This is a local problem.[2]
DP-FL-01	Des Plaines	Pavement flooding	Central Road at West of US Route 45	Reported by IDOT: Last incident 10/13/01	Local	This is a local problem.[2]
DP-FL-02	Des Plaines	Pavement flooding	Des Plaines River Road at between IL 72 & Devon Avenue	Reported by IDOT: Last incident 10/14/01	Local	This is a local problem.[2]

TABLE 3.6.7
Community Response Data for Mainstem Lower Des Plaines River Watershed

Problem Area ID[1,3]	Municipality	Problems Reported by Local Agency	Location	Problem Description	Local/ Regional	Resolution in DWP
DP-FL-03	Des Plaines	Pavement flooding	Devon Avenue at I-294 West of River Road	Reported by IDOT: Last incident 8/14/87	Local	This is a local problem.[2]
DP-FL-04	Des Plaines	Pavement flooding	Touhy Avenue at east of Interstate Route 294	Reported by IDOT: Last incident 5/09/90	Local	This is a local problem.[2]
DP-FL-05	Des Plaines	Pavement flooding	Des Plaines River Road at Touhy Ave To Dempster Street	Reported by IDOT: Last incident 8/24/07	Local	This is a local problem.[2]
DP-FL-06	Des Plaines	Pavement flooding	Illinois Route 58 at Des Plaines River	Reported by IDOT	Local	This is a local problem.[2]
DP-FL-07	Des Plaines	Pavement flooding	Illinois Route 58 at C&NW RR (Des Plaines River)	8/23/07 Des Plaines River cresting	Local	This is a local problem.[2]
DP-FR-03	Des Plaines	Pavement flooding	Des Plaines River Road at Gregory to Central Road	Reported by IDOT: Last incident 8/24/07 (Feehanville Ditch problem area DP-FHDT-WT-FR-02)	Regional	FHDT-2, see Section 3.10
DP-FR-04	Des Plaines	Pavement flooding	US Route 14 (Miner Street) at Des Plaines River	Reported by IDOT	Regional	DPR-3A,
DP-FR-06	Des Plaines	Structure flooding	Oakton Street (Locust and Maple Street)	09/13/08: Major flooding on Des Plaines River. Seventeen businesses had up to 24 inches of first floor flooding. 06/19/09: 4 inches in 1 hour. Des Plaines River did not over top but low area held water to foundation level.	Regional	DPR-2B
DP-FR-07	Des Plaines	Structure flooding	Fargo Avenue and River Road	09/13/08: Major flooding on Des Plaines River. Seventeen businesses had up to 24 inches of first floor flooding. 06/19/09: 4 inches in 1 hour. Des Plaines River did not over top but low area held water to foundation level.	Regional	DPR-3A
DP-FR-08	Des Plaines	Structure flooding	River Road and Oakton Street	09/13/08: Major flooding on Des Plaines River. Seventeen businesses had up to 24 inches of first floor flooding.	Regional	DPR-3A

TABLE 3.6.7
Community Response Data for Mainstem Lower Des Plaines River Watershed

Problem Area ID[1,3]	Municipality	Problems Reported by Local Agency	Location	Problem Description	Local/ Regional	Resolution in DWP
DP-FR-11	Des Plaines	Pavement flooding	Illinois Route 58 (Golf Road) at Oakton Community College	Reported by IDOT: Last incident 4/24/99	Regional	Could not raise Golf Road due to railroad underpass east of Des Plaines River Road
PR-FR-01	Park Ridge	Pavement flooding	Illinois Route 72 at Des Plaines River	Reported by IDOT	Regional	DPR-4
PR-FL-02	Park Ridge	Pavement flooding	Devon Avenue at Des Plaines River	Reported by IDOT	Local	This is a local problem.[2]
CD-FR-01	CCHD	Pavement flooding	Fullerton Avenue at Des Plaines River Road	Des Plaines River floods over bank	Regional	DPR-6D
CD-SM-02	CCHD	Maintenance/Debris	Structure #016-3251, 0.2 mi. east of US 45.	Debris collected at center pier.	Local	This is a local problem.[2]
CF-ER-01	FPDCC	Erosion	LaGrange Road and 63rd Street	Severe erosion within Theodore Stone Forest Preserve ravine needs to be restored to natural topography.	Local	This is a local problem.[2]
HH-FL-01	Harwood Heights	Combined sewers	Lawrence Avenue and Harlem Avenue	Separate combined sewer proposal	Local	This is a local problem.[2]
LT-FL-01	Lyons Township	Pavement flooding	Interstate Route 55 at Des Plaines River	Reported by IDOT: Last incident 5/28/00	Local	This is a local problem.[2]
MT-FR-01	Maine Township	Pavement flooding	Central Road at East River Road to River Road	Reported by IDOT: Last incident 3/1/07	Regional	DPR-2B
NT-FL-01	Northfield Township	Pavement flooding	Illinois Route 21 at Central Road	Reported by IDOT: Last incident 8/10/98	Local	This is a local problem.[2]
NT-FL-02	Northfield Township	Pavement flooding	Central Avenue, between Dearlove and Glenwood Road	Street and structural flooding due to undersized storm sewer along Central, IDOT has preliminary study that did not proceed due to lack of funding, pictures included in Form B	Local	This is a local problem.[2]
PT-FL-01	Proviso Township	Pavement flooding	Illinois Route 171 at 13th Street (Loyola Hospital)	Reported by IDOT: Last incident 5/28/96	Local	This is a local problem.[2]
EP-FL-01	Elmwood Park	Pavement flooding	Illinois Route 64 at Des Plaines River	Reported by IDOT	Local	This is a local problem.[2]

TABLE 3.6.7
Community Response Data for Mainstem Lower Des Plaines River Watershed

Problem Area ID[1,3]	Municipality	Problems Reported by Local Agency	Location	Problem Description	Local/ Regional	Resolution in DWP
EP-FR-01	Elmwood Park	Residential flooding	Flooding from Des Plaines River at Thatcher Road	Village sand bags now when River rises. Street and house flooding when overtopping occurs. Village would like to build berm but were told no by State.	Regional	GCTR-1, see Section 3.12
FO-EL-01	Forest Park	Erosion	Roosevelt Road & Des Plaines Avenue	Significant bank erosion, sedimentation, and pollution present.	Local	This is a local problem.[2]
FO-FL-01	Forest Park	Pavement flooding	Interstate Route 290 at Des Plaines	Reported by IDOT. Phase I studies complete.	Local	This is a local problem.[2]
FO-FL-02	Forest Park	Pavement flooding	Illinois Route 171 at Roosevelt to Cermak	Reported by IDOT: Last incident 11/4/03	Local	This is a local problem.[2]
FP-FL-01	Franklin Park	Pavement flooding	Des Plaines River Road at Belmont Avenue	Reported by IDOT: Last incident 4/23/99	Local	This is a local problem.[2]
FP-FR-01	Franklin Park	Pavement flooding	Des Plaines River Road between King Avenue and Robinson Avenue	Reported by IDOT: Last incident 6/5/00	Regional	DPR-5
GV-FL-01	Glenview	Storm sewer	Central Road at Milwaukee Road	Storm sewer at Milwaukee and Central is undersized, causing flooding impacts in areas that drain to Central Road storm sewer, also impacts 600 Naples Court Condo.	Local	This is a local problem.[2]
GV-FL-02	Glenview	Erosion	Forest Drive near Des Plaines River	Deteriorating of ditch on FPDCC property has caused flooding problems in the subdivision. The FPDCC is not allowing the Village to perform the required corrective work	Local	This is a local problem.[2]
GV-FL-03	Glenview	Pavement flooding	Illinois Route 21 at Glenview Road	Reported by IDOT: Last incident 10/13/01	Local	This is a local problem.[2]
LG-FL-01	LaGrange	Pavement flooding	47th Street at East Avenue	Reported by IDOT: Last incident 5/9/03	Local	This is a local problem.[2]
LY-FL-01	Lyons	Pavement flooding	Illinois Route 171 at 45th Street	Reported by IDOT: Last incident 11/10/06	Local	This is a local problem.[2]
LY-FR-01	Lyons	Pavement flooding	US Route 34 (Ogden Avenue) east of Plainfield Road	Reported by IDOT: Last incident 8/15/87	Regional	DPR-12
LY-FR-02	Lyons	Pavement flooding	47th Street at Des Plaines River	Reported by IDOT	Regional	DPR-14B
LY-FR-03	Lyons	Residential flooding	Forest Avenue and 1st Avenue	High River levels cause property damage	Regional	DPR-11C

TABLE 3.6.7
Community Response Data for Mainstem Lower Des Plaines River Watershed

Problem Area ID[1,3]	Municipality	Problems Reported by Local Agency	Location	Problem Description	Local/ Regional	Resolution in DWP
MW-FL-01	Maywood	Combined sewers	Various Locations	Village experience extensive basement flooding. After heavy rainfall, combined sewers cannot handle runoff, therefore, causing basement flooding.	Local	This is a local problem.[2]
MW-FL-02	Maywood	Pavement flooding	Illinois Route 171 at south of Lake Street	Reported by IDOT: Last incident 7/7/04	Local	This is a local problem.[2]
MW-FL-03	Maywood	Pavement flooding	Illinois Route 171 at Madison Street (School Street)	Reported by IDOT: Last incident 6/7/93	Local	This is a local problem.[2]
MC-FR-01	McCook	Overbank flooding	McCook Levee at Des Plaines River	March 1979 Des Plaines River breach of levee caused damage in McCook and Summit.	Regional	DPR-14C
NR-FL-01	North Riverside	Overbank flooding	General overbank flooding - no location specified	Flooding occurs as indicated on FIRM panels. (Structures not affected.)	Local	This is a local problem.[2]
NR-FL-02	North Riverside	Pavement flooding	Illinois Route 171 at 31st St to Ogden Avenue	Reported by IDOT: Last incident 8/17/97	Local	This is a local problem.[2]
NR-FL-03	North Riverside	Pavement flooding	26th Street at Des Plaines River	Reported by IDOT	Local	This is a local problem.[2]
NB-EL-01	Northbrook	Erosion	Portwine Road and Forest View Drive along ditch	Severe bank erosion along 0.5 miles of Portwine Ditch	Local	This is a local problem.[2]
RF-FL-01	River Forest	Sewer	Lake Street and River Oaks Drive near 1st Avenue and Lake	Sewer Surcharging into basements and streets due to high River levels and overland flooding. River Forest completed study of problem area for levee project in 1988.	Local	This is a local problem.[2]
RF-FR-01	River Forest	Restrictive structure	Lake Street crossing	Possible restrictive structure	Regional	DPR-8B
RF-FR-02	River Forest	Restrictive structure	UPRR crossing	Possible restrictive structure	Regional	DPR-8B
RF-FR-03	River Forest	Sewer	Chicago Avenue and Thatcher Avenue	Sewer Surcharging into basements and streets due to high River levels and overland flooding. River Forest completed study of problem area for levee project in 1988.	Regional	DPR-8A
RG-EL-01	River Grove	Erosion	Des Plaines River Road and Grand Avenue to Fullerton	Bank Erosion along roadway	Local	This is a local problem.[2]

TABLE 3.6.7
Community Response Data for Mainstem Lower Des Plaines River Watershed

Problem Area ID[1,3]	Municipality	Problems Reported by Local Agency	Location	Problem Description	Local/ Regional	Resolution in DWP
RG-ER-01	River Grove	Erosion/Overbank Flooding	Des Plaines River Road and 1st Avenue. Drainage ditch along west side of Des Plaines River Road	Pile of crushed stone along west side of Des Plaines River Road began to erode. Stone eroded into drainage ditch and filled ditch enough to cause surface runoff to flood over banks onto Des Plaines River Road. IDOT planning to dredge and re-contour ditch.	Regional	DPR-6D
RG-FL-01	River Grove	Storm and combined sewer	Basements throughout Village	Storm and combined sewer backup into basements	Local	This is a local problem.[2]
RG-FL-02	River Grove	Pavement flooding	Belmont Avenue at Des Plaines River	Reported by IDOT	Local	This is a local problem.[2]
RG-FL-03	River Grove	Pavement flooding	Belmont Avenue at Forest Reserve	Reported by IDOT: Last incident 7/18/93	Local	This is a local problem.[2]
RG-FR-01	River Grove	Pavement flooding	Along Des Plaines River from Grand to Fullerton	After heavy rains, the Des Plaines River cannot handle the volume of stormwater and results in bank erosion and severe overbank flooding and often results in lane closures along Des Plaines River Road.	Regional	DPR-6D
RG-FR-02	River Grove	Pavement flooding	Des Plaines River Road at Grand Avenue to 1st Avenue	Reported by IDOT: Last incident 5/27/04	Regional	DPR-6D
RS-FL-01	Riverside	Pavement flooding	31st Street at Des Plaines River	Reported by IDOT	Local	This is a local problem.[2]
RS-FR-01	Riverside	Residential flooding	Groveland north of Forest Avenue	Structure flooding	Regional	DPR-11C
RS-FR-02	Riverside	Residential flooding	Forest Avenue and 1st Avenue	High River levels cause property damage	Regional	DPR-11C
RM-FL-01	Rosemont	Pavement flooding	US Route 12/45 at IL Route 72	Reported by IDOT: Last incident 2/21/97	Local	This is a local problem.[2]
RM-FL-02	Rosemont	Pavement flooding	Touhy Avenue at US Route 12/45	Reported by IDOT: Last incident 8/30/01	Local	This is a local problem.[2]
RM-FL-03	Rosemont	Sediment Deposition	West of intersection of Rosemont Avenue and Kirschoff Street	Sedimentation in Willow Creek channel creating an island	Local	This is a local problem.[2]

TABLE 3.6.7
Community Response Data for Mainstem Lower Des Plaines River Watershed

Problem Area ID[1,3]	Municipality	Problems Reported by Local Agency	Location	Problem Description	Local/ Regional	Resolution in DWP
SM-FL-01	Summit	Pavement flooding	Interstate Route 55 at Illinois Route 171	Reported by IDOT	Local	This is a local problem.[2]
WH-FL-03	Wheeling	Pavement flooding	Illinois Route 68 west of Interstate Route 294	Reported by IDOT: Last incident 2/21/97	Local	This is a local problem.[2]
WH-FL-04	Wheeling	Pavement flooding	Illinois Route 68 at Des Plaines River	Submitted by IDOT	Local	This is a local problem.[2]
WT-SM-01	Wheeling Township	Sediment deposition	Portwine Road and Forest View Road, Northbrook	Outlet to Des Plaines River has large sediment deposits causing restricted flow into Des Plaines River and causing basement flooding and ponding in residential area. Channel needs to be reconstructed	Local	This is a local problem.[2]

[1] All Problem Area IDs begin with DP-DP- as they are in the Des Plaines River – MLDPR Subwatershed.
[2] Problem does not meet regional definition (refer to chapter 1). Solutions for the local problems are not addressed in the DWP.
[3]These problem areas were identified prior to the June and July 2010 storm events.

3.6.1.6 Near Term Planned Projects

In the 3rd Quarter of 2010, the USACE and the IDNR signed a Project Participation Agreement for the Phase 1 and 2 Des Plaines River Dam Projects. Phase 1 includes the removal of the Armitage and Fairbanks dams. Phase 2 includes the notching of the Hofmann Dam and re-grading of Swan Pond to return it to a more natural drainage state. The notching of the Hofmann Dam was included in the existing conditions analysis for the MLDPR. Levee 37, which is under construction in 2010 and 2011, and the associated compensatory storage facility at Heritage Park flood storage projects were also included in the existing conditions analysis for the MLDPR.

3.6.2 Watershed Analysis

3.6.2.1 Hydrologic Model Development

Subbasin Delineation. The eastern portion of the subbasin boundary of the direct tributary area to the MLDPR Subwatershed was coordinated with HDR, Inc. who prepared the North Branch Chicago River DWP.

The southern boundary of the direct tributary area to the MLDPR is located between the Des Plaines River and the Chicago Sanitary and Ship Canal. The east boundary of the MLDPR Watershed in between the North Branch Chicago River and the Chicago Sanitary and Ship Canal is consistent with the TARP service area.

Areas in the southwest corner of the MLDPR Subwatershed are tributary from DuPage County and were delineated based on the DuPage County 2-foot topographic mapping. The west boundary is the Will County boundary at the Des Plaines River and then DuPage County proceeding north to the Lake County boundary which comprises the north limits of the detailed study.

The subdivides for the direct tributary area were based on the USACE HEC-1 watershed areas, the Cook County 2-foot topographic mapping, and the available combined sewer mapping. Additionally, MLDPR direct tributary area draining to the Summit Conduit was diverted out of the watershed. The Summit Conduit is described below. There are 24 sub-basins ranging in size from 0.1 to 20.0 square miles with a total drainage area of approximately 89 square miles in Cook County.

