HYDRAULIC REPORT

ELGIN O'HARE – WEST BYPASS
P-91-443-06

WEST BYPASS OVER
BENSENVILLE DITCH
CHICAGO, DuPAGE COUNTY
ILLINOIS

Prepared For:

Illinois Department of Transportation
201 West Center Court
Schaumburg, IL 60196-1096

Prepared By:

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CBBEL Project No. 07-0404

October 2012

CH2MHILL®

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WEST BYPASS OVER BENSENVILLE DITCH

Illinois Department of Transportation

HYDRAULIC REPORT OUTLINE (HRO)

In order to facilitate a more efficient and timely approval of Hydraulic Reports, a "Hydraulic Report Outline" shall be prepared and submitted with each hydraulic project. This Outline shall be submitted to the District Hydraulic Engineer along with the Hydraulic Report to aid in review of the report.

If any deviations from the procedural steps below are necessary, they must be documented in the outline. Hydraulic Reports prepared by a Qualified District Hydraulic Engineer or under his supervision, are exempt from the HRO requirement. To facilitate Pump Station Hydraulic Report reviews, the Checklist and Data Sheets from the IDOT Drainage Manual, 13-303 and 13-304, will be used. The Data Sheets must be signed by the consultant's QA/QC person or the District Hydraulic Engineer.

1. SN ___-___ (Existing); SN ___-___ (Proposed)
   Route/Stream: EOWB over Bensenville Ditch
   County: DuPage/Chicago

2. Prepared By: ☒ Consultant: Christopher B. Burke Engr., Ltd.
   ☐ District ____

3. Chapter 2 of the IDOT Drainage ☒ Yes ☐ No
   If no, explain ____
   Completed checklist (2-701.02) must be attached.

4. Design Considerations:
   a. Backwater limitations due to:
      IDNR Individual or Floodway Permit ☒ Yes ☐ No
      Sensitive Flood Receptor(s) ☐ Yes ☒ No
   b. Does proposed average design velocity through the structure exceed natural channel velocities? ☐ Yes ☒ No
   c. Is the clearance policy met? ☐ Yes ☐ No
   d. Is the freeboard policy met? ☒ Yes ☐ No

5. Project scope (check all that apply):
   a. ☐ Complete replacement.
   b. ☐ Superstructure replacement.
   c. ☐ Superstructure replacement and/or widening; Length of pier extension in the water, upstream ____ft., downstream ____ft.
   d. ☐ Bridge ☒ Culvert
   e. ☒ New alignment
   f. Work planned below Q100 HWE: ☐ Yes ☐ No

6. Hydrology: ☐ USGS ☒ FIS ☒ Other IDNR-OWR approved flowrates
   Gage data utilized? ☐ Yes ☒ No

7. WIT: Attached copy of all completed WIT(s) ☒ Yes ☐ No ____

8. Modeling:
   a. ☒ HEC RAS ☐ WSPRO ☐ Other _____
   b. N-values estimated according to Chapter 5 of Drainage Manual? ☒ Yes ☐ No
   c. Source of starting WSE FIS Flood Elevations
   d. Non-IDOT encroachments in survey? ☐ Yes ☒ No
      If yes, are they accounted for? ☐ Yes ☐ No
   e. Tail water controls(s)? ☐ Yes ☒ No
      If yes, list: _____
      Properly addressed? ☐ Yes ☐ No
   f. Expansion/Contraction cones addressed per Chapter 7 of Drainage Manual? ☒ Yes ☐ No
      If N/A, explain: _____

9. IDNR-OWR Permit: Drainage Area _ sq. mi.; ☐ Rural; ☒ Urbanizing;
   Public Water or within Public Water boundaries ☐ Yes ☒ No
   Indicate Permit Type Required:
   a. Individual ☒
   b. Statewide #2 ☐
   c. Statewide #12 ☐
   d. Floodway ☐
   e. Other: _____
   f. None: ☐

10. Sensitive flood receptors ☐ Yes ☒ No
    Give type, elevations and locations: _____

    History of flooding or overtopping problems: Yes ☐ No ☒
    Sources of observed highwater: N/A

11. Scour/migration problems: ☒ None/minimal ☐ Significant ☐ Severe
    Comments: _____

    Ice/Debris concerns: None/minimal ☒ Significant ☐ Severe ☐
    Comments: _____

    Countermeasures proposed: _____

12. Deviations from the general procedures presented above and in Chapters 6 and 7 of the Drainage Manual: _____
    (Attach supporting documents if necessary)

Prepared by: Donald Oliphant Date: December 12, 2011

Signed: (AQ/QC) _____ Date: 4/19/12

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)

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Tab 1

SECTION 1

NARRATIVE
WEST BYPASS OVER BENSENVILLE DITCH

NARRATIVE

Project Description

The Elgin O'Hare – West Bypass (EOWB) study area encompasses nine (9) watersheds: West Branch DuPage River, Spring Brook, Meacham Creek, Salt Creek, Willow Creek, Higgins Creek, Bensenville Ditch, Silver Creek, and Addison Creek. The length of the expressway and interchanges to be improved is approximately 50 miles, including the Elgin O'Hare Expressway and Thorndale Avenue approximately from Gary Avenue to York Road, I-90 approximately from Arlington Heights Road to Wolf Road, and I-294 approximately from North Avenue to Mannheim Road. It is estimated that approximately 25 miles of arterials and frontage roads also will be included in the study. A general project location map is included in Section 3 of this report.

The hydraulic report is submitted for the impacted structures located within the Bensenville Ditch watershed. Separate hydraulic reports for impacted structures within each of the other watersheds are concurrently being prepared.

This hydraulic report documents the hydraulic conditions of the Bensenville Ditch at the proposed Elgin O'Hare-West Bypass in the City of Chicago. The USGS Hydrologic Investigations Atlas and Flood Insurance Rate Map included in Section 3 show the future structure location.

Site Description

The site in the vicinity of the proposed crossing is located within the City of Chicago O'Hare International Airport property. The O'Hare Modernization Program (OMP) has reserved a 300 feet wide corridor for the future EOWB project on the western portion of the airport. This report is being completed under the assumption the ultimate Airport Layout Plan (ALP) of the Bensenville Ditch will be active. This alignment was approved by the Illinois Department of Natural Resources – Office of Water Resources (IDNR-OWR) through Permit No. NE2010055, dated November 24, 2010. This permit is included in Section 15. It is anticipated that this alignment will be active by the end of 2012. The surrounding area has been recently demolished and consists primarily of open area and sparse roadways.

Field Observations

Direct access to this area is limited to aerial photography due to security measures on the O'Hare International Airport property. However, several photographs of the area are included with permission by the OMP personnel. The photographs were taken on June 16, 2010. An aerial photograph of the area and all photographs are provided in Section 4.

Stream Survey

No stream survey was completed as part of the EOWB project at this future crossing. Proposed cross-sections and stream profiles of the future alignment of the Bensenville Ditch are used as existing conditions of the EOWB project, which are based on the NGVD 1929 datum.

Datum Correlation

A datum correlation is required between the IDOT datum used for the survey and the NGVD 1929 datum used in the HEC-RAS modeling. The IDOT datum and EOWB roadway plans are based on the NAVD 1988 datum.

The vertical datum conversion factor at EOWB was determined to be -0.295 feet (-0.3 feet) added to the NGVD 1929 datum to equate to the NAVD 1988 vertical datum. The conversion value was calculated using the National Oceanic and Atmospheric Administration (NOAA) National Geodetic Survey (NGS) VERTCON online conversion tool. A copy of the VERTCON output is included in Section 14.

The Baseline Conditions, Existing Conditions, and Natural Conditions HEC-RAS models are based on NGVD 1929 datum; Waterway Information Tables (WITs) are based on the NAVD 1988 datum.

Historical Flooding

The best available historical flooding data was taken from the Elmhurst Quadrangle Hydrologic Investigations Atlas (1963 – HA-68). The maximum known high water level per the Hydrologic Investigations Atlas is approximately 663.0 feet during the October 1954 event. The USGS Profiles of Floods on Bensenville Ditch are provided in Section 3.

Other significant storm events within the Bensenville Ditch watershed occurred in August 1987, September 2008, and July 2010. However, due to a lack of rainfall data or stream gages within the Bensenville Ditch watershed, significant data could not be obtained.

Sensitive Flood Receptors

There are no sensitive flood receptors located within the vicinity of this crossing.

Other Studies and Reports

The OMP has completed numerous studies within the Bensenville Ditch watershed to coincide with different phasing of airport construction. As previously stated, the OMP received a Floodway Construction Permit (No. NE2010055) from IDNR-OWR for the ultimate alignment of the Bensenville Ditch. This Floodway Construction permit is included in Section 13. CBBEL completed a Phase 1 hydraulic report for a grade separation project at Irving Park Road and York Road. This project is discussed in further detail under the Hydraulic Analysis section.

Hydrology

Flow rates used for this analysis were taken from the IDNR-OWR Floodway Construction Permit No. NE2010055.

Hydraulic Analysis

The OMP has completed numerous construction projects within the waterway and watershed of Bensenville Ditch. Therefore, the hydrologic and hydraulic models for Bensenville Ditch have been significantly modified over the last few years. A plan and profile of the ultimate alignment of the Bensenville Ditch is provided in Section 5. This alignment should be activated sometime in the Fall of 2012. The OMP hydraulic modeling is considered best available information at this time. This updated modeling also includes a project outside of the OMP for the IDOT grade separation of York Road and Irving Park Road. HDR, Inc. is the IDOT Phase 2 consultant for the York Road/Irving Park Road grade separation project. HDR Inc. has incorporated their proposed stream modifications into this model upstream of the EOWB corridor (From River Sta. 8.910 to Sta. 8.962). These modifications include the addition of four-celled 10 feet wide by 7 feet high RCBC and extension of the York Road twin-celled 10 feet wide by 7 feet high RCBC west of the crossing. While these proposed improvements have not been approved by INDR-OWR at this time, it is understood they will be in place when the EOWB crossing is constructed.

Prior to the OMP, the FEMA FIS for Bensenville Ditch began at the DuPage County border just downstream of Orchard Avenue. Floodplain areas within Cook County and the City of Chicago were shown as Zone A with no associated FIS data.

Revisions to the effective HEC-2 hydraulic model began in 2003 when the OMP began design projects that reduced the watershed area to Bensenville Ditch. Over the next 9 years, the OMP has completed several phases further reducing the watershed area and changing the alignment of the watercourse to what is currently under construction and referred to as the ultimate alignment. Approximately 1.16 square miles of tributary has been removed from the Bensenville Ditch Watershed since the beginning of the OMP project (4.03 to 2.87 square miles). OMP improvements included in the ultimate alignment begin upstream of Taft Road.

Natural/Existing/Baseline Conditions Models

The natural, existing, and baseline conditions models will be identical since there is no structure at the future location of the EOWB crossing. These models will serve as the permit/design models for the future crossing. Manning's "n" values for the hydraulic model are reflective of approved conditions by IDNR-OWR. The Bensenville Ditch will be a newly constructed grass-lined channel in good condition. The existing conditions HEC-RAS output is provided in Section 9. Tables 1A-1C compare natural conditions and existing conditions water surface elevations for all modeled storm events.

TABLE 1A
Comparison of 10-Year WSEL between
Natural Conditions and Existing Conditions
Based on NGVD 1929 Datum

XS ID	Distance To EOWB Crossing (ft)	Existing Conditions WSEL (ft)[1]	Natural Conditions WSEL (ft)[1]
8.686 D/S	1188	656.23	656.23
8.743 D/S	938	656.27	656.27
8.820 D/S	688	656.31	656.31
8.830 D/S	438	656.22	656.22
8.852 D/S	187	657.01	657.01
8.864 D/S	137	657.24	657.24
8.870	Future UPRR Crossing		
8.888	--[2]	657.37	657.37
8.900 U/S	50	657.51	657.51
8.910 U/S	80	657.50	657.50
8.932	Future CPRR Crossing		
8.937 U/S	181	657.53	657.53
8.943 U/S	204	657.48	657.48
8.952	Future York Road w/ Extension		
8.962 U/S	348	657.85	657.85
8.972 U/S	405	658.10	658.10
8.982 U/S	455	658.29	658.29
9.001 U/S	555	658.38	658.38
9.020 U/S	655	659.17	659.17
9.039 U/S	752	659.30	659.30
9.058 U/S	852	659.45	659.45
9.078 U/S	997	659.75	659.75

[1] NGVD 1929
[2] Approximate future crossing location

TABLE 1B
Comparison of 50-Year WSEL between
Natural Conditions and Existing Conditions
Based on NGVD 1929 Datum

XS ID	Distance To EOWB Crossing (ft)	Existing Conditions WSEL (ft) [1]	Natural Conditions WSEL (ft) [1]
8.686 D/S	1188	657.96	657.96
8.743 D/S	938	657.98	659.98
8.820 D/S	688	657.99	657.99
8.830 D/S	438	657.89	657.89
8.852 D/S	187	658.21	658.21
8.864 D/S	137	658.31	658.31
8.870	Future UPRR Crossing		
8.888	--[2]	658.51	658.51
8.900 U/S	50	658.71	658.71
8.910 U/S	80	658.69	658.69
8.932	Future CPRR Crossing		
8.937 U/S	181	658.74	658.74
8.943 U/S	204	658.68	658.68
8.952	Future York Road w/ Extension		
8.962 U/S	348	659.09	659.09
8.972 U/S	405	659.49	659.49
8.982 U/S	455	659.61	659.61
9.001 U/S	555	659.58	659.58
9.020 U/S	655	660.18	660.18
9.039 U/S	752	660.30	660.30
9.058 U/S	852	660.42	660.42
9.078 U/S	997	660.68	660.68

[1] NGVD 1929
[2] Approximate future crossing location

TABLE 1C
Comparison of 100-Year WSEL between
Natural Conditions and Existing Conditions
Based on NGVD 1929 Datum

XS ID	Distance To EOWB Crossing (ft)	Existing Conditions WSEL (ft)[1]	Natural Conditions WSEL (ft)[1]
8.686 D/S	1188	658.73	658.73
8.743 D/S	938	658.75	658.75
8.820 D/S	688	658.75	658.75
8.830 D/S	438	658.66	658.66
8.852 D/S	187	658.88	658.88
8.864 D/S	137	658.92	658.92
8.870	Future UPRR Crossing		
8.888	--[2]	659.13	659.13
8.900 U/S	50	659.34	659.34
8.910 U/S	80	659.31	659.31
8.932	Future CPRR Crossing		
8.937 U/S	181	659.37	659.37
8.943 U/S	204	659.31	659.31
8.952	Future York Road w/ Extension		
8.962 U/S	348	659.71	659.71
8.972 U/S	405	660.15	660.15
8.982 U/S	455	660.23	660.23
9.001 U/S	555	660.20	660.20
9.020 U/S	655	660.68	660.68
9.039 U/S	752	660.79	660.79
9.058 U/S	852	660.88	660.88
9.078 U/S	997	661.13	661.13

[1] NGVD 1929
[2] Approximate future crossing location

The 500-year recurrence interval information provided on the WIT was estimated using a log-log plot of approved flowrates and a best fit curve. This estimated flowrate was then input in a truncated HEC-RAS model of the crossing to determine created head and headwater elevations. Back-up calculations for the 500-year recurrence interval have been included in Sections 2, 8, and 11.

Proposed Conditions Model

The existing conditions model was revised to include the proposed structure beneath the EOWB embankment. Due to the proximity of the EOWB corridor to the UPRR embankment a separate structure is not possible. Therefore, the existing 137 feet long UPRR triple-celled 10 feet wide by 6 feet high RCBC will be extended downstream. The resultant structure will be approximately 504 feet long. A plan view of the ultimate alignment has been included in Section 5 as Exhibit 7 to show all cross-section locations. Cross-sections 8.830, 8.852, and 8.864 were removed since they were within the culvert extension section. Cross-sections 8.826 and 8.827 were added to represent downstream approach and face of the new culvert. The overall reach length of the model was not revised. Table 2A through Table 2C summarizes a comparison between existing/natural and proposed conditions.

TABLE 2A
Comparison of 10-Year WSEL between
Existing/Natural Conditions and Proposed Conditions
Based on NGVD 1929 Datum

XS ID	Distance To EOWB Crossing (ft)	Existing/Natural Conditions WSEL (ft)[1]	Proposed Conditions WSEL (ft)[1]	Difference (ft)[2]
8.686 D/S	1188	656.23	656.23	0.00
8.743 D/S	938	656.27	656.27	0.00
8.820 D/S	688	656.31	656.31	0.00
8.826 D/S	555		656.12	
8.827 D/S	505		656.60	
8.830 D/S		656.22		
8.852 D/S		657.01		
8.864 D/S		657.24		
8.870	UPRR/EOWB Culvert			
8.888	--	657.37	656.92	-0.45
8.890 U/S	50	657.51	657.10	-0.41
8.910 U/S	80	657.50	657.09	-0.41
8.932 U/S	Future CPRR Culvert			
8.937 U/S	201	657.53	657.15	-0.38
8.943 U/S	212	657.48	657.08	-0.40
8.952	Future York Road Culvert			
8.962 U/S	349	657.85	657.65	-0.20
8.972 U/S	405	658.10	657.92	-0.18
8.982 U/S	455	658.29	658.16	-0.13
9.001 U/S	555	658.38	658.28	-0.10
9.020 U/S	655	659.17	659.15	-0.02
9.039 U/S	752	659.30	659.29	-0.01
9.058 U/S	852	659.45	659.44	-0.01
9.078 U/S	997	659.75	659.74	-0.01

[1] NGVD 1929
[2] Drop in WSE attributed to increased culvert opening relative to existing cross-section

TABLE 2B
Comparison of 50-Year WSEL between
Existing/Natural Conditions and Proposed Conditions
Based on NGVD 1929 Datum

XS ID	Distance To EOWB Crossing (ft)	Existing/Natural Conditions WSEL (ft)[1]	Proposed Conditions WSEL (ft)[1]	Difference (ft)[2]
8.686 D/S	1188	657.96	657.96	0.00
8.743 D/S	938	657.98	657.98	0.00
8.820 D/S	688	657.99	657.99	0.00
8.826 D/S	555		657.86	
8.827 D/S	505		657.95	
8.830 D/S		657.89		
8.852 D/S		658.21		
8.864 D/S		658.31		
8.870	UPRR/EOWB Culvert			
8.888	--	658.51	658.32	-0.19
8.890 U/S	50	658.71	658.54	-0.17
8.910 U/S	80	658.69	658.51	-0.18
8.932 U/S	Future CPRR Culvert			
8.937 U/S	201	658.74	658.57	-0.17
8.943 U/S	212	658.68	658.62	-0.06
8.952	Future York Road Culvert			
8.962 U/S	349	659.05	658.97	-0.08
8.972 U/S	405	659.49	659.39	-0.10
8.982 U/S	455	659.61	659.52	-0.09
9.001 U/S	555	659.58	659.50	-0.08
9.020 U/S	655	660.18	660.14	-0.04
9.039 U/S	752	660.30	660.26	-0.04
9.058 U/S	852	660.42	660.38	-0.04
9.078 U/S	997	660.68	660.66	-0.02

[1] NGVD 1929
[2] Drop in WSE attributed to increased culvert opening relative to existing cross-section

TABLE 2C
Comparison of 100-Year WSEL between
Existing/Natural Conditions and Proposed Conditions
Based on NGVD 1929 Datum

XS ID	Distance To EOWB Crossing (ft)	Existing/Natural Conditions WSEL (ft)[1]	Proposed Conditions WSEL (ft)[1]	Difference (ft)[2]
8.686 D/S	1188	658.73	658.73	0.00
8.743 D/S	938	658.75	658.75	0.00
8.820 D/S	688	658.75	658.75	0.00
8.826 D/S	555		658.63	
8.827 D/S	505		658.66	
8.830 D/S		658.66		
8.852 D/S		658.88		
8.864 D/S		658.92		
8.870	UPRR/EOWB Culvert			
8.888	--	659.13	659.00	-0.13
8.890 U/S	50	659.34	659.23	-0.11
8.910 U/S	80	659.31	659.20	-0.11
8.932 U/S	Future CPRR Culvert			
8.937 U/S	201	659.37	659.26	-0.11
8.943 U/S	212	659.31	659.19	-0.12
8.952	Future York Road Culvert			
8.962 U/S	349	659.71	659.62	-0.09
8.972 U/S	405	660.15	660.07	-0.08
8.982 U/S	455	660.23	660.17	-0.06
9.001 U/S	555	660.20	660.13	-0.07
9.020 U/S	655	660.68	660.64	-0.04
9.039 U/S	752	660.79	660.75	-0.04
9.058 U/S	852	660.88	660.85	-0.03
9.078 U/S	997	661.13	661.10	-0.03

[1] NGVD 1929
[2] Drop in WSE attributed to increased culvert opening

Decreases in resultant water surface elevations can be attributed to the increased opening of the proposed culvert relative to the existing cross-section area. Since this hydraulic report summarizes the proposed extension of the existing UPPR culvert, burying the culvert to promote fish passage or environmental habitat is not feasible since the upstream section will already be in place. The profile over the culvert extension represents the UPPR since it is thought to be lower than the EOWB profile. A WIT table has been provided in Section 2. WITs for the future CPRR and York have been provided by IDOT are included in Section 2. These

WITs have been included directly from the Phase 2 grade separation report from HDR. No changes are anticipated to these WITs.

Compensatory Storage/Permit Requirements

The EOWB embankment will be constructed within the future floodplain of Bensenville Ditch. The future floodplain in this vicinity will be contained within the channel banks to minimize the required compensatory storage for the crossing. The floodplain and floodway will be concurrent through this section. Due to a consistent typical section through the crossing, the proposed floodplain fill volume was determined by averaging the upstream and downstream existing cross-section areas. The proposed floodplain fill and compensatory storage volumes are summarized below.

- Floodplain Fill minus Culvert Volume
  - Normal to 10-Yr
    - Fill with no Culvert – 0.74 ac-ft
    - Proposed Culvert Volume – 0.80 ac-ft
    - No Compensatory Storage Required
  - 10 to 100-Yr
    - Fill with no Culvert– 0.89 ac-ft
    - Proposed Culvert Volume – 0.55 ac-ft
    - Required Compensatory Storage at 1.5:1 – 0.51 ac-ft
- Compensatory Storage
  - Normal to 10-Yr – 0.10 ac-ft (D/S of Culvert in Proposed basin)
  - Normal to 10-Yr – 0.06 ac-ft (Excess Volume in Culvert)
  - 10 to 100-Yr – 0.69 ac-ft (D/S of Culvert in Proposed basin)

Compensatory storage will be met incrementally at a 1.5:1 ratio in accordance with DuPage County regulations. The normal to 10-Yr compensatory storage requirement will be met due to the construction of the proposed culvert extension. However, total compensatory storage requirements between 10-year and 100-year flood elevations cannot be met within the EOWB corridor. The remaining compensatory storage required for this crossing would be provided downstream within the O'Hare International Airport property. For purposes of this report, small compensatory storage areas have been proposed downstream of the culvert extension. This location is shown on an exhibit in Section 12

This development will meet requirements for an individual permit through the Illinois Department of Natural Resources – Office of Water Resources (IDNR-OWR). No floodway is currently in the vicinity of this project. IDNR-OWR permit summary and compensatory storage calculations are included in Section 12.

Scour Analysis

No scour analysis was completed since the proposed structure is a culvert.

Conclusion and Design Requirements

The proposed EOWB cross culvert has the following design parameters:

- The existing 137 feet long triple 10 feet (span) by 6 feet (height) RCBC structure will be extended 367 feet downstream to accommodate the West Bypass embankment,
- The resultant structure is a 504 feet long triple 10 feet (span) by 6 feet (height) RCBC

In order to facilitate the IDOT review, a "Hydraulic Report Outline" for the EOWB structure is included at the beginning of the report. The proposed culvert crossing extension is sized to meet the following criteria:

- The 50-year headwater elevation of 658.21 feet (NAVD 1988) is lower than the culvert crown elevation of 659.47 feet (NAVD 1988),
- The 50-year freeboard of 29.02 feet to the proposed edge of pavement (EOP) is greater than the 3 feet requirement.

DCO/
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Tab 2

SECTION 2

WATERWAY INFORMATION TABLE
HYDRAULIC REPORT DATA SHEETS

Illinois Department of Transportation

Culvert Waterway Information Table

Route: EOWB
Section:
County: DuPage
Station:

S.N. Exist: N/A
S.N. Prop: TBD
Waterway: Bensenville Ditch

Computed by: DCO
Checked by: JSH

Date: 06/19/12
Date: 10/18/12

Drainage Area = 1.73 Square Miles

Existing Overtopping Elevation: - -
Proposed Overtopping Evaluation: 682.5

ft. @ Sta
ft. @ Sta

Flood	Frequency Year	Discharge cfs	Waterway Opening (sq. ft.)		Natural H.W.E.	Head (ft.)		Headwater Elev. (ft.)	
			Existing	Proposed		Existing	Proposed	Existing	Proposed
	10	403	108.0	108.0	657.07	0.00	0.00	657.07	657.07
Design	50	648	142.2	142.2	658.21	0.00	0.00	658.21	658.21
Base	100	757	160.8	160.8	658.83	0.00	0.00	658.83	658.83
OVT(E)	N/A								
OVT(P)	N/A								
Max Calc	500	1050	172.5	174.0	659.22	0.00	0.31	659.22	659.53

10-Year Outlet Velocity from Existing Structure = 3.7 fps
10-Year Outlet Velocity from Proposed Structure = 3.7 fps

OVT = Overtopping Event
(E) Existing (P) Proposed

DATUM: NAVD '88, All elevations are on Higway Datum, NAVD '88=NGVD '29 - 0.3 ft.