Portions of the direct tributary area to the MLDPR Watershed have flow diversions to storm sewers, water reclamation plant, and the TARP system. The area tributary to these diversions was incorporated into the HEC-HMS hydraulic model with respect to estimates of the associated tributary area boundaries for each diversion rating curve. The diversion rating curves were taken from the HEC-1 hydrologic model. Additionally, flow diversions from sub-watersheds that contribute to the MLDPR Watershed were included in the HEC-RAS hydraulic model. These flow diversions included the William Rogers Memorial Diversion Channel in the Buffalo Creek Watershed, the diversion pipe from the Farmers Prairie Creek Subwatershed, and diversion channels in the Weller Creek and Salt Creek Watersheds.

The detailed subwatershed studies within Cook County and the tributary area north of Lake-Cook Road were incorporated by reading in the downstream hydrograph results, in DSS format, from the respective Unsteady HEC-RAS hydraulic modeling. The hydrographs for the subwatershed studies were input into the September 2008 and 100-year storm event basin models in HEC-HMS only for reference purposes.

Summit Conduit. The Summit Conduit is an inverted siphon that conveys flow from west of the Des Plaines River under the Des Plaines River to discharge in the Chicago Sanitary and Ship Canal. The area tributary to the Summit Conduit is roughly bounded by Willow Springs Road to the west, Joliet Road to the south and east, and 47th Street to the north. The northeast portion of the drainage area extends southeast past Joliet Road to the McCook Levee to the northeast and the Des Plaines River south of the McCook Levee to approximately East 55th Street. In addition to direct tributary area from the MLDPR being tributary to the Summit Conduit, the entire East Avenue Ditch Subwatershed and the area tributary to the Plainfield Road storm sewer are tributary to the Summit Conduit. The Plainfield Road storm sewer conveys flow from the area south of Plainfield Road away from the Des Plaines River Tributary A Subwatershed to the Summit Conduit.

Depth Area Method. The USACE HEC-1 hydrologic model applied rainfall depths for the design storms using the depth-area method. The depth-area method relationship follows the reasoning that rainfall depth decreases as drainage area increases for large watersheds. The depth-area methodology applied in the HEC-1 hydrologic model cannot be duplicated in

the HEC-HMS hydrologic model. The rainfall depths incorporated into the HEC-HMS hydrologic model are based on the rainfall depth-area relationship in the HEC-1 hydrologic models. At the approximate point along the Des Plaines River a sub-watershed or subbasin is added, the drainage area of the Des Plaines River was approximated and the associated rainfall depth was applied for that area from the HEC-1 relationship.

Hydrologic Parameter Calculations. CN values were estimated for each subbasin based upon NRCS soil data and 2001 CMAP land use data. This method is further described in Section 1.3.2, with lookup values for specific combinations of land use and soil data presented in Appendix C. An area-weighted average of the CN was generated for each subbasin.

Clark's unit hydrograph parameters were estimated using the method described in Section 1.3.2. Appendix G provides a summary of the hydrologic parameters used for subbasins in each subwatershed.

3.6.2.2 Hydraulic Model Development

Field Data, Investigation, and Existing Model Data. The USACE HEC-2 hydraulic model for 2007 Des Plaines River Phase I study was utilized as the best available information for the MLDPR Subwatershed.

Supplemental field survey was performed by D.B. Sterlin, Inc. in mid 2010 under the protocol of FEMA's *Guidelines and Specifications for Flood Hazard Mapping partners, Appendix A: Guidance for Aerial Mapping and Surveying*. The field survey was completed for the McCook Levee, 47th Street Levee, and the Union Pacific railroad bridge south of Lake Street.

HEC-GeoRAS cross-sections extracted from the TIN created in GIS from the 2003 Cook County LiDAR topographic data were imported into HEC-RAS. Cross-section placement was generally consistent with the locations of the cross-sections in the USACE HEC-2 hydraulic model. The surveyed channel from the USACE HEC-2 hydraulic model was integrated into each cross-section to better define the channel. The structure information from the USACE HEC-2 hydraulic model was also utilized to represent stream crossings in the HEC-RAS hydraulic model. Available plans, Cook County topographic data, and information gathered at site visits were used to better define stream crossings of the MLDPR. The geometry for the existing conditions also includes the proposed USACE project, notching the Hofmann Dam.

Field visits were performed to assess channel and overbank roughness characteristics at several locations along the MLDPR. Photographs and aerial photography were reviewed with the Manning's *n* roughness coefficients from the USACE HEC-2 hydraulic model. The Manning's *n* roughness coefficients from the USACE HEC-2 hydraulic model concurred with the review; therefore, they were incorporated into unsteady HEC-RAS hydraulic model.

Boundary Conditions. The downstream boundary condition for the MLDPR Subwatershed is the normal depth method associated with the channel slope of the downstream portion of the Des Plaines River.

3.6.2.3 Calibration and Verification

The MLDPR Watershed HEC-HMS hydrologic model and unsteady HEC-RAS hydraulic models were calibrated to the September 13-14, 2008 storm event.

The MLDPR Watershed existing conditions HEC-HMS hydrologic model and unsteady HEC-RAS hydraulic models incorporate gaged subwatershed models that were calibrated to the September 13-14, 2008 storm event USGS stream gages and ungaged subwatersheds run for the September 13-14 storm event. A verification run was also completed utilizing the October 2006 storm event. The peak flow from the tributary area upstream of Lake-Cook Road (modeled in HEC-HMS) was calibrated to USGS stream gage 05528000 – Des Plaines River near Gurnee and USGS stream gage 05529000 - Des Plaines River Near Des Plaines stream gages. The direct tributary areas were directly incorporated into the HEC-HMS and HEC-RAS models.

Additionally, the USGS provided location information to District for HWM along the MLDPR associated with the September 2008 storm event that were surveyed by D.B. Sterlin, Inc. Three additional HWM locations and elevations along the Des Plaines River were provided by the Village of Wheeling. Table 3.6.9 lists the approximate locations of the HWMs used in the study.

The existing conditions water surface profile for the September 2008 storm event meets the MWRD calibration criteria of 0.5 feet from the observed HWM from Irving Park Road continuing upstream to Lake Cook Road. The existing conditions water surface profile from Hofmann Dam upstream to Irving Park Road deviates from the observed conditions for the September storm event. The model also reflects the partially blocked conditions due to debris jam of the Salt Creek Diversion for the September 2008 storm event.

Stream Gage Data. The USGS stream gage near the City of Des Plaines measured a peak stream elevation of 636.0 feet, NAVD, and had an associated discharge of 3,010 cfs during the September 2008 storm event. The elevation of 636.0 feet, NAVD, correlates well to the HWLs for the September 2008 storm both upstream and downstream of the gage. The discharge-elevation relationship for the September 2008 storm event does not correlate with previous storm events where a flowrate of 3,010 cfs would correspond to a water surface elevation of approximately 633.1 feet, NAVD. The USGS measured the gage height at the Des Plaines stream gage three times during the September 2008 storm event and made measurements within approximately 0.5 feet of the River cresting. While the exact cause of the discharge-elevation discrepancy is not known, it is estimated that seasonal growth in the channel and overbanks, general watershed development, sandbagging, and potential blockages could have contributed to the higher water surface elevations during the large storm event.

The USGS stream gage at the Village of Riverside measured a peak discharge of 9,560 cfs during the September 2008 storm event with an associated stream elevation of 604.3 feet, which correlates well to the discharge-elevation relationship of previous large historical storm events.

Table 3.6.8 provides a summary of the USGS stream gage data and the existing conditions modeling for the September 2008 storm event. Plots of the USGS stream gage data versus the Existing Conditions data are provided in Appendix 2.

TABLE 3.6.8
September 2008 Existing Conditions Versus USGS Stream Gages

USGS Gage	Sept 2008 Peak Flowrate (cfs)	Existing Peak Flowrate (cfs)	% Diff	Sept 2008 Volume (A-F)	Existing Volume (A-F)	% Diff	Sept 2008 Peak WSEL (ft)	Existing Peak WSEL (ft)	% Diff
Gurnee	973	1,002	3	12,909	6,137	-52	N/A	N/A	N/A
Des Plaines	3,010	3,269	8	35,194	27,406	-22	636.0	635.3	-0.7
Riverside	9,560	10,353	8	96,118	85,485	-11	604.3	605.4	1.1

The above summary shows that the flowrates at the gages meet the District 30% calibration criteria of calculated versus observed conditions for the gages at Gurnee, Des Plaines, and Riverside. The volume is also within the 30% criteria except for at the Gurnee gage, where the peak flowrate is within 3% of the observed conditions. As previously noted, the water surface profile for the September 2008 storm event is within the District criteria of 0.5 feet of the observed HWM from the Irving Park Road continuing upstream to Lake Cook Road.

Table 3.6.9 shows the computed water surface elevations at the HWMs upstream of Irving Park road are generally within the District calibration specifications of 0.5 feet from the observed HWM.

TABLE 3.6.9
Observed High Water Marks vs. Modeled Results for September 2008 Storm Event

Cross Section River Station	Closest Road Crossing	Observed HWM (NAVD 1988)	Modeled Water Surface Elevation (NAVD 1988)	Difference
257312.2	Lake Cook Road	640.3	639.1	-1.2
244642	Dundee Road	638.3	637.6	-0.7
223894	Lake-Euclid	635.5	635.2	-0.3
223710.6	Lake-Euclid	635.4	635.1	-0.3
217872.3	Central Road	634.1	633.9	-0.2
212188.4	Golf Road	633.6	633.1	-0.5
210121.3	Golf Road	632.8	633.0	0.2
205899.2	Rand Road	632.5	632.6	0.1
205290.7	Rand Road	632.9	632.5	-0.4
204117.9	Rand Road	632.5	632.3	-0.2
204051.1	Rand Road	631.1	632.3	1.2

TABLE 3.6.9
Observed High Water Marks vs. Modeled Results for September 2008 Storm Event

Cross Section River Station	Closest Road Crossing	Observed HWM (NAVD 1988)	Modeled Water Surface Elevation (NAVD 1988)	Difference
201080.5	Dempster Street	631.7	631.9	0.2
201005.5	Dempster Street	631.7	632.0	0.3
198043.7	Algonquin Road	631.2	631.2	0.0
195111.8	Oakton Street	630.1	630.9	-0.1
186147.6	Touhy Avenue	629.9	630.3	0.4
179188.1	Devon Avenue	629.4	629.8	0.4
164813.3	Lawrence Avenue	627.3	627.5	0.2
159665	Irving Park Road	625.2	627.3	2.1
159488.5	Irving Park Road	625.9	627.2	1.3
159385	Irving Park Road	626.8	627.2	0.4
159201.4	Irving Park Road	626.4	627.0	0.6
156620	Irving Park Road	626.7	626.8	0.1
152985.3	Belmont Road	625.2	626.3	1.1
149821.2	Grand Avenue	625.0	625.7	0.7
144976.1	First Avenue	624.3	625.2	0.9
131539.4	Chicago Avenue	623.2	623.8	0.6
128942.1	Lake Street	622.8	623.6	0.8
118208.9	Roosevelt Road	621.5	620.0	-1.5
112199	22nd Street	617.5	618.4	0.9
108517.6	26th Street	616.4	616.6	0.2
104526.1	31st Street	615.7	615.7	0.0
93124.5	Barrypoint Road	604.3	605.4	1.1

Figure 3.6.2 shows the modeled peak flowrate near Gurnee from the HEC-HMS hydrologic model for the September 2008 storm event is within 3% of observed peak flowrate for the September 2008 storm event.

FIGURE 3.6.2
Mainstem Lower Des Plaines River
Flow Comparison near Gurnee for the September 2008 Storm Event

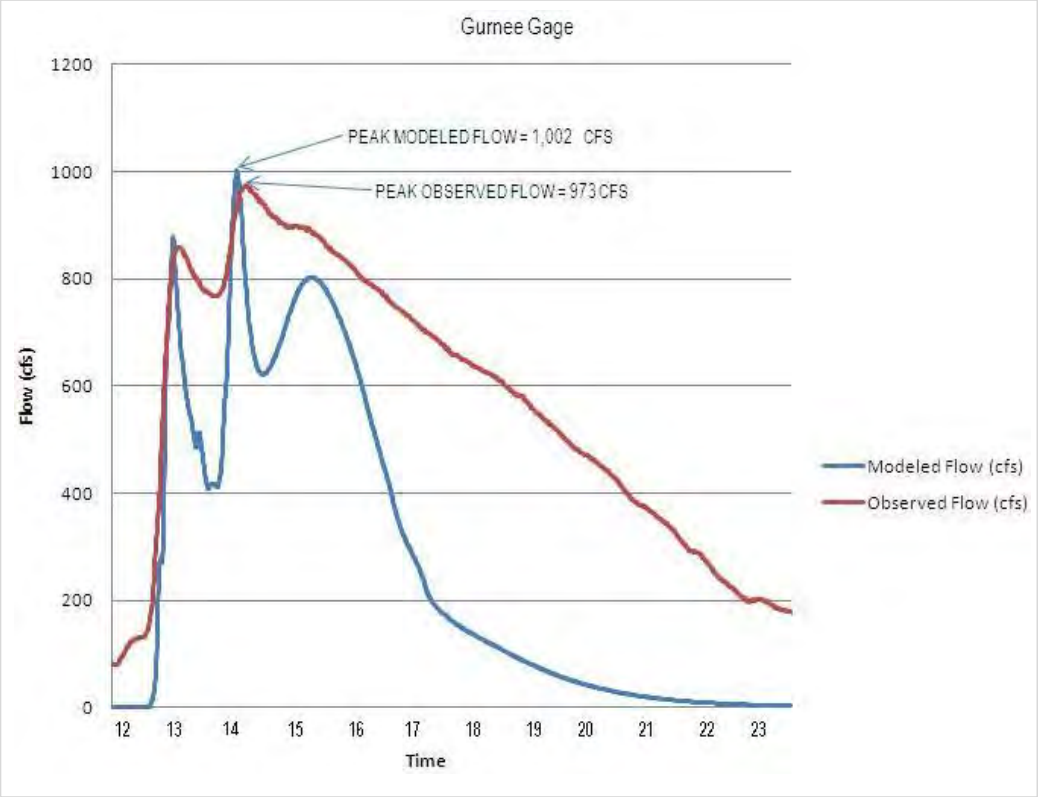
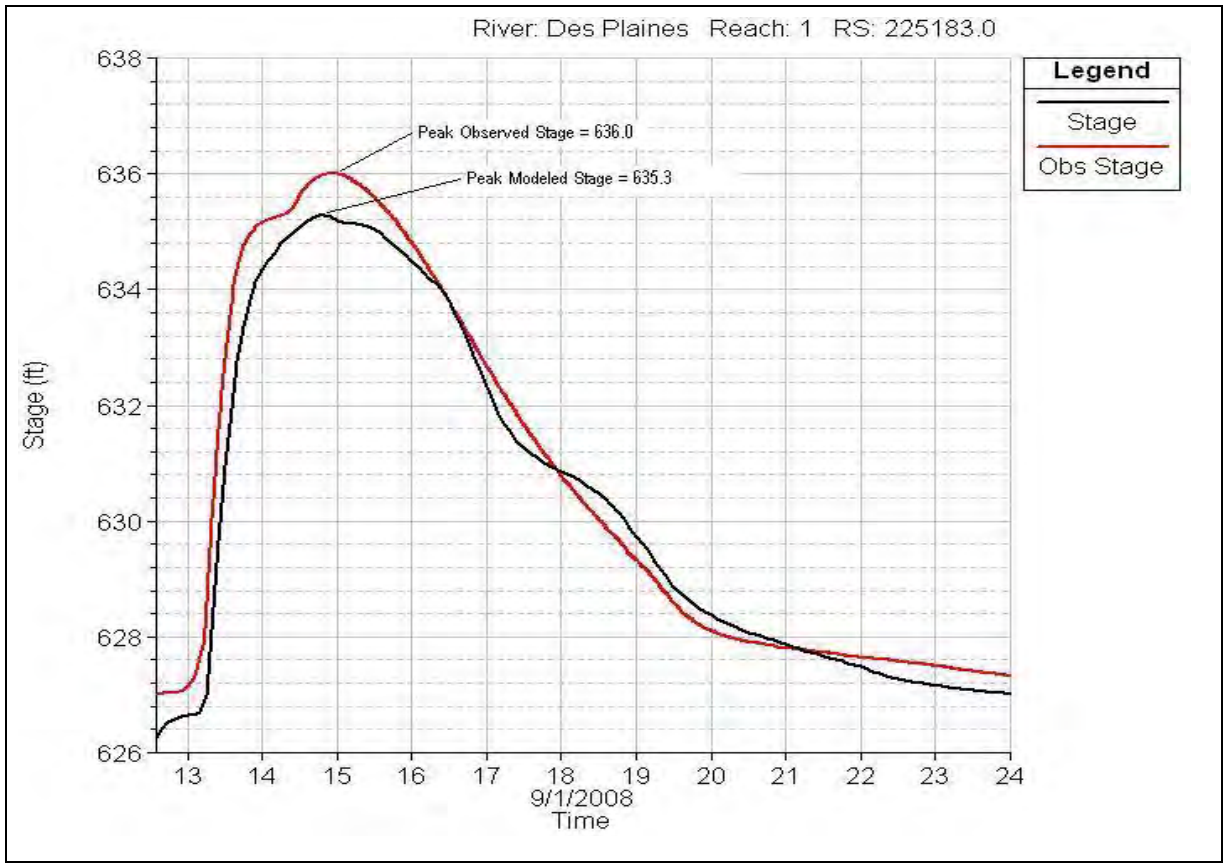


Figure 3.6.3 shows the modeled peak water surface elevation near Des Plaines at HEC-RAS cross-section 225183.0 is within 0.7 feet of observed peak stage elevation.