ALL-TIME H.W.E. & DATE: N/A, New Alignment

SCOPE OF WORK:

EXISTING STRUCTURE

Bridge or Culvert Type:	RCBC
Cell Dimensions (W x H):	10'x6'
# of spans \ cells:	3
Length:	137
U/S Flowline:	653.47
D/S Flowline:	653.32
Skew:	0
Low EOP:	670.0

EXISTING DROPBOX

Dimensions:	
Drop:	
Weir Elevation:	

PROPOSED STRUCTURE

Culvert Type:	RCBC
Cell Dimensions (W x H):	10'x6'
# of cells:	3
Length:	504
U/S Flowline:	653.47
D/S Flowline:	652.93
Skew:	0
Low EOP:	+/-687.23

PROPOSED DROPBOX

Dimensions:	
Drop:	
Weir Elevation:	

NOTE(S): All elevations shown are at the U/S Face of the UPRR culvert, FEMA Datum = NGVD 1929

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ENGINEERING, LTD.
One Professional Center Suite 314
Crown Point, Indiana 46307
(219) 663-3410 Fax (219) 663-3450

JOB 07-404 - BENSENVILLE DITCH
SHEET NO. 1 OF 1
CALCULATED BY DCO DATE 10/17/12
CHECKED BY JSG DATE 10/18/12
SCALE NAVD '88

EXISTING/NATURAC VS. PROPOSED WIT CALCULATIONS

NATURAC WSELS (XS-8.888)

10 - 657.07'
50 - 658.21'
100 - 658.83'
500 - 659.22'

AREA

U/S INV. 653.47'

	W	PARALLS	
657.07' - 653.47 = 3.60'	x10	x 3 =	108.0 ft²
658.21' - 653.47 = 4.74'	x10	x 3 =	142.2 ft²
658.83' - 653.47 = 5.36'	x10	x 3 =	160.8 ft²
659.22' - 653.47 = 5.75'	x10	x 3 =	172.5 ft²

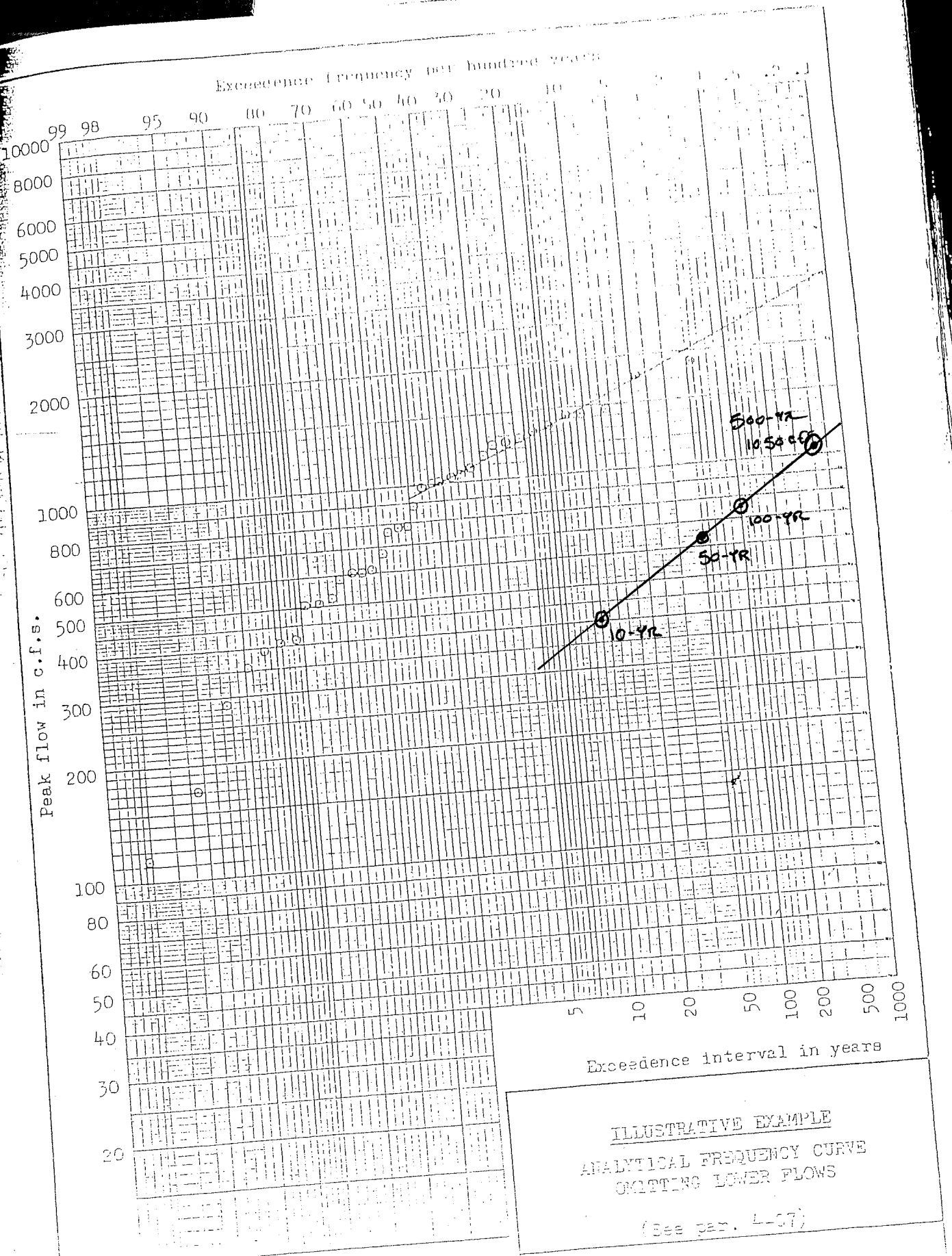
CREATED HEAD

* EXISTING UPRR STRUCTURE IS IN BOTH EXISTING/NATURAC MODELS. THEREFORE, NO CREATED HEAD IS CALCULATED.
* PROPOSED UPRR/EOWB CULVERT EXTENSION CREATES ZERO OR NEGATIVE HEAD DUE TO CULVERT OPENING SIZE AND INCREASED ROUGHNESS. THEREFORE, ZERO CREATED HEAD IS SHOWN IN THE TABLE.

500-YR

XS-8.900

- CREATED HEAD = 659.61 - 659.30 = 0.31'
- HEADWATER ELEVATION = 659.22' + 0.31' = 659.53'



ILLUSTRATIVE EXAMPLE

ANALYTICAL FREQUENCY CURVE
OMITTING LOWER FLOWS

(See par. 4-07)

Note: See Exhibit 17 for computations.

EXHIBIT 1

WATERWAY INFORMATION TABLE
IDOT
HEC-2

Route: York Road S.N. N/A

Section: Station 503+63 S.N. N/A

County: DuPage Waterway: Bensenville Ditch

Computed: DCO Date: 10/3/2008

Checked: [signature] Date: 10/6/2008

Drainage Area 1.56 Sq. Mi.

Existing Low Grade Elevation** = 661.08 (EGL), 660.48 (EOP) Sta. 503+63

Proposed Low Grade Elevation** = 661.33 (PGL), 660.55 (EOP) Sta. 503+63

Flood	Frequency Year	Discharge (cfs)	Waterway Opening (sq. ft.)* Existing	Waterway Opening (sq. ft.)* Proposed	Natural H.W.E.	Created Head (ft.) Existing	Created Head (ft.) Proposed	Headwater Elevation Existing	Headwater Elevation Proposed
	10	392	89.0	89.0	658.51	0.36	0.00	658.87	658.51
Design	30	510	103.8	103.8	659.25	0.66	0.00	659.91	659.25
	50	594	113.6	113.6	659.74	0.88	0.00	660.62	659.74
Base	100	684	121.4	121.4	660.13	1.17	0.02	661.30	660.15
Overtopping	>100								
Max.	500								

10 Year Velocity through Existing Structure = 4.40 fps

10 Year Velocity through Proposed Structure = 4.40 fps

*Based on Natural HWE

** Assume 2% cross slope

DATUM: All elevations on Highway Datum (FEMA DATUM = HIGHWAY DATUM + 0.3 ft.)

ALL-TIME H.W.E. & DATE: 663.0 ft. (USGS HA-68, March 1948)

Elevations computed from CBBEL HEC-2 1/08.

SCOPE OF WORK: Road Widening

EXISTING STRUCTURE

Type: Culvert (twin)
Length 102'
Span: 10'
Height: 7'
Skew: N/A
US Invert: 654.06
DS Invert: 653.90

PROPOSED STRUCTURE

Type: Culvert (twin)
Length 133'
Span: 10'
Height: 7'
Skew: N/A
US Invert: 654.06
DS Invert: 653.8

Notes: 1) The maximum HWE might not be relevant any longer since channel improvements done in the 1980's lower all WSE.
2) Proposed elevations are lower then existing due to improvments done to D/S structure.

Exhibit 1-03.2a

WATERWAY INFORMATION TABLE
IDOT
HEC-2

Route: Canadian Pacific RR **S.N.** N/A **Computed:** DCO **Date:** 10/3/2008

Section: Station 303+13 **S.N.** N/A **Checked:** CW **Date:** 10/6/2008

County: DuPage **Waterway:** Bensenville Ditch

Drainage Area 1.56 Sq. Mi.

Existing Low Grade Elevation = 667.70 Sta. N/A

Proposed Low Grade Elevation = 684.00 Sta. N/A

			Waterway Opening (sq. ft.)*			Created Head (ft.)		Headwater Elevation	
Flood	Frequency Year	Discharge (cfs)	Existing	Proposed	Natural H.W.E.	Existing	Proposed	Existing	Proposed
	10	473	50.5	174.8	658.16	0.52	0.00	658.68	658.16
	50	728	65.6	225.2	659.42	0.84	0.00	660.26	659.42
Base	100	847	70.1	240.0	659.79	1.12	0.00	660.91	659.79
Overtopping	>100								
Max.	500								

10 Year Velocity through Existing Structure = 9.36 fps
*Based on Natural HWE

10 Year Velocity through Proposed Structure = 2.53 fps

DATUM: All elevations on Highway Datum (FEMA DATUM = HIGHWAY DATUM + 0.3 ft.)

ALL-TIME H.W.E. & DATE: 663.0 ft. (USGS HA-68, March 1948)

SCOPE OF WORK: Railroad Re-Alignment

Elevations computed from CBBEL HEC-2 1/08.

EXISTING STRUCTURE

Type:	Culvert
Length	60'
Span:	12'
Height:	8'
Skew:	N/A
US Invert:	653.95
DS Invert:	653.55

PROPOSED STRUCTURE

Type:	Culvert (quad)
Length	136'
Span:	10'
Height:	6'
Skew:	N/A
US Invert:	653.79
DS Invert:	653.60

Illinois Department of Transportation

Hydraulic Report Data Sheets

Route	Elgin O'Hare-West Bypass	P or D #	
Section	Bensenville Ditch Crossing	PTB #	
County	DuPage		
Exist SN	N/A		
Prop SN	TBD		

General Information

1. Name of the Stream: Bensenville Ditch

2. Location of the Structure: SW ¼ of the NW ¼ of Section 13, Township 40N, Range 11E 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.): +/- 1.7 sq. mi.

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

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

8. Number of Waterway Information Tables (WIT): 1
   If more than one, explain:

Hydrologic & Hydraulic Analysis

9. Hydrology Modeling (check all that apply): ☐ USGS/Stream Stats ☒ FIS ☐ Gage Data
   ☒ Other Taken from IDNR-OWR approved flowrates

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
    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:

g. What Expansion and Contraction Rates were used? Expansion: 4:1 (X:1)
Contraction 1:1 (X:1)

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:
New Alignment

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):
a. ☐ Complete Replacement
b. ☐ Superstructure Replacement
c: ☐ Superstructure Widening; Length of Pier Extension in the water:
U/S D/S
d. ☐ Bridge ☒ 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):
Preliminary low beam elevation (ft):
Width of deck (ft):
Total length from face to face of abutment (ft)
Abutment type:
Skew (degrees):
Number of spans:

18. If a culvert is proposed, supply:
Type and size: 3-10'(w)x6'(h) RCBC
Upstream invert elevation (ft): 653.47
Downstream invert elevation (ft): 652.93
Length (ft): 504
Entrance type: Headwall
Skew (degrees): 0
Note: Upstream and downstream elevations should reflect the elevations before the 3" drop is applied

19. If a three-sided structure is proposed, supply:
Flow line elevation (ft):
Span (ft):
Height (ft):
Skew (degrees):
Length (ft):
Number of spans:

20. a. Is the IDOT Clearance Policy Met? ☐ Yes ☐ No ☒ NA Value (ft):
b. Is the IDOT Freeboard Policy Met? ☒ Yes ☐ No ☐ NA Value (ft): 29.06 ft.

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

22. Scour/ Migration Problems: ☒ None/Minimal ☐ Significant ☐ Severe
Comments:

Ice Concerns: ☒ None/Minimal ☐ Significant ☐ Severe
Comments:

Debris Concerns: ☒ None/Minimal ☐ Significant ☐ Severe
Comments:

Countermeasures Proposed:

Existing Structure Data

	Structure U/S	Subject Structure	Structure D/S
23. Distance from proposed structure: (ft.)	80	No Existing Structure	1,483
24. Type of structure:	4 –10'W x 7'H RCBC (CPRR)		2 –11'W x 7'H RCBC (OMP Long culvert)
25. Low beam elevation:	N/A		N/A
26. Flow line elevation:	653.79 ft		651.32 ft
27. Maximum known high water elevation:	N/A		N/A
28. Date of maximum high water:	N/A		N/A
29. Cause (backwater, headwater, etc.):	Backwater		Backwater
30. Does structure carry entire design flood flow?	☒ Yes ☐ No	☐ Yes ☐ No	☒ Yes ☐ No
If not, state area of additional waterway opening: (ft^2)	N/A		N/A
31. Type and size of existing overflow structures:	N/A		N/A
32. Has adverse scour occurred under or adjacent to the structure?	N/A		N/A
33. Classify type of scour and/or aggradation / degradation:	N/A		N/A

Required Additional Data

34. Deviations from the General Procedures presented in IDOT DM CH. 2, CH.6, and CH.7:

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

36. Site Inspection made by: Donald Oliphant Date: 06/2010

Remarks:

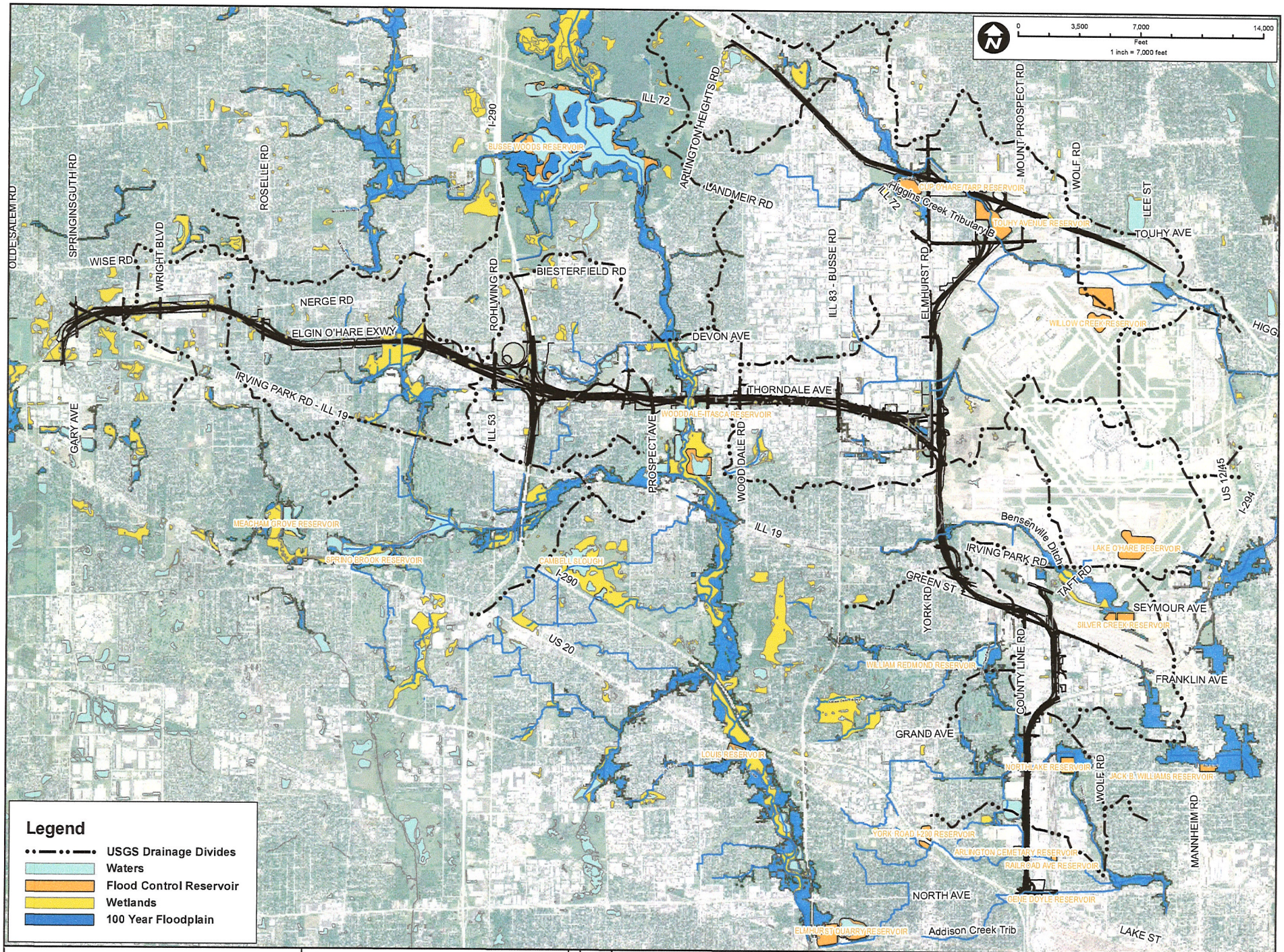
37. Prepared by: Donald Oliphant Date 11/30/11

Signed (QA/QC): Date 6/19/12

Tab 3

SECTION 3

GENERAL PROJECT LOCATION MAP
USGS HYDROLOGIC INVESTIGATIONS ATLAS
USGS PROFILES OF FLOODS ON BENSENVILLE DITCH
FLOOD INSURANCE RATE MAP
FLOOD INSURANCE STUDY INFORMATION



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Rosemont, Illinois 60018
(847) 823-0500

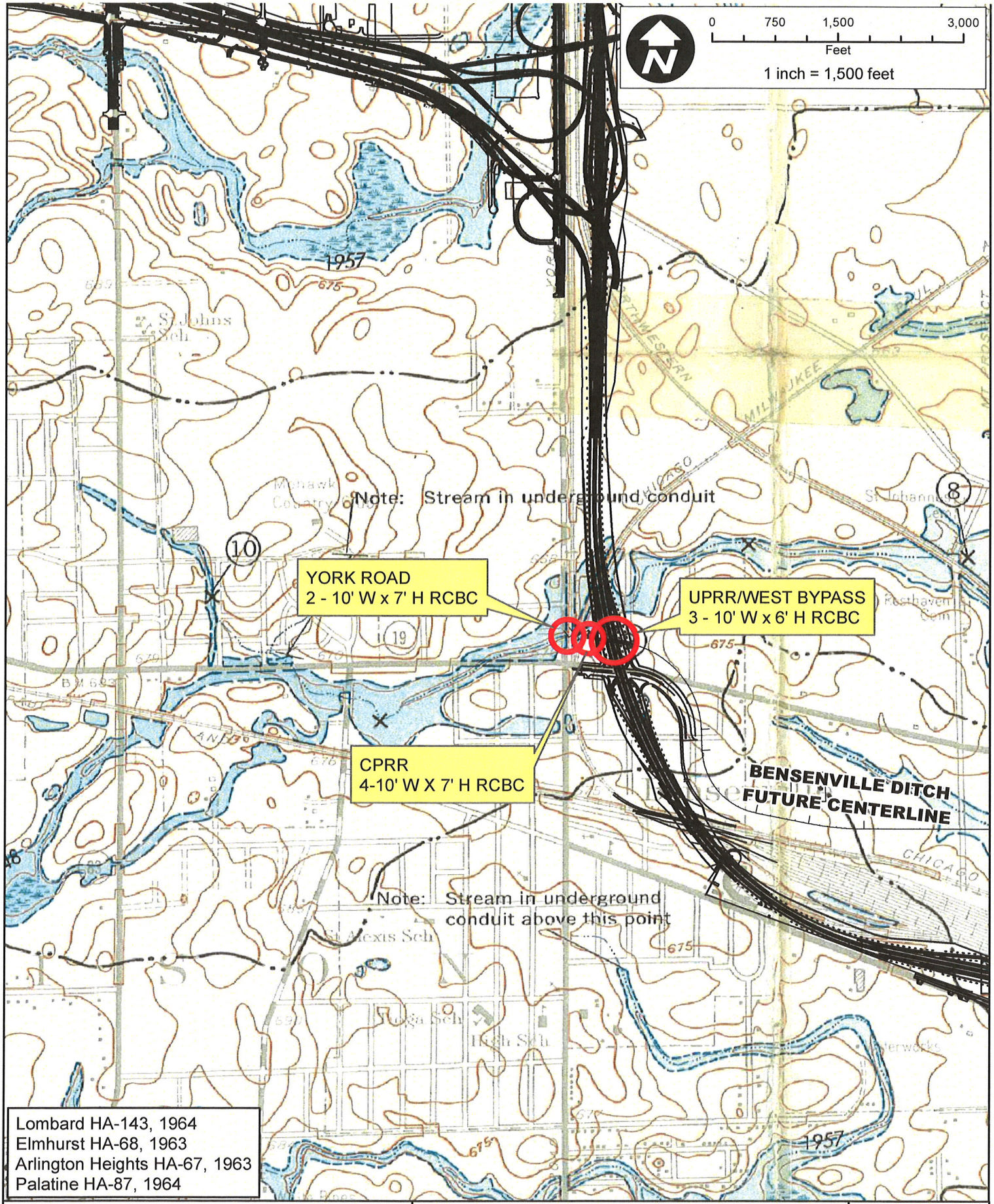
CLIENT:
ILLINOIS DEPARTMENT OF TRANSPORTAION

NO.	DATE	NATURE OF REVISION

DSGN.:
DWN.: DWALTERS
CHKD.:
SCALE: 1:7,000
CHKD.: MODEL: ArcGIS 10
PLOT DATE: 12/13/2011
FILE NAME: Drainage Exhibit Revised 8.5X11
PATH: N:\Mdt\070404\GIS\Exhibits\Drainage Exhibit Revised 8.5X11.mxd

TITLE:
ELGIN O'HARE - WEST BYPASS GENERAL PROJECT LOCATION MAP

PROJ. NO. 070404
DATE
SHEET 0 OF 0
DRAWING NO.
EXH 1



CLIENT:

ILLINOIS DEPARTMENT OF TRANSPORTATION

TITLE:

ELGIN O'HARE - WEST BYPASS
WEST BYPASS OVER BENSENVILLE DITCH
USGS HYDRAULIC INVESTIGATIONS ATLAS

PROJ. NO.	070404
DATE:	11-01-2010
SHEET	0 OF 0
DRAWING NO.	EXH 2

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DSGN.			SCALE:	1"=1,500'
DWN.			GIS USER	MHAYES
CHKD.			PLOT DATE	
FILE:				

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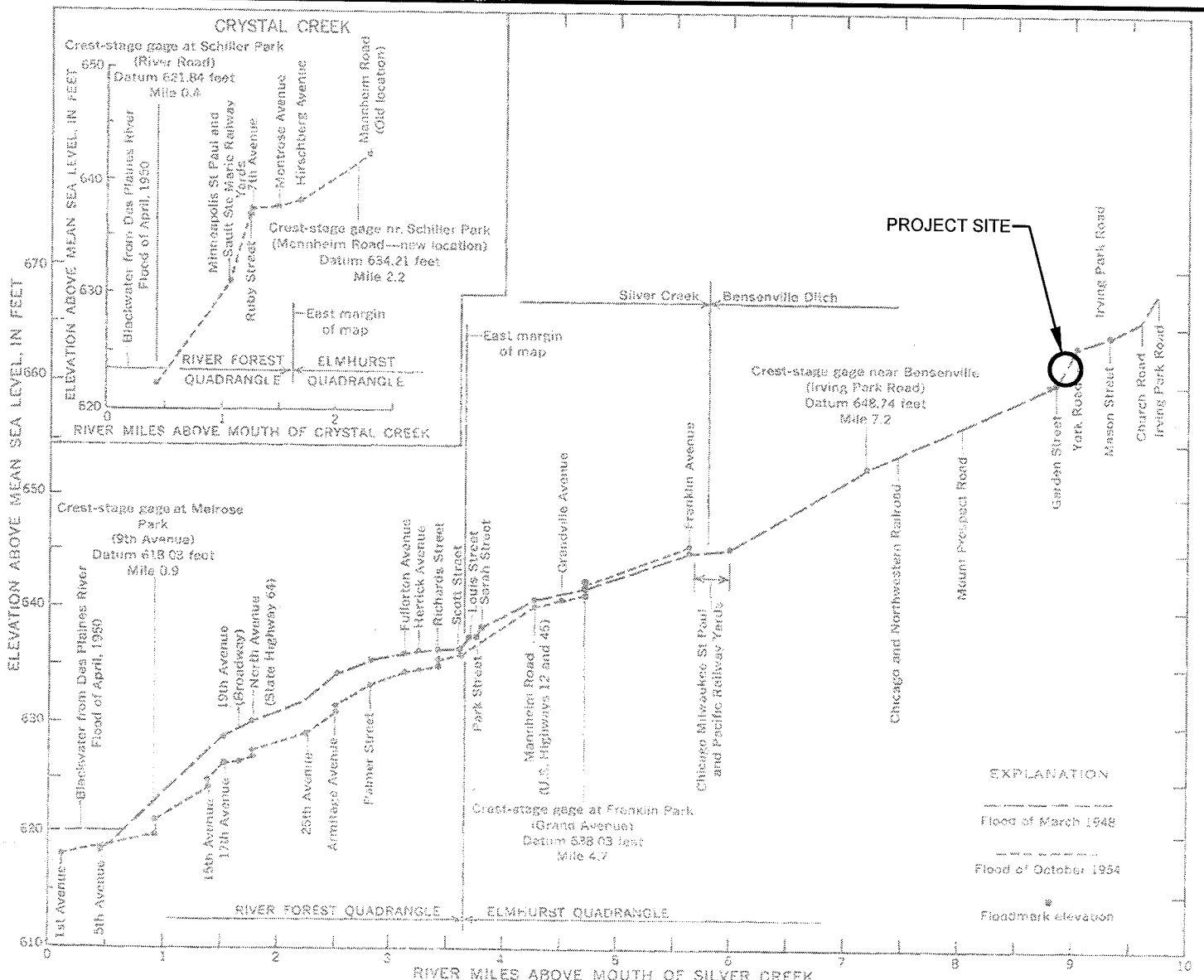

SOURCE:
ELMHURST QUADRANGLE HYDROLOGIC INVESTIGATIONS ATLAS, 1963.

FIGURE 7.—Profiles of floods on Silver Creek, Bensenville Ditch and Crystal Creek

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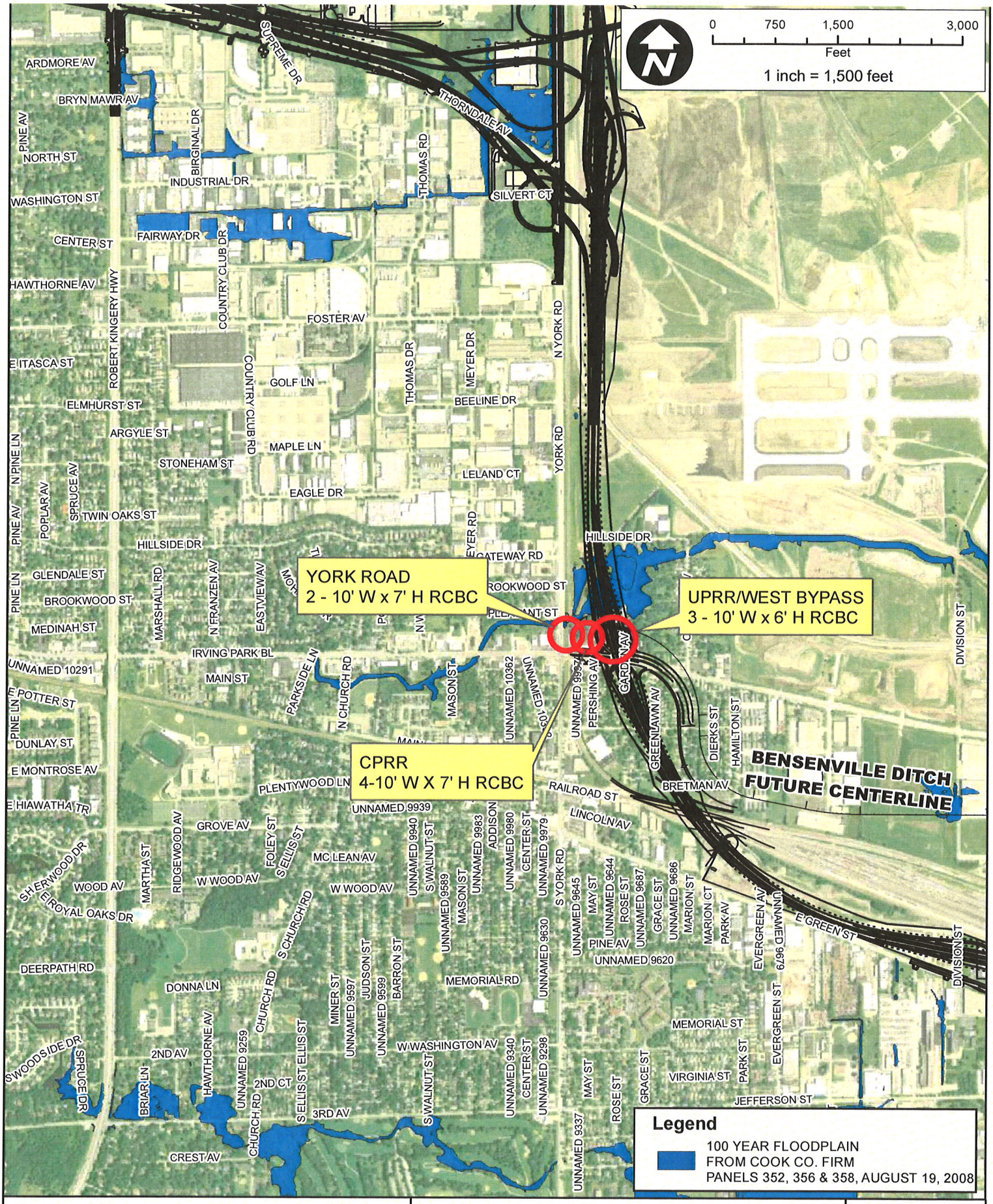
CLIENT: **STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**

PROJECT NO. 07-0404

HISTORICAL FLOODING

DATE 2/18/2011

EXHIBIT 2B



CLIENT:

ILLINOIS DEPARTMENT OF TRANSPORTATION

TITLE:

ELGIN O'HARE - WEST BYPASS
WEST BYPASS OVER BENSENVILLE DITCH
FLOOD INSURANCE RATE MAP

PROJ. NO.	070404
DATE:	11-01-2010
SHEET	0 OF 0
DRAWING NO.	EXH 3

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DSGN.			SCALE:	1"=1,500'
DWN.			GIS USER	MHAYES
CHKD.			PLOT DATE	
FILE:				

Map Document: (N:\ldot\070404\GIS\Exhibits\HA and FIRM Exhibits\FIRM Exhibits\Bensenville Ditch.mxd)
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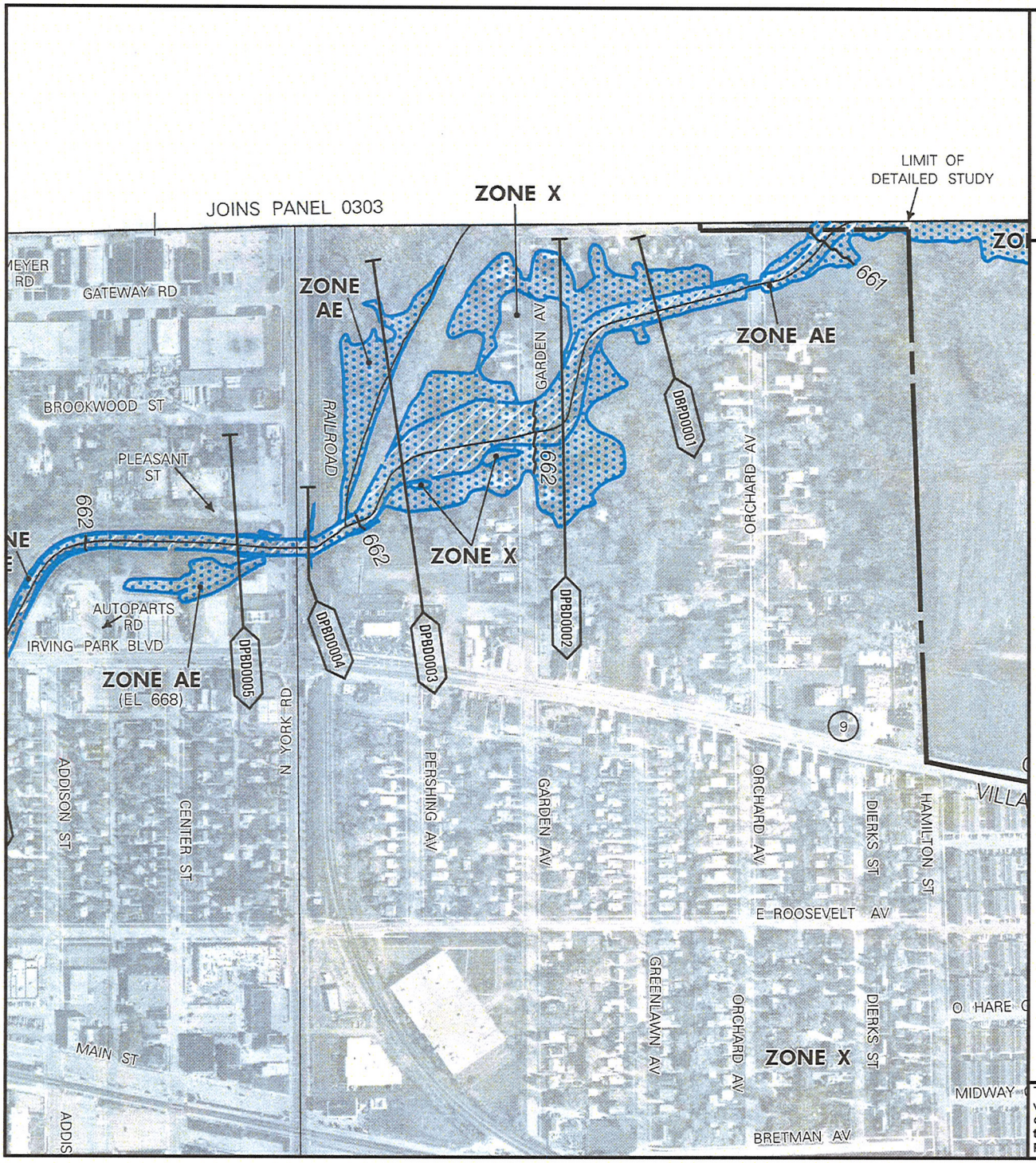
National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET



NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0306H

FIRM

FLOOD INSURANCE RATE MAP

DuPAGE COUNTY,
ILLINOIS
AND INCORPORATED AREAS

PANEL 0306 OF 1006

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DuPAGE COUNTY	170197	0306	H

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
17043C0306H

EFFECTIVE DATE
DECEMBER 16, 2004

Federal Emergency Management Agency

EXHIBIT 3A - SUPERSEDED BY OMP FWCP

Tab 4

SECTION 4

SITE PHOTOGRAPHS

N:\dot\070404\Water\Exhibit DCO Future UPRR & Irving Pk\070404exh4 AerialPhotograph .dgn

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CLIENT: STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PROJECT NO. 07-0404

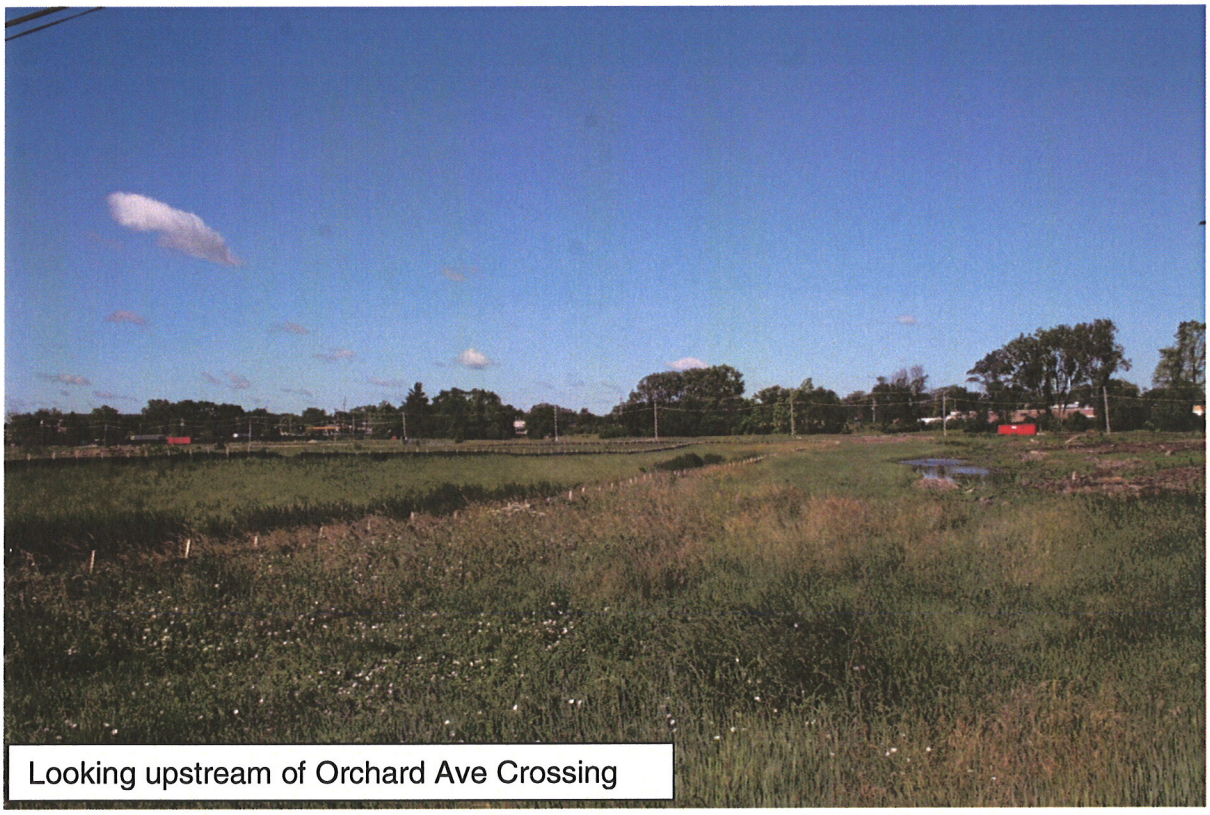
ELGIN O'HARE – WEST BYPASS
BENSENVILLE DITCH
AERIAL PHOTOGRAPH w/PROJECT DETAILS

DATE 4/5/2012

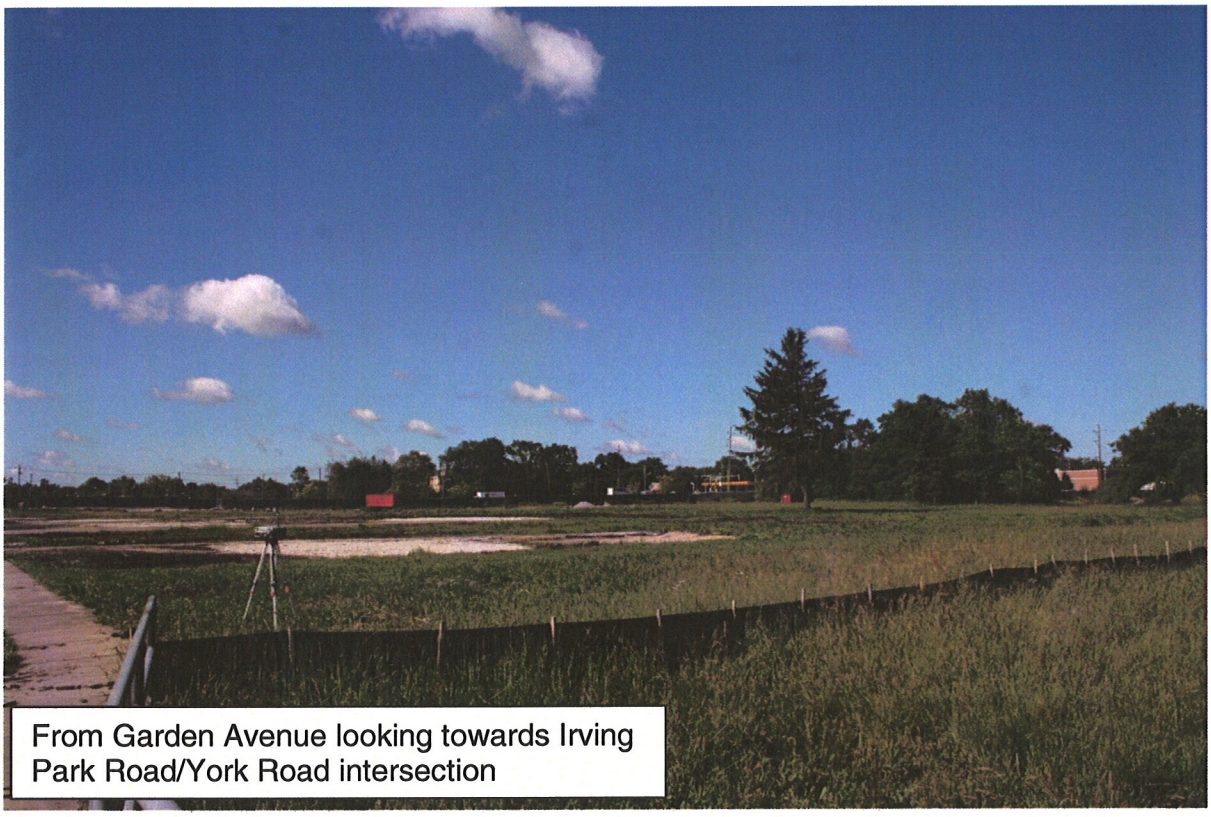
EXHIBIT 4

EXHIBIT 4

June 2010 Area Photos

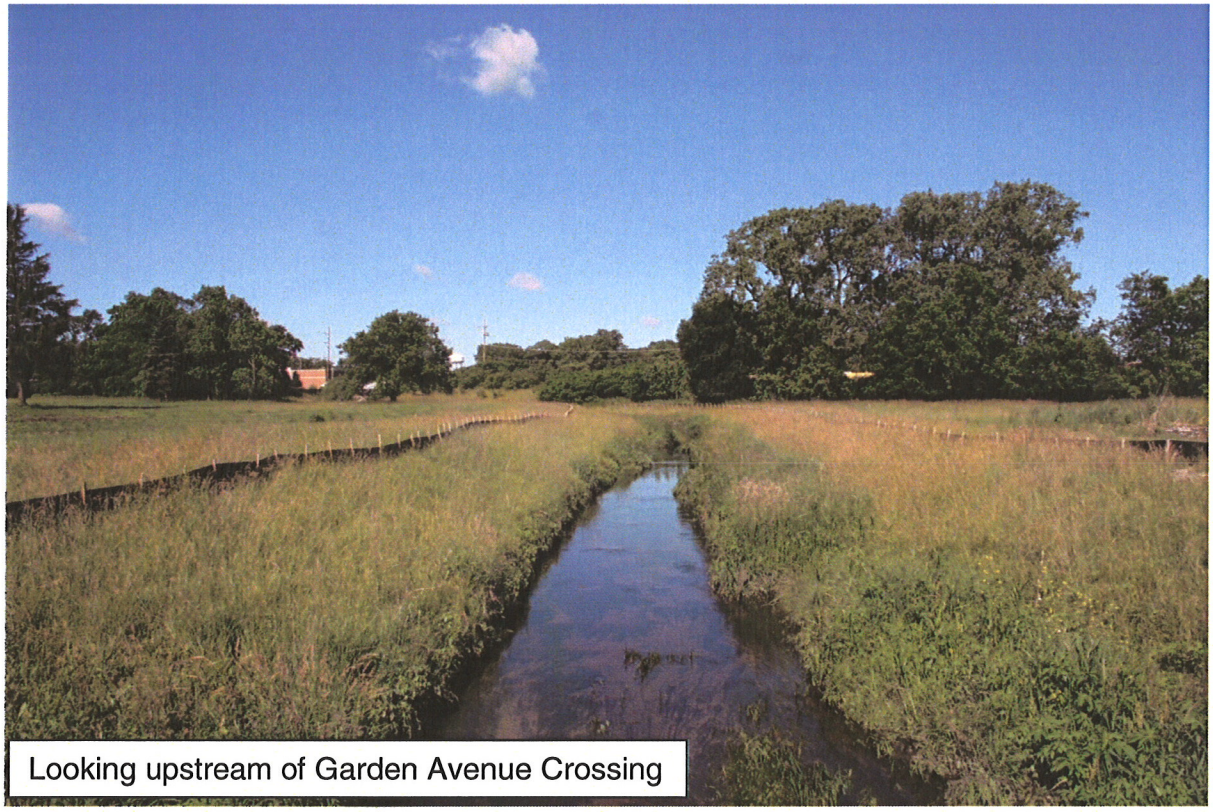


Looking upstream of Orchard Ave Crossing



From Garden Avenue looking towards Irving Park Road/York Road intersection

June 2010 Area Photos



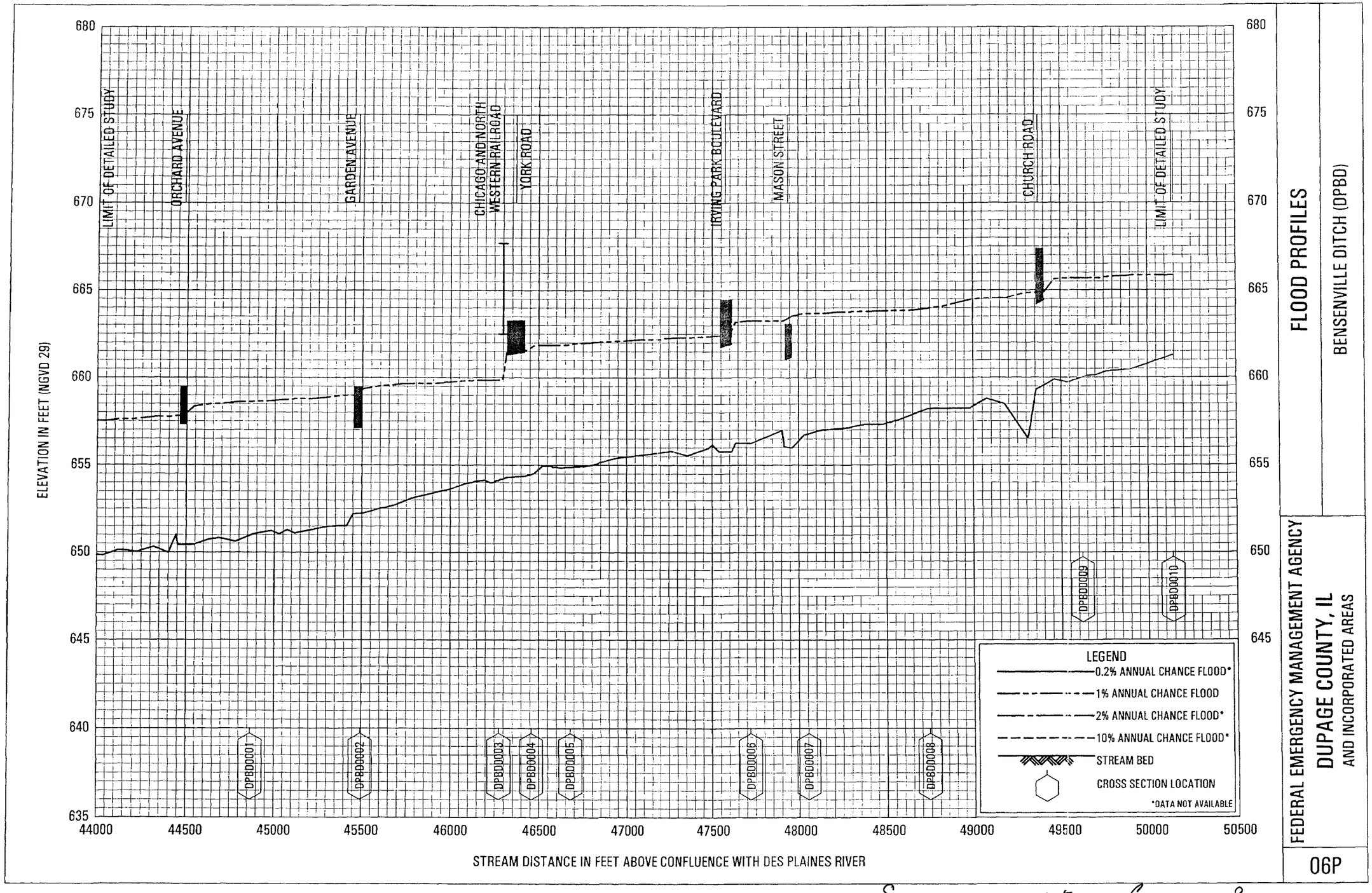
Looking upstream of Garden Avenue Crossing

DCO\
N:\Idot\070404\Water\Bensenville Ditch\images\Site Photos.docx

Tab 5

SECTION 5

STREAMBED PLAN AND PROFILE
ROADWAY PLAN AND PROFILE



FLOOD PROFILES

BENSENVILLE DITCH (DPBD)

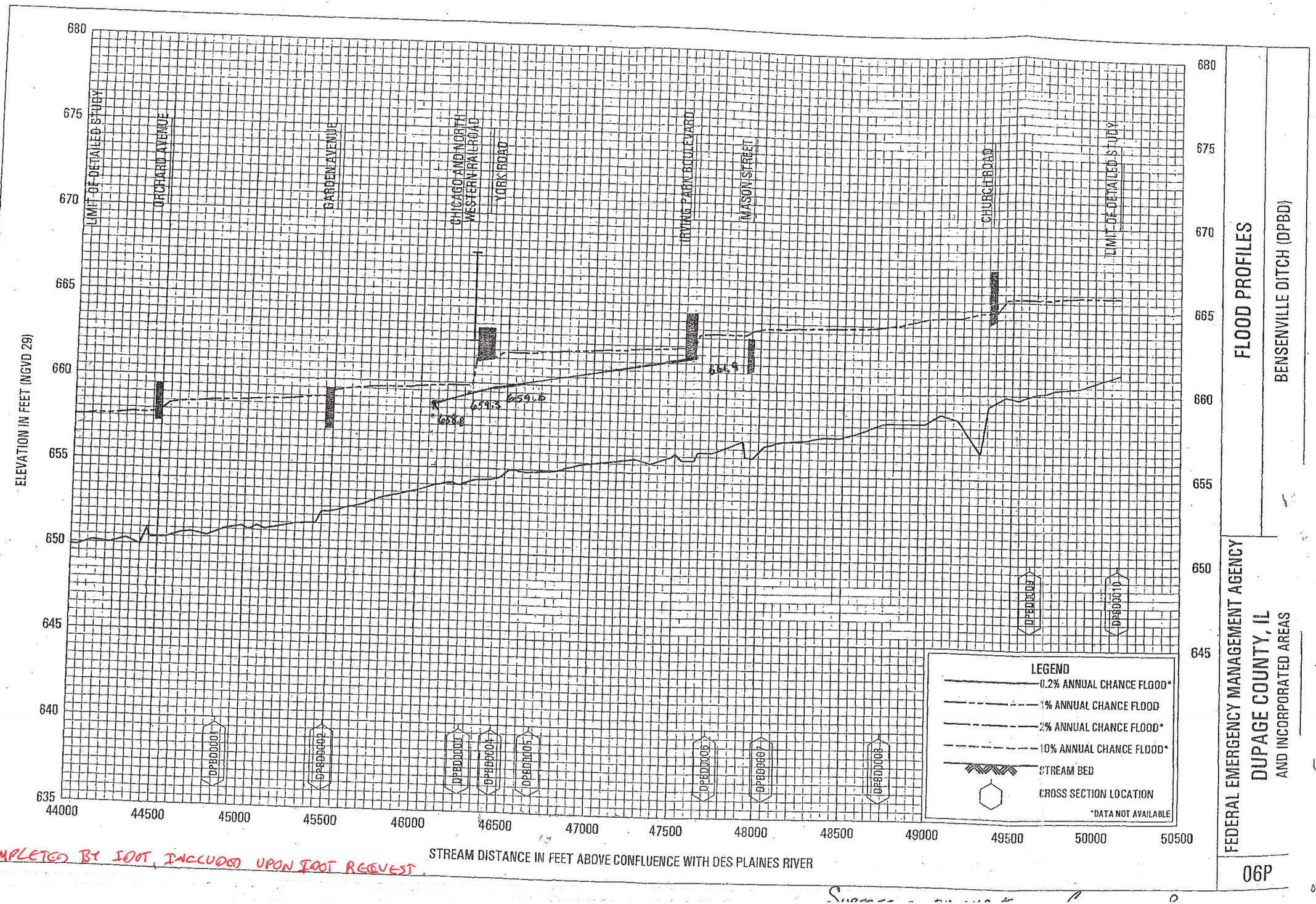
FEDERAL EMERGENCY MANAGEMENT AGENCY

DUPAGE COUNTY, IL

AND INCORPORATED AREAS

06P

SUPERSEDED BY OMP FLOODPLAT CONSTRUCTION PERMIT



FLOOD PROFILES

BENSENVILLE DITCH (DPBD)

FEDERAL EMERGENCY MANAGEMENT AGENCY

DUPAGE COUNTY, IL

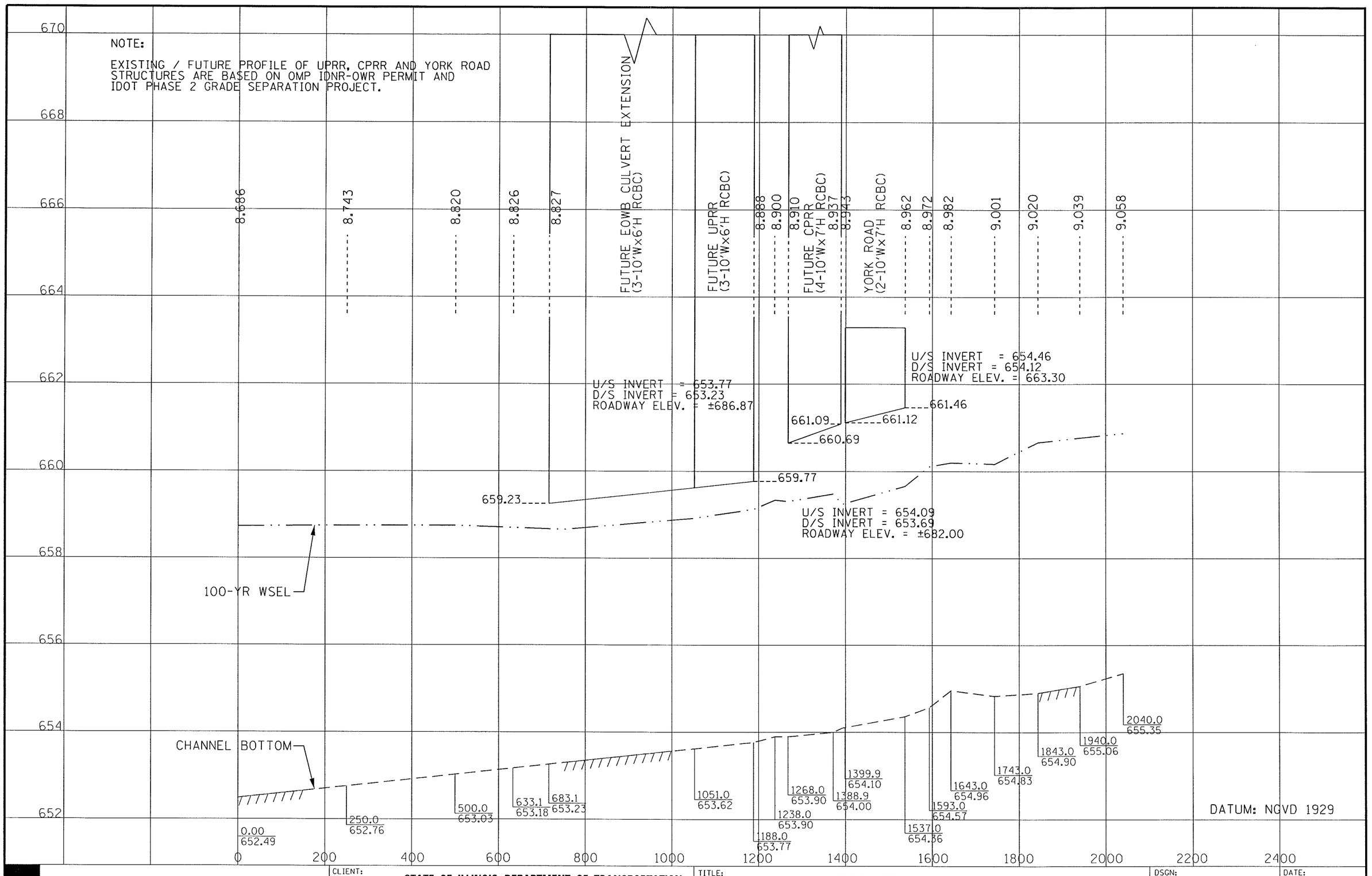
AND INCORPORATED AREAS

06P

COMPLETED BY IDOT, INCLUDED UPON IDOT REQUEST.