FIGURE 3.6.3
Mainstem Lower Des Plaines River
Stage Comparison near Des Plaines for the September 2008 Storm Event



The peak flowrate of the unsteady HEC-RAS model near Des Plaines at cross section 225183.0 is within 9% of the peak gaged flowrate as shown in Figure 3.6.4. Figure 3.6.4 also shows the computed volume is within 22%.

FIGURE 3.6.4
Mainstem Lower Des Plaines River
Flow Comparison near Des Plaines for the September 2008 Storm Event

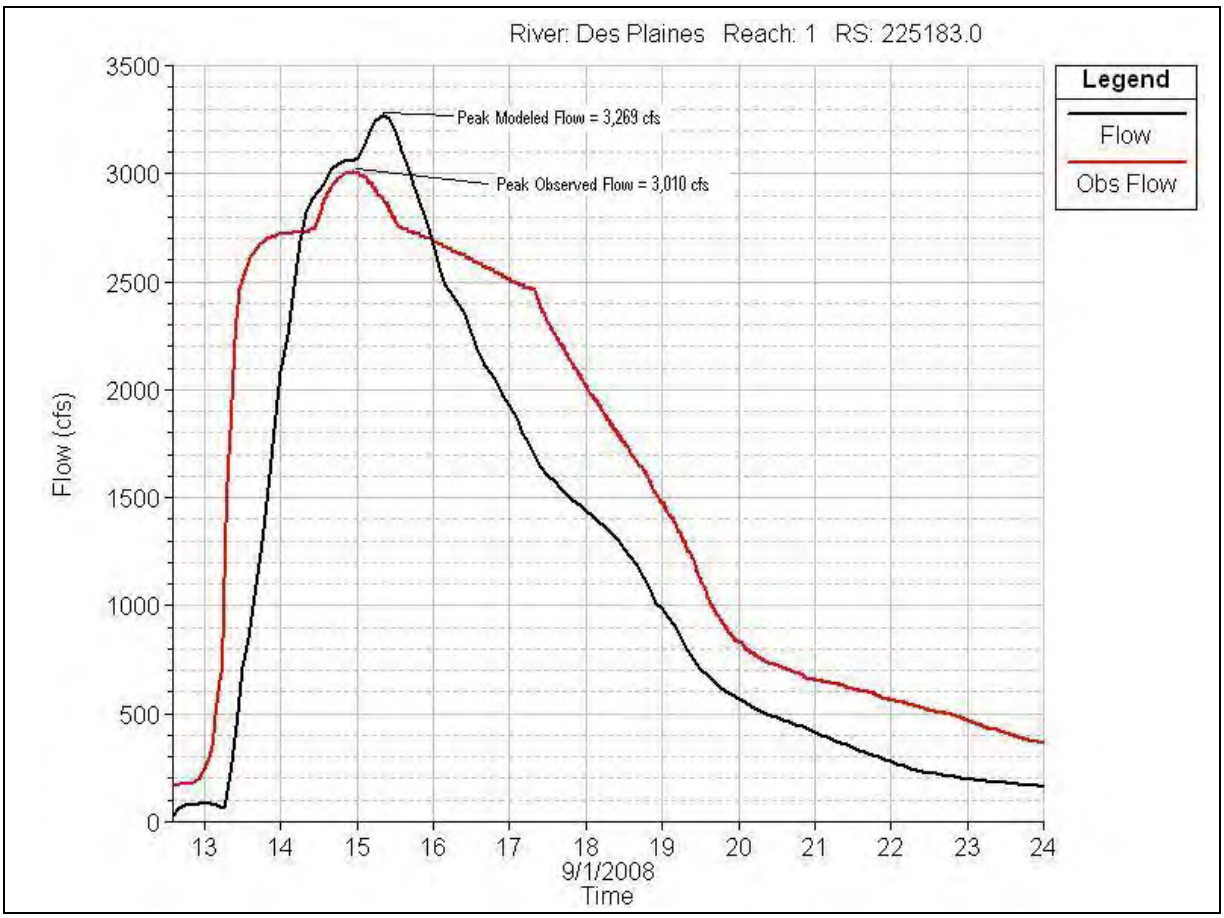
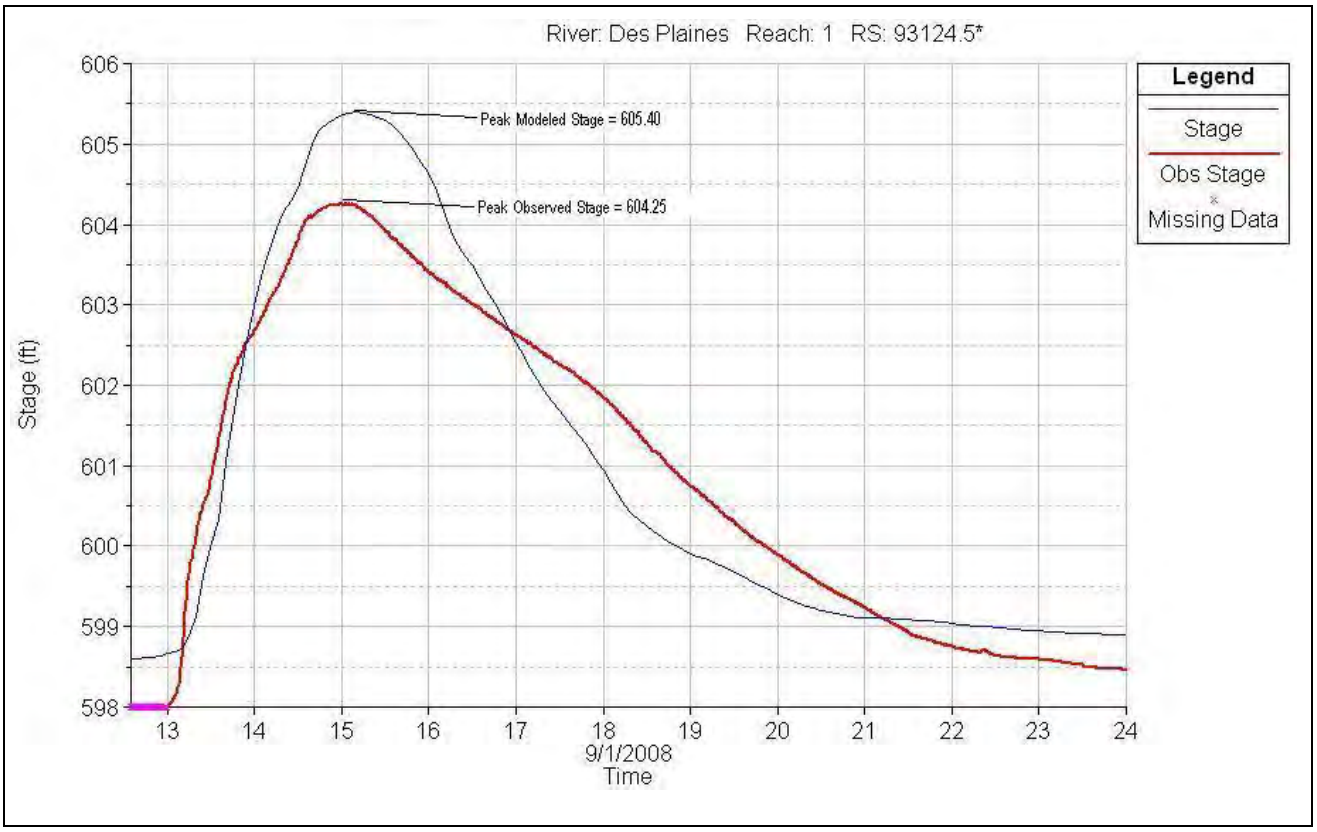


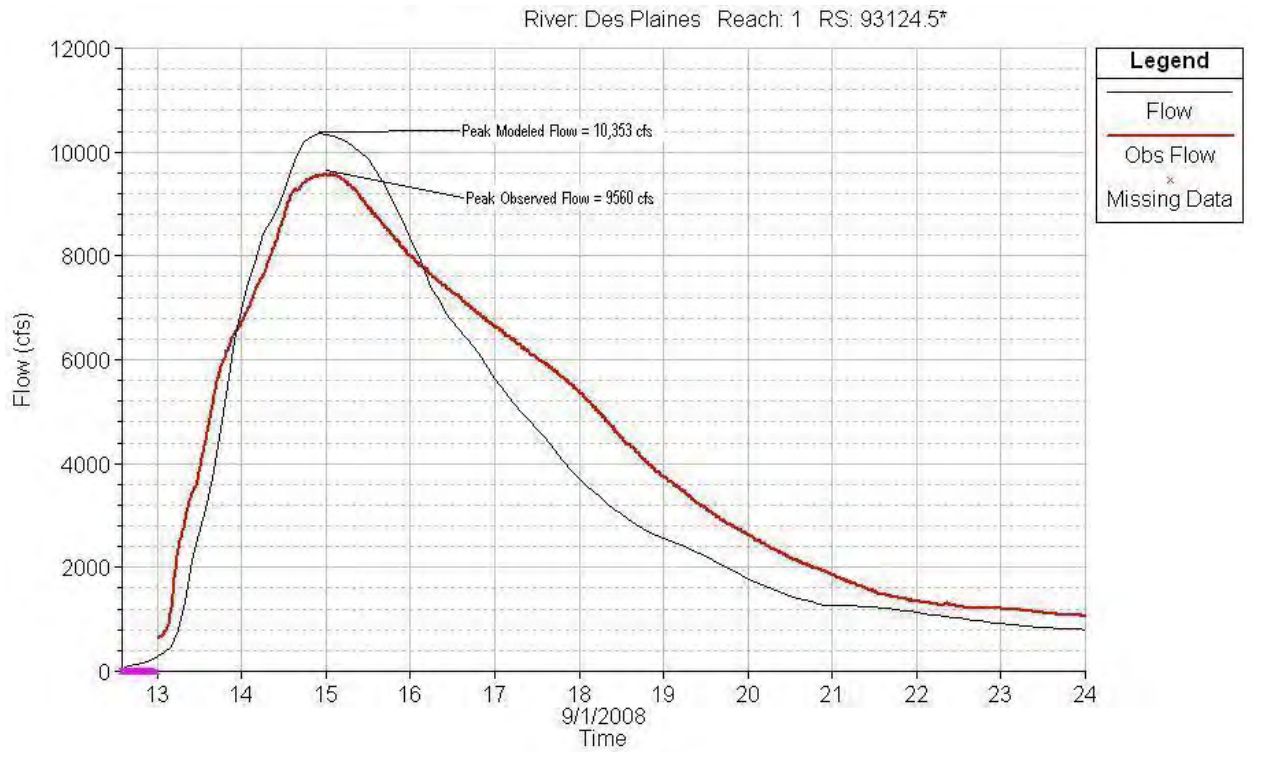
Figure 3.6.5 shows the modeled peak water surface elevation near Riverside at HEC-RAS cross-section 93124.5 is within 1.1 feet of observed peak stage elevation.

FIGURE 3.6.5
Mainstem Lower Des Plaines River
Stage Comparison near Riverside for the September 2008 Storm Event



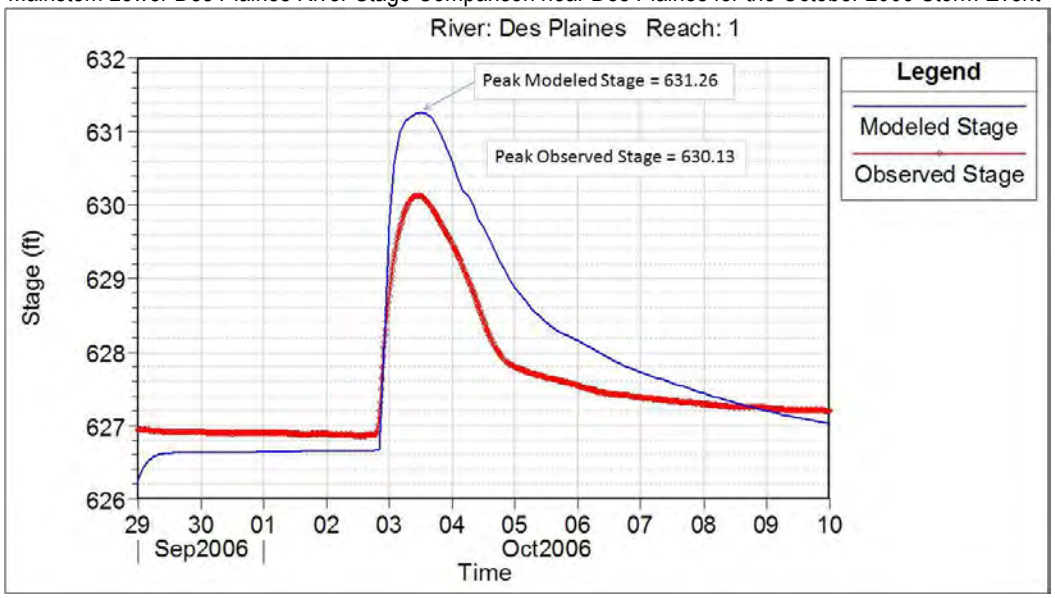
The peak flowrate of the unsteady HEC-RAS model near Riverside at cross section 93124.5 is within 9% of the peak gaged flowrate as shown in Figure 3.6.6. Figure 3.6.6 also shows the computed volume is within 11%.

FIGURE 3.6.6
Mainstem Lower Des Plaines River
Flow Comparison near Riverside for the September 2008 Storm Event



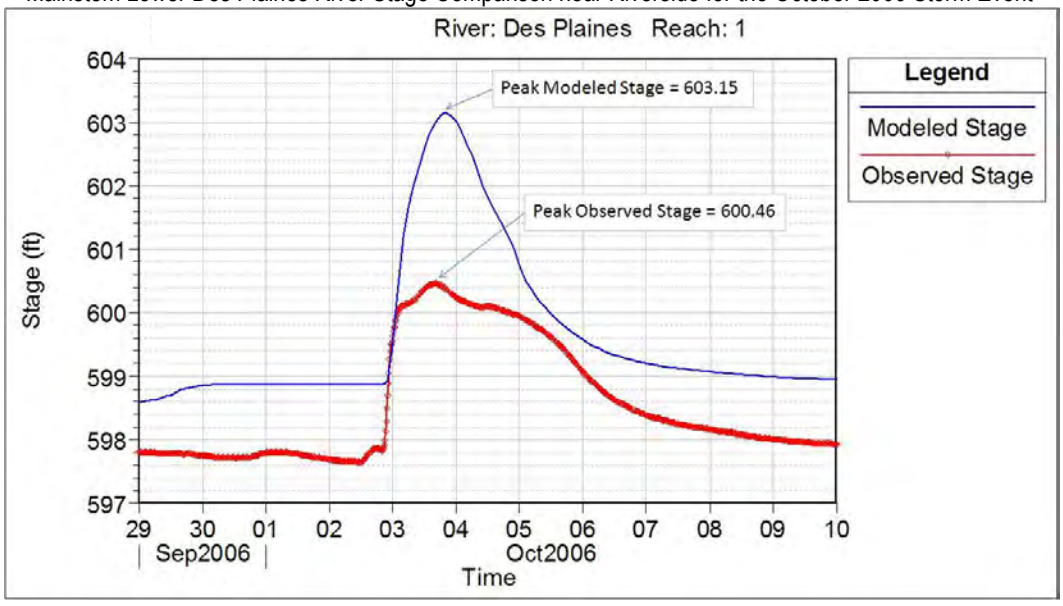
The peak stage of the unsteady HEC-RAS model near Des Plaines is shown below in Figure 3.6.7a for the verification storm event run for the October 2006 storm event.

FIGURE 3.6.7a
Mainstem Lower Des Plaines River Stage Comparison near Des Plaines for the October 2006 Storm Event



The peak stage of the unsteady HEC-RAS model near Riverside is shown below in Figure 3.6.7b for the verification storm event run for the October 2006 storm event.

FIGURE 3.6.7b
Mainstem Lower Des Plaines River Stage Comparison near Riverside for the October 2006 Storm Event



3.6.2.4 Existing Conditions Evaluation

Flood Inundation Areas. Figure 3.6.1 shows inundation areas in the MLDPR Subwatershed produced by the DWP's hydraulic model for the 100-year, 10-day duration design storm, which was used as the critical duration storm event. The 10-day duration storm event is consistent with the USACE analysis.

Hydraulic Profiles. Appendix H contains existing conditions hydraulic profiles for the MLDPR. Profiles are shown for the 2-, 5-, 10-, 25-, 50-, 100-, and 500-year recurrence interval design storms.