NOTE:

EXISTING / FUTURE PROFILE OF UPRR, CPRR AND YORK ROAD STRUCTURES ARE BASED ON OMP IDNR-OWR PERMIT AND IDOT PHASE 2 GRADE SEPARATION PROJECT.



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Rosemont, Illinois 60018 (847) 823-0500

CLIENT: STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION		TITLE: ELGIN O'HARE – WEST BYPASS BENSENVILLE DITCH FUTURE STREAMBED PROFILE	DSGN: DCO
PROJECT NO. 07-0404	SCALE: 1"=2' VERT. 1"=200' HOR.		DWN: EAT
			DATE: 10/18/2012

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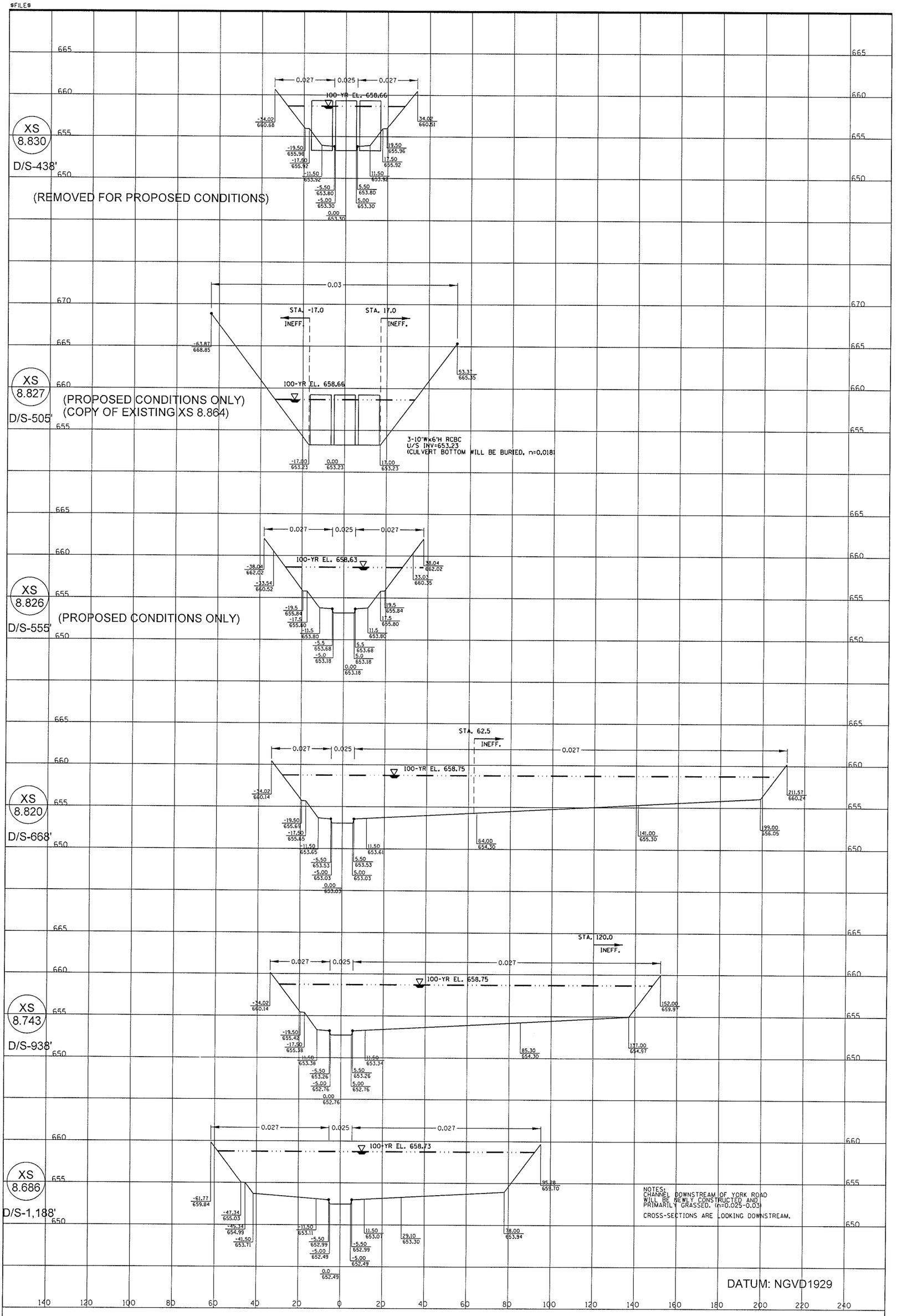

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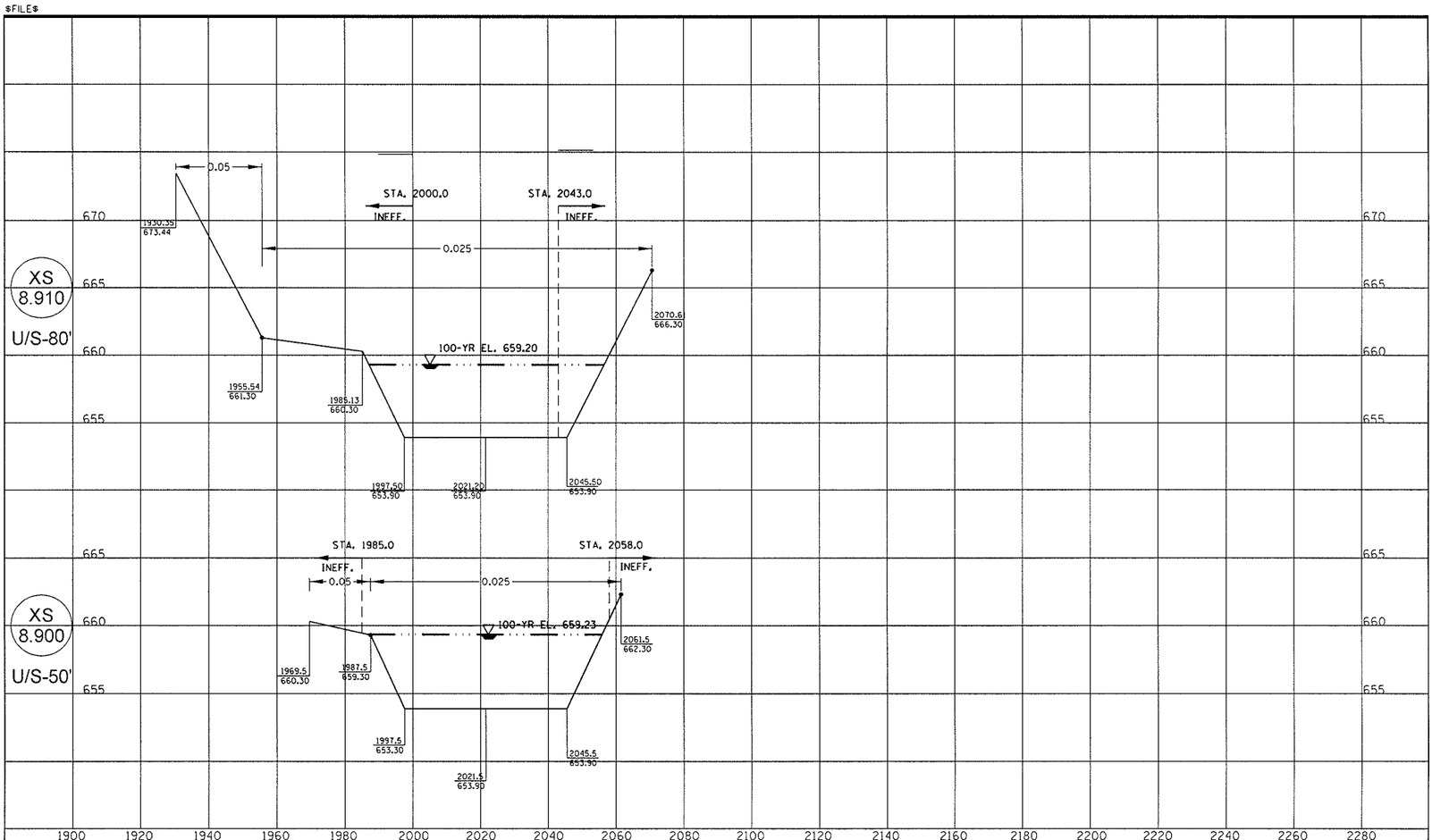
CLIENT:
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

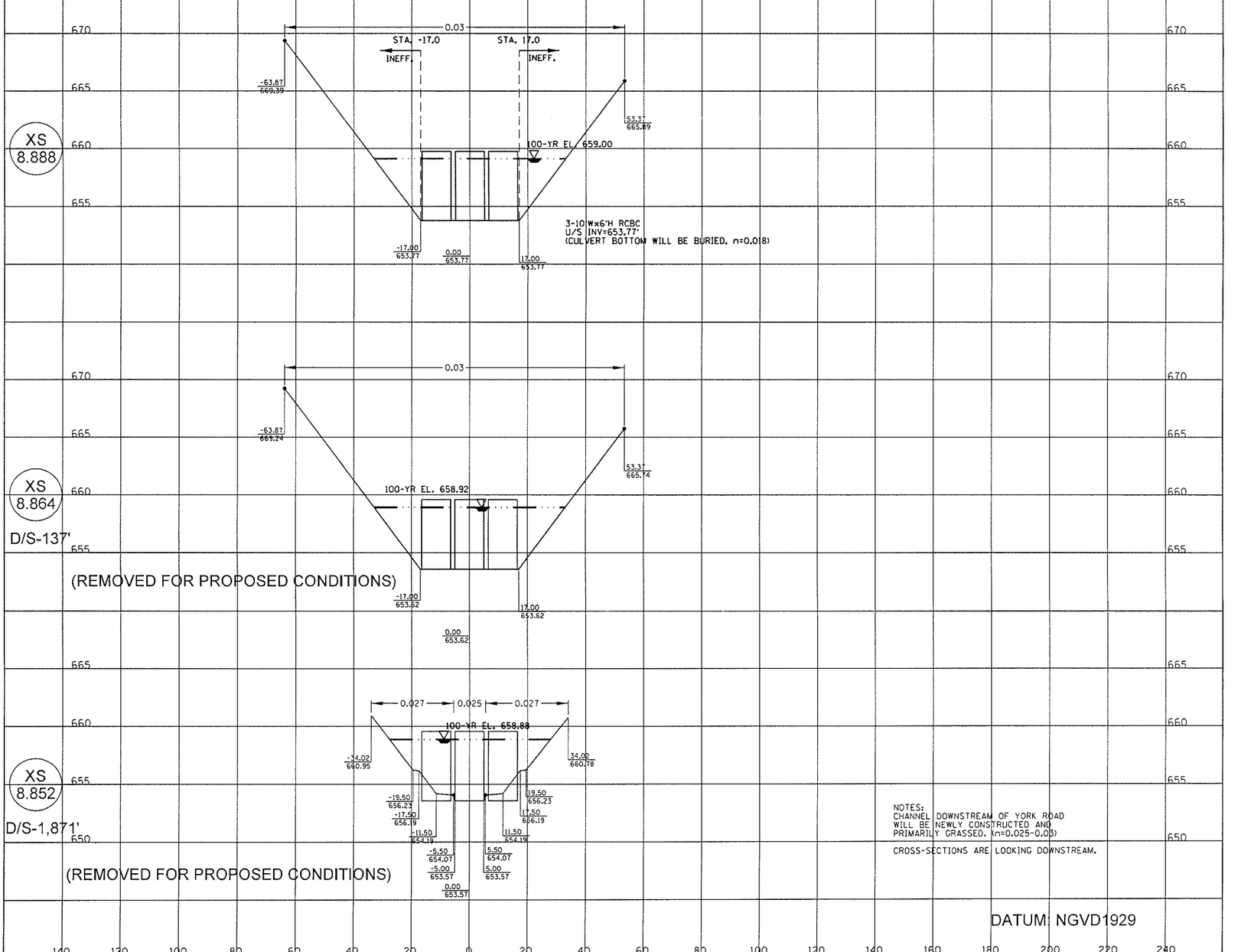
NO.	DATE	NATURE OF REVISION
DSGN.	DCO	
DWN.	EAT	
CHKD.	DCO	
SCALE:	1"=5'V; 1"=20'H	

TITLE :
ELGIN O'HARE – WEST BYPASS
BENSENVILLE DITCH CROSS SECTIONS

07-0424
10/18/2012 CHKD.
SHEET 1 OF 4

$FILE$





NOTES:
CHANNEL DOWNSTREAM OF YORK ROAD WILL BE NEWLY CONSTRUCTED AND PRIMARILY GRASSED. (n=0.025-0.03)

CROSS-SECTIONS ARE LOOKING DOWNSTREAM.

DATUM: NGVD1929

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

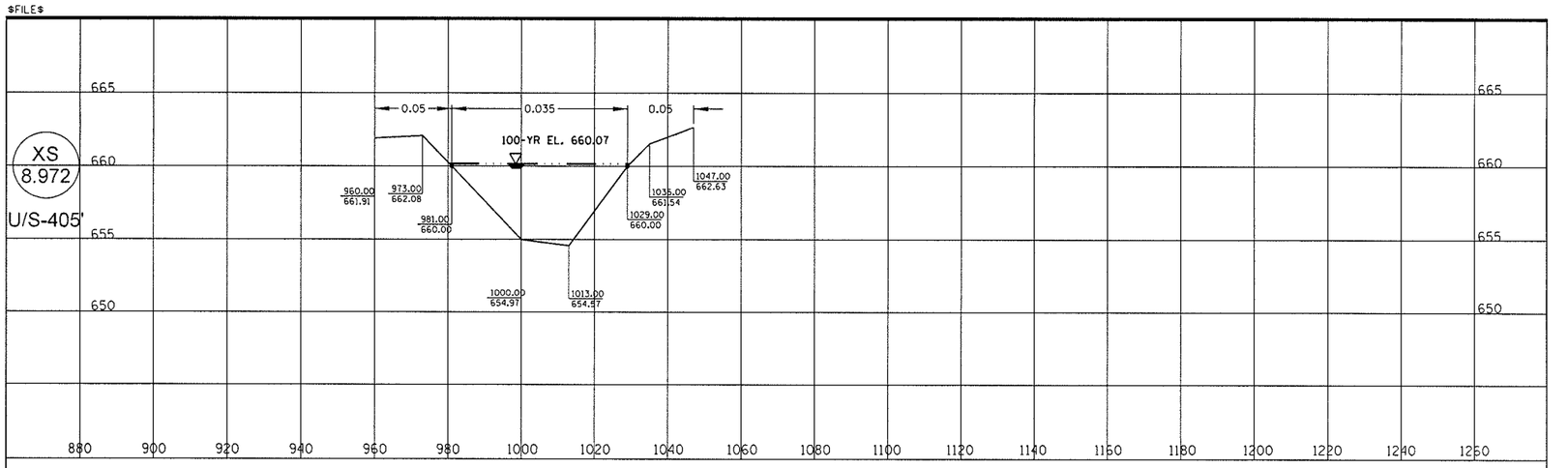
CLIENT:
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

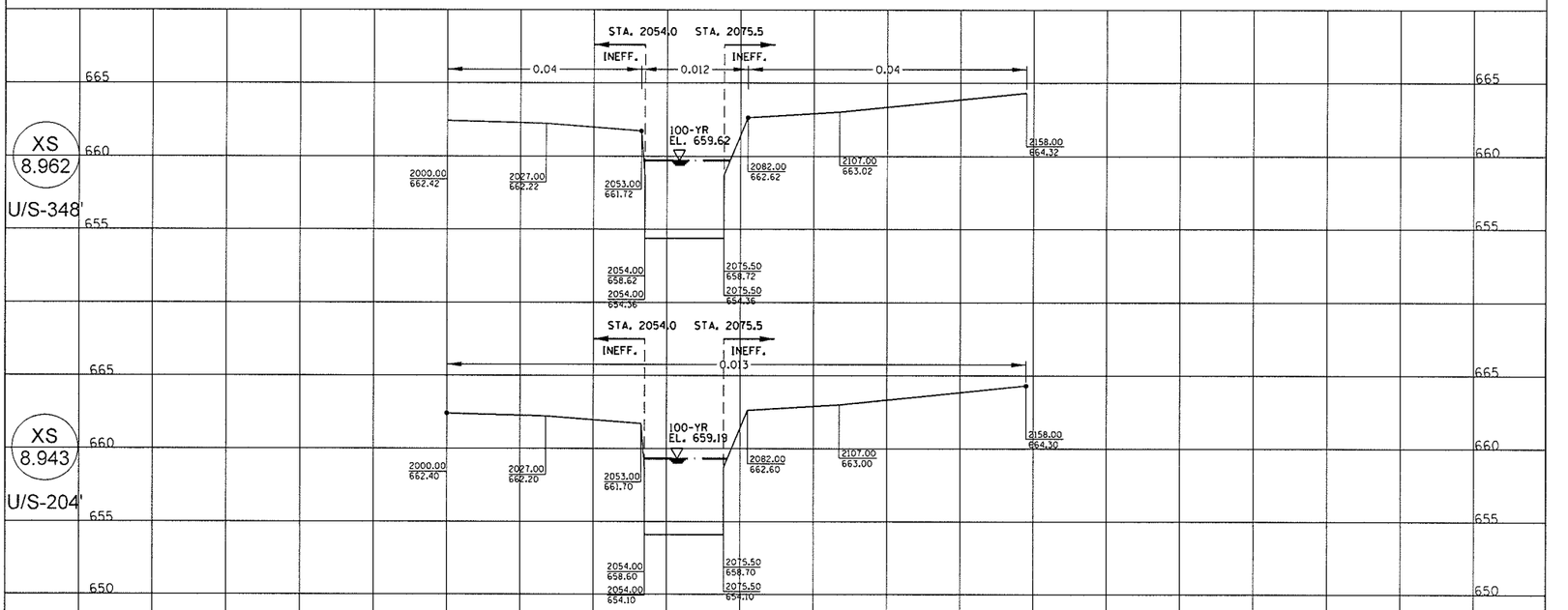
NO.	DATE	NATURE OF REVISION
DSGN.	DCD	
DWN.	EAT	
CHKD.	DCD	
SCALE:	1"=5'V; 1"=20'H	

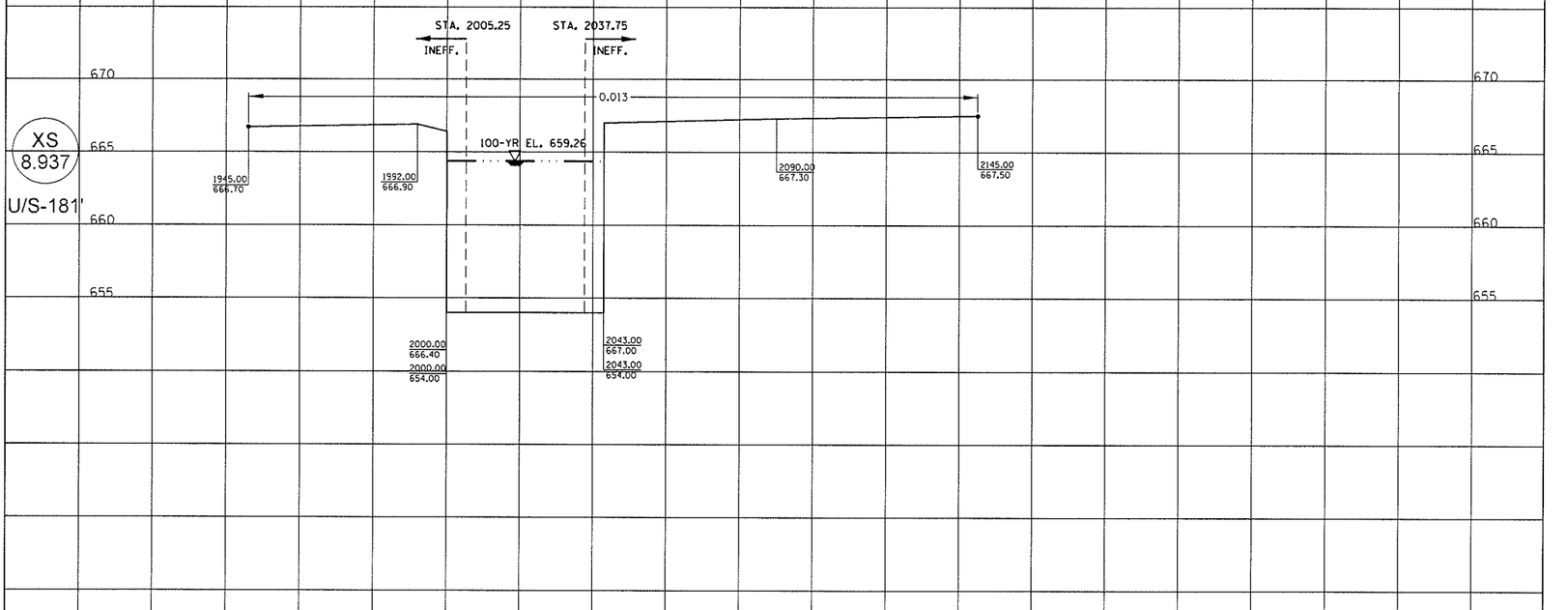
07-0404
10/18/2012 CHKD.
SHEET 2 OF 4

TITLE :
ELGIN O'HARE – WEST BYPASS
BENSENVILLE DITCH CROSS SECTIONS

$FILE$







NOTES:
CROSS-SECTIONS ARE LOOKING DOWNSTREAM.

X-SEC 8.962 IS CONCRETE AT CULVERT n=0.012
FACE AND ESTABLISHED GRASS ON OVERBANKS
n=0.035-0.05

X-SECS 8.937-8.943 ARE WITHIN CONCRETE JUNCTION
CHAMBER n=0.013

DATUM: NGVD1929

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

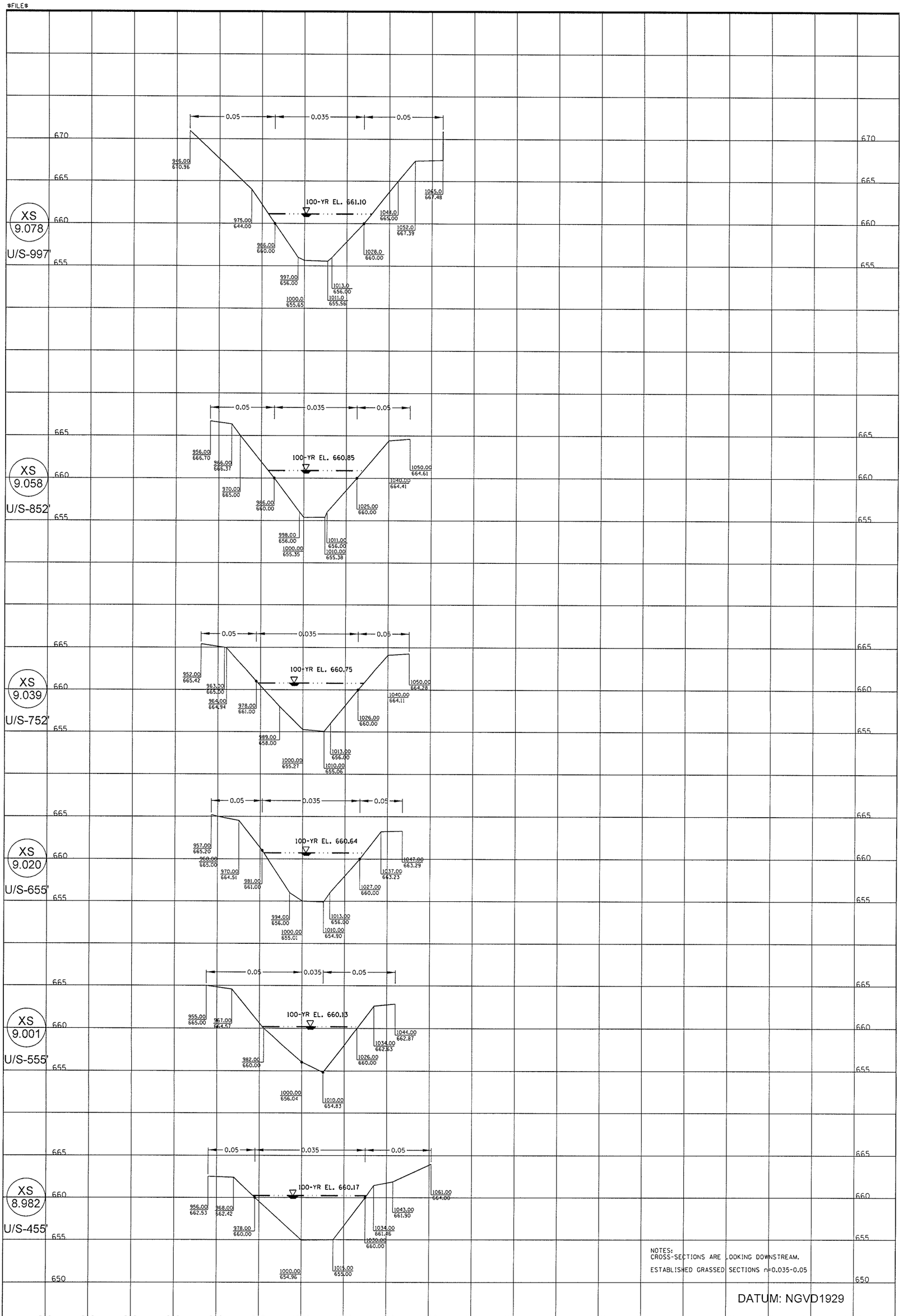
CLIENT:
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NO.	DATE	NATURE OF REVISION
DSGN.	DCO	
DWN.	EAT	
CHKD.	DCO	
SCALE:	1"=5'V: 1"=20'H	

TITLE :
ELGIN O'HARE – WEST BYPASS
BENSENVILLE DITCH CROSS SECTIONS

07-0404
10/18/2012 CHKD.
SHEET 3 OF 4

$FILE$



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

CLIENT:
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NO.	DATE	NATURE OF REVISION
DSGN.	DCO	
DWN.	EAT	
CHKD.	DCO	
SCALE:	1"=5'V; 1"=20'H	

TITLE :
ELGIN O'HARE – WEST BYPASS
BENSENVILLE DITCH CROSS SECTIONS

07-0404
10/18/2012 CHKD.
SHEET 4 OF 4

PLAN
SURVEYED
PLOTTED
ALIGNMENT CHECKED
DRAWING CHECKED
CADD FILE NAME
NOTE BOOK
NO.
BY
DATE

PROFILE
SURVEYED
PLOTTED
DRAWING CHECKED
NOTE BOOK
NO.
STRUCTURE NOTATIONS ADDED
BY
DATE

Y:\36180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CADD\Models Geometric & Grading\exh-04-HY-Drainage-GeomProf_210.dgn 4/6/2012 8:56:02 AM

690
680
670
660
650

+2.85% VPI STA. 209+00.00
ELEVATION 699.50
-1.7%

14'-9" MIN CLEARANCE

FUTURE BENSENVILLE DITCH

℄ +25.00 EL. 682.17

EXISTING BENSENVILLE DITCH

RAMP U4
GORE NOSE
℄ +25.00 EL. 668.30

TOP OF CULVERT = 658.93

RAMP U4

℄ RAMP U1 ℄ RAMP U4
℄ RAMP U2 ℄ RAMP U3
℄ IRVING PARK RD

D/S INV. HLE 652.93
U/S INV. HLE 653.47

DATUM: NAVD '88

206+00	207+00	208+00	209+00	210+00	211+00	212+00	213+00	214+00	215+00	216+00	217+00	218+00	219+00	220+00
659.34	659.65	660.41	661.27	661.49	662.29	662.71	662.87	663.87	661.27	660.93	660.43	660.46	660.48	661.03
688.56	**689.20**	**689.73**	**690.14**	**690.44**	**690.63**	**690.71**	**690.67**	**690.52**	**690.26**	**689.89**	**689.40**	**688.80**	**688.09**	**687.27**
661.28	660.68	660.08	659.49	658.34	657.78	652.19	658.05	657.78	658.46	659.16	659.04	658.95	665.59	663.99
686.33	**685.28**	**684.12**	**682.85**	**681.47**	**680.09**	**678.70**	**677.31**	**675.93**	**674.54**	**673.15**	**671.77**	**670.38**	**668.99**	**667.62**

FILE NAME = exh-04-HY-Drainage-GeomProf_210.dgn	USER NAME = mgoldenberg	DESIGNED MA/EB	REVISED -
		DRAWN MYG	REVISED -
	PLOT SCALE = 100'	CHECKED CW	REVISED -
	PLOT DATE = 4/4/2012	DATE -	REVISED -

ELGIN O'HARE WEST BYPASS
communities. opportunities. solutions.