3.6.3 Development and Evaluation of Alternatives

3.6.3.1 Problem Definition

Hydraulic model results were reviewed with inundation mapping and Form B questionnaire response data to identify locations where property damage due to overbank flooding is predicted. Table 3.6.10 summarizes additional regional problem areas identified through hydraulic modeling of the MLDPR.

TABLE 3.6.10
Modeled Problem Definition for Mainstem Lower Des Plaines River Watershed

Problem Area ID[1]	Location	Recurrence Interval (yr) of Flooding	Associated Form B[2]	Resolution in DWP	No. of Structures Flooded
CC-FR-01	Bismark Street and Stanley Avenue	2, 5, 10, 25, 50, 100	N	DPR-13	39
CC-FR-02	Des Plaines River at Cermak Avenue/22nd Street	50, 100	N	DPR-10	0
CH-FR-01	Lawrence Avenue at the Des Plaines River	100	N	See Table 3.6.12	-
DP-FR-01	West of Des Plaines River Road between Howard Avenue and Sherwin Avenue	5, 10, 25, 50, 100	N	DPR-3A	300-500
DP-FR-02	Shagbark Lake east of Des Plaines River Road	25, 50, 100	N	DPR-3A	300-500
DP-FR-05	Des Plaines River Road at Algonquin Road	100	N	DPR-2A, DPR-2B	0
DP-FR-09	West of Des Plaines River north of Rand Road	5, 10, 25, 50, 100	N	DPR-3A	300-500
DP-FR-12	Des Plaines River at Rand Road	25, 50, 100	N	DPR-2A, DPR-2B	0
DP-FR-13	Des Plaines River at Oakton Street	25, 50, 100	N	DPR-2A, DPR-2B	0

TABLE 3.6.10
Modeled Problem Definition for Mainstem Lower Des Plaines River Watershed

Problem Area ID[1]	Location	Recurrence Interval (yr) of Flooding	Associated Form B[2]	Resolution in DWP	No. of Structures Flooded
DP-FR-14	East of River Road and north of Central Road	10, 25, 50, 100	N	DPR-2A, DPR-2B	0
DP-FR-10	South of Miner Street north of Oakton west of the Des Plaines River	25, 50, 100	N	DPR-2A, DPR-2B	0
FP-FR-02	Des Plaines River at Roosevelt Road	25, 50, 100	N	DPR-9A	0
FV-FR-01	47th Street Levee	100	N	DPR-14D	220
HK-FR-01	North of Interstate Route 55	50, 100	N	DPR-15	5
HK-FR-02	West of Interstate Route 55	50, 100	N	DPR-15	5
LY-FR-04	46th Street and Fishermanns Terrace	50, 100	N	DPR-14A	12
MW-FR-01	Des Plaines River at 1st Avenue	25, 50, 100	N	DPR-11A, DPR-11B, DPR-11C	59
RG-FR-04	South of Fullerton west of Des Plaines River Road	5, 10, 25, 50, 100	N	DPR-6D	115
RG-FR-05	West of Des Plaines River between Grand and Fullerton	5, 10, 25, 50, 100	N	DPR-6D	115
RM-FR-01	Higgins and River Road at Des Plaines River	25, 50, 100	N	DPR-4	0
SP-FR-01	South of Irving Park Road, west of and at Des Plaines River Road	25, 50, 100	N	DPR-5	13
WH-FR-01	East of Des Plaines River Road at Manchester Drive	10, 25, 50, 100	N	DPR-1	6
WH-FR-02	Illinois Route 21 at Hintz Road to Palatine Road	100	N	See table 3.6.12	-
WH-FR-03	Diversion Channel: Meadow Lane	100	N	See table 3.6.12	-

[1] All Problem Area IDs begin with DP-DP- as they are in the Des Plaines River – Lower Des Plaines River Mainstem Watershed.

3.6.3.2 Damage Assessment

Economic damages were defined following the protocol outlined in Chapter 6.6 of the CCSMP. Recreation damages due to flooding are not being identified as part of the DWP. No erosion damages due to flooding were identified for the MLDPR. Transportation damages were estimated as 15 percent of property damages plus regional transportation damages associated with the regional transportation damages listed in Table 3.6.37. Table 3.6.10 lists the existing estimated average annual damages for the MLDPR.

TABLE 3.6.11
Estimated Average Annual Damages for Mainstem Lower Des Plaines River

Damage Category	Estimated Average Annual Damage ($)	Description
Property	4,794,549	Includes structure and content damage for residential and non-residential structures
Erosion	0	No critical erosion damages were identified
Transportation	2,910,405	Assumed as 15% of property damage plus regional transportation damages

3.6.3.3 Technology Screening

Flood control technologies were screened to identify those most appropriate for addressing the flooding problems in the Watershed. Storage, floodwalls, and roadway modifications were identified as the principal technologies applicable for addressing stormwater problems in the MLDPR Watershed. The feasibility of the technologies defined in Chapter 6.6 of the CCSMP is summarized for each alternative in Table 3.6.12.

TABLE 3.6.12
Technology Screening for Mainstem Lower Des Plaines River

Technology	Feasibility for DP-FR-03 (River Road at Gregory to Central)
See Table 3.10.6 problem areas FHDT-WT-FR-01 and FHDT-WT-FR-02	
Technology	**Feasibility for DP-FR-04 (Miner Street at Des Plaines River)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Feasible – Raise road
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Levee 50 and proposed floodwall with closure structure would address problem
Technology	**Feasibility for DP-FR-06 (Oakton Street, Locust and Maple Street)**
Storage Facility	Feasible – May be required for mitigation storage

Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall
Technology	**Feasibility for DP-FR-07 (Fargo Avenue and River Road)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not Feasible – culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall
Technology	**Feasibility for DP-FR-08 (River Road and Oakton Street)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Feasible – Road raise would address problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall
Technology	**Feasibility for DP-FR-11 (Golf Road at Oakton Community College)**
Storage Facility	Not feasible – roadway flooding
Conveyance Improvement – Culvert/Bridge Replacement	Not Feasible – Not adequate road clearance to raise Golf Road profile under railroad
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Not feasible – Road closures would be required for freeboard tie-ins
Technology	**Feasibility for CD-FR-01 (Fullerton Avenue at River Road)**
Storage Facility	Not feasible – Roadway flooding
Conveyance Improvement – Culvert/Bridge Replacement	Not Feasible – culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall

Technology	Feasibility for MT-FR-01 (Central Road at East River Road to River Road)
Storage Facility	Not feasible – Roadway flooding
Conveyance Improvement – Culvert/Bridge Replacement	Feasible – Road raise and enlarge bridge opening
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Not feasible – Road closures would be required for freeboard tie-ins
Technology	**Feasibility for EP-FR-01 (Thatcher Road at Des Plaines River)**
See Table 3.12.5 problem areas DP-FR-01	
Technology	**Feasibility for FP-FR-01 (River Road between King Avenue and Robinson Avenue)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Feasible – Raising roadway
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall
Technology	**Feasibility for LY-FR-01 (Ogden Avenue east of Plainfield Road)**
Storage Facility	Not feasible – Roadway flooding
Conveyance Improvement – Culvert/Bridge Replacement	Feasible – Road raise of Ogden Avenue
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Not feasible – Road closures would be required for freeboard tie-ins
Technology	**Feasibility for LY-FR-02 (47th Street at Des Plaines River)**
Storage Facility	Not feasible – Roadway flooding
Conveyance Improvement – Culvert/Bridge Replacement	Feasible – Road raise of 47th Street
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Not feasible – Road closures would be required for freeboard tie-ins
Technology	**Feasibility for LY-FR-03 (Forest Avenue and 1st Avenue)**

Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not Feasible – culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall
Technology	**Feasibility for MC-FR-01 (McCook Levee)**
Storage Facility	Feasible – Adequate vacant land not available for effective storage
Conveyance Improvement – Culvert/Bridge Replacement	Not feasible –Bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Enhancement of existing levee
Technology	**Feasibility for RF-FR-01 (Lake Street at Des Plaines River)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not Feasible – culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall
Technology	**Feasibility for RF-FR-02 (UPRR Railroad south of Lake Street)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not Feasible – Bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Would not address problem
Technology	**Feasibility for RF-FR-03 (Chicago Avenue and Thatcher Avenue)**
Storage Facility	Not feasible – Roadway flooding
Conveyance Improvement – Culvert/Bridge Replacement	Not Feasible – Raise road and enlarge waterway opening
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts

Flood Barriers, Levees/Floodwalls	Not feasible – Road closures would be required for freeboard tie-ins
Technology	**Feasibility for RF-ER-01 (River Road at First Avenue)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not Feasible – culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwalls
Technology	**Feasibility for RG-FR-01 (River Road from Grand to Fullerton)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not Feasible – culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwalls
Technology	**Feasibility for RG-FR-02 (River Road at Grand to 1st Avenue)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Feasible – 1st Avenue road raise
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwalls
Technology	**Feasibility for RS-FR-01 (Groveland north of First Avenue)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Feasible – Railroad bridge pier improvement
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall enhancement
Technology	**Feasibility for RS-FR-02 (Forest Avenue and 1st Avenue)**
Storage Facility	Feasible – May be required for mitigation storage

Conveyance Improvement – Culvert/Bridge Replacement	Feasible – Railroad bridge pier improvement
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwalls
Technology	**Feasibility for CC-FR-01 (Riverside Lawndale)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall
Technology	**Feasibility for CC-FR-02 (Cermak Avenue/22nd Street at Des Plaines River)**
Storage Facility	Not feasible – Roadway flooding
Conveyance Improvement – Culvert/Bridge Replacement	Feasible – Road raising
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Not feasible – Road closures would be required for freeboard tie-ins
Technology	**Feasibility for CH-FR-01 (Lawrence Avenue at Des Plaines River)**
Storage Facility	Not feasible – Roadway flooding
Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Raising not feasible due to intersection conflicts
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Not feasible – Road closures would be required for freeboard tie-ins
Technology	**Feasibility for DP-FR-01 (Howard Avenue to Sherwin Avenue west or River Road)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall

Technology	Feasibility for DP-FR-02 (Shagbark Lake east of River Road)
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall
Technology	**Feasibility for DP-FR-05 (Algonquin Road at Des Plaines River)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Roadway raising
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Not feasible – Road closures would be required for freeboard tie-ins
Technology	**Feasibility for DP-FR-09 (West of Des Plaines River north of Rand Road)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall
Technology	**Feasibility for DP-FR-10 (South of Miner Street west of Des Plaines River)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall
Technology	**Feasibility for DP-FR-12 (Rand Road at Des Plaines River)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Feasible – Road raising

Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Not feasible – Road closures would be required for freeboard tie-ins
Technology	**Feasibility for DP-FR-13 (Oakton Street at Des Plaines River)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Feasible – Road raising
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Not feasible – Road closures would be required for freeboard tie-ins
Technology	**Feasibility for DP-FR-14 (East of Des Plaines River north of Central)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Feasible – Road raising/enlarge waterway opening
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Not feasible – Road closures would be required for freeboard tie-ins
Technology	**Feasibility for FP-FR-02 (Roosevelt Road at Des Plaines River)**
Storage Facility	Not feasible – Roadway flooding
Conveyance Improvement – Culvert/Bridge Replacement	Feasible – Road raising
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Not feasible – Road closures would be required for freeboard tie-ins
Technology	**Feasibility for HK-FR-01 (North of Interstate 55)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall
Technology	**Feasibility for HK-FR-02 (West of Interstate 55)**

Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall

Technology	**Feasibility for LY-FR-04 (46th Street at Fishermanns Terrace)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall

Technology	**Feasibility for MW-FR-01 (1st Avenue at Des Plaines River)**
Storage Facility	Feasible – However, adequate benefits not provided
Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall

Technology	**Feasibility for RG-FR-04 (South of Fullerton, west of River Road)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall

Technology	**Feasibility for RG-FR-05 (Between Grand and Fullerton west of Des Plaines River)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts

Flood Barriers, Levees/Floodwalls	Feasible – Floodwall
Technology	**Feasibility for RM-FR-01 (Higgins and River Road at Des Plaines River)**
Storage Facility	Not feasible – Roadway flooding
Conveyance Improvement – Culvert/Bridge Replacement	Feasible – Road raise
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Not feasible – Road closures would be required for freeboard tie-ins
Technology	**Feasibility for RM-FR-01 (South of Irving Park Road west of River Road)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall
Technology	**Feasibility for SP-FR-01 (Higgins and River Road at Des Plaines River)**
Storage Facility	Not feasible – Roadway flooding
Conveyance Improvement – Culvert/Bridge Replacement	Feasible – Road raise
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Not feasible – Road closures would be required for freeboard tie-ins
Technology	**Feasibility for WH-FR-01 (Manchester Drive west of River Road)**
Storage Facility	Feasible – May be required for mitigation storage
Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Feasible – Floodwall
Technology	**Feasibility for WH-FR-02 (Route 21 at Hintz Road to Palatine Road)**
Storage Facility	Not feasible – Roadway flooding

Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – Significant environmental impacts
Flood Barriers, Levees/Floodwalls	Not feasible – Floodwall would block Buffalo Creek

Technology	**Feasibility for WH-FR-03 (Diversion Channel: Meadow Lane)**
Storage Facility	Not feasible – Des Plaines River backwater area
Conveyance Improvement – Culvert/Bridge Replacement	Not feasible – Culvert/bridge not the source of problem
Conveyance Improvement – Channel Improvement	Not feasible – New channel
Flood Barriers, Levees/Floodwalls	Not feasible – Flooding caused by backwater

3.6.3.4 Alternative Development

Flood Control Alternatives. Alternative solutions to regional flooding were developed and evaluated consistent with the methodology described in Section 1.4 of this report. At the time this report is being printed, the USACE is developing its Upper Des Plaines Feasibility Study (Phase 2) of the Des Plaines River and its tributaries upstream of its confluence with Salt Creek. The District attended multiple agency coordination meetings with the USACE while preparing this report to ensure that any alternatives being considered were incorporated into both studies. Table 3.6.13 summarizes flood control alternatives for the MLDPR Watershed.

TABLE 3.6.13
Flood Control Alternatives for Mainstrem Lower Des Plaines River

Alternative	Addressed Problem Area IDs[1]	Location	Description
DPR-1	WH-FR-01	Wheeling	*Floodwall:* Approximately 6,000 feet of floodwall on east side of Milwaukee Avenue from Alexia Court to Hintz Road. Average wall height 3.5 feet. Two pump stations to address interior drainage.
DPR-2A	MT-FR-01, DP-FR-05, FP-FR-10, DP-FR-13, DP-FR-14	Des Plaines	*Road raises and mitigation storage:* Raise Central Road, Rand Road, Algonquin Road, Oakton Street to approximately 0.5 feet above the 100-year flood inundation. Mitigation storage provided in two USACE concept reservoirs.

TABLE 3.6.13
Flood Control Alternatives for Mainstrem Lower Des Plaines River

Alternative	Addressed Problem Area IDs[1]	Location	Description
DPR-2B	MT-FR-01, DP-FR-05, FP-FR-10, DP-FR-13, DP-FR-14	Des Plaines	*Road raise and bridge modification:* Raise Central Road, Rand Road, Algonquin Road, Oakton Street to approximately 0.5 feet above the 100-year flood inundation. Enlarge waterway opening at Central Road.
DPR-3A	DP-FR-01, DP-FR-02, DP-FR-09, DP-FR-04, DP-FR-07, DP-FR-08,	Des Plaines	*Floodwall and mitigation storage:* City of Des Plaines Regional Floodwall. Five floodwalls approximately 26,500 feet total length from railroad south of Golf Road to Sherwin Avenue. Twelve pump stations to address interior drainage.
DPR-4	RM-FR-01	Rosemont	*Road raise:* Raise intersection of River Road and Higgins Road, and intersection of River Road and Glenlake Avenue to approximately 0.5 feet above the 100-year inundation.
DPR-5	SP-FR-01, FR-FR-01	Schiller Park, Franklin Park	*Floodwall and road raise:* Approximately 6,600 feet of floodwall on the east side of River Road from Irving Park Road to Belmont Avenue. Average wall height is 8 feet. Four pump stations to address interior drainage. Raise Irving Park Road and Lawrence Avenue to approximately 0.5 feet above the 100-year inundation.
DPR-6D	RG-FR-01, RG-FR-02, RG-FR-04, RG-FR-05, RG-ER-01, CD-FR-01	River Grove	*Floodwalls and road raises:* 7,500 feet 4-8 feet average height west floodwall and 3,000 feet 4-8 feet average height east floodwall. Approximately 6 total pump stations to address interior drainage. Raise Grand Avenue and 1st Avenue to approximately 0.5 feet above the 100-year inundation.
DPR-8A	RF-FR-03	River Forest	*Road raise and bridge modification:* Raise Chicago Avenue to approximately 0.5 feet above the 100-year flood inundation and enlarge waterway opening.
DPR-8B	RF-FR-01, RF-FR-02	River Forest	*Floodwall:* Approximately 2,200 feet of floodwall on the east side of the Des Plaines River north of Lake Street. Average wall height

TABLE 3.6.13
Flood Control Alternatives for Mainstrem Lower Des Plaines River

Alternative	Addressed Problem Area IDs[1]	Location	Description
			4 feet. Pump station to address interior drainage.
DPR-9A	FP-FR-02	Forest Park	*Road raise and bridge modification:* Raise Roosevelt road to approximately 0.5 feet above the 100-year flood inundation and enlarge the waterway opening. Raise low chord.
DPR-10	CC-FR-02	Proviso Township and Riverside Township	*Road raise:* Raise Cermak Road/22nd Street to approximately 0.5 feet above the 100-year flood inundation.
DPR-11A	MW-FR-01, RS-FR-01, RS-FR-02	Riverside	*Floodwalls and road raises:* Groveland Avenue/east floodwall approximately 3,500 feet in length with 3 pump stations to address interior drainage. Raise 1st Avenue and Forest Avenue to approximately 0.5 feet over the 100-year flood inundation.
DPR-11B	MW-FR-01, RS-FR-01	Riverside	*Floodwall:* Enhance existing Groveland Avenue floodwall from 31st Street to Brookfield Avenue, approximately 3,500 feet. Average wall height 7 feet.
DPR-11C	MW-FR-01, RS-FR-01, RS-FR-02, LY-FR-03	Riverside	*Floodwalls, road raises, pier extension:* Groveland Avenue/east floodwall approximately 3,500 feet in length with 3 pump stations to address interior drainage. USACE/IDNR concept CB&Q Railroad pier extension. Raise 1st Avenue and Forest Avenue to approximately 0.5 feet over the 100-year flood inundation.
DPR-12	LY-FR-01, NR-FR-01	Lyons	*Road raise:* Raise Ogden Avenue east of 1st Avenue to approximately 0.5 feet over the 100-year flood inundation.
DPR-13	CC-FR-01	Unincorporated Cook County	*Floodwall:* Approximately 2,400 feet of average 6 feet high floodwall from Joliet Avenue to Ogden Avenue. Two pump stations to address interior drainage.

TABLE 3.6.13
Flood Control Alternatives for Mainstrem Lower Des Plaines River

Alternative	Addressed Problem Area IDs[1]	Location	Description
DPR-14A	LY-FR-04	Lyons	*Floodwall:* Approximately 1,200 feet of 3-4 feet average high floodwall from 45th Street to 47th Street west of the MLDPR. Pump station to address interior drainage.
DPR-14B	LY-FR-02	Lyons	*Road raise:* Raise 47th Street to approximately 0.5 feet over the 100-year flood inundation.
DPR-14C	MC-FR-01	McCook, Lyons, Summit	*Floodwall:* Enhance existing McCook Levee from 47th Street to Interstate 55, approximately 5,000 feet. Average wall height 4 feet.
DPR-14D	FV-FR-01	Lyons	*Floodwall and mitigating storage:* Enhance existing 47th Street Levee from 43rd Street to 47th Street, approximately 3,000 feet. Mitigating storage in Lyons Quarry.
DPR-15	HK-FR-01, HK-FR-02	Hodgkins	*Floodwall:* Approximately 10,000 feet of average 3-5 feet high floodwall north of Interstate 55. Pump stations to address interior drainage.
DPR-22[2]	N/A	Lyons	*Storage: Utilized existing Lyons Quarry as flood control reservoir with approximately 3,500 A-F*
DPR-23	Across watershed	Lower Des Plaines River Watershed	*Storage:* Five USACE concept flood control reservoirs totaling approximately 4,600 A-F
DPR-26	EP-FL-01	Elmwood Park, River Forest, River Grove	*Road raise:* Raise North Avenue to approximately 0.5 feet over the 100-year flood inundation.

[1] All Problem Area IDs begin with DP- as they are in the Des Plaines River Watershed.
[2] Alternative was evaluated per request of Riverside Residents for Flood Prevention.

Regional problems identified in the study area involve overbank flooding into residential neighborhoods, and commercial and industrial areas. Channel improvements, floodwalls, and stormwater detention alternatives were evaluated to address regional flooding problems along the MLDPR. Mitigating storage is required for floodwalls that would result in

adverse increases in water surface elevations or to compensate for lost floodplain storage due to the proposed alternative.

Alternative DPR-1 includes the construction of a floodwall, averaging approximately 3.5 feet in height along the east side of Milwaukee Avenue from Alexia Court to Hintz Road. The problem area contains structures that are at risk of overbank flooding from the MLDPR east of Milwaukee Avenue. To protect these structures from the risk of flooding, approximately 6,000 linear feet of floodwall will be constructed along the MLDPR. The floodwall would have approximately 3 feet of freeboard above the 100-year flood inundation. Pump stations would be required to address interior drainage.

Alternative DPR-2A proposes to raise four roadways, Central Road, Rand Road, Algonquin Road, and Oakton Street to approximately 0.5 feet above the 100-year inundation. Mitigation storage is proposed in two USACE concept reservoirs located between Lake-Cook Road and Dundee Road and between Euclid and Central Road. The reservoirs are proposed on the east side of the Des Plaines River on FPDCC property. This alternative would address the regional transportation damages associated with Central Road, Rand Road, Algonquin Road, and Oakton Street.

Alternative DPR-2B proposes to raise four roadways, Central Road, Rand Road, Algonquin Road, and Oakton Street to approximately 0.5 feet above the 100-year flood inundation. Additionally, the waterway opening of Central Road would be enlarged. This alternative would address the regional transportation damages associated with Central Road, Rand Road, Algonquin Road, and Oakton Street. This alternative produces the same damage reductions as Alternative DPR-2A but has no requirement for mitigating storage.

The City of Des Plaines Regional Floodwall is proposed as Alternative DPR-3A. The regional floodwall would consist of five floodwalls totaling approximately 26,500 feet in length. The system of floodwalls would extend between the railroad south of Golf Road to Sherwin Avenue. Pump stations would be required to address interior drainage. Mitigating storage could be provided in the USACE concept reservoirs located east of the Des Plaines River within FPDCC property between Lake-Cook Road and Dundee Road, between Euclid and Central Avenue, and south of Dundee Road. This alternative would address structural flooding risks associated with the MLDPR west of the River. The floodwall would have approximately 3 feet of freeboard above the 100-year inundation.

Alternative DPR-4 consists of raising the intersection of River Road and Higgins Road and the intersection of River Road and Glenlake Avenue to approximately 0.5 feet above the 100-year inundation. This alternative would address the regional transportation damages associated with the River Road and Higgins Road intersection.

Alternative DPR-5 consists of an approximately 6,600 feet long floodwall from Irving Park Road south to Belmont Avenue on the east side of River Road. The average height of the wall would be approximately 8 feet and includes approximately 3 feet of freeboard above the 100-year flood inundation. Pump stations would be required to address interior drainage. Approximately 520 feet of Irving Park Road would be raised approximately 2.5 feet to

approximately 0.5 feet above the 100-year flood inundation. Additionally, Lawrence Avenue would be raised to approximately 0.5 feet above the 100-year flood inundation. This alternative would address residential flood risk in the Villages of Schiller Park and Franklin Park and regional transportation damages associated with River Road.

Two floodwalls and two road raises comprise Alternative DPR-6D. The floodwalls consist of a west and an east floodwall measuring approximately 7,500 and 3,000 linear feet, respectively. Each floodwall would average approximately 4-8 feet in height and have approximately 3 feet of freeboard over the 100-year flood inundation. Pump stations would be required to address interior drainage. The floodwall would address the residential structures at risk of flooding west of 1st Avenue. The two road raises include 1,400 feet along Grand Avenue and 1,850 feet along 1st Avenue over the Des Plaines River to 0.5 feet above the 100-year inundation.

Alternative DPR-8A would raise Chicago Avenue a maximum 4.25 feet to an elevation approximately 0.5 feet above the 100-year flood inundation. The waterway opening would also be enlarged. This alternative would address the regional transportation damages associated with Chicago Avenue.

The floodwall north of Lake Street was evaluated as Alternative DPR-8B. The approximately 2,200 feet long floodwall would average approximately 4 feet in height and would incorporate approximately 3 feet of freeboard over the 100-year flood inundation. Pump stations would be required to address interior drainage. The floodwall would address the residential structures at risk of flooding at Lake Street east of the MLDPR.

Alternative DPR-9A would raise Roosevelt Road a maximum of 2.5 feet to approximately 0.5 feet above the 100-year flood inundation. Additionally, the waterway opening would be enlarged and the low chord would be raised. This alternative would address the regional transportation damages associated with Roosevelt Road.

Alternative DPR-10 would raise Cermak Road/22nd Street a maximum of 1.5 feet to approximately 0.5 feet above the 100-year flood inundation. This alternative would address regional transportation damages associated with Cermak Road/22nd Street.

Alternative DPR-11A consists of enhancing the existing Groveland Avenue Levee for a length of approximately 3,500 feet. The floodwall would have an average height of approximately 7 feet and would include approximately 3 feet of freeboard over the 100-year flood inundation. Pump stations would be required to address interior drainage. Additionally, a west floodwall would be added south of Forest Avenue east of 1st Avenue. First Avenue and Forest Avenues would be raised approximately 2.5 feet to an elevation approximately 0.5 feet above the 100-year flood inundation. This alternative would add height and freeboard to the existing Groveland Avenue Levee and address the regional transportation damages associated with 1st Avenue and Forest Avenue.

Alternative 11-B consists of enhancement of the existing Groveland Avenue Levee for a length of approximately 3,500 feet between 31st Street and Brookfield Avenue. The average

height of the floodwall would be approximately 7 feet which would include approximately 3 feet of freeboard over the 100-year flood inundation. Pump stations would be required to address interior drainage. This alternative would add height and freeboard to the existing Groveland Avenue Levee to address the flooding risk to residential structures behind the existing levee.

Alternative DPR-11C consists of enhancement of the existing Groveland Avenue Levee for a length of approximately 3,500 feet between 31st Street and Brookfield Avenue. The average height of the floodwall would be approximately 7 feet which would include approximately 3 feet of freeboard over the 100-year flood inundation. Pump stations would be required to address interior drainage. Additionally, the USACE/IDNR proposed pier extension of the CB & Q railroad is proposed. First Avenue and Forest Avenues would be raised approximately 1.0 foot and 1.5 feet, respectively, to an elevation approximately 0.5 feet above the 100-year flood inundation. This alternative would add height and freeboard to the existing Groveland Avenue Levee and address the regional transportation damages associated with 1st Avenue and Forest Avenue.

Ogden Avenue at the Lyons Quarry will be raised a maximum of 2.5 feet to approximately 0.5 feet above the 100-year flood inundation for Alternative DPR-12. This alternative will address the regional transportation damages associated with Ogden Avenue.

Alternative DPR-13 consists of an approximately 2,400 feet long floodwall south of the Des Plaines River and north of 39th Street to address the flood risk in the Riverside Lawndale area. The average wall height would be approximately 6 feet and includes approximately 3 feet of freeboard above the 100-year flood inundation. Pump stations would be required to address interior drainage.

Alternative DPR-14A consists of an approximately 1,200 feet long floodwall west of the Des Plaines River from 45th Street to 47th Street. The average wall height would be approximately 3-4 feet and includes approximately 3 feet of freeboard above the 100-year flood inundation. Pump stations would be required to address interior drainage.

Alternative DPR-14B would raise 47th Street a maximum of 3.5 feet to approximately 0.5 feet above the 100-year flood inundation. This alternative would address regional transportation damages associated with 47th Street.

Alternative 14-C consists of enhancement of the existing McCook Levee for a length of approximately 5,000 feet between 47th Street and Interstate 55. The average height of the floodwall would be approximately 4 feet which would include approximately 3 feet of freeboard over the 100-year flood inundation. Pump stations would be required to address interior drainage. This alternative would add height and freeboard to the existing McCook Levee to address the flooding risk behind the existing levee.

Alternative 14-D consists of enhancement of the existing 47th Street Diversion Levee for a length of approximately 3,000 feet between 43rd Street and 47th Street. The average height of the floodwall would be approximately 2.5 feet which would include approximately 3 feet of

freeboard over the 100-year flood inundation. Pump stations would be required to address interior drainage. This alternative would add height and freeboard to the existing 47th Street Levee to address the flooding risk behind the existing levee. Mitigating storage would be required and could be provided in the Lyons Quarry, south of Ogden Avenue.

Alternative DPR-15 includes the construction of a floodwall, averaging approximately 3-5 feet in height along the west side of the Des Plaines River north of Interstate 55. The floodwall would have approximately 3 feet of freeboard above the 100-year flood inundation. Pump stations would be required to address interior drainage. The floodwall would address structures that are at risk of overbank flooding from the MLDPR north of Interstate 55.

Alternative DPR-22 would raise Ogden Avenue to approximately 0.5 feet above the 100-year flood inundation and allow for a diversion structure to convey flow under Ogden Avenue to the existing Lyons Quarry. The Lyons Quarry would be utilized as a flood control reservoir to provide approximately 3,500 A-F of storage volume. This alternative would provide an increased level of protection in the area of the quarry.

Five USACE concept flood control reservoir locations comprise DPR-23 which would provide a total of approximately 4,600 A-F of storage volume along the MLDPR. This alternative would provide an increased level of protection along reaches of the Des MLDPR.

Alternative DPR-26 would raise North Avenue a maximum of 2.5 feet to approximately 0.5 feet above the 100-year flood inundation. This alternative would address regional transportation damages associated with North Avenue.

Erosion Control Alternatives. No regional erosion problem areas were reported; therefore, alternatives were not developed for the MLDPR Watershed.

3.6.3.5 Alternative Evaluation and Selection

Alternatives listed in Table 3.6.13 were evaluated to determine their effectiveness and to produce data for the countywide prioritization of watershed projects. Flood control alternatives were modeled to evaluate their impact on water surface elevations and flood damages. Table 3.6.39 provides a summary B/C ratio, net benefits, total project costs, number of structures protected, and other relevant alternative data.

DPR-1. DPR-1 was developed to address the flooding risk of 6 structures which can incur flooding at the 100-year flood inundation along the west side of the Des Plaines River south of Dundee Road north of Hintz Road within the Village of Wheeling.

The proposed strategy for DPR-1 is to construct an approximately 6,000 feet long floodwall on the east side of Milwaukee Avenue from Alexia Court to Hintz Road. The average wall height would be approximately 3.5 feet which would include 3 feet of freeboard over the 100-year flood inundation. Two pump stations would be required to address interior drainage. Table 3.6.14 compares the peak modeled water surface elevation and flow for Alternative DPR-1.

TABLE 3.6.14
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-1 Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-1	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of Dundee Road	252101.0	641.1	4,816	641.1	4,816
Upstream of Buffalo Creek Confluence	244642.0	639.5	4,173	639.5	4,175
Upstream of Palatine Road	238260.0	638.5	5,113	638.5	5,116

DPR-2A. DPR-2A was developed to address the flooding risk of 4 roadways in the City of Des Plaines which can incur flooding at the 100-year flood inundation of the MLDPR. The 4 roadways, Central Road, Rand Road, Algonquin Road, and Oakton Street would be raised to approximately 0.5 feet above the 100-year flood inundation. Mitigating storage could be provided in 2 USACE concept flood control reservoirs located within FPDCC property between Lake-Cook Road and Dundee Road, and between Euclid Avenue and Milwaukee Avenue on the east side of the Des Plaines River. Approximately 1,100 A-F is proposed in the reservoir between Lake-Cook Road and Dundee Road and approximately 2,100 A-F is proposed in the reservoir between Euclid and Central Road. Each reservoir would be pump evacuated. Table 3.6.15 compares the peak modeled water surface elevation and flow for Alternative DPR-2A.

TABLE 3.6.15
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-2A Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-2A	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of Euclid Avenue	227415.6	636.7	5,188	636.5	4,953
Upstream of Central Road	217928.2	635.0	5,556	634.9	4,978
Upstream of Rand Road	204117.9	633.1	5,823	632.6	5,252
Upstream of Algonquin Road	197957.7	631.8	5,993	631.3	5,426
Upstream of Oakton Street	195201.0	631.4	6,013	630.9	5,443
Upstream of Touhy Avenue	186437.3	630.7	6,057	630.2	5,484
Upstream of Lawrence Avenue	164910.7	627.7	6,706	627.4	6,335

DPR-2B. DPR-2B was developed to address the flooding risk of 4 roadways in the City of Des Plaines which can incur flooding at the 100-year flood inundation of the MLDPR. The 4 roadways, Central Road, Rand Road, Algonquin Road, and Oakton Street would be raised to approximately 0.5 feet above the 100-year flood inundation. In addition to raising the road profiles, the waterway opening of Central Road would be enlarged. Table 3.6.16 compares the peak modeled water surface elevation and flow for Alternative DPR-2B. No mitigating storage is required for this alternative.