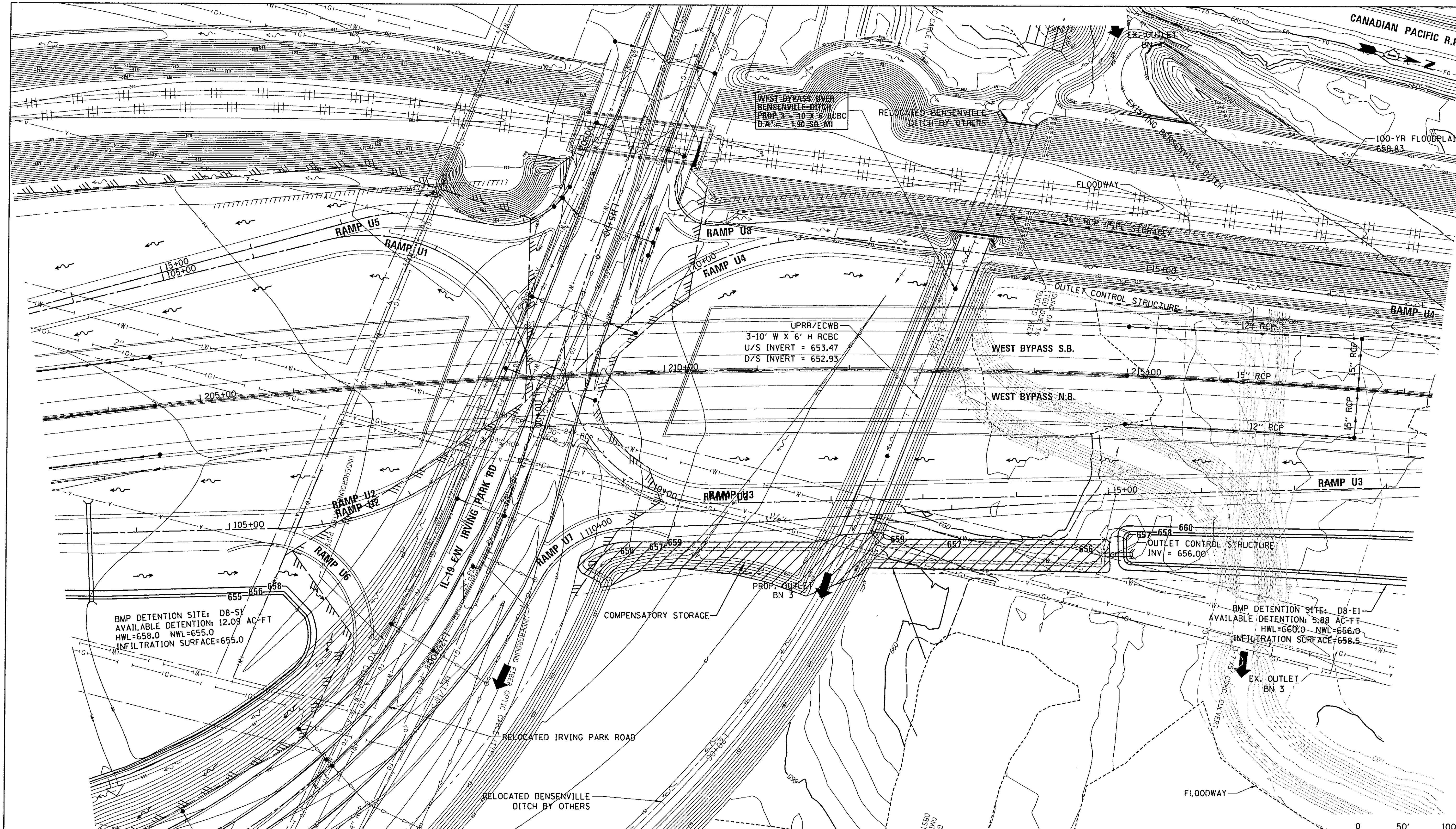
Illinois Department of Transportation

CHRISTOPHER B. BURKE ENGINEERING, LTD.

PROPOSED DRAINAGE PROFILE

SCALE: 1"=50'H 1"=5'V SHEET NO. OF SHEETS STA. TO STA.

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



LEGEND:

BOUNDARY LINES/SYMBOLS	EXISTING	PROPOSED
REFERENCE LINE/CENTERLINE AND STATIONING	430+00	115+00
RIGHT OF WAY LINE		
COUNTY LINE		
DRAINAGE DIVIDE (HYDROLOGIC ATLAS)		
TEMPORARY EASEMENT		
PERMANENT EASEMENT		
STORM SEWER REMOVAL		

	EXISTING	PROPOSED
SWALE		
DITCH		
DITCH SUMMIT		
CULVERT SIZE/TYPE	2 X 2 BOX	2 X 2 BOX
HEADWALL		
CATCH BASIN		
INLET/SCUPPER		
MANHOLE		
INVERT	(XXX.XX)	XXX.XX
STORM SEWER		

	EXISTING	PROPOSED
OVERFLOW		
OUTLET		
SHEET FLOW		
DITCH CHECK		
DRAINAGE BOUNDARY		

DNOTE
DNOTE-B
DNOTE-D
DNOTE-E1
DNOTE-E2

Datum: NAVD 1988

EXHIBIT 7

FILE NAME =	USER NAME = elmotoda	DESIGNED MA	REVISED -
DIEOWB-sht-pr-drain-Bensenville_ditch.dgn		DRAWN MYG	REVISED -
	PLOT SCALE = 100'	CHECKED CW	REVISED -
	PLOT DATE = 7/2/2012	DATE -	REVISED -

ELGIN O'HARE WEST BYPASS
communities. opportunities. solutions.

Illinois Department of Transportation

CHRISTOPHER B. BURKE ENGINEERING, LTD.

PROPOSED DRAINAGE PLAN
BENSENVILLE DITCH WATERSHED
WEST BYPASS

SCALE: 1"=50'	SHEET NO.	OF	SHEETS	STA.	TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK,DuPAGE	$TOTAL	PWBY9
		CONTRACT NO.		
	ILLINOIS	FED. AID PROJECT		

Y:\35180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models Geometric FullBuild\Concept Drainage Exhibit\DIEOWB-sht-pr-drain-Bensenville_ditch.dgn
8:29:13 AM

MATCH LINE SEE SHEET 62

MATCH LINE SEE SHEET 64

IL-19/IRVING PARK RD

FLOODWAY

100-YR FLOODPLAIN 658.58

MCI FIBER

LEVEL 3 FIBER

PLEASANT ST

BROOKWOOD ST

YORK RD.
2-10' W X 7' H RCBC
U/S INVERT = 654.16
D/S INVERT = 653.82

N YORK RD

CANADIAN PACIFIC R.R

CPRR
4-10' W X 7' H RCBC
U/S INVERT = 653.79
D/S INVERT = 653.39

8'X8' OUTLET

100-YR FLOODPLAIN 658.83

WATER UTILITY QUALITY LEVEL "D"

EXISTING GRANSENVILLE DITCH

BENSENVILLE DITCH REALIGNMENT BY OTHERS

OUTLET CONTROL STRUCUTRE

16' RCP (PIPE STORAGE)

120+00

RAMP U4

WEST BYPASS S.B.

WEST BYPASS N.B.

SEE SHEET 134, 135

0' 50' 100'

LEGEND:

BOUNDARY LINES/SYMBOLS	EXISTING	PROPOSED
REFERENCE LINE/CENTERLINE AND STATIONING	1430+00	1715+00
RIGHT OF WAY LINE		
COUNTY LINE		
DRAINAGE DIVIDE (HYDROLOGIC ATLAS)		
TEMPORARY EASEMENT		TT TT TT T
PERMANENT EASEMENT		
STORM SEWER REMOVAL		

	EXISTING	PROPOSED
SWALE		
DITCH		
DITCH SUMMIT		
CULVERT SIZE/TYPE	2 X 2 BOX	2 X 2 BOX
HEADWALL		
CATCH BASIN		
INLET/SCUPPER		
MANHOLE		
INVERT	(XXX.XX)	XXX.XX
STORM SEWER		

	EXISTING	PROPOSED
OVERFLOW		
OUTLET		
SHEET FLOW		
DITCH CHECK		

DRAINAGE PROPOSAL

- MAINTAIN EXISTING STORM SEWERS AND EXISTING DITCHES UNLESS NOTED TO CONTRARY.
- CONSTRUCT PROPOSED DRAINAGE SYSTEM INCLUDING STORM SEWERS, DITCHES AND PIPE CULVERTS AS SHOWN.

Datum: NAVD 1988

KEY PLAN

IL-19/IRVING PARK RD · MAIN ST · N YORK RD · BEELINE DR · ELGIN O'HARE EXPY · SUPREME DR · E DEVON AVE · ELMHURST RD · HIGGINS RD · JANE ADDAMS MEMORIAL TOLLWAY (I-90) · TOUHY AVE · IL-83 NYE/CANTON ST · UNION PACIFIC R.R. · CHICAGO O'HARE INT'L AIRPORT

FILE NAME = DIEOWB-sht-pr-drain-Bensenville_ditch_2.exh	USER NAME = mgoldenberg	DESIGNED MA	REVISED -
		DRAWN MYG	REVISED -
	PLOT SCALE = 100'	CHECKED CW	REVISED -
	PLOT DATE = 4/11/2012	DATE -	REVISED -

ELGIN O'HARE WEST BYPASS
communities. opportunities. solutions.

Illinois Department of Transportation

CHRISTOPHER B. BURKE ENGINEERING, LTD.

PROPOSED DRAINAGE PLAN
BENSENVILLE DITCH WATERSHED
N YORK ROAD

SCALE: 1"=50' | SHEET NO. OF SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK,DuPAGE	230	63
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

Y:\36180 - Elgin O'Hare - West Bypass\TIER_TWO\NY\CAD\Models Geometric Full Build\Concept Drainage Exhibit\DIEOWB-sht-pr-drain-Bensenville_ditch_2.dgn

MATCH LINE STATION 2016+50.00
SEE SHEET 45

MATCH LINE STATION 2022+25.00
SEE SHEET 54

EXISTING R.O.W.

YORK RD.

PLEASANT ST.

63' R.O.W.

30'

33'

50'

60'

YORK ROAD

502

503

504

505+00

506

507

2017

2018

2019

2020+00

2021

2022

STA. 2019+76.98 ℄ YORK RD. =
STA. 95+35.01 ℄ PLEASANT ST.

PROPOSED R.O.W.

10'

PERM. EASEMENT

ROPOSED R.O.W.

EXISTING CONDITIONS & REMOVALS

N

SCALE IN FEET
20 0 10 20 30

MATCH LINE STATION 2016+50.00
SEE SHEET 46

MATCH LINE STATION 2022+25.00
SEE SHEET 54

EXISTING R.O.W.

YORK RD.

PLEASANT ST.

+62.8
85.6 LT

30.9'
CE+78

+93.7
85.6 LT

+64.6
65.7' LT

+57.2
92.2' LT
+57.1
89.9' LT

+93.5
92.9' LT
+93.6
89.7' LT

R=26.6'

R=25'

+44.6
66.0' LT

+84.7
66.0' LT

+18.6
66.0' LT

STA. 504+74.47 ℄ YORK RD. =
STA. 95+00.00 ℄ PLEASANT ST.

91°26'41"

FOR DETAIL OF PAVEMENT OVER CULVERT AND CULVERT EXTENSION SEE SHEETS 389 AND 390

STA. 2019+76.98 ℄ YORK RD. =
STA. 95+35.01 ℄ PLEASANT ST.

91°6'19"

SB PGL
(30' LT OF ℄)

+43.8
6.0' LT

+83.8
6.0' LT

+43.7
0.0' RT

+63.7
0.3' RT

+63.1
42.2' RT

+83.7
0.0' RT

PR ℄ YORK ROAD & NB PGL

PT
+99.86
36.00' RT

PC
+13.80
47.58' RT

R=1500'

BOX CULVERT EXTENSION
SEE STRUCTURAL PLANS

+83.2
40.5' RT

+43.1
44.2' RT

PROP. RETAINING WALL CPR RW-5; SN 022-WXXX

SEE STRUCTURAL PLANS

(72.5' LT OF CPR TRACK #2 ALIGNMENT)

PROPOSED R.O.W.

(62.5' LT OF CPR TRACK #2 ALIGNMENT)

PERM. EASEMENT

SEE RAIL AND STRUCTAL SHEETS FOR CONTINUATION OF PROPOSED R.O.W. AND RETAINING WALLS CPR-RW1. 2. AND 5

PROP. RETAINING WALL CPR RW-2

21.5'

(42.5' LT OF CPR TRACK #2 ALIGNMENT)

TEMPORARY CULVERT
SEE STRUCTURAL PLANS

ROPOSED R.O.W.

PROPOSED CONDITIONS

NOTE: SEE SHEET #1 OF 12 FOR EXISTING AND PROPOSED PLAN LEGENDS

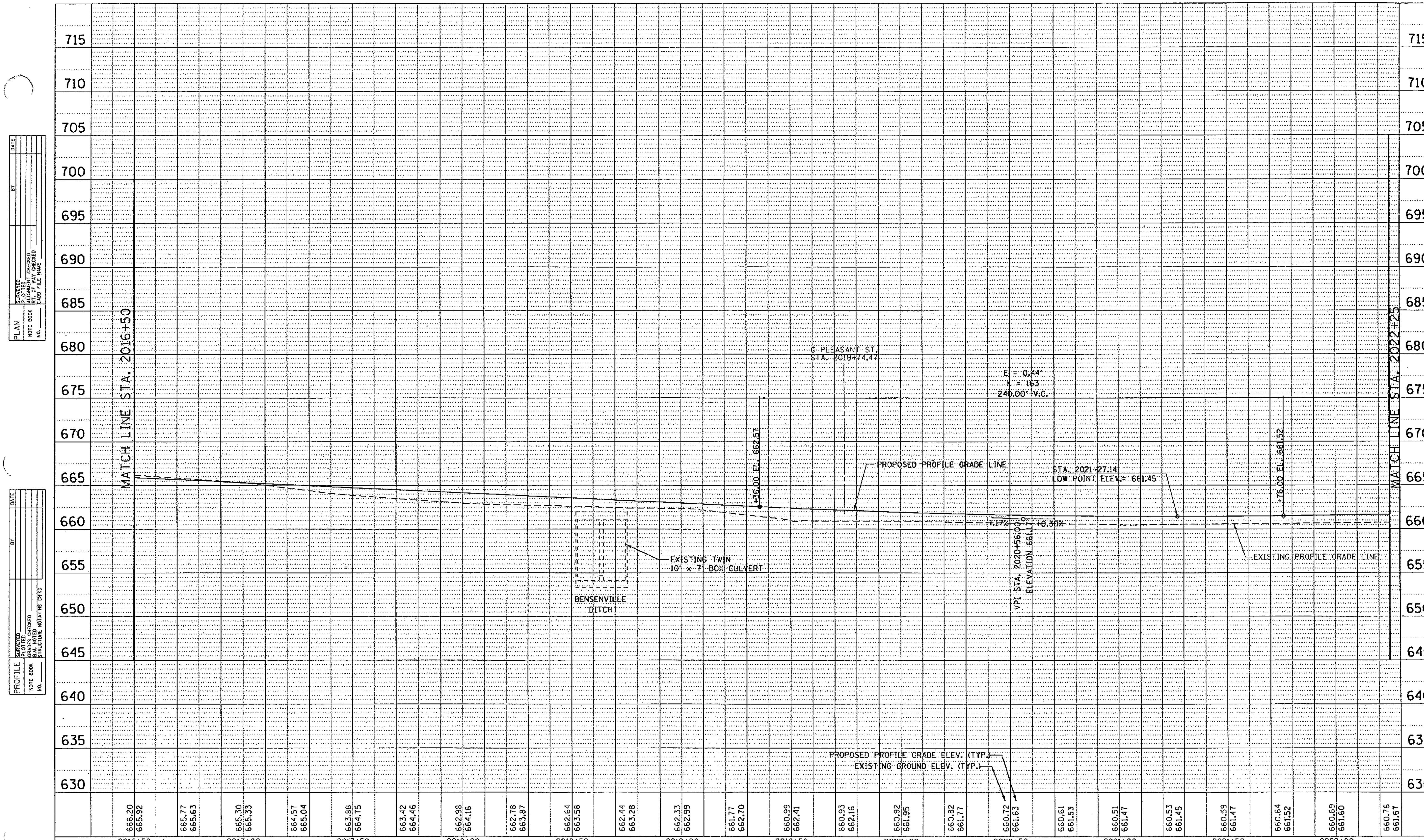
FILE NAME = ...\D160842-SHT-PLAN-11.DGN	USER NAME = malopez	DESIGNED - MPK	REVISED -
		DRAWN - ML	REVISED -
	PLOT SCALE = #SCALE$	CHECKED - LGP	REVISED -
	PLOT DATE = 12/22/2010	DATE - 12-22-2010	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

EXISTING AND PROPOSED PLAN
YORK RD.

SCALE: 1"=20' | SHEET NO. 11 OF 13 SHEETS | STA. 2016+50 TO STA. 2022+25

F.A.U RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1321	32 WRS-5	DUPAGE	576	53
		CONTRACT NO. 60B42		
		ILLINOIS FED. AID PROJECT		



MATCH LINE STA. 2016+50
MATCH LINE STA. 2022+25
℄ PLEASANT ST.
STA. 2019+74.47
E = 0.44'
K = 163
240.00' V.C.
+36.00 EL. 662.57
+76.00 EL. 661.52
PROPOSED PROFILE GRADE LINE
STA. 2021+27.14
LOW POINT ELEV. = 661.45
-1.17%
+0.30%
VPI STA. 2020+56.00
ELEVATION 661.17
EXISTING TWIN
10' x 7' BOX CULVERT
BENSENVILLE
DITCH
EXISTING PROFILE GRADE LINE
PROPOSED PROFILE GRADE ELEV. (TYP.)
EXISTING GROUND ELEV. (TYP.)
715
710
705
700
695
690
685
680
675
670
665
660
655
650
645
640
635
630
666.20 665.92
665.77 665.63
665.30 665.33
664.57 665.04
663.88 664.75
663.42 664.46
662.98 664.16
662.78 663.87
662.64 663.58
662.44 663.28
662.33 662.99
661.77 662.70
660.99 662.41
660.93 662.16
660.92 661.95
660.82 661.77
660.72 661.63
660.61 661.53
660.51 661.47
660.53 661.45
660.59 661.47
660.64 661.52
660.69 661.60
660.76 661.67
2016+50
2017+00
2017+50
2018+00
2018+50
2019+00
2019+50
2020+00
2020+50
2021+00
2021+50
2022+00
PLAN
NOTE BOOK NO.
SURVEYED
PLOTTED
ALIGNMENT CHECKED
RT. OF WAY CHECKED
CADD FILE NAME
BY
DATE
PROFILE
NOTE BOOK NO.
SURVEYED
PLOTTED
GRADES CHECKED
B.M. NOTED
STRUCTURE NOTATIONS CHKD

FILE NAME = ...\D160B42-SHT-PROFILE-09.DGN	USER NAME = malopez	DESIGNED - MPK	REVISED -
		DRAWN - ML	REVISED -
	PLOT SCALE = *SCALE*	CHECKED - LGP	REVISED -
	PLOT DATE = 12/22/2010	DATE - 12-22-10	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PROFILE
YORK RD.

SCALE: 1"=20'/1"=5' | SHEET NO. 9 OF 11 SHEETS | STA. 2016+50 TO STA. 2022+25

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1321	32 WRS-5	DUPAGE	576	64
		CONTRACT NO. 60B42		
	ILLINOIS FED. AID PROJECT			

NOTES:
1) METRA FA = METRA FORCE ACCOUNT WORK
2) CPR FA = CANADIAN PACIFIC RAILWAY FORCE ACCOUNT WORK
3) ANY PARTIAL STATIONS AND OFFSETS SHOWN ON THIS SHEET ARE BASED ON PROPOSED CPR TRACK "1

TOPSOIL FURNISH AND PLACE, 6"
TURF REINFORCEMENT MAT
EROSION CONTROL BLANKET
SEEDING, CLASS 4A (MODIFIED)

VARIES APPROX 3.5' 1:2 10' 1:2

ADVANCE CONTRACT TEMPORARY DITCH (BY OTHERS)

PROPOSED CROSS DITCH DETAIL
N.T.S.

SEE SHEETS292 AND 293 FOR ADDITIONAL INFORMATION

METRA STA. 888+36.34
STA. 10271+95.48
PS PROP. "15 TURNOUT (METRA FA)

STA. 10271+95.48 BEGIN PROP. CPR TRACK "1

PROPOSED TEMP. EASEMENT

METRA STA. 893+06.70
STA. 20276+30.43
PROP. PS "15 TURNOUT (METRA FA)

STA. 20276+30.43
BEGIN PROP. CPR TRACK "2

PROPOSED 90' SPIRAL (CPR2-SPO1)

℄ EXISTING METRA MILWAUKEE DIST. WEST TRACKS

PROPOSED R.O.W

PROPOSED CROSS DITCH @ 0.50% (SEE DETAIL ABOVE)

STA. 10275+83.51, 79.30' RT
FLOWLINE = 662.61
MATCH UPRR DITCH (BY OTHERS)

PROP. CURVE CPR1-C1

GRADING (BY OTHERS)

PROPOSED UPRR RE-ALIGNMENT (BY OTHERS)

PROPOSED UPRR DITCH (BY OTHERS)

UTILITIES TO BE RELOCATED BY UTILITY COMPANY

PROPOSED DITCH RT

136" RE CWR ON WOOD TIES (CPR FA)

PROPOSED 90' SPIRAL (CPR1-SPO1)

PROPOSED CURVE CPR2-C1

PROPOSED CURVE CPR1-C2

℄ EXISTING CPR TRACK "2

℄ EXISTING CPR TRACK "1

℄ PROPOSED CPR TRACK "2

℄ PROPOSED CPR TRACK "1

MATCH EXISTING (AGGREGATE)
STA. 20282+27.17

EXISTING LIFT STATION TO REMAIN

EXISTING R.O.W

PROPOSED ACCESS ROAD

PROPOSED DITCH LT

STA. 10284+00.00, 57.27' LT
STEEL END SECTIONS 36"

STA. 10284+00.00
75 LF PIPE CULVERTS, CLASS D, TYPE 5 36"

STA. 10284+00.00, 17.73' RT
STEEL END SECTIONS 36"

MATCH LINE STA. 10286+00

GRADING (BY OTHERS)

GRAPHIC SCALE 50' 0' 50' 100' 150'

MATCH RESURFACED TOP OF RAIL PROFILE

STA. 10271+95.48, ELEV. 668.53
P.S. PROPOSED "15 TURNOUT

+0.258% +0.095%

VPI STA. 10275+00.00
ELEVATION 669.31

+00.00 EL. 669.05

+00.00 EL. 669.41

+00.00 EL. 662.90

+00.00 EL. 669.60

ex = -0.04'
K = 1228 (r=-0.08)
200.00' V.C.

STA. 10276+00, ELEV. 662.90
BEGIN SPECIAL DITCH GRADE RT

EXISTING GROUND LINE AT PROP ℄ CPR TRACK "1

+0.20%

SPECIAL DITCH GRADE RT

T/R PROFILE PROPOSED TRACK CPR "1
FOR PROPOSED CPR TRACK "2 PROFILE SEE SHEETS299 AND300

EXISTING GROUND ELEVATION
PROPOSED TOP OF RAIL ELEVATION (PROP. CPR TRACK "1)

ex = 0.60
K = 752 (r=0.13)
600.00' V.C.