TABLE 3.6.16
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-2B Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-2B	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of Euclid Avenue	227415.6	636.7	5,188	636.7	5,180
Upstream of Central Road	217928.2	635.0	5,556	635.0	5,549
Upstream of Rand Road	204117.9	633.1	5,823	633.1	5,807
Upstream of Algonquin Road	197957.7	631.8	5,993	631.8	5,978
Upstream of Oakton Street	195201.0	631.4	6,013	631.4	5,997
Upstream of Touhy Avenue	186437.3	630.7	6,057	630.7	6,044

DPR-3A. DPR-3A was developed to address the flooding risk to hundreds of structures in the City of Des Plaines which can occur west of the Des Plaines River. The proposed City of Des Plaines Regional Floodwall would consist of 5 floodwall segments totaling approximately 26,500 feet in length. The regional floodwall would extend from the railroad south of Golf Road to Sherwin Avenue and would require approximately 12 pump stations to address interior drainage. Mitigating storage would be provided in 3 USACE concept flood control reservoirs located within FPDCC property between Lake-Cook Road and Dundee Road, between Euclid Avenue and Milwaukee Avenue, and south of Dundee Road on the east side of the Des Plaines River. Table 3.6.17 compares the peak modeled water surface elevation and flow for Alternative DPR-3A.

TABLE 3.6.17
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-3A Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-3A	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of Central Road	217928.2	635.0	5,556	634.6	5,048
Upstream of Golf Road	212317.5	633.9	5,555	633.5	4,499
Upstream of Rand Road	204117.9	633.1	5,823	632.4	4,923
Upstream of Miner Street	201165.7	632.7	5,914	632.0	5,030
Upstream of Algonquin Road	197957.7	631.8	5,993	631.2	5,131
Upstream of Oakton Street	195201.0	631.4	6,013	630.8	5,164
Upstream of Lawrence Avenue	165073.0	627.8	6,705	627.3	6,215

DPR-4. DPR-4 was developed to address the flooding risk at the intersections of Higgins Road and River Road, and River Road and Glenlake Avenue which can occur during the 100-year flood inundation in the Village of Rosemont. River Road, Higgins Road, and Glenlake Avenue would be raised to approximately 0.5 feet above the 100-year flood inundation. Table 3.6.18 compares the peak modeled water surface elevation and flow for Alternative DPR-4.

TABLE 3.6.18
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-4 Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-4	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of Devon Avenue	179270.9	630.1	6,100	630.1	6,102
Upstream of Higgins Road	176103.1	629.9	6,122	629.9	6,118
Upstream of Interstate 90	174628.0	629.5	6,672	629.5	6,675

DPR-5. DPR-5 was developed to address the flooding risk which can occur on River Road, Irving Park Road, Lawrence Avenue, and 13 structures west of River Road between Irving Park Road and Belmont Avenue in the Villages of Franklin Park and Schiller Park. The proposed strategy includes the construction of an approximately 6,600 feet long floodwall averaging 8 feet high and raising a section of Irving Park Road. The floodwall height includes 3 feet of freeboard over the 100-year inundation. Approximately 4 pump stations would be required to address interior drainage. Irving Park Road would be raised for approximately 500 feet to approximately 0.5 feet above the 100-year flood inundation. Lawrence Avenue would also be raised above the 0.5 feet above the 100-year flood inundation. Table 3.6.19 compares the peak modeled water surface elevation and flow for Alternative DPR-5.

TABLE 3.6.19
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-5 Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-5	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of Lawrence Avenue	165073.0	627.8	6,705	627.8	6,714
Upstream of Irving Park Road	159385.0	627.2	6,915	627.2	6,922
Upstream of Belmont	153106.6	626.4	6,912	626.4	6,920
Upstream of Grand	149902.6	625.8	6,915	625.8	6,921

DPR-6D. DPR-6D was developed to address the risk of flooding to 115 structures on the east and west sides of the Des Plaines River between Franklin Street and 1st Avenue and the risk of flooding to 1st and Grand Avenues which can incur flooding at the 100-year flood inundation of the MLDPR in the Village of River Grove. The west floodwall would average between 4-8 feet high for approximately 7,500 feet and require 4 pump stations to address interior drainage. The east floodwall, from River Grove Avenue to Fullerton Avenue, would measure approximately 3,000 feet long, average 4-8 feet high, and require 2 pump stations to address interior drainage. Both floodwalls include 3 feet of freeboard over the 100-year flood inundation.

Additionally, Grand Avenue would be raised for approximately 1,400 feet and would require the waterway opening to be enlarged. First Avenue would be raised for approximately 1,800 feet. Both roads would be raised to approximately 0.5 feet over the 100-year flood inundation. Table 3.6.20 compares the peak modeled water surface elevation and flow for Alternative DPR-6D.

TABLE 3.6.20
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-6D Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-6D	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of Belmont	153106.6	626.4	6,912	626.4	6,912
Upstream of Soo Line Railroad	151370.3	626.0	6,910	626.0	6,910
Upstream of Grand	149902.6	625.8	6,915	625.8	6,915
Upstream of 1st Avenue	145060.7	615.1	6,917	625.1	6,918
Upstream of North Avenue	138355.0	624.7	6,932	624.7	6,934

DPR-8A. DPR-8A was developed to address the risk of flooding at Chicago Avenue in the Village of River Forest. The proposed alternative would raise approximately 3,300 feet of Chicago Avenue to approximately 0.5 above the 100-year flood inundation. Additionally, the waterway opening would be enlarged. Table 3.6.21 compares the peak modeled water surface elevation and flow for Alternative DPR-8A.

TABLE 3.6.21
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-8A Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-8A	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of North Avenue	138355.0	624.7	6,932	624.7	6,935
Upstream of Chicago Avenue	131616.0	623.7	7,081	623.7	7,084
Upstream of Lake Street	128749.8	623.4	7,096	623.4	7,100

DPR-8B. DPR-8B was developed to address the risk of flooding to 19 structures north and south of Lake Street, east of the Des Plaines River in the Village of River Forest. The proposed alternative would consist of an approximately 2,200 feet long floodwall with an average height of 4 feet. The floodwall would include 3 feet of freeboard over the 100-year flood inundation and would require pump stations to address interior drainage. Table 3.6.22 compares the peak modeled water surface elevation and flow for Alternative DPR-8B.

TABLE 3.6.22
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-8B Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-8A	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of Chicago Avenue	131616.0	623.7	7,081	623.7	7,083
Upstream of Lake Street	128749.8	623.4	7,096	623.4	7,097
Upstream of CB & Q Railroad	128467.0	623.1	7,097	623.1	7,098

DPR-9A. DPR-9A was developed to address the flooding risk at Roosevelt Road in the Village of Forest Park. The proposed alternative would raise approximately 715 feet of Roosevelt Road and would include enlarging the waterway opening and raising the low chord. The road profile would be raised to approximately 0.5 feet above the 100-year flood inundation. Table 3.6.23 compares the peak modeled water surface elevation and flow for Alternative DPR-9A.

TABLE 3.6.23
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-9A Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-9A	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of Cemetery Bridge	119541.8	620.3	7,155	620.3	7,147
Upstream of Roosevelt Road	118367.1	620.1	7,162	620.1	7,154
Upstream of Cermak/22nd Street	111577.9	618.3	7,147	618.3	7,148

DPR-10. DPR-10 was developed to address the flooding Risk at Cermak Road/22nd Street in Proviso Township and Riverside Township. Cermak Road/22nd Street would be raised for approximately 450 feet to approximately 0.5 feet above the 100-year flood inundation. Table 3.6.24 compares the peak modeled water surface elevation and flow for Alternative DPR-10.

TABLE 3.6.24
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-10 Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-10	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of Roosevelt Road	118367.1	620.1	7,162	620.1	7,162
Upstream of Cermak/22nd Street	111577.9	618.3	7,147	618.3	7,147
Upstream of 26th Street	108602.1	617.0	7127	617.0	7126

DPR-11A. DPR-11A was developed to address the flooding risk at Forest Avenue, 1st Avenue, and 59 structures located east of the existing Groveland Avenue Levee in Village of Ri-

verside. The proposed alternative would consist of enhancing the existing Groveland Levee north to 31st Street and provide 3 feet of freeboard above the 100-year flood inundation. The floodwall would be approximately 3, 500 feet long with an average height of 7 feet. Three pump stations would be required to address interior drainage. Additionally, 1st Avenue would be raised for approximately 2,600 feet and Forest Avenue would be raised for approximately 1,800 feet to approximately 0.5 feet above the 100-year flood inundation. Table 3.6.25 compares the peak modeled water surface elevation and flow for Alternative DPR-11A.

TABLE 3.6.25
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-11A Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-11A	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of 26th Street	108602.1	617.0	7,127	617.0	7,161
Upstream of 31st Street	104720.2	616.0	8,304	616.0	8,302
Downstream of Forest Avenue	101667.1	615.0	8,315	615.0	8,306
Upstream of CB & Q Railroad	100937.8	614.8	8,318	614.8	8,306

DPR-11B. DPR-11B was developed to address the flooding risk for 59 homes east of the existing Groveland Avenue Levee north of Brookfield Avenue and south of 31st Street in the Village of Riverside. The proposed strategy for this area is to extend the levee to the north to block off flow that goes around the north side of the levee and to provide 3 feet of freeboard for the subject area. To provide 3 feet of freeboard, the levee was extended north to 31st Street. The average height of the approximately 3,500 feet long levee would be 7 feet and would require 3 pump stations to address interior drainage. Table 3.6.26 compares the peak modeled water surface elevation and flow for Alternative DPR-11B.

TABLE 3.6.26
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-11B Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-11B	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of 26th Street	108602.1	617.0	7,127	617.0	7139
Upstream of 31st Street	104720.2	616.0	8,304	616.0	8,285
Downstream of Forest Avenue	101667.1	615.0	8,315	615.0	8,299
Upstream of CB & Q Railroad	100937.8	614.8	8,318	614.8	8,299

DPR-11C. DPR-11C was developed to address the flooding risk at Forest Avenue, 1st Avenue, and 59 structures located east of the existing Groveland Avenue Levee in Village of Riverside. The proposed strategy was to incorporate the proposed USACE/IDNR pier

extension project at the CB & Q Railroad to provide upstream benefits and allow optimization of the projects to address risks at Forest Avenue and 1st Avenue.

The USACE/IDNR pier extension project would extend the piers 50 feet to 100 feet upstream and downstream of the existing CB & Q Railroad. The angle of the pier extension will be in the direction of flow of the Des Plaines River. The Groveland Avenue floodwall would average 7 feet high for approximately 3,500 feet and require 3 pump stations to address interior drainage. First Avenue would be raised for approximately 1,100 feet and Forest Avenue would be raised approximately 750 feet to approximately 0.5 feet above the 100-year flood inundation. Table 3.6.27 compares the peak modeled water surface elevation and flow for Alternative DPR-11C.

TABLE 3.6.27
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-11C Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-11C	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of 26th Street	108602.1	617.0	7,127	616.7	7,163
Upstream of 31st Street	104720.2	616.0	8,304	615.6	8,299
Downstream of Forest Avenue	101667.1	615.0	8,315	614.3	8,283
Downstream of CB & Q Railroad	99283.76	613.0	7,026	613.0	7,055

DPR-12. DPR-12 was developed to address the flooding risk at Ogden Avenue east of First Avenue in Village of Lyons. Approximately 900 feet of Ogden Avenue would be raised to approximately 0.5 feet above the 100-year flood inundation. Table 3.6.28 compares the peak modeled water surface elevation and flow for Alternative DPR-12.

TABLE 3.6.28
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-12 Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-12	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Adjacent to Ogden Avenue	96674.10	612.1	9,058	612.1	9,058

DPR-13. DPR-13 was developed to address the flooding risk of 39 structures which can incur flooding at the 100-year inundation level along the south side of the Des Plaines River north of 39th Street between Joliet Avenue and Ogden Avenue in Unincorporated Cook County. The Riverside Lawndale Floodwall would be approximately 2,300 feet long with an average height of 6 feet. The floodwall would include 3 feet of freeboard above the 100-year flood inundation and would require 2 pump stations to address interior drainage. Table 3.6.29 compares the peak modeled water surface elevation and flow for Alternative DPR-13.

TABLE 3.6.29
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-13 Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-13	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Downstream of Hofmann Dam	93298.31	605.4	9,888	605.4	9,886
Upstream of 43rd Street	85781.03	603.3	9,877	603.3	9,884

DPR-14A. DPR-14A was developed to address the flooding risk of 12 structures which can incur flooding at the 100-year inundation level along the west side of the Des Plaines River between 45th Street and 47th Street. The proposed alternative is comprised of an approximately 1,200 feet long floodwall averaging 3 to 4 feet in height. The floodwall would include 3 feet of freeboard over the 100-year inundation and would require pump stations to address interior drainage. Table 3.6.30 compares the peak modeled water surface elevation and flow for Alternative DPR-14A.

TABLE 3.6.30
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-14A Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-14A	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of 43rd Street	85781.03	603.3	9,877	603.3	9,898
Upstream of 47th Street	82725.92	602.9	9,868	602.9	9,901
Upstream of Chicago and Illinois Railroad	82234.2	602.8	9,866	602.8	9,899

DPR-14B. DPR-14B was developed to address the flooding risk at the 47th Street crossing of the Des Plaines River in the Village of Lyons. The proposed alternative would raise approximately 700 feet of 47th Street to approximately 0.5 feet over the 100-year flood inundation. Table 3.6.31 compares the peak modeled water surface elevation and flow for Alternative DPR-14B.

TABLE 3.6.31
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-14B Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-14B	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of 43rd Street	85781.03	603.3	9,877	603.3	9,877
Upstream of 47th Street	82725.92	602.9	9,868	602.9	9,868
Upstream of Chicago and Illinois Railroad	82234.2	602.8	9,866	602.8	9,866

DPR-14C. DPR-14C was developed to address the flooding risk behind the existing McCook Levee in the Village of McCook, Summit, and Lyons. The proposed strategy for this area is

to enhance the existing McCook Levee to meet 3 feet of freeboard along the length of the levee from 47th Street to Interstate 55. To provide 3 feet of freeboard, additional sheet pile would be added to the appropriate elevation. The average height of the approximately 5,000 feet long levee would be 4 feet above the existing levee and would require pump stations to address interior drainage. Table 3.6.32 compares the peak modeled water surface elevation and flow for Alternative DPR-14C.

TABLE 3.6.32
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-14C Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-14C	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of 43rd Street	85781.03	603.3	9,877	603.3	9,898
Upstream of 47th Street	82725.92	602.9	9,868	602.9	9,901
Upstream of Chicago and Illinois Railroad	82234.2	602.8	9,866	602.8	9,899
Approximately 5,100 feet downstream of 47th Street	77614.32	602.1	9,865	602.1	9,896

DPR-14D. DPR-14D was developed to address the flooding risk to 204 structures behind the existing 47th Street Levee between 43rd Street and 47th Street in the Village of Lyons. The average height of the floodwall that would enhance the height of the existing levee, would be approximately 2.5 feet which would include approximately 3 feet of freeboard over the 100-year flood inundation. Pump stations would be required to address interior drainage. Mitigating storage would be provided in the Lyons Quarry. Table 3.6.33 compares the peak modeled water surface elevation and flow for Alternative DPR-14D.

TABLE 3.6.33
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-14D Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-14D	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of 43rd Street	85781.03	603.3	9,877	602.6	8,940
Upstream of 47th Street	82725.92	602.9	9,868	602.2	8,946
Upstream of Chicago and Illinois Railroad	82234.2	602.8	9,866	602.1	8,947

DPR-15. DPR-15 was developed to address the flooding risk to 5 non-residential structures west of the Des Plaines River north of Interstate 55 in the Village of Hodgkins. An approximately 10,000 feet long floodwall would be proposed averaging 3 to 5 feet in height which would include 3 feet of freeboard above the 100-year flood inundation. Pump stations would be required to address interior drainage. Table 3.6.34 compares the peak modeled water surface elevation and flow for Alternative DPR-15.

TABLE 3.6.34
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-15 Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-15	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of 43rd Street	85781.03	603.3	9,877	603.3	9,878
Upstream of 47th Street	82725.92	602.9	9,868	602.9	9,870
10,100 feet upstream of Flagg Creek Confluence	48224.2	599.0	9,930	599.0	9,937

DPR-22. DPR-22 was developed per the request of the Riverside Residents for Flood Prevention. The proposed alternative consists of utilizing the existing Lyons Quarry as a flood control reservoir. The proposed storage volume evaluated was approximately 3,500 A-F. Ogden Avenue would also be raised to address the flooding risk on Ogden Avenue and accommodate a control structure to divert flow from the Des Plaines River to the Lyons Quarry. This alternative does not address a specific reported problem area but does provide an increase in the level of protection in the area of the quarry. This alternative does not remove the downstream structures from the risk of flooding. Table 3.6.35 compares the peak modeled water surface elevation and flow for Alternative DPR-22.

TABLE 3.6.35
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-22 Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-22	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Downstream of 31st Street	103825.6	615.7	8,308	615.7	8,307
Downstream of Forest Avenue	101667.1	615.0	8,315	615.0	8,192
Upstream of CB & Q Railroad	100937.8	614.8	8,318	614.8	8,191
Upstream of 43rd Street	85781.03	603.3	9,877	602.8	9,364
Upstream of 47th Street	82725.92	602.9	9,868	602.4	9,335

DPR-23. DPR-23 was developed to evaluate 5 USACE concept flood control reservoirs along the MLDPR corridor. The five flood control reservoirs are located as follows: In Lake County along Aptakisic Creek, between Lake-Cook Road and Dundee Road, south of Dundee Road, between Euclid Avenue and Central Road, and between Irving Park Road and Belmont Avenue. The flood control reservoirs would provide approximately 400 A-F, 1,100 A-F, 300 A-F, 2,100 A-F, and 700 A-F, respectively, for a total of approximately 4,600 A-F of flood control storage. This alternative does not address a specific reported problem area but does provide an increase in the level of protection along reaches of the MLDPR corridor. This alternative does not remove structures from the risk of flooding. Table 3.6.36 compares the peak modeled water surface elevation and flow for Alternative DPR-23.

TABLE 3.6.36
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-23 Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-23	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Upstream of Dundee Road	252101.0	641.1	4,816	640.8	4,604
Upstream of Central Road	217928.2	635.0	5,556	634.7	5,057
Upstream of Oakton Street	195201.0	631.4	6,013	631.0	5,620
Upstream of Lawrence Avenue	165073.0	627.8	6,705	627.3	6,559
Upstream of North Avenue	138355.0	624.7	6,932	624.3	6,468
Upstream of Cermak/22nd Street	111577.9	618.3	7,147	618.2	6,833

DPR-26. DPR-26 was developed to address the flooding risk at the North Avenue crossing of the Des Plaines River that impacts portions of the Villages of Elmwood Park, River Forest, and River Grove. The proposed alternative would raise approximately 2,000 feet of North Avenue to approximately 0.5 feet over the 100-year flood inundation. Table 3.6.37 compares the peak modeled water surface elevation and flow for Alternative DPR-26.

TABLE 3.6.37
Mainstem Lower Des Plaines River Existing and Alternative Condition DPR-26 Flow and WSEL Comparison

		Existing Conditions		Alternative DPR-26	
Location	Station	Max WSEL (ft)	Max Flow (cfs)	Max WSEL (ft)	Max Flow (cfs)
Downstream of 1st Avenue	144976.1	625.1	6918	625.1	6,905
Upstream of North Avenue	138355.0	624.7	6,932	624.7	6,919
Upstream of Chicago Avenue	131616.0	623.7	7,081	623.7	7,067

A number of properties are at risk of shallow flooding during the 100-year flood event under existing conditions or recommended alternatives. In addition, due to their locations, other properties' risk of flooding cannot be feasibly mitigated by structural measures. Such properties are candidates for protection using nonstructural flood control measures, such as flood-proofing or acquisition. These measures may be considered to address damages that are not fully addressed by capital projects recommended in the Lower Des Plaines River DWP.

Hydraulic modeling results for MLDPR Watershed shows the roadways crossings (state route, US highway, or four-lane road or greater) that are overtopped for storm events of 100-year recurrence interval and below by a depth of greater than 0.5 feet. Table 3.6.38 provides a summary of the depth of road flooding for existing conditions and with recommended alternatives.

TABLE 3.6.38
MLDPR Watershed Road Overtopping Summary

Road Crossing	Road Elevation	25-yr Depth of Flooding	50-yr Depth of Flooding	100-yr Depth of Flooding
Central Road	631.43	2.64	3.1	3.52
Central Road (with DPR-2A)	636	-	-	-
Central Road (with DPR-2B)	636	-	-	-
Golf Road[1]	631.4	1.5	1.99	2.49
Rand Road	630	1.85	2.45	3.07
Rand Road (with DPR-2A)	634	-	-	-
Rand Road (with DPR-2B)	634	-	-	-
Des Plaines River Road at Rand Road	629.4	0.77	1.51	2.13
Des Plaines River Road between Thacker and Campbell	629	-	0.94	1.51
Algonquin Road	629.52	1.12	1.71	2.33
Algonquin Road (with DPR-2A)	632.5	-	-	-
Algonquin Road (with DPR-2B)	632.5	-	-	-
Des Plaines River Road between Algonquin and Whitcomb	630.5	0.22	0.8	1.4
Oakton Street	630	0.24	0.85	1.45
Oakton Street (with DPR-2A)	632	-	-	-
Oakton Street (with DPR-2B)	632	-	-	-
Des Plaines River Road between Howard and Fargo	627.5	0.78	1.56	2.14
Higgins Road	627.9	0.54	1.4	2.03
Higgins Road (with DPR-4)	630.5	-	-	-
Lawrence Avenue	626.0	-	1.1	1.8
Lawrence Avenue (with DPR-5)	628.3	-	-	-
Irving Park Road	621.7	3.91	4.72	5.35
Irving Park Road (with DPR-5)	627.2	-	-	-
River Road between Irving Park	622.9	2.33	3.15	3.76

TABLE 3.6.38
MLDPR Watershed Road Overtopping Summary

Road Crossing	Road Elevation	25-yr Depth of Flooding	50-yr Depth of Flooding	100-yr Depth of Flooding
Road and Belmont Avenue				
River Road between Irving Park Road and Belmont Avenue (with DPR-5)		-	-	-
Des Plaines River Road between Irving Park and Ivanhoe	622.5	0.83	1.75	2.31
Des Plaines River Road between Ivanhoe & Robinson	622.5	-	1.49	2.07
Des Plaines River Road between Robinson and Belmont	623.5	-	-	0.97
Grand Avenue	621.68	2.7	3.45	4.01
Grand Avenue (with DPR-6D)	626.2	-	-	-
1st Avenue	622	1.87	2.59	3.16
1st Avenue (with DPR-6D)	625.6	-	-	-
North Avenue	621.75	-	2.16	2.89
North Avenue (with DPR-26)	625.14	-	-	-
Chicago Avenue	619.53	2.79	3.59	4.16
Chicago Avenue (DPR-8A)	624.2	-	-	-
Roosevelt Road	618	0.93	1.51	1.95
Roosevelt Road (DPR-9A)	620.5	-	-	-
Cermak Road/22nd Street	614.63	2.7	3.28	3.71
Cermak Road/22nd Street (with DPR-10)	618.85	-	-	-
1st Avenue south of 31st Street	614.6	0.03	0.52	1.01
1st Avenue south of 31st Street (with DPR-11A)	617.1	-	-	-
1st Avenue south of 31st Street (with DPR-11C)	616.1	-	-	-
Forest Avenue	614	0.07	1.55	1.03
Forest Avenue (with DPR-11A)	615.6	-	-	-

TABLE 3.6.38
MLDPR Watershed Road Overtopping Summary

Road Crossing	Road Elevation	25-yr Depth of Flooding	50-yr Depth of Flooding	100-yr Depth of Flooding
Forest Avenue (with DPR-11C)	614	-	-	0.43
Ogden Avenue	612	-	-	0.74
Ogden Avenue (with DPR-12)	614.5	-	-	-
47th Street	600.34	1.09	1.91	2.52
47th Street (with DPR-14B)	603.5	-	-	-
River Road at Gregory Street[2]				

Note: Blank entry indicates that road crossing does not overtop for that particular storm event.

[1] Golf Road cannot be raised because it goes under a viaduct.

[2] See the Feehanville Ditch Section 3.6 for River Road at Gregory Street

3.6.3.6 Data Required for Countywide Prioritization of Watershed Projects

Appendix I presents conceptual level cost estimates for the recommended alternatives. Table 3.6.12 lists alternatives analyzed in detail as part of the DWP development.

Alternatives DPR-1, DPR-3A, DPR-5, DPR-6D, DPR-8B, DPR-11C, DPR-13, DPR-14A, and DPR-15 all address the risk of flooding for structures and roads primarily by the construction of floodwalls. Alternatives DPR-14D and DRP-15 address the risk of flooding that can occur by enhancing existing levees. Alternatives DPR-2B, DPR-4, DPR-8A, DPR-9A, DPR-12, DPR-14B, and DPR-26 address regional transportation damages through raising roadways and modifying waterway openings, if necessary.

Figures 3.6.8 through 3.6.31 show the locations and a summary of the proposed and recommended alternatives described in Table 3.6.39. Figures 3.6.8 through 3.6.31 also show comparisons of the existing condition and alternative condition inundation areas.

TABLE 3.6.39
Des Plaines River Project Alternative Matrix to Support District CIP Prioritization

Alternative ID	Description	B/C Ratio	Net Benefits ($)	Total Project Cost ($)	Cumulative Structures Removed from 100-year Inundation	Roadways Protected	Water Quality Benefit	Recom-mended	Communities Involved
DPR-1	Dundee to Hintz Roads Floodwall	0.01	258,750	17,826,218	6	0	No Impact	Y	Wheeling
DPR-2A	Raise 4 Roads, Mitigating Storage	0.03	11,936,692	385,800,282	N/A	4	Positive	N	Des Plaines, Unincorporated Cook County
DPR-2B	Raise 4 Roads, Modify Central Road Bridge	0.4	7,884,379	18,967,319	0	4	No Impact	Y	Des Plaines
DPR-3A	City of Des Plaines Regional Floodwall	0.1	52,565,869	523,018,856	300 - 500	N/A	No Impact	Y	Des Plaines, Unincorporated Cook County
DPR-4	Raise Higgins and River Roads, Glenlake Avenue	0.2	1,558,254	9,305,254	0	3	No Impact	Y	Rosemont
DPR-5	Irving Park Road to Belmont Ave-nue. Floodwall, raise Irving Park Road, Lawrence Avenue	0.3	9,936,443	28,619,651	13	3	No Impact	Y	Franklin Park, Schiller Park
DPR-6D	Franklin Street to First Avenue Floodwalls, Raise Grand and First Avenues	0.4	19,352,980	45,891,893	115	3	No Impact	Y	River Grove
DPR-8A	Raise Chicago Avenue and Modify Bridge	0.04	407,298	10,371,259	0	1	No Impact	Y	River Forest

TABLE 3.6.39
Des Plaines River Project Alternative Matrix to Support District CIP Prioritization

Alternative ID	Description	B/C Ratio	Net Benefits ($)	Total Project Cost ($)	Cumulative Structures Removed from 100-year Inundation	Roadways Protected	Water Quality Benefit	Recom-mended	Communities Involved
DPR-8B	Floodwall North of Lake Street	0.2	985,073	6,097,943	19	0	No Impact	Y	River Forest
DPR-9A	Raise Roosevelt Road and Modify Bridge	0.2	821,943	4,596,656	0	1	No Impact	Y	Forest Park
DPR-10	Raise Cermak Road	0.2	126,538	538,276	0	1	No Impact	Y	Proviso Town-ship and River-side Township
DPR-11A	Groveland Ave-nue Floodwall, Raise 1st and Forest Avenues	0.4	11,553,857	29,244,335	59	2	No Impact	N	Riverside
DPR-11B	Groveland Ave-nue Floodwall	0.6	10,083,162	15,930,181	59	0	No Impact	N	Riverside
DPR-11C	Groveland Ave-nue Floodwall, Raise 1st and Forest Avenues, Railroad Pier Extension	0.4	11,767,856	28,267,020	59	2	No Impact	Y	Riverside
DPR-12	Raise Ogden Avenue	0.05	51,782	1,029,060	0	1	No Impact	Y	Lyons
DPR-13	Riverside Lawn-dale Floodwall	1.4	14,100,116	9,880,904	39	0	No Impact	Y	Unincorporated Cook County
DPR-14A	Floodwall North of 47th Street	0.08	370,987	4,594,661	12	0	No Impact	Y	Lyons

TABLE 3.6.39
Des Plaines River Project Alternative Matrix to Support District CIP Prioritization

Alternative ID	Description	B/C Ratio	Net Benefits ($)	Total Project Cost ($)	Cumulative Structures Removed from 100-year Inundation	Roadways Protected	Water Quality Benefit	Recom-mended	Communities Involved
DPR-14B	Raise 47th Street	0.01	269,713	18,200,778	0	1	No Impact	Y	Lyons
DPR-14C	McCook Levee Enhancement	0.2	1,350,067	8,265,570	17	0	No Impact	Y	McCook, Sum-mit, Lyons
DPR-14D	47th Street Levee Enhancement	0.03	8,621,560	260,991,361	204	0	Positive	Y	Stickney, Forest View
DPR-15	Floodwall North of Interstate55	<0.01	194,043	25,785,787	5	0	No Impact	Y	Hodgkins
DPR-22	Lyons Quarry Storage	<0.01	648,217	251,163,010	0	1	Positive	N	Lyons
DPR-23	USACE Concept Reservoirs	<0.01	5,000,000	> 600,000,000	N/A	N/A	Positive	N	Numerous Communities
DPR-26	Raise North Avenue	0.08	322,411	4,243,200	0	1	No Impact	Y	Elmwood Park, River Forest, River Grove

Municipality Index

Alsip: 0609, 0617, 0628, 0636, 0637, 0638, 0639
Arlington Heights: 0044, 0063, 0064, 0182, 0184, 0192, 0201, 0202, 0203, 0204, 0211, 0212
Barrington Hills: 0015, 0020, 0155, 0156, 0157
Barrington: 0020, 0038
Bartlett: 0144, 0163, 0164, 0168, 0285, 0305, 0306
Bedford Park: 0487, 0488, 0489, 0495, 0515, 0606
Bellwood: 0369, 0388, 0457, 0476
Bensenville: 0358
Berkeley: 0368, 0369, 0456
Berwyn: 0483, 0484, 0485
Blue Island: 0637, 0639, 0643, 0644, 0645
Bridgeview: 0489, 0495, 0602, 0606, 0608
Broadview: 0476, 0477
Brookfield: 0478, 0479, 0486, 0487
Buffalo Grove: 0063, 0064
Burbank: 0495, 0515, 0606, 0607, 0630
Burnham: 0664, 0668, 0669
Burr Ridge: 0466, 0468, 0469, 0581, 0582
Calumet City: 0664, 0668, 0669, 0752, 0754, 0756, 0757, 0758, 0759
Calumet Park: 0643, 0644, 0645
Chicago Heights: 0742, 0743, 0744, 0763, 0806, 0807, 0826
Chicago Ridge: 0606, 0607, 0608, 0609
Chicago: 0214, 0218, 0219, 0239, 0243, 0244, 0265, 0270, 0352, 0356, 0357, 0358, 0359, 0376, 0378, 0380, 0382, 0385, 0386, 0387, 0395, 0401, 0402, 0403, 0404, 0410, 0415, 0416, 0417, 0418, 0419, 0438, 0440, 0484, 0485, 0491, 0492, 0495, 0503, 0504, 0505, 0506, 0507, 0508, 0509, 0515, 0520, 0526, 0528, 0529, 0540, 0545, 0628, 0630, 0635, 0636, 0637, 0645, 0655, 0658, 0659, 0660, 0661, 0662, 0663, 0664, 0668, 0669, 0670
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Countryside: 0467, 0469, 0486, 0488
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Deer Park: 0038, 0039, 0043
Deerfield: 0069, 0088, 0089
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Dolton: 0644, 0663, 0664, 0732, 0751, 0752
East Dundee: 0155
East Hazel Crest: 0733, 0734
Elgin: 0135, 0142, 0144, 0155, 0161, 0163, 0305
Elk Grove Village: 0193, 0194, 0211, 0213, 0214, 0218, 0331, 0332, 0351, 0352
Elmhurst: 0456
Elmwood Park: 0380, 0387, 0395
Evanston: 0253, 0255, 0260, 0265, 0270
Evergreen Park: 0628, 0630, 0635
Flossmoor: 0737, 0739, 0741, 0742, 0743, 0744
Ford Heights: 0763, 0764, 0768, 0826, 0827
Forest Park: 0389, 0395, 0477, 0485
Forest View: 0484, 0491, 0492
Frankfort: 0781, 0782
Franklin Park: 0358, 0359, 0366, 0367, 0378, 0386
Glencoe: 0093, 0094, 0113, 0231, 0232, 0251
Glenview: 0207, 0209, 0226, 0227, 0228, 0229, 0231, 0233, 0234, 0236, 0237, 0241
Glenwood: 0742, 0761, 0762, 0763, 0764
Golf: 0233, 0234, 0241, 0242
Hanover Park: 0168, 0169, 0306, 0307
Harvey: 0643, 0644, 0731, 0732, 0734, 0751
Harwood Heights: 0380, 0385
Hazel Crest: 0729, 0733, 0734, 0737
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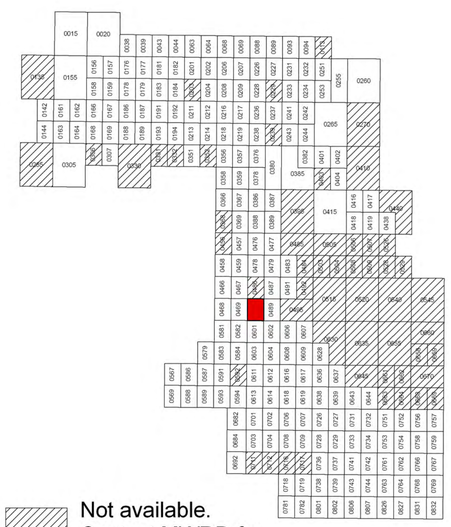