+0.095% +0.893%

VPI STA. 10281+00.00
ELEVATION 669.88

+00.00 EL. 672.56

+00.00 EL. 665.00

+00.00 EL. 664.50

STA. 10284+00, ELEV. 665.00
BEGIN SPECIAL DITCH GRADE LT

+0.50% +0.20%

SPECIAL DITCH GRADE LT

MATCH LINE STA. 10286+00

	10272+00	10273+00	10274+00	10275+00	10276+00	10277+00	10278+00	10279+00	10280+00	10281+00	10282+00	10283+00	10284+00	10285+00	10286+00
EXISTING GROUND ELEVATION	667.30	667.47	667.51	666.99	666.80	666.30	664.71	665.45	665.83	665.94	666.01	666.03	666.40	666.77	667.38
PROPOSED TOP OF RAIL ELEVATION (PROP. CPR TRACK "1)	668.54	668.67	668.80	668.92	669.05	669.17	669.27	669.35	669.41	669.45	669.50	669.55	669.60	669.66	669.76
	667.68	667.86	667.80	667.82	667.92	667.97	667.23	665.71	666.71	665.97	665.50	663.52	663.65	664.46	
	669.89	670.05	670.25	670.48	670.75	671.04	671.37	671.74	672.13	672.56	673.01	673.46	673.90	674.35	

HDR ENGINEERING, INC.	USER NAME = rratterm	DESIGNED - NMR	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	CANADIAN PACIFIC RAILWAY PLAN AND PROFILE
		DRAWN - NMR	REVISED -		
	PLOT SCALE = 50.0000 ' / IN.	CHECKED - MPH	REVISED -		SCALE: 1" = 50' SHEET NO. 3 OF 12 SHEETS STA. 10272+40.23 TO STA. 10286+00
	PLOT DATE = 10/23/2011	DATE - 10/19/2011	REVISED -		

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1321	32VB	DUPAGE	371	294
		CONTRACT NO. 60R38		
		ILLINOIS FED. AID PROJECT		

PLAN: SURVEYED, PLOTTED, ALIGNMENT CHECKED, GRADES CHECKED, NOTE BOOK, NO.____, BY, DATE
PROFILE: SURVEYED, PLOTTED, GRADES CHECKED, NOTE BOOK, NO.____, BY, DATE, STRUCTURE NO(S)/ENG CHK'D

FILE NAME = ...\D160R38-SHT-PLNPRF-FRR03.DGN

NOTES:
1) METRA FA = METRA FORCE ACCOUNT WORK
2) CPR FA = CANADIAN PACIFIC RAILWAY FORCE ACCOUNT WORK
3) ANY PARTIAL STATIONS AND OFFSETS SHOWN ON THIS SHEET ARE BASED ON PROPOSED CPR TRACK "1

PLAN
SURVEYED
PLOTTED
ALIGNMENTS CHECKED
NOTE BOOK
NO.
BY
DATE

PROFILE
SURVEYED
PLOTTED
GRADES CHECKED
NOTE BOOK
NO.
STRUCTURE NO(S).
BY
DATE

PROPOSED DITCH LT
STA. 10290+00, 69.31' LT
PROP. DITCH HIGH POINT
℄ EXISTING CPR TRACK "2
℄ EXISTING CPR TRACK "1
EXISTING R.O.W.
MATCH LINE STA. 10286+00
PROPOSED DITCH RT
UTILITIES TO BE RELOCATED BY UTILITY COMPANY
136# RE CWR ON WOOD TIES (CPR FA)
PROP. CURVE CPR2-C1
PROP. CURVE CPR1-C2
GRADING (BY OTHERS)
℄ PROPOSED CPR TRACK "1
℄ PROPOSED CPR TRACK "2
CS Sta 20291+89.50
PI Sta 20292+19.51
ST Sta 20292+79.50
CS Sta 10292+07.31
PI Sta 10292+37.32
ST Sta 10292+67.31
PROPOSED 90' SPIRAL (CPR1-SO2)
PROPOSED 90' SPIRAL (CPR2-SO2)
STA. 10290+00, 33.80' RT
END PROPOSED DITCH RT
ROOSEVELT AVENUE (CLOSED)
AREA RESERVED FOR SIGNAL BUNGALOW
PROPOSED RETAINING WALL RW-6
+00.00
104.85 LT
PROPOSED RETAINING WALL RW-4
+63.44
105.03 LT
PROPOSED R.O.W.
PROPOSED ACCESS ROAD TURNAROUND
+00.00
75.80 LT
+00.00
64.60 LT
68.2'
STA. 20293+47.70
PS PROP. #15 TURNOUT (CPR FA)
75'
25'
25'
EXISTING R.O.W.
PROPOSED ACCESS ROAD
20295+00
10295+00
STA. 10297+72.22
PS PROP. #15 TURNOUT (CPR FA)
PROPOSED RETAINING WALL RW-3
PROPOSED R.O.W.
GRADING (BY OTHERS)
MATCH LINE STA. 10298+00
PROPOSED UPRR DITCH (BY OTHERS)
PROPOSED UPRR RE-ALIGNMENT (BY OTHERS)
GRAPHIC SCALE 50' 0' 50' 100' 150'

695
690
685
680
675
670
665
660
655
MATCH LINE STA. 10286+00
+0.89%
FOR PROPOSED CPR TRACK "2 PROFILE SEE SHEETS 299 AND 300
T/R PROFILE PROPOSED CPR TRACK "1
+00.00 EL. 666.80
SPECIAL DITCH GRADE LT
EXISTING GROUND LINE AT PROP ℄ CPR TRACK "1
+0.30%
-0.30%
+0.20%
+00.00 EL. 665.70
STA. 10290+00.00, ELEV. 665.70
END SPECIAL DITCH GRADE RT
SPECIAL DITCH GRADE RT
EXISTING GROUND ELEVATION
PROPOSED TOP OF RAIL ELEVATION (PROP. CPR TRACK "1)
STA. 10297+72.22 ELEV. 684.82
P.S. PROPOSED #15 TURNOUT
+90.00 EL. 684.98
RETAINING WALL RW-3
MATCH LINE STA. 10298+00

10286+00	10287+00	10288+00	10289+00	10290+00	10291+00	10292+00	10293+00	10294+00	10295+00	10296+00	10297+00	10298+00
664.46 / 674.35	664.70 / 674.80	665.07 / 675.24	665.05 / 675.69	665.43 / 676.14	663.60 / 676.58	664.11 / 677.03	664.19 / 677.48	664.70 / 677.92	665.79 / 678.37	665.30 / 678.82	662.97 / 679.26	663.33 / 679.71
664.05 / 680.16	664.94 / 680.60	665.64 / 681.05	666.84 / 681.50	667.06 / 681.94	667.51 / 682.39	666.88 / 682.84	665.93 / 683.28	665.50 / 683.73	665.27 / 684.18	664.90 / 684.62	666.22 / 685.07	

FILE NAME = ...\0160838-SHT-PLNPRF-RR04.DGN

HDR ENGINEERING, INC.	USER NAME = nratterm	DESIGNED - NMR	REVISED -
		DRAWN - NMR	REVISED -
	PLOT SCALE = 50.0000 ' / IN.	CHECKED - MPH	REVISED -
	PLOT DATE = 10/23/2011	DATE - 10/19/2011	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CANADIAN PACIFIC RAILWAY
PLAN AND PROFILE

SCALE: 1" = 50' | SHEET NO. 4 OF 12 SHEETS | STA. 10286+00 | TO STA. 10298+00

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1321	32VB	DUPAGE	371	295
		CONTRACT NO. 60R38		
		ILLINOIS	FED. AID PROJECT	

PROPOSED RETAINING WALL RW-4
PROPOSED SIGNAL (TYPE, LOCATION AND FOUNDATION T.B.D. BY METRA SIGNAL DESIGNER) (METRA FA)
TEMPORARY CROSSING SIGNAL (FOR MOT STAGES 1A AND 2) (CPR FA-SEE NOTE 4)
FURNISH AND INSTALL TIMBER AND ASPHALT CROSSING SURFACE (CPR FA)
TEMPORARY CROSSING SIGNAL (FOR MOT STAGES 1A RELOCATE FOR MOT STAGE 2) (CPR FA-SEE NOTE 4)
TEMPORARY CROSSING SIGNAL (FOR MOT STAGES 1A AND 2) (CPR FA-SEE NOTE 4)
FURNISH AND INSTALL TIMBER AND ASPHALT CROSSING SURFACE (CPR FA)
TEMPORARY CROSSING SIGNAL (FOR MOT STAGES 1A RELOCATE FOR MOT STAGE 2) (CPR FA-SEE NOTE 4)

MATCH LINE STA. 10298+00

MATCH LINE STA. 10313+00

YORK ROAD

GRAPHIC SCALE 50' 0' 50' 100' 150'

PROPOSED DITCH
PROPOSED RETAINING WALL RW-2
PROPOSED ACCESS ROAD
PROPOSED RETAINING WALL (RW-5)
PROPOSED ACCESS ROAD TURNAROUND
EXISTING R.O.W.
PROPOSED R.O.W.
℄ EXISTING CPR TRACK #2
℄ EXISTING CPR TRACK #1
PROPOSED RETAINING WALL RW-1
STA. 10298+27.82
STA. 20298+27.82
BEGIN STEEL TIES (CPR FA)
STA. 10300+33.82
STA. 20300+33.82
END STEEL TIES (CPR FA)
PROPOSED SIGNAL (TYPE, LOCATION AND FOUNDATION T.B.D. BY METRA SIGNAL DESIGNER) (METRA FA)
PROPOSED STRUCTURE
IRVING PARK ROAD
PROPOSED RETAINING WALL (RW-3
PROPOSED TEMPORARY CULVERT
TEMPORARY CHANNEL
PROPOSED CULVERT
PROPOSED CHANNEL
PC Sta 10304+31.37
PI Sta 10304+80.05
PT Sta 10305+28.72
PROP. CURVE CPR1-C3
PC Sta 10306+19.75
PI Sta 10306+88.43
PT Sta 10307+57.09
PROP. CURVE CPR1-C4
UTILITIES TO BE RELOCATED BY UTILITY COMPANY
136# RE CWR ON WOOD TIES (CPR FA)
℄ PROPOSED CPR TRACK #2
℄ PROPOSED CPR TRACK #1
COMBINED UPRR / CPR DITCH (BY OTHERS)
PROPOSED UPRR RE-ALIGNMENT (BY OTHERS)

NOTES:
1) METRA FA = METRA FORCE ACCOUNT WORK
2) CPR FA = CANADIAN PACIFIC RAILWAY FORCE ACCOUNT WORK
3) ANY PARTIAL STATIONS AND OFFSETS SHOWN ON THIS SHEET ARE BASED ON PROPOSED CPR TRACK #1
4) SEE MOT DETAIL PLANS FOR MORE DETAILED DESIGN INFORMATION CONCERNING THE TEMPORARY CROSSING SIGNALS

PLAN: SURVEYED, PLOTTED, ALIGNMENT CHECKED, GRADES CHECKED, CADD FILE NAME, NOTE BOOK, NO., BY, DATE

PROFILE: SURVEYED, PLOTTED, GRADES CHECKED, ALIGNMENT CHECKED, STRUCTURE NO., BY, DATE

VPI STA. 10300+90.00
ELEVATION 687.66
+0.893% -0.850%
℄ IRVING PARK RD
I ex = -1.31'
K = 344 (r=-0.29)
600.00' V.C.
90.00 EL. 685.11
T/R PROFILE PROPOSED CPR TRACK #1
FOR PROPOSED CPR TRACK #2 PROFILE SEE SHEETS 299 AND 300
EXISTING GROUND LINE AT PROP ℄ CPR TRACK #1
PROPOSED TEMPORARY CULVERT
RETAINING WALL RW-1
PROPOSED CULVERT
SPECIAL DITCH GRADE LT
STA. 10298+45.32, ELEV. 664.56
END PROPOSED DITCH PROFILE
PROPOSED DITCH PROFILE
RETAINING WALL RW-3
STA. 10311+77.80, ELEV. 664.70
BEGIN SPECIAL DITCH GRADE LT
EXISTING GROUND ELEVATION
PROPOSED TOP OF RAIL ELEVATION (PROP. CPR TRACK #1)

10298+00	10299+00	10300+00	10301+00	10302+00	10303+00	10304+00	10305+00	10306+00	10307+00	10308+00	10309+00	10310+00	10311+00	10312+00	10313+00
666.22 / 685.07	667.08 / 685.46	666.98 / 685.79	667.35 / 686.04	663.21 / 686.22	662.73 / 686.32	661.55 / 686.35	663.05 / 686.31	665.88 / 686.20	666.14 / 686.02	666.92 / 685.76	660.20 / 685.43	657.01 / 685.03	657.87 / 684.60	655.33 / 684.18	657.60 / 683.75	658.28 / 683.33	658.46 / 682.90	658.49 / 682.48	659.18 / 682.05	659.50 / 681.63	659.28 / 681.20	659.06 / 680.78	658.81 / 680.35	659.02 / 679.93	660.20 / 679.50	661.80 / 679.08	664.52 / 678.65	666.50 / 678.23	667.02 / 677.80	666.59 / 677.38

HDR ENGINEERING, INC.	USER NAME = mratterm	DESIGNED - NMR	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION
		DRAWN - NMR	REVISED -	
	PLOT SCALE = 50.0000 ' / IN.	CHECKED - MPH	REVISED -	
	PLOT DATE = 10/19/2011	DATE - 10/19/2011	REVISED -	

CANADIAN PACIFIC RAILWAY
PLAN AND PROFILE

SCALE: 1" = 50' | SHEET NO. 5 OF 12 SHEETS | STA. 20298+00 TO STA. 20313+00

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1321	32VB	DUPAGE	371	296
		CONTRACT NO. 60R38		
	ILLINOIS FED. AID PROJECT			

FILE NAME = ...\D160R38-SHT-PLVPRF-RR05.DGN

NOTES:
1) METRA FA = METRA FORCE ACCOUNT WORK
2) CPR FA = CANADIAN PACIFIC RAILWAY FORCE ACCOUNT WORK
3) ANY PARTIAL STATIONS AND OFFSETS SHOWN ON THIS SHEET ARE BASED ON PROPOSED CPR TRACK #1

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

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

FILE NAME = ...\D160R38-SHT-PLNPRF-RR06.DGN

HDR
HDR ENGINEERING, INC.

USER NAME = nrotterm	DESIGNED - NMR	REVISED -
	DRAWN - NMR	REVISED -
PLOT SCALE = 50.0000 '/ IN.	CHECKED - MPH	REVISED -
PLOT DATE = 10/23/2011	DATE - 10/19/2011	REVISED -

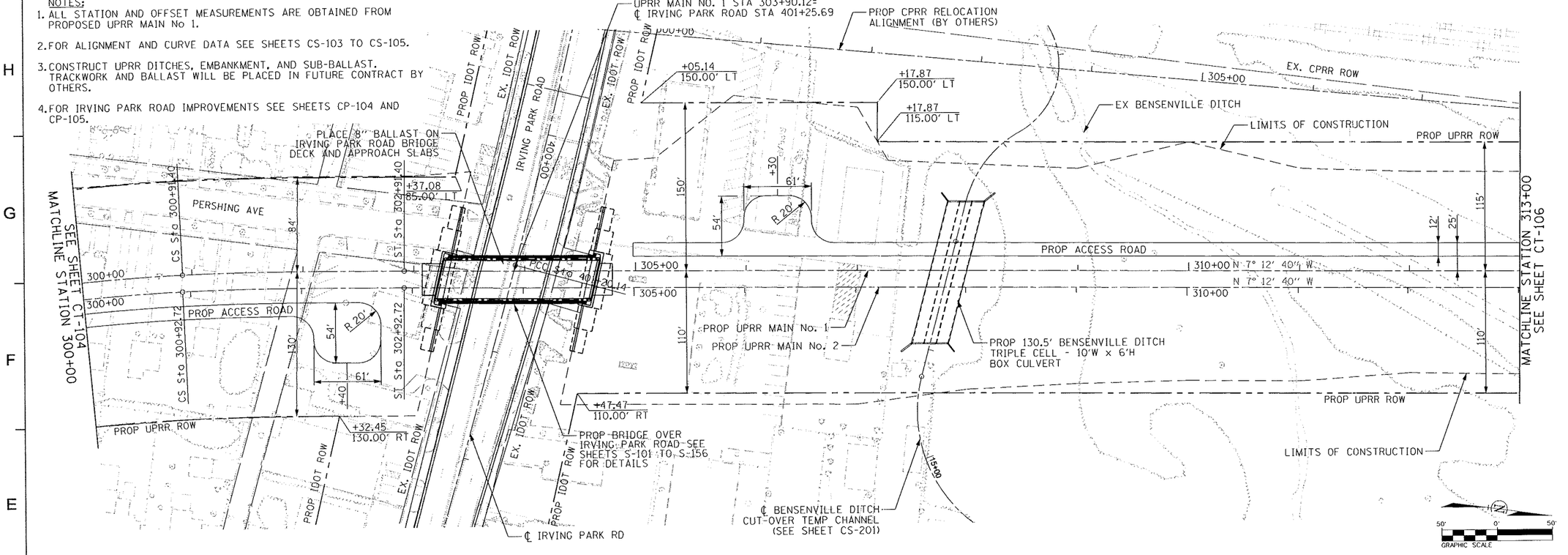
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

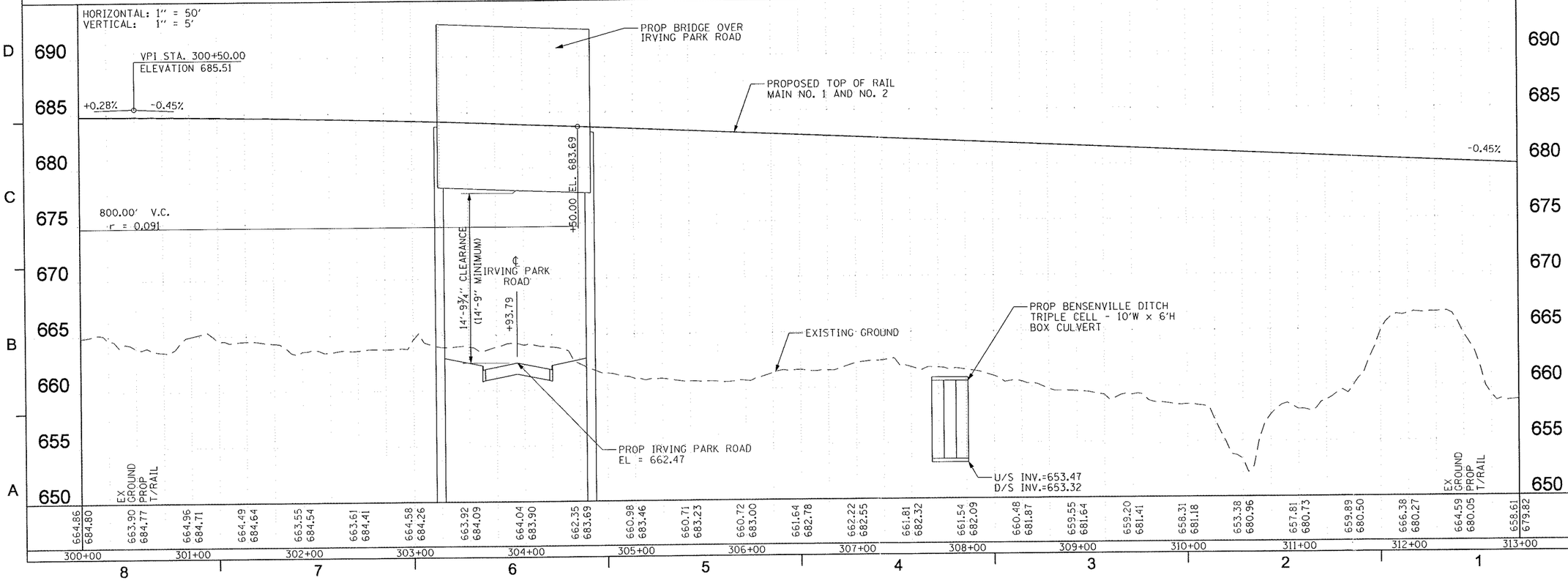
CANADIAN PACIFIC RAILWAY
PLAN AND PROFILE

SCALE: 1" = 50' | SHEET NO. 6 OF 12 SHEETS | STA. 10313+00 TO STA. 10328+00

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1321	32VB	DUPAGE	371	297
		CONTRACT NO. 60R38		
	ILLINOIS FED. AID PROJECT			

NOTES:
1. ALL STATION AND OFFSET MEASUREMENTS ARE OBTAINED FROM PROPOSED UPRR MAIN No 1.
2. FOR ALIGNMENT AND CURVE DATA SEE SHEETS CS-103 TO CS-105.
3. CONSTRUCT UPRR DITCHES, EMBANKMENT, AND SUB-BALLAST. TRACKWORK AND BALLAST WILL BE PLACED IN FUTURE CONTRACT BY OTHERS.
4. FOR IRVING PARK ROAD IMPROVEMENTS SEE SHEETS CP-104 AND CP-105.



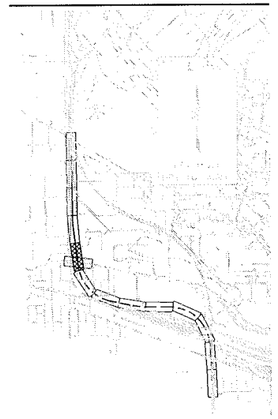


O'Hare Modernization Program

O'HARE INTERNATIONAL AIRPORT
CITY OF CHICAGO
DEPARTMENT OF AVIATION

RICHARD M. DALEY
MAYOR
ROSEMARIE S. ANDOLINO
COMMISSIONER

TSD Rail Specialists, LLC



APPROVED AS WORKING PLAN
BY:

REV	DATE	DESCRIPTION
	4-14-10	ISSUED FOR PERMIT
	3-26-10	ISSUED FOR PROCUREMENT
	1-22-10	90% PLAN SUBMITTAL
	11-14-08	60% PLAN SUBMITTAL
	6-6-08	30% PLAN SUBMITTAL

PROJECT NAME:

O'HARE MODERNIZATION PROGRAM
UPRR RELOCATION SOUTH OF IRVING PARK ROAD TO NORTH CONTRACT LIMIT

SHEET TITLE:
PROPOSED PLAN AND PROFILE UPRR STA 300+00 TO 313+00

DESIGNED:	DRAWN:	CHECKED:
KKY	BVW	MAR

PROJECT NO.: OH6130.550.40.140
DATE: 03/26/2010

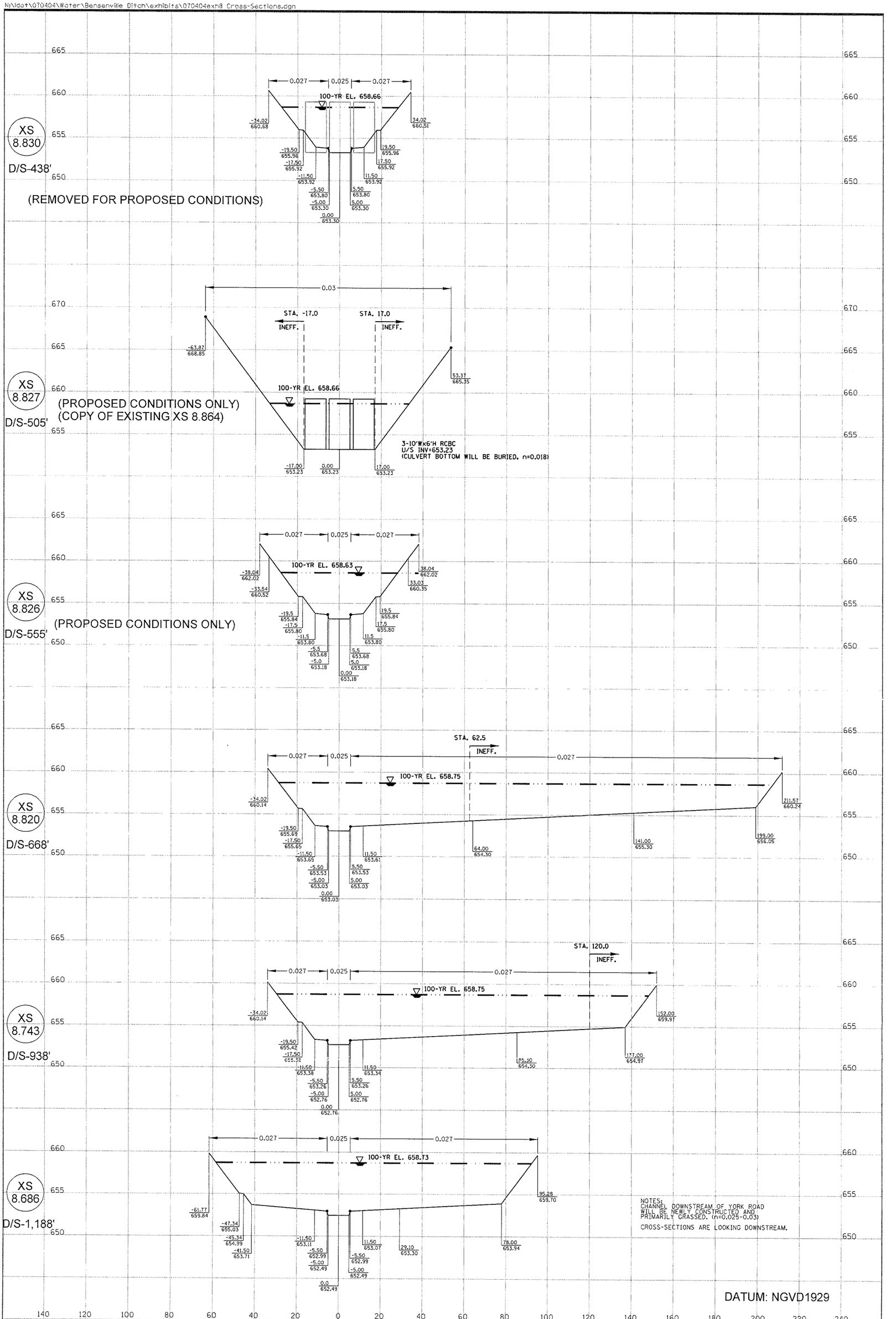
SHEET NO.: CT-105
REVISION:

Tab 6

SECTION 6

STREAM CROSS-SECTION PLOTS
STRUCTURE OPENING PLOTS

N:\dot\070404\Water\Bensenville Ditch\exhibits\070404exh8 Cross-Sections.dgn



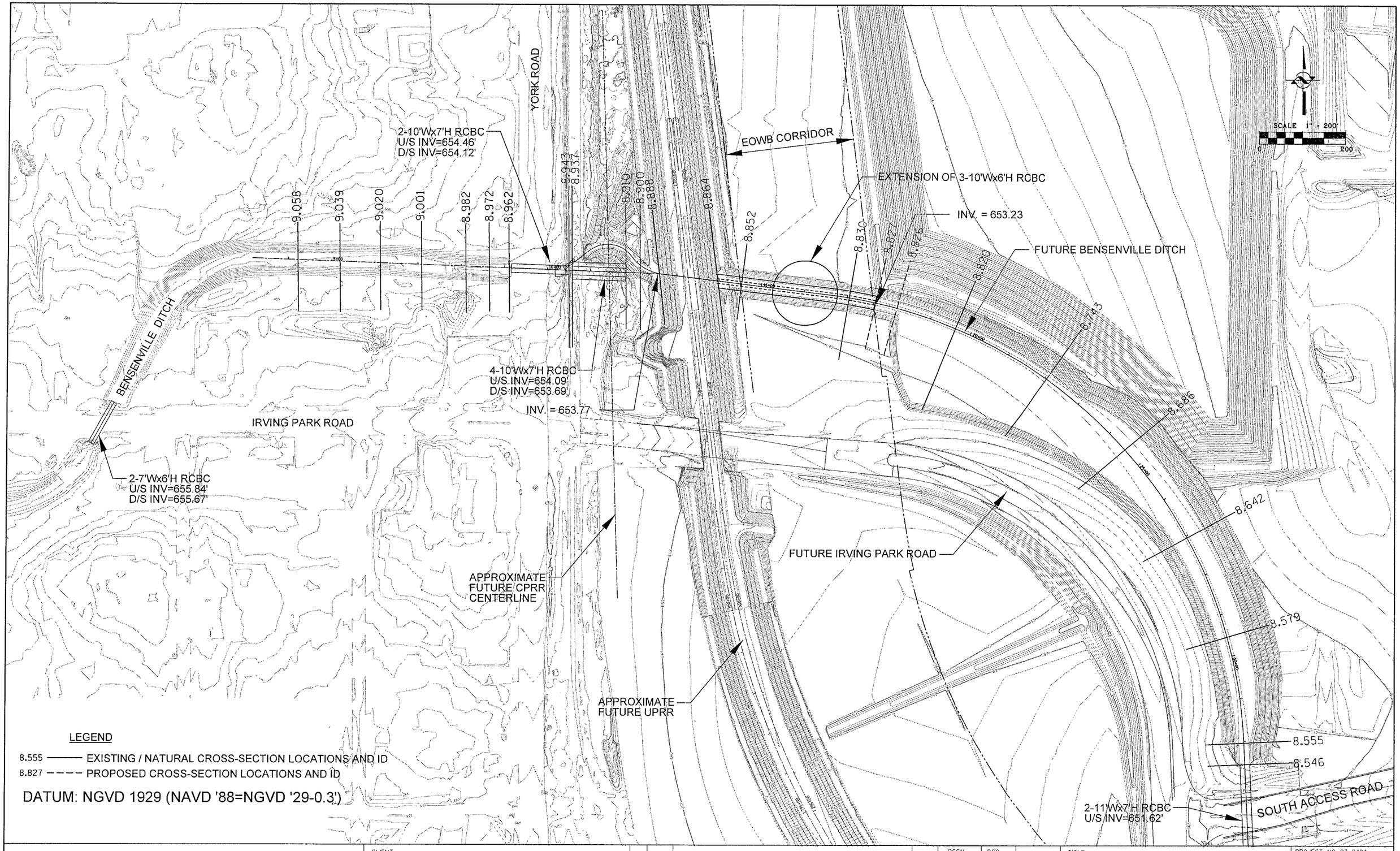
CHRISTOPHER B. BURKE ENGINEERING LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500

CLIENT:
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NO.	DATE	NATURE OF REVISION
DSGN.	DCO	
DWN.	EAT	
CHKD.	DCO	
SCALE:	1"=5'V; 1"=20'H	

TITLE :
ELGIN O'HARE – WEST BYPASS
BENSENVILLE DITCH CROSS SECTIONS

07-0404
7/2/2012
CHKD.
SHEET 1 OF 4



LEGEND

8.555 ——— EXISTING / NATURAL CROSS-SECTION LOCATIONS AND ID

8.827 – – – – PROPOSED CROSS-SECTION LOCATIONS AND ID

DATUM: NGVD 1929 (NAVD '88=NGVD '29-0.3')

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

CLIENT:

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NO.	DATE	NATURE OF REVISION	CHKD.

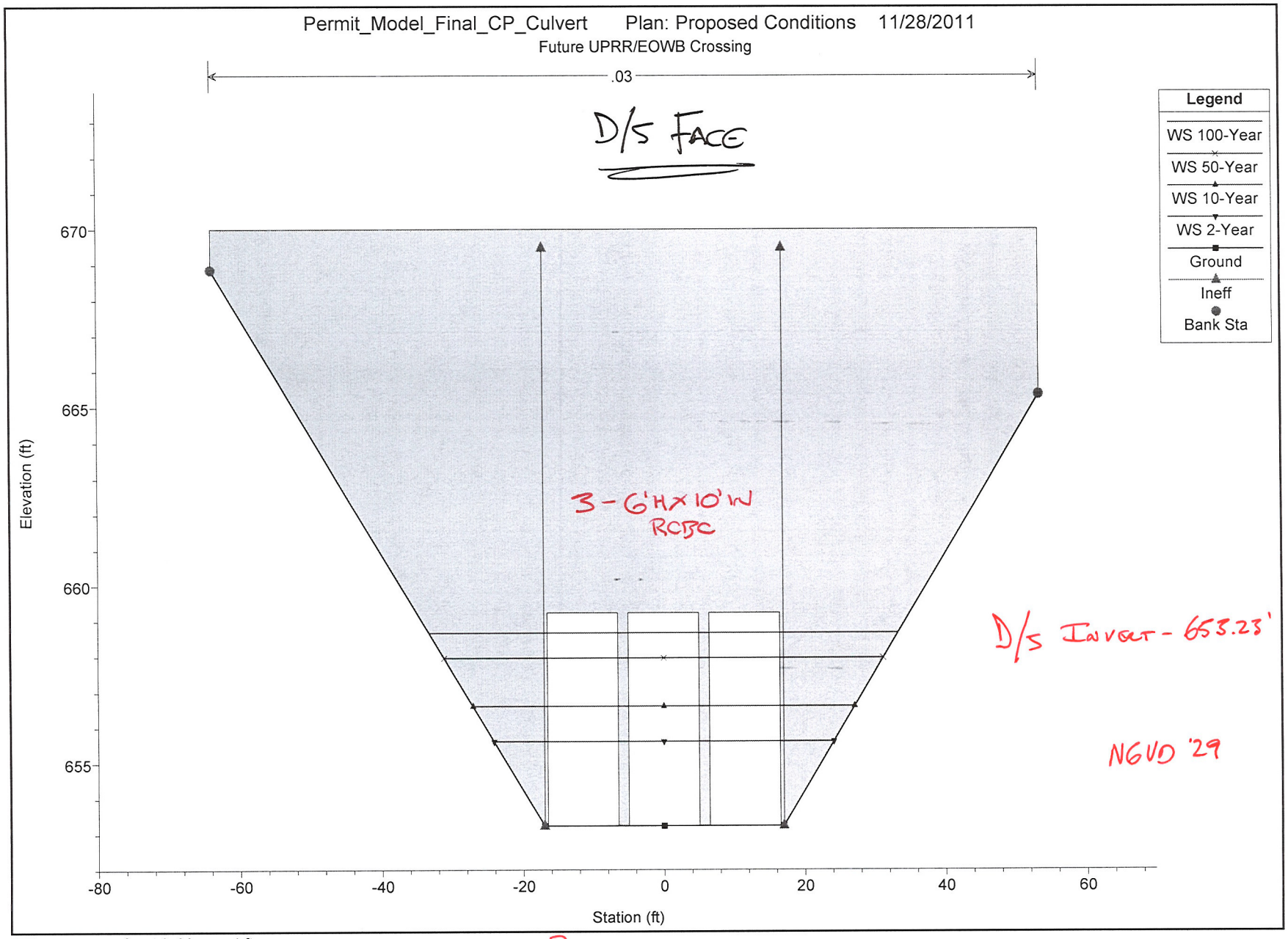
N:\dot\070404\Water\Bensenville Ditch\exhibits\070404exh7 Hydraulic Plan B-size.dgn

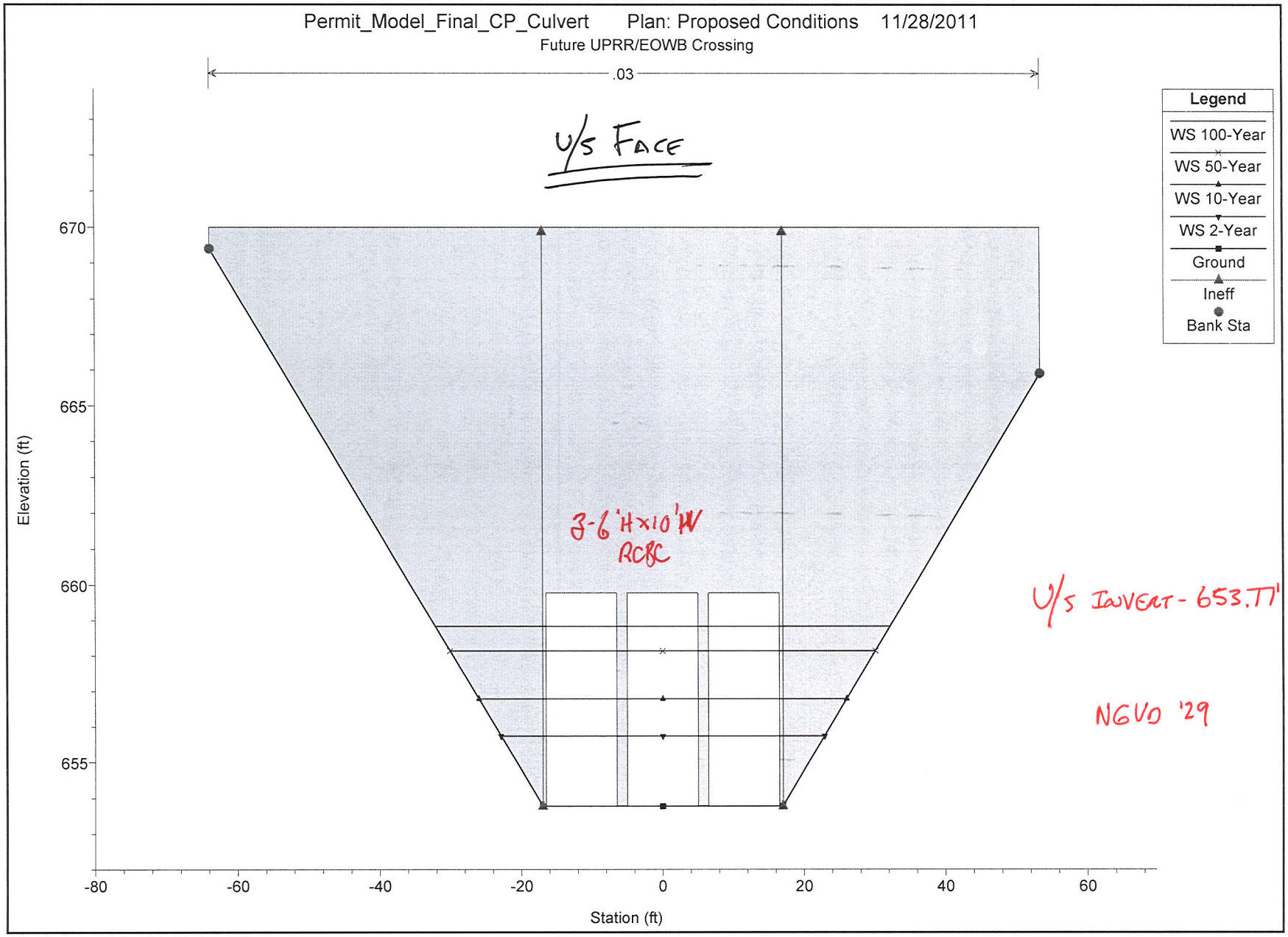
DSGN.	DCO	
DWN.	EAT	
CHKD.	DCO	
SCALE:	1"=200'	

TITLE:

ELGIN O'HARE – WEST BYPASS
BENSENVILLE DITCH HYDRAULIC PLAN

PROJECT NO. 07-0404
DATE: 4/11/2012


Permit_Model_Final_CP_Culvert Plan: Proposed Conditions 11/28/2011
Future UPRR/EOWB Crossing
.03
D/S FACE
Legend
WS 100-Year
WS 50-Year
WS 10-Year
WS 2-Year
Ground
Ineff
Bank Sta
3-6'H x 10'W RCBC
D/S Invert - 653.23'
NGVD '29
Elevation (ft)
670
665
660
655
-80
-60
-40
-20
0
20
40
60
Station (ft)
1 in Horiz. = 20 ft 1 in Vert. = 4 ft
Structure Sketches



1 in Horiz. = 20 ft 1 in Vert. = 4 ft

STRUCTURE SKETCHES

Tab 7

SECTION 7

IDNR-OWR PERMITTED OMP MODEL

CHRISTOPHER B. BURKE
ENGINEERING, LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500 Fax (847) 823-0520

JOB 07-404 - BENSENVILLE DITCH
SHEET NO. 1 OF 1
CALCULATED BY DCO DATE 3/28/11
CHECKED BY JSG DATE 4/24/12
SCALE —

BENSENVILLE DITCH HEC-RAS NATURAL/EXISTING SCHEMATIC

SEE PROPOSED SCHEMATIC

DIST. TO & FROM STRUCTURE	REACH LENGTH	PROPOSED	EXISTING / FIS
		8.686 (PROPOSED)	8.972 (FIS)
1,188'	250'		
		8.743 (PROPOSED)	8.982 (FIS)
938'	250'		
		8.820 (PROPOSED)	9.001 (FIS)
688'	250'		
		8.830 (PROPOSED)	9.020 (FIS)
438'	251'		
		8.852 (PROPOSED)	9.039 (FIS)
		FUTURE EOWB CROSSING	
187'	50'		
		8.864 (PROPOSED)	9.058 (FIS)
137'	137'	FUTURE UPRR CROSSING	
		8.888 (PROPOSED) *	9.078 (FIS)
			REFERENCE POINT
50'	50'		
		8.890 (PROPOSED)	9.100 (FIS)
80'	30'		
		8.910 (PROPOSED)	9.121 (FIS)
181'	102'	FUTURE CPRR CROSSING	
		8.937 (PROPOSED)	9.134 (FIS)
204'	22'		
		8.943 (PROPOSED)	9.153 (FIS)
348'	144'	YORK RD.	
		8.962 (FIS)	9.162 (FIS)

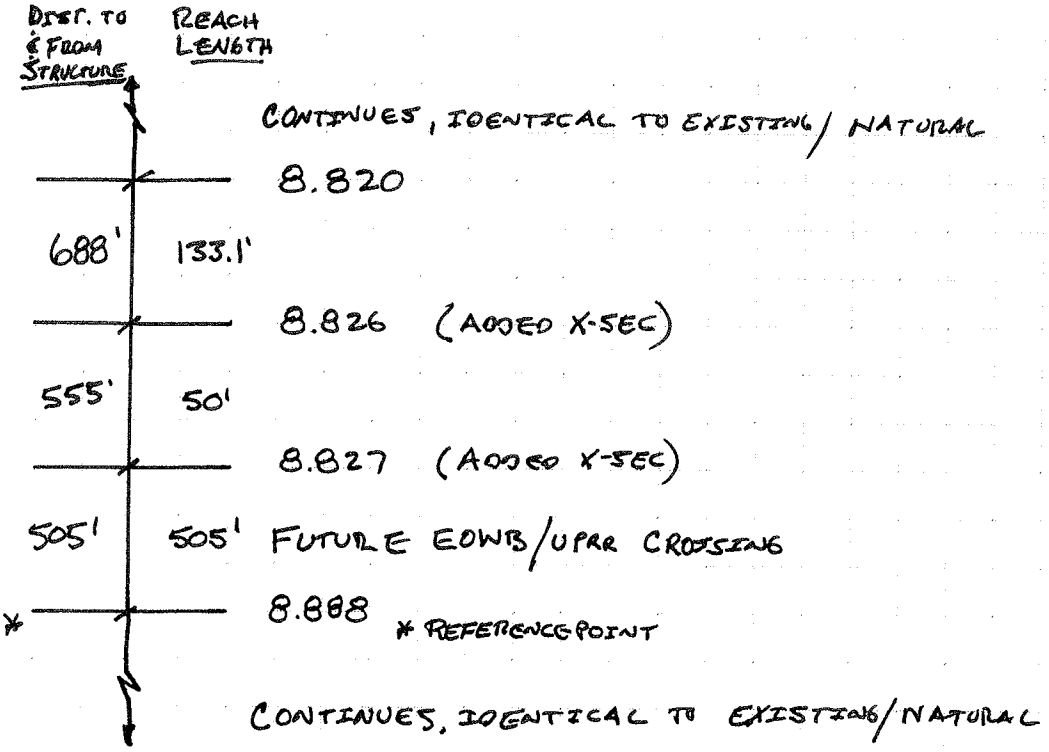
DIST. TO & FROM STRUCTURE	REACH LENGTH	EXISTING / FIS
		8.972 (FIS)
405'	50'	
		8.982 (FIS)
455'	100'	
		9.001 (FIS)
555'	100'	
		9.020 (FIS)
655'	97'	
		9.039 (FIS)
752'	100'	
		9.058 (FIS)
852'	145'	
		9.078 (FIS)
997'	96'	
		9.100 (FIS)
+ 1,000'	97'	
		9.121 (FIS)
	98'	
		9.134 (FIS)
	117'	
		9.153 (FIS)
	26'	
		9.162 (FIS)
	37'	

9.171 (FIS)
78' IRVING PARK ROAD
9.186 (FIS)

CHRISTOPHER B. BURKE
ENGINEERING, LTD.
One Professional Center Suite 314
Crown Point, Indiana 46307
(219) 663-3410 Fax (219) 663-3450

JOB 07-404 - BENSENVILLE DITCH
SHEET NO. 1 OF 1
CALCULATED BY DCO DATE 4/2/12
CHECKED BY _____ DATE _____
SCALE —

BENSENVILLE DITCH HEC-RAS PROPOSED SCHEMATIC



CROSS-SECTIONS REMOVED

* 8.830
* 8.852
* 8.864

OMP HEC-RAS MODEL W/O HDR IMPROVEMENTS AS PERMITED BY IDNR-OWR ON 11/2010.

HEC-RAS Plan: ALP Alignm River: Bensenville Ditc Reach: US Reach

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)	
US Reach	6.467	100-Year	1175.00	643.10	649.85	646.19	649.91	0.000508	2.57	908.89	614.01	0.18
US Reach	6.467	10-Year	519.00	643.10	648.55	644.90	648.62	0.000534	2.27	313.44	299.46	0.17
US Reach	6.467	2-Year	210.00	643.10	647.75	644.08	647.77	0.000176	1.18	179.84	69.65	0.10
US Reach	6.467	50-Year	954.00	643.10	649.47	645.79	649.54	0.000555	2.58	692.88	522.86	0.18
US Reach	6.467	500-Year	1998.00	643.10	648.85	648.85	649.60	0.005540	7.59	413.15	373.07	0.57
US Reach	6.481	100-Year	1175.00	643.10	649.81	646.20	649.98	0.000097	3.72	883.21	603.90	0.26
US Reach	6.481	10-Year	519.00	643.10	648.55	644.90	648.64	0.000054	2.41	314.30	300.30	0.19
US Reach	6.481	2-Year	210.00	643.10	647.75	644.09	647.77	0.000016	1.18	180.05	70.26	0.10
US Reach	6.481	50-Year	954.00	643.10	649.44	645.79	649.60	0.000087	3.40	678.20	516.08	0.24
US Reach	6.481	500-Year	1998.00	643.10	648.78	647.55	649.90	0.000666	8.70	390.26	358.04	0.66
US Reach	6.497		Bridge									
US Reach	6.513	100-Year	1175.00	642.39	649.88	646.12	650.02	0.000051	2.97	641.53	325.33	0.20
US Reach	6.513	10-Year	519.00	642.39	648.78	644.80	648.82	0.000020	1.64	418.26	144.54	0.12
US Reach	6.513	2-Year	210.00	642.39	647.81	643.98	647.82	0.000006	0.82	295.09	109.91	0.07
US Reach	6.513	50-Year	954.00	642.39	649.55	645.71	649.65	0.000041	2.58	547.58	231.65	0.18
US Reach	6.513	500-Year	1998.00	642.39	649.64	647.42	650.05	0.000171	5.30	570.64	257.82	0.37
US Reach	6.516	100-Year	1175.00	643.44	649.88		650.02	0.001583	3.18	428.65	103.76	0.23
US Reach	6.516	10-Year	519.00	643.44	648.77		648.82	0.000700	1.84	320.00	92.11	0.15
US Reach	6.516	2-Year	210.00	643.44	647.81		647.82	0.000273	0.98	235.85	81.96	0.09
US Reach	6.516	50-Year	954.00	643.44	649.54		649.65	0.001318	2.79	394.18	100.21	0.21
US Reach	6.516	500-Year	1998.00	643.44	649.63		650.07	0.005439	5.72	402.91	101.12	0.43
US Reach	6.518	100-Year	1175.00	642.59	649.91		650.03	0.001495	2.91	427.17	108.12	0.22
US Reach	6.518	10-Year	519.00	642.59	648.78		648.83	0.000668	1.67	318.75	87.66	0.14
US Reach	6.518	2-Year	210.00	642.59	647.81		647.82	0.000261	0.88	239.66	75.22	0.09
US Reach	6.518	50-Year	954.00	642.59	649.56		649.66	0.001251	2.55	391.49	100.42	0.20
US Reach	6.518	500-Year	1998.00	642.59	649.73		650.13	0.004888	5.15	408.24	104.11	0.40
US Reach	6.535	100-Year	1175.00	643.47	650.06		650.12	0.000611	2.09	609.85	122.39	0.15
US Reach	6.535	10-Year	519.00	643.47	648.84		648.86	0.000260	1.19	468.92	111.23	0.09
US Reach	6.535	2-Year	210.00	643.47	647.83		647.84	0.000095	0.62	360.11	103.55	0.05
US Reach	6.535	50-Year	954.00	643.47	649.69		649.74	0.000503	1.83	565.52	117.63	0.13
US Reach	6.535	500-Year	1998.00	643.47	650.22		650.38	0.001608	3.45	629.54	128.66	0.24
US Reach	6.538	100-Year	1175.00	642.78	650.11		650.16	0.000508	1.82	684.04	136.77	0.13
US Reach	6.538	10-Year	519.00	642.78	648.86		648.88	0.000230	1.05	520.17	126.67	0.08
US Reach	6.538	2-Year	210.00	642.78	647.84		647.84	0.000087	0.56	393.16	120.69	0.05
US Reach	6.538	50-Year	954.00	642.78	649.73		649.77	0.000426	1.59	632.45	133.37	0.12
US Reach	6.538	500-Year	1998.00	642.78	650.36		650.48	0.001268	2.95	717.85	138.72	0.21
US Reach	6.551	100-Year	1175.00	643.50	650.15		650.17	0.000224	1.27	1008.44	206.57	0.09
US Reach	6.551	10-Year	519.00	643.50	648.88		648.88	0.000099	0.73	763.02	184.09	0.06
US Reach	6.551	2-Year	210.00	643.50	647.84		647.84	0.000037	0.38	580.03	169.42	0.03
US Reach	6.551	50-Year	954.00	643.50	649.76		649.77	0.000187	1.11	930.51	196.55	0.08
US Reach	6.551	500-Year	1998.00	643.50	650.45		650.51	0.000541	2.03	1072.72	220.13	0.14
US Reach	6.554	100-Year	1175.00	643.44	650.16	645.03	650.17	0.000155	1.07	1204.12	699.44	0.07
US Reach	6.554	10-Year	519.00	643.44	648.88	644.51	648.89	0.000070	0.62	903.93	635.97	0.05
US Reach	6.554	2-Year	210.00	643.44	647.84	644.17	647.84	0.000026	0.32	685.78	592.57	0.03
US Reach	6.554	50-Year	954.00	643.44	649.76	644.87	649.78	0.000130	0.94	1107.83	673.63	0.07
US Reach	6.554	500-Year	1998.00	643.44	650.47	645.58	650.51	0.000372	1.71	1289.60	731.51	0.12
US Reach	6.557	100-Year	1175.00	644.30	650.17	645.62	650.18	0.000109	0.80	1512.06	936.24	0.06
US Reach	6.557	10-Year	519.00	644.30	648.89	645.19	648.89	0.000055	0.47	1125.15	916.81	0.04
US Reach	6.557	2-Year	210.00	644.30	647.85	644.91	647.85	0.000025	0.26	821.37	896.17	0.03
US Reach	6.557	50-Year	954.00	644.30	649.78	645.49	649.79	0.000094	0.71	1391.88	930.26	0.06
US Reach	6.557	500-Year	1998.00	644.30	650.51	646.00	650.54	0.000256	1.28	1617.10	941.36	0.09
US Reach	6.573	100-Year	1175.00	643.53	650.18	644.72	650.18	0.000041	0.54	2283.72	962.67	0.04
US Reach	6.573	10-Year	519.00	643.53	648.89	644.40	648.89	0.000018	0.31	1763.67	925.22	0.02
US Reach	6.573	2-Year	210.00	643.53	647.85	644.19	647.85	0.000007	0.16	1361.14	895.63	0.01
US Reach	6.573	50-Year	954.00	643.53	649.78	644.62	649.79	0.000034	0.47	2121.36	950.55	0.03
US Reach	6.573	500-Year	1998.00	643.53	650.53	645.02	650.54	0.000097	0.86	2430.47	974.40	0.06
US Reach	6.597	100-Year	1175.00	644.15	650.19	645.39	650.19	0.000025	0.37	3233.90	1249.27	0.03
US Reach	6.597	10-Year	519.00	644.15	648.89	645.08	648.89	0.000013	0.22	2387.87	1217.20	0.02
US Reach	6.597	2-Year	210.00	644.15	647.85	644.81	647.85	0.000006	0.12	1732.78	1189.93	0.01
US Reach	6.597	50-Year	954.00	644.15	649.79	645.33	649.79	0.000021	0.32	2972.14	1243.59	0.03
US Reach	6.597	500-Year	1998.00	644.15	650.55	645.64	650.55	0.000057	0.58	3472.59	1252.76	0.04
US Reach	6.611	100-Year	1175.00	643.59	650.19	644.64	650.19	0.000018	0.37	3375.78	1155.57	0.03
US Reach	6.611	10-Year	519.00	643.59	648.89	644.38	648.89	0.000008	0.21	2626.22	1122.08	0.02
US Reach	6.611	2-Year	210.00	643.59	647.85	644.18	647.85	0.000003	0.11	2036.88	1095.85	0.01
US Reach	6.611	50-Year	954.00	643.59	649.79	644.57	649.79	0.000015	0.32	3143.29	1145.07	0.02
US Reach	6.611	500-Year	1998.00	643.59	650.55	644.86	650.56	0.000043	0.58	3590.21	1165.47	0.04

HEC-RAS Plan: ALP Alignm River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	6.636	100-Year	1175.00	643.92	650.19		650.20	0.000162	0.90	1317.06	289.50	0.07
US Reach	6.636	10-Year	519.00	643.92	648.89		648.90	0.000090	0.55	955.51	275.66	0.05
US Reach	6.636	2-Year	210.00	643.92	647.85		647.85	0.000047	0.31	670.25	269.88	0.03
US Reach	6.636	50-Year	954.00	643.92	649.79		649.80	0.000142	0.80	1204.81	280.62	0.07
US Reach	6.636	500-Year	1998.00	643.92	650.55		650.58	0.000367	1.43	1424.33	305.77	0.11
US Reach	6.648	100-Year	1175.00	643.65	650.20		650.21	0.000128	0.96	1274.44	236.13	0.07
US Reach	6.648	10-Year	519.00	643.65	648.90		648.90	0.000056	0.55	980.39	217.57	0.04
US Reach	6.648	2-Year	210.00	643.65	647.85		647.85	0.000020	0.28	759.90	203.87	0.02
US Reach	6.648	50-Year	954.00	643.65	649.80		649.81	0.000106	0.84	1181.72	230.16	0.06
US Reach	6.648	500-Year	1998.00	643.65	650.57		650.60	0.000302	1.54	1363.10	242.06	0.10
US Reach	6.649	100-Year	1175.00	643.75	650.18		650.22	0.000362	1.63	782.70	169.71	0.11
US Reach	6.649	10-Year	519.00	643.75	648.89		648.91	0.000159	0.93	594.07	134.04	0.07
US Reach	6.649	2-Year	210.00	643.75	647.85		647.85	0.000058	0.48	458.02	126.52	0.04
US Reach	6.649	50-Year	954.00	643.75	649.78		649.81	0.000301	1.42	719.95	149.25	0.10
US Reach	6.649	500-Year	1998.00	643.75	650.52		650.62	0.000858	2.60	841.82	172.61	0.18
US Reach	6.681	100-Year	1175.00	643.04	650.25		650.29	0.000433	1.55	758.60	141.89	0.12
US Reach	6.681	10-Year	519.00	643.04	648.92		648.94	0.000198	0.90	575.22	135.01	0.08
US Reach	6.681	2-Year	210.00	643.04	647.86		647.86	0.000078	0.48	434.57	129.49	0.05
US Reach	6.681	50-Year	954.00	643.04	649.84		649.87	0.000363	1.36	701.51	139.79	0.11
US Reach	6.681	500-Year	1998.00	643.04	650.69		650.78	0.000982	2.43	821.44	144.17	0.18
US Reach	6.686	100-Year	1175.00	644.75	650.25		650.30	0.000601	1.89	674.82	169.50	0.14
US Reach	6.686	10-Year	519.00	644.75	648.93		648.94	0.000321	1.15	479.65	132.77	0.10
US Reach	6.686	2-Year	210.00	644.75	647.86		647.87	0.000148	0.64	343.19	123.65	0.06
US Reach	6.686	50-Year	954.00	644.75	649.85		649.89	0.000526	1.68	609.15	149.36	0.13
US Reach	6.686	500-Year	1998.00	644.75	650.70		650.82	0.001292	2.92	751.18	173.45	0.21
US Reach	6.724	100-Year	1175.00	644.80	650.38		650.44	0.000729	2.10	610.81	160.18	0.16
US Reach	6.724	10-Year	519.00	644.80	648.99		649.02	0.000401	1.29	426.19	116.28	0.11
US Reach	6.724	2-Year	210.00	644.80	647.89		647.90	0.000190	0.73	302.49	108.60	0.07
US Reach	6.724	50-Year	954.00	644.80	649.95		650.01	0.000644	1.88	545.28	131.50	0.15
US Reach	6.724	500-Year	1998.00	644.80	650.96		651.09	0.001438	3.15	705.16	164.76	0.22
US Reach	6.772	100-Year	1175.00	645.51	650.57		650.62	0.000666	1.70	689.94	156.97	0.14
US Reach	6.772	10-Year	519.00	645.51	649.11		649.13	0.000448	1.11	465.68	149.06	0.11
US Reach	6.772	2-Year	210.00	645.51	647.95		647.96	0.000308	0.71	297.44	142.84	0.09
US Reach	6.772	50-Year	954.00	645.51	650.13		650.17	0.000610	1.54	621.02	154.58	0.14
US Reach	6.772	500-Year	1998.00	645.51	651.33		651.43	0.001165	2.46	811.03	161.07	0.19
US Reach	6.799	100-Year	1175.00	644.19	650.65		650.67	0.000236	1.32	936.18	163.00	0.09
US Reach	6.799	10-Year	519.00	644.19	649.15		649.16	0.000115	0.77	698.04	154.64	0.06
US Reach	6.799	2-Year	210.00	644.19	647.97		647.98	0.000048	0.42	520.41	148.09	0.04
US Reach	6.799	50-Year	954.00	644.19	650.19		650.21	0.000201	1.16	863.09	160.48	0.08
US Reach	6.799	500-Year	1998.00	644.19	651.47		651.53	0.000446	1.97	1076.83	184.98	0.13
US Reach	6.838	100-Year	1175.00	645.72	650.71		650.75	0.000680	1.72	688.00	165.26	0.14
US Reach	6.838	10-Year	519.00	645.72	649.18		649.20	0.000546	1.17	444.22	154.17	0.12
US Reach	6.838	2-Year	210.00	645.72	647.99		648.00	0.000465	0.79	265.17	146.31	0.10
US Reach	6.838	50-Year	954.00	645.72	650.25		650.29	0.000651	1.56	612.89	161.93	0.14
US Reach	6.838	500-Year	1998.00	645.72	651.58		651.67	0.001061	2.42	835.23	171.60	0.19
US Reach	6.875	100-Year	1175.00	645.00	650.81		650.85	0.000331	1.46	849.56	165.21	0.11
US Reach	6.875	10-Year	519.00	645.00	649.25		649.26	0.000192	0.90	599.39	154.94	0.08
US Reach	6.875	2-Year	210.00	645.00	648.03		648.04	0.000100	0.52	415.53	146.94	0.05
US Reach	6.875	50-Year	954.00	645.00	650.35		650.37	0.000293	1.30	772.88	162.13	0.10
US Reach	6.875	500-Year	1998.00	645.00	651.76		651.82	0.000564	2.10	1008.54	171.42	0.14
US Reach	6.894	100-Year	1175.00	645.03	650.85		650.88	0.000282	1.35	909.07	173.80	0.10
US Reach	6.894	10-Year	519.00	645.03	649.27		649.28	0.000164	0.83	643.51	163.47	0.07
US Reach	6.894	2-Year	210.00	645.03	648.04		648.05	0.000086	0.48	447.01	156.67	0.05
US Reach	6.894	50-Year	954.00	645.03	650.38		650.40	0.000250	1.20	827.70	170.29	0.09
US Reach	6.894	500-Year	1998.00	645.03	651.82		651.88	0.000475	1.93	1081.26	181.00	0.13
US Reach	6.925	100-Year	1175.00	644.62	650.90		650.93	0.000331	1.24	946.91	205.49	0.10
US Reach	6.925	10-Year	519.00	644.62	649.30		649.31	0.000240	0.83	625.99	195.76	0.08
US Reach	6.925	2-Year	210.00	644.62	648.06		648.07	0.000183	0.54	387.82	188.22	0.07
US Reach	6.925	50-Year	954.00	644.62	650.42		650.44	0.000307	1.12	849.17	202.58	0.10
US Reach	6.925	500-Year	1998.00	644.62	651.91		651.96	0.000505	1.73	1157.12	211.82	0.13
US Reach	6.932	100-Year	1175.00	645.08	650.92		650.94	0.000179	1.08	1134.49	212.62	0.08
US Reach	6.932	10-Year	519.00	645.08	649.31		649.32	0.000106	0.67	801.22	202.55	0.06
US Reach	6.932	2-Year	210.00	645.08	648.07		648.07	0.000057	0.39	554.01	194.74	0.04
US Reach	6.932	50-Year	954.00	645.08	650.44		650.45	0.000159	0.96	1033.03	209.61	0.07
US Reach	6.932	500-Year	1998.00	645.08	651.94		651.97	0.000297	1.54	1354.09	219.00	0.10