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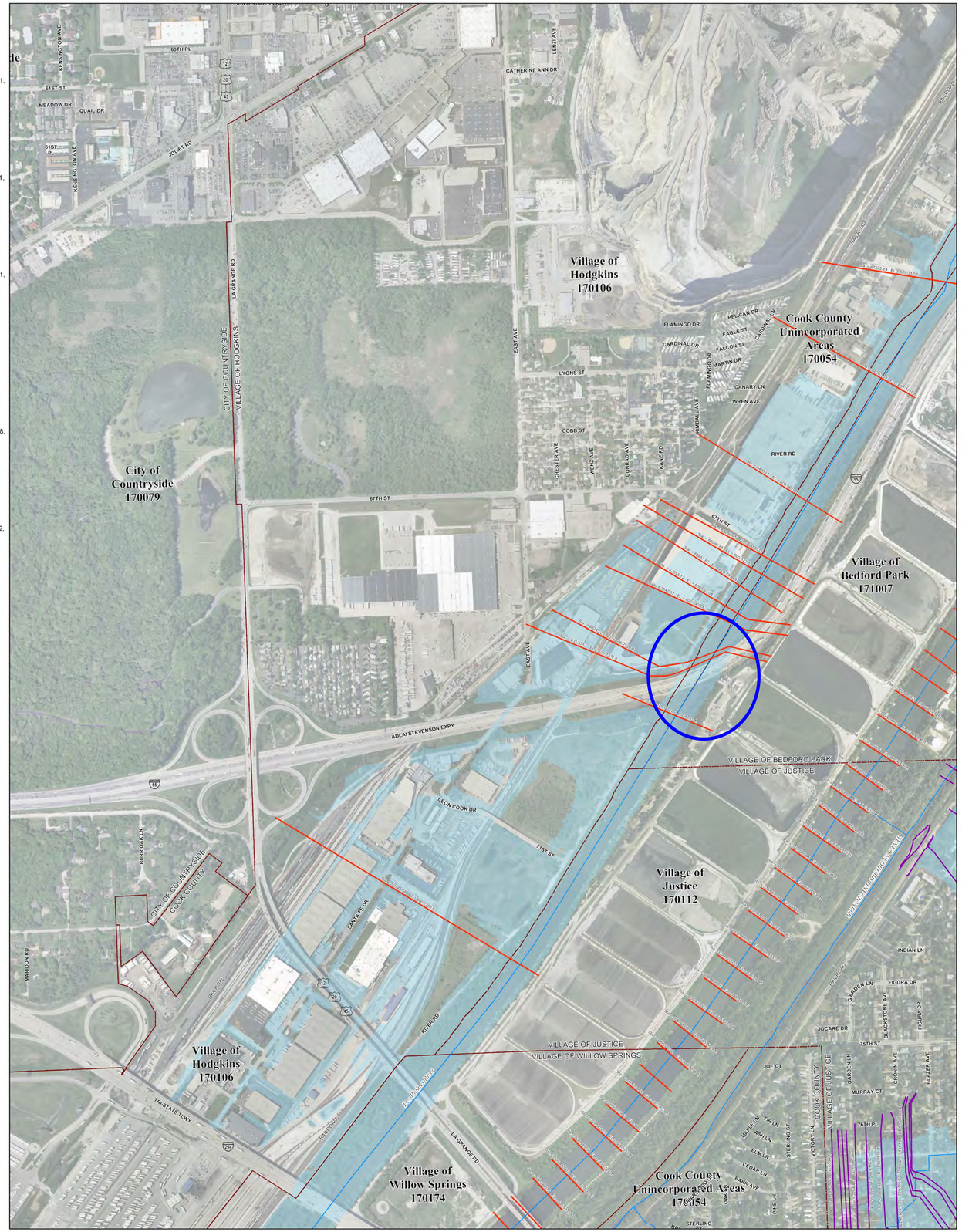


NOTES TO USER:

The inundation areas and water surface elevations shown on this map were developed as part of the Metropolitan Water Reclamation District of Greater Chicago's (MWRD) Stormwater Management Program. Specific details regarding the development of the new models used to generate the maps are described in MWRD's Detailed Watershed Plans, which are available for download at www.mwrd.org. To access, click on "Services & Facilities" in the top navigation bar, click on "Stormwater Management", and then click on "Stormwater Annual Reports and Publications" on the left navigation bar of the Stormwater Management webpage.

This map does not delineate floodways. The information contained on this map is in addition to and does not substitute for the relevant Federal Emergency Management Agency's (FEMA) Flood Insurance Study (FIS) and associated Flood Insurance Rate Map (FIRM).

Elevations stated on this map are consistent with the North American Vertical Datum (NAVD) 1988. Flood elevations must be compared to ground structures referenced to the same datum. Hydraulic profiles of modeled waterways are available for download at www.mwrd.org. To access, click on "Services & Facilities" in the top navigation bar, click on "Stormwater Management", and then click on "Inundation Maps & Profiles" on the left navigation bar of the Stormwater Management webpage.

The corporate limits shown on this map are based on the best information available at the time of study.

If you have questions on this map, please contact the MWRD's Engineering Department-Stormwater Management Section, at 312-751-5600, or via e-mail Stormwater@mwrd.org.

N

DWP 100-year (1% Chance) Inundation Area
River/Stream
Municipal Boundry

Cross Section (By Watershed)

Calumet Sag Channel DWP
DP
Little Calumet River DWP
NB
PC
Upper Salt Creek DWP

0 650 1,300 2,600 3,900 5,200
Feet

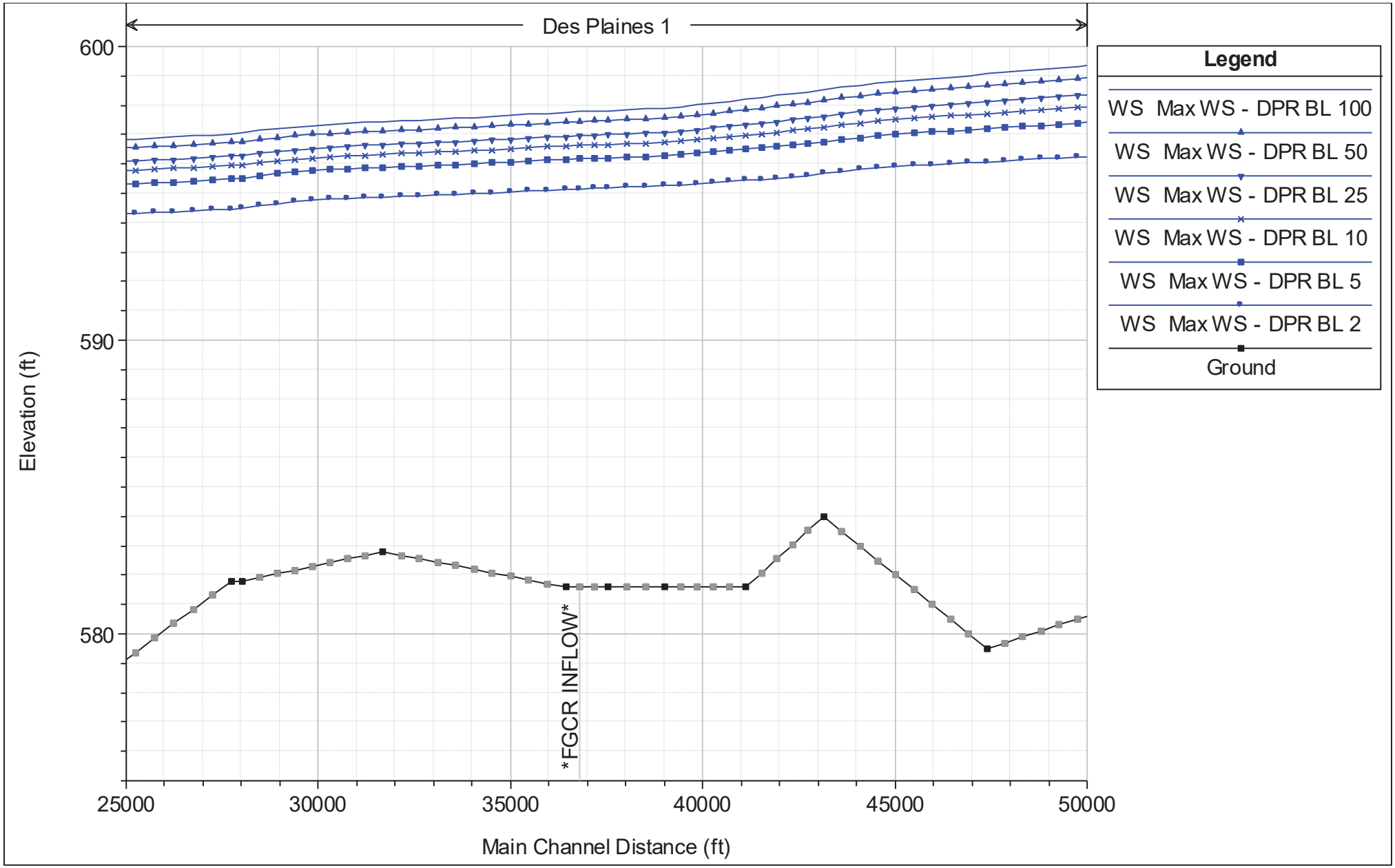
Protecting Our Water Environment

Metropolitan Water Reclamation District of Greater Chicago

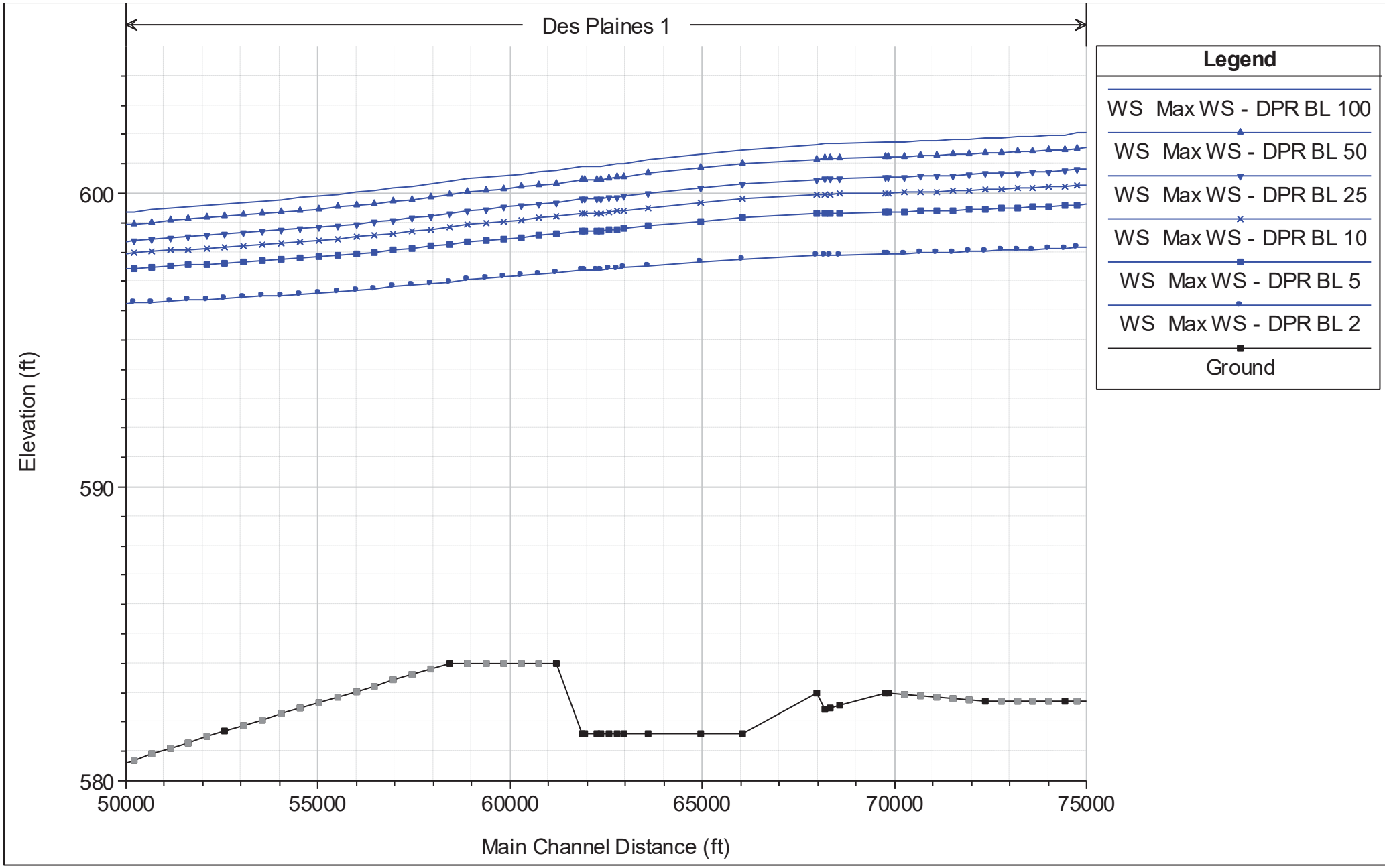
Cook County Inundation Map

Panel 0488

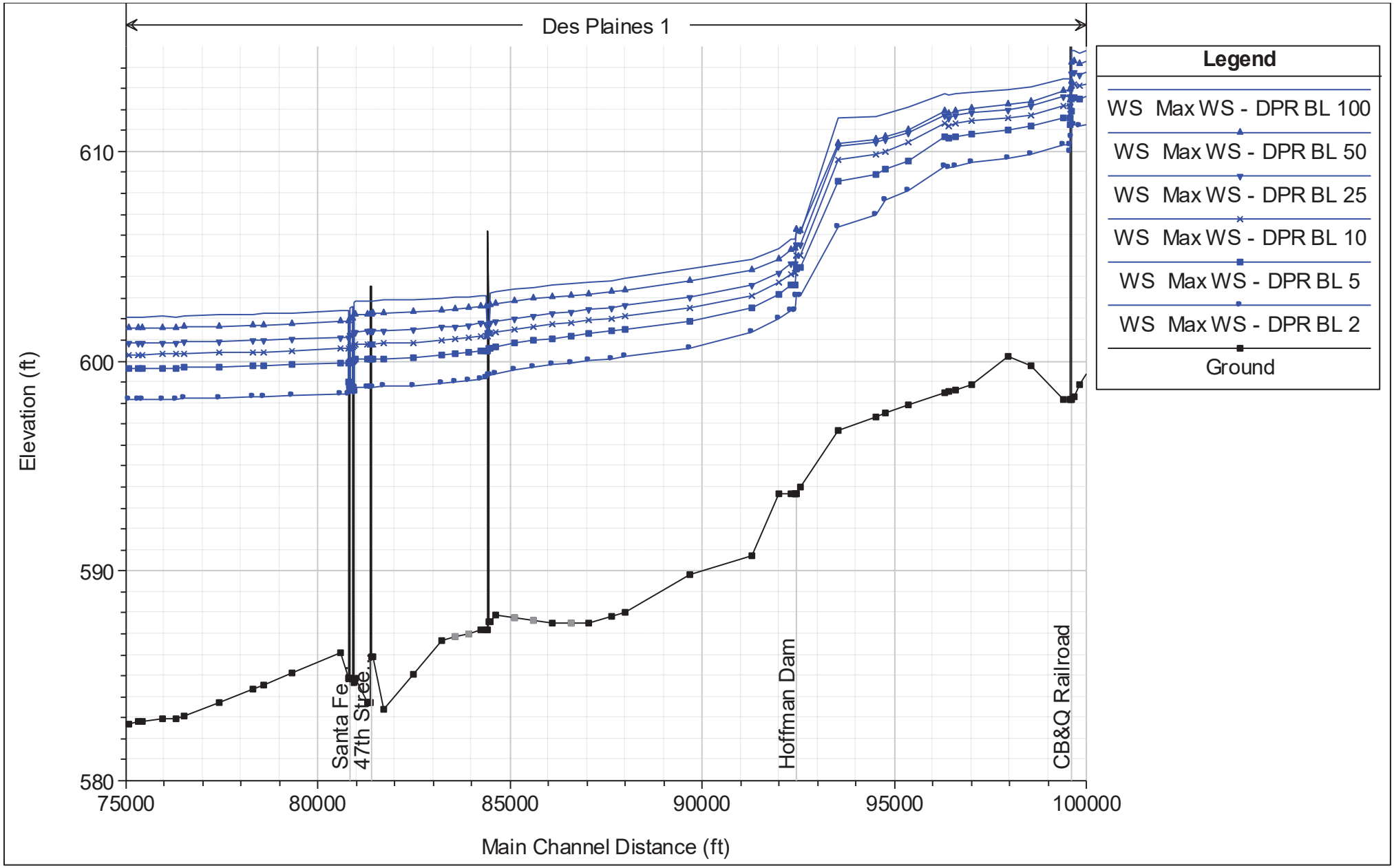
The area depicted in this map cooresponds to FEMA's DFIRM Panel: 17031C0488J



Lower Des Plaines River Mainstem from approximately 15,000' upstream of Santa Fe Railroad to approximately 13,500' upstream of Flagg Creek confluence



Lower Des Plaines River between Flagg Creek confluence and 47th Street



Lower Des Plaines River Mainstem from approximately 6,500' downstream of 47th Street to upstream of CB&Q railroad

Tab 21

SECTION 21

CD

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