HEC-RAS Plan: ALP Alignm River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	6.97	100-Year	1175.00	645.13	650.95		650.97	0.000128	0.91	1336.28	247.88	0.07
US Reach	6.97	10-Year	519.00	645.13	649.33		649.34	0.000076	0.56	942.76	237.61	0.05
US Reach	6.97	2-Year	210.00	645.13	648.08		648.08	0.000042	0.33	649.77	229.67	0.03
US Reach	6.97	50-Year	954.00	645.13	650.47		650.48	0.000114	0.81	1216.77	244.81	0.06
US Reach	6.97	500-Year	1998.00	645.13	652.00		652.02	0.000210	1.30	1598.20	254.48	0.09
US Reach	7.001	100-Year	1175.00	644.63	650.98		650.99	0.000196	1.03	1164.56	239.64	0.08
US Reach	7.001	10-Year	519.00	644.63	649.35		649.35	0.000140	0.68	780.36	232.04	0.06
US Reach	7.001	2-Year	210.00	644.63	648.09		648.09	0.000103	0.44	491.77	226.16	0.05
US Reach	7.001	50-Year	954.00	644.63	650.49		650.50	0.000181	0.93	1048.37	237.37	0.08
US Reach	7.001	500-Year	1998.00	644.63	652.03		652.06	0.000298	1.45	1420.24	244.46	0.10
US Reach	7.027	100-Year	1175.00	645.20	651.00		651.02	0.000130	0.91	1327.97	245.72	0.07
US Reach	7.027	10-Year	519.00	645.20	649.36		649.37	0.000079	0.57	933.21	236.20	0.05
US Reach	7.027	2-Year	210.00	645.20	648.10		648.10	0.000044	0.33	638.87	228.84	0.03
US Reach	7.027	50-Year	954.00	645.20	650.51		650.52	0.000116	0.81	1208.34	242.88	0.06
US Reach	7.027	500-Year	1998.00	645.20	652.07		652.10	0.000210	1.30	1594.54	251.95	0.09
US Reach	7.058	100-Year	1175.00	645.25	651.02		651.04	0.000132	0.92	1321.49	245.74	0.07
US Reach	7.058	10-Year	519.00	645.25	649.38		649.38	0.000081	0.57	924.78	236.12	0.05
US Reach	7.058	2-Year	210.00	645.25	648.11		648.11	0.000046	0.34	629.25	228.69	0.04
US Reach	7.058	50-Year	954.00	645.25	650.53		650.54	0.000118	0.82	1201.31	242.86	0.06
US Reach	7.058	500-Year	1998.00	645.25	652.11		652.13	0.000211	1.30	1591.42	252.08	0.09
US Reach	7.059	100-Year	1175.00	644.25	651.03		651.04	0.000077	0.78	1558.00	247.73	0.05
US Reach	7.059	10-Year	519.00	644.25	649.38		649.38	0.000039	0.46	1156.76	239.04	0.04
US Reach	7.059	2-Year	210.00	644.25	648.11		648.11	0.000017	0.25	856.82	232.33	0.02
US Reach	7.059	50-Year	954.00	644.25	650.54		650.54	0.000066	0.68	1436.62	245.13	0.05
US Reach	7.059	500-Year	1998.00	644.25	652.12		652.13	0.000133	1.13	1830.48	253.46	0.07
US Reach	7.067	100-Year	1175.00	643.02	651.03		651.04	0.000094	0.86	1440.24	240.48	0.06
US Reach	7.067	10-Year	519.00	643.02	649.38		649.38	0.000050	0.52	1050.24	232.25	0.04
US Reach	7.067	2-Year	210.00	643.02	648.11		648.11	0.000023	0.29	758.51	225.90	0.03
US Reach	7.067	50-Year	954.00	643.02	650.54		650.55	0.000081	0.76	1322.30	238.02	0.05
US Reach	7.067	500-Year	1998.00	643.02	652.12		652.14	0.000159	1.24	1705.19	245.94	0.08
US Reach	7.07	100-Year	1175.00	644.25	651.03		651.04	0.000103	0.86	1419.73	247.53	0.06
US Reach	7.07	10-Year	519.00	644.25	649.38		649.39	0.000057	0.52	1020.60	236.10	0.04
US Reach	7.07	2-Year	210.00	644.25	648.11		648.11	0.000028	0.29	725.45	227.28	0.03
US Reach	7.07	50-Year	954.00	644.25	650.54		650.55	0.000090	0.76	1298.52	244.12	0.06
US Reach	7.07	500-Year	1998.00	644.25	652.12		652.15	0.000171	1.23	1693.74	255.08	0.08
US Reach	7.077	100-Year	1175.00	644.05	650.59	648.35	651.50	0.000498	7.70	152.68	97.90	0.53
US Reach	7.077	10-Year	519.00	644.05	649.24	646.57	649.53	0.000210	4.28	121.18	74.56	0.33
US Reach	7.077	2-Year	210.00	644.05	648.07	645.44	648.15	0.000081	2.24	93.60	58.96	0.20
US Reach	7.077	50-Year	954.00	644.05	650.21	647.79	650.89	0.000401	6.63	143.81	91.33	0.47
US Reach	7.077	500-Year	1998.00	644.05	650.96	650.16	653.34	0.001196	12.38	161.44	104.39	0.83
US Reach	7.094		Culvert									
US Reach	7.111	100-Year	1175.00	644.40	651.65	648.66	652.39	0.000345	6.89	170.48	111.95	0.45
US Reach	7.111	10-Year	519.00	644.40	649.50	646.88	649.79	0.000218	4.33	119.87	87.62	0.34
US Reach	7.111	2-Year	210.00	644.40	648.14	645.75	648.23	0.000100	2.39	87.90	72.26	0.22
US Reach	7.111	50-Year	954.00	644.40	650.86	648.11	651.47	0.000334	6.28	151.82	102.98	0.44
US Reach	7.111	500-Year	1998.00	644.40	655.30	650.48	655.36	0.000032	2.01	994.04	144.10	0.13
US Reach	7.122	100-Year	1108.00	644.45	652.30		652.47	0.000307	4.00	349.90	70.13	0.25
US Reach	7.122	10-Year	540.00	644.45	649.68		649.82	0.000420	3.57	186.93	54.43	0.28
US Reach	7.122	2-Year	273.00	644.45	648.14		648.24	0.000478	3.02	110.15	45.18	0.28
US Reach	7.122	50-Year	917.00	644.45	651.36		651.54	0.000368	4.03	287.01	64.53	0.27
US Reach	7.122	500-Year	1884.00	644.45	655.22		655.40	0.000218	4.17	569.07	76.08	0.22
US Reach	7.141	100-Year	1032.00	644.72	652.39		652.54	0.000296	3.87	337.18	69.04	0.25
US Reach	7.141	10-Year	507.00	644.72	649.79		649.93	0.000423	3.51	178.30	53.47	0.28
US Reach	7.141	2-Year	250.00	644.72	648.27		648.36	0.000477	2.93	103.68	44.32	0.28
US Reach	7.141	50-Year	858.00	644.72	651.47		651.63	0.000358	3.91	276.19	63.51	0.27
US Reach	7.141	500-Year	1754.00	644.72	655.29		655.45	0.000205	3.99	553.82	76.08	0.22
US Reach	7.154	100-Year	1032.00	645.00	652.45		652.63	0.000335	4.04	322.71	67.77	0.26
US Reach	7.154	10-Year	507.00	645.00	649.90		650.05	0.000492	3.70	168.93	52.41	0.30
US Reach	7.154	2-Year	250.00	645.00	648.39		648.50	0.000581	3.14	96.70	43.36	0.30
US Reach	7.154	50-Year	858.00	645.00	651.55		651.73	0.000406	4.08	263.88	62.34	0.28
US Reach	7.154	500-Year	1754.00	645.00	655.33		655.51	0.000226	4.13	536.01	76.08	0.23
US Reach	7.25	100-Year	1032.00	645.27	652.53		652.72	0.000377	4.21	309.84	66.62	0.28
US Reach	7.25	10-Year	507.00	645.27	650.02		650.18	0.000561	3.87	161.18	51.52	0.31
US Reach	7.25	2-Year	250.00	645.27	648.53		648.66	0.000681	3.31	91.43	42.63	0.32
US Reach	7.25	50-Year	858.00	645.27	651.65		651.84	0.000455	4.24	253.17	61.30	0.30
US Reach	7.25	500-Year	1754.00	645.27	655.38		655.57	0.000248	4.27	519.35	76.08	0.24

HEC-RAS Plan: ALP Alignm River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	7.382	100-Year	1032.00	645.54	652.62		652.82	0.000420	4.38	297.86	65.53	0.29
US Reach	7.382	10-Year	507.00	645.54	650.15		650.34	0.000633	4.03	154.46	50.73	0.33
US Reach	7.382	2-Year	250.00	645.54	648.71		648.85	0.000775	3.47	87.32	42.04	0.34
US Reach	7.382	50-Year	858.00	645.54	651.76		651.96	0.000508	4.41	243.38	60.34	0.31
US Reach	7.382	500-Year	1754.00	645.54	655.44		655.64	0.000273	4.41	503.09	76.08	0.25
US Reach	7.426	100-Year	1032.00	645.81	652.72		652.94	0.000467	4.54	286.79	64.51	0.30
US Reach	7.426	10-Year	507.00	645.81	650.31		650.51	0.000704	4.18	148.76	50.05	0.35
US Reach	7.426	2-Year	250.00	645.81	648.90		649.05	0.000858	3.59	84.25	41.60	0.36
US Reach	7.426	50-Year	858.00	645.81	651.88		652.10	0.000563	4.56	234.54	59.45	0.33
US Reach	7.426	500-Year	1754.00	645.81	655.50		655.72	0.000299	4.55	487.26	76.08	0.26
US Reach	7.450	100-Year	1032.00	646.08	652.83		653.07	0.000516	4.69	276.62	63.55	0.32
US Reach	7.450	10-Year	507.00	646.08	650.49		650.69	0.000771	4.31	144.03	49.48	0.36
US Reach	7.450	2-Year	250.00	646.08	649.12		649.28	0.000925	3.68	82.04	41.28	0.37
US Reach	7.450	50-Year	858.00	646.08	652.01		652.25	0.000619	4.72	226.65	58.65	0.34
US Reach	7.450	500-Year	1754.00	646.08	655.57		655.80	0.000329	4.70	471.91	76.08	0.27
US Reach	7.50	100-Year	1032.00	646.35	652.96		653.21	0.000566	4.85	267.37	62.68	0.33
US Reach	7.50	10-Year	507.00	646.35	650.68		650.90	0.000832	4.43	140.20	49.01	0.38
US Reach	7.50	2-Year	250.00	646.35	649.35		649.52	0.000975	3.75	80.52	41.06	0.38
US Reach	7.50	50-Year	858.00	646.35	652.17		652.42	0.000675	4.86	219.69	57.93	0.36
US Reach	7.50	500-Year	1754.00	646.35	655.65		655.89	0.000360	4.86	457.10	76.08	0.28
US Reach	7.54	100-Year	1032.00	646.62	653.09		653.36	0.000618	4.99	259.06	61.87	0.35
US Reach	7.54	10-Year	507.00	646.62	650.89		651.12	0.000886	4.52	137.15	48.64	0.39
US Reach	7.54	2-Year	250.00	646.62	649.60		649.77	0.001010	3.80	79.50	40.91	0.39
US Reach	7.54	50-Year	858.00	646.62	652.33		652.60	0.000730	4.99	213.65	57.30	0.37
US Reach	7.54	500-Year	1754.00	646.62	655.73		655.99	0.000394	5.02	442.86	76.08	0.29
US Reach	7.57	100-Year	1032.00	646.75	653.16		653.44	0.000643	5.06	255.35	61.51	0.35
US Reach	7.57	10-Year	507.00	646.75	650.99		651.22	0.000909	4.56	135.90	48.48	0.39
US Reach	7.57	2-Year	250.00	646.75	649.72		649.89	0.001024	3.81	79.12	40.86	0.39
US Reach	7.57	50-Year	858.00	646.75	652.41		652.69	0.000755	5.05	211.02	57.03	0.37
US Reach	7.57	500-Year	1754.00	646.75	655.77		656.04	0.000412	5.09	436.20	76.08	0.30
US Reach	7.58	100-Year	1032.00	646.80	653.03	650.46	653.66	0.001450	6.37	161.89	62.39	0.45
US Reach	7.58	10-Year	507.00	646.80	650.99	649.08	651.33	0.001311	4.65	108.94	50.17	0.40
US Reach	7.58	2-Year	250.00	646.80	649.78	648.22	649.94	0.000998	3.23	77.36	42.88	0.33
US Reach	7.58	50-Year	858.00	646.80	652.33	650.04	652.88	0.001494	5.97	143.62	58.17	0.45
US Reach	7.58	500-Year	1754.00	646.80	655.47	652.02	656.41	0.001391	7.78	225.33	77.04	0.47
US Reach	8.000		Culvert									
US Reach	8.546	100-Year	963.00	651.62	658.06	655.13	658.58	0.001128	5.75	167.46	63.67	0.40
US Reach	8.546	10-Year	479.00	651.62	655.66	653.82	655.99	0.001320	4.56	105.06	49.27	0.40
US Reach	8.546	2-Year	236.00	651.62	654.14	652.99	654.34	0.001550	3.60	65.48	40.13	0.40
US Reach	8.546	50-Year	805.00	651.62	657.34	654.73	657.79	0.001175	5.42	148.58	59.32	0.40
US Reach	8.546	500-Year	1637.00	651.62	665.25	656.60	665.30	0.000081	1.84	891.43	100.26	0.11
US Reach	8.555	100-Year	927.00	651.67	658.46		658.64	0.000402	4.16	281.33	64.89	0.28
US Reach	8.555	10-Year	467.00	651.67	655.84		656.05	0.000825	4.30	132.93	48.48	0.37
US Reach	8.555	2-Year	228.00	651.67	654.20		654.43	0.001671	4.38	62.29	34.48	0.49
US Reach	8.555	50-Year	776.00	651.67	657.67		657.86	0.000480	4.18	231.93	59.93	0.30
US Reach	8.555	500-Year	1576.00	651.67	665.24		665.31	0.000067	2.70	741.52	68.04	0.13
US Reach	8.579	100-Year	927.00	651.94	658.65		658.71	0.000123	2.29	491.65	99.82	0.16
US Reach	8.579	10-Year	467.00	651.94	656.11		656.16	0.000219	2.22	257.35	84.57	0.19
US Reach	8.579	2-Year	228.00	651.94	654.58		654.62	0.000379	2.14	134.85	75.38	0.23
US Reach	8.579	50-Year	776.00	651.94	657.87		657.93	0.000142	2.26	416.04	95.16	0.16
US Reach	8.579	500-Year	1576.00	651.94	665.30		665.32	0.000024	1.61	1177.76	103.39	0.08
US Reach	8.642	100-Year	927.00	652.22	658.69		658.74	0.000104	2.04	544.66	111.94	0.14
US Reach	8.642	10-Year	467.00	652.22	656.17		656.21	0.000197	2.03	281.66	96.82	0.18
US Reach	8.642	2-Year	228.00	652.22	654.68		654.72	0.000379	2.04	143.96	85.98	0.23
US Reach	8.642	50-Year	776.00	652.22	657.92		657.96	0.000121	2.03	460.08	107.31	0.15
US Reach	8.642	500-Year	1576.00	652.22	665.31		665.33	0.000019	1.42	1316.22	116.89	0.07
US Reach	8.686	100-Year	927.00	652.49	658.73		658.76	0.000062	1.54	723.11	150.82	0.11
US Reach	8.686	10-Year	467.00	652.49	656.23		656.26	0.000134	1.61	364.61	135.81	0.15
US Reach	8.686	2-Year	228.00	652.49	654.78		654.81	0.000328	1.81	174.40	125.23	0.21
US Reach	8.686	50-Year	776.00	652.49	657.96		657.99	0.000074	1.54	608.98	146.21	0.12
US Reach	8.686	500-Year	1576.00	652.49	665.32		665.33	0.000011	1.05	1755.01	157.05	0.05
US Reach	8.743	100-Year	927.00	652.76	658.75	655.10	658.77	0.000073	1.63	690.74	178.06	0.12
US Reach	8.743	10-Year	467.00	652.76	656.27	654.65	656.30	0.000200	1.89	328.79	162.99	0.18
US Reach	8.743	2-Year	228.00	652.76	654.88	654.26	654.93	0.000711	2.53	135.75	146.00	0.31
US Reach	8.743	50-Year	776.00	652.76	657.98	654.97	658.01	0.000091	1.66	577.07	173.41	0.13

HEC-RAS Plan: ALP Alignm River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	8.743	500-Year	1576.00	652.76	665.33	655.57	665.34	0.000009	0.93	1997.31	186.02	0.05
US Reach	8.820	100-Year	826.00	653.03	658.75	655.37	658.81	0.000160	2.34	414.66	236.00	0.17
US Reach	8.820	10-Year	432.00	653.03	656.31	654.85	656.38	0.000439	2.67	200.71	221.16	0.26
US Reach	8.820	2-Year	213.00	653.03	655.07	654.48	655.14	0.000968	2.88	100.15	138.73	0.36
US Reach	8.820	50-Year	700.00	653.03	657.99	655.22	658.05	0.000204	2.40	346.09	231.38	0.19
US Reach	8.820	500-Year	1404.00	653.03	665.33	656.02	665.34	0.000005	0.66	2524.65	245.59	0.03
US Reach	8.830	100-Year	826.00	653.30	658.66		658.96	0.000882	5.26	194.91	55.92	0.40
US Reach	8.830	10-Year	432.00	653.30	656.22		656.75	0.003274	6.75	77.23	40.65	0.70
US Reach	8.830	2-Year	213.00	653.30	655.28		655.68	0.004037	5.76	44.00	31.14	0.73
US Reach	8.830	50-Year	700.00	653.30	657.89		658.24	0.001227	5.60	153.88	51.12	0.46
US Reach	8.830	500-Year	1404.00	653.30	665.28		665.37	0.000085	2.80	633.93	68.04	0.14
US Reach	8.852	100-Year	826.00	653.57	658.88		659.19	0.000918	5.33	192.10	55.61	0.41
US Reach	8.852	10-Year	432.00	653.57	657.01		657.33	0.001613	5.29	99.26	43.91	0.50
US Reach	8.852	2-Year	213.00	653.57	656.08		656.28	0.001518	4.15	61.45	34.33	0.46
US Reach	8.852	50-Year	700.00	653.57	658.21		658.54	0.001180	5.52	156.08	51.39	0.45
US Reach	8.852	500-Year	1404.00	653.57	665.30		665.39	0.000093	2.88	616.86	68.04	0.15
US Reach	8.864	100-Year	826.00	653.62	658.92	656.27	659.24	0.000928	4.59	180.11	65.79	0.35
US Reach	8.864	10-Year	432.00	653.62	657.24	655.34	657.43	0.000904	3.51	123.07	55.72	0.33
US Reach	8.864	2-Year	213.00	653.62	656.28	654.69	656.36	0.000615	2.36	90.38	49.95	0.25
US Reach	8.864	50-Year	700.00	653.62	658.31	655.97	658.61	0.001001	4.39	159.46	62.15	0.36
US Reach	8.864	500-Year	1404.00	653.62	665.26	657.37	665.45	0.000195	3.55	395.60	103.83	0.18
US Reach	8.87		Culvert									
US Reach	8.888	100-Year	757.00	653.77	659.13	656.26	659.39	0.000752	4.16	182.09	66.14	0.32
US Reach	8.888	10-Year	403.00	653.77	657.37	655.39	657.54	0.000798	3.29	122.55	55.63	0.31
US Reach	8.888	2-Year	199.00	653.77	656.34	654.80	656.42	0.000598	2.27	87.49	49.44	0.25
US Reach	8.888	50-Year	648.00	653.77	658.51	656.00	658.76	0.000828	4.02	161.11	62.44	0.33
US Reach	8.888	500-Year	1287.00	653.77	666.26	657.32	666.40	0.000129	3.03	424.71	107.85	0.15
US Reach	8.9	100-Year	757.00	653.83	659.19		659.43	0.000567	4.22	218.55	58.13	0.33
US Reach	8.9	10-Year	403.00	653.83	657.39		657.59	0.000772	3.72	123.84	47.35	0.35
US Reach	8.9	2-Year	199.00	653.83	656.35		656.47	0.000700	2.78	77.79	41.10	0.32
US Reach	8.9	50-Year	648.00	653.83	658.55		658.80	0.000678	4.23	182.73	54.30	0.35
US Reach	8.9	500-Year	1287.00	653.83	666.36		666.42	0.000051	2.26	818.34	87.00	0.11
US Reach	8.91	100-Year	757.00	653.89	659.26	656.86	659.46	0.000498	3.96	263.39	92.58	0.31
US Reach	8.91	10-Year	403.00	653.89	657.43	655.90	657.64	0.000835	3.83	120.05	60.45	0.37
US Reach	8.91	2-Year	199.00	653.89	656.38	655.20	656.51	0.000772	2.88	73.46	39.23	0.33
US Reach	8.91	50-Year	648.00	653.89	658.58	656.59	658.84	0.000709	4.30	183.17	78.95	0.36
US Reach	8.91	500-Year	1287.00	653.89	666.39	657.96	666.42	0.000035	1.85	1071.70	116.00	0.09
US Reach	8.92	100-Year	757.00	653.95	659.33		659.49	0.000384	3.50	266.81	70.28	0.27
US Reach	8.92	10-Year	403.00	653.95	657.55		657.68	0.000509	3.06	153.01	57.85	0.29
US Reach	8.92	2-Year	199.00	653.95	656.47		656.55	0.000486	2.33	94.47	50.27	0.27
US Reach	8.92	50-Year	648.00	653.95	658.71		658.88	0.000450	3.48	225.03	65.99	0.29
US Reach	8.92	500-Year	1287.00	653.95	666.38		666.43	0.000046	2.14	793.88	75.00	0.11
US Reach	8.927	100-Year	757.00	654.00	658.44	658.29	660.45	0.002140	11.35	66.67	15.00	0.95
US Reach	8.927	10-Year	403.00	654.00	657.06	656.83	658.26	0.001782	8.77	45.93	15.00	0.88
US Reach	8.927	2-Year	199.00	654.00	656.28	655.76	656.81	0.001049	5.82	34.19	15.00	0.68
US Reach	8.927	50-Year	648.00	654.00	657.87	657.87	659.80	0.002324	11.15	58.10	15.00	1.00
US Reach	8.927	500-Year	1287.00	654.00	666.01	660.11	666.80	0.000318	7.14	180.17	31.59	0.36
US Reach	8.932		Bridge									
US Reach	8.937	100-Year	684.00	654.20	658.50	658.22	660.25	0.001921	10.61	64.48	15.00	0.90
US Reach	8.937	10-Year	392.00	654.20	657.11	656.97	658.36	0.001955	8.97	43.69	15.00	0.93
US Reach	8.937	2-Year	202.00	654.20	656.31	655.98	656.94	0.001373	6.39	31.59	15.00	0.78
US Reach	8.937	50-Year	594.00	654.20	657.94	657.85	659.68	0.002165	10.60	56.05	15.00	0.97
US Reach	8.937	500-Year	1163.00	654.20	667.36	659.93	667.90	0.000192	5.89	197.36	356.23	0.29
US Reach	8.943	100-Year	684.00	654.20	660.22	657.36	660.65	0.000264	5.29	129.37	24.55	0.38
US Reach	8.943	10-Year	392.00	654.20	658.36	656.37	658.66	0.000289	4.38	89.49	21.50	0.38
US Reach	8.943	2-Year	202.00	654.20	656.90	655.60	657.09	0.000284	3.48	57.99	21.50	0.37
US Reach	8.943	50-Year	594.00	654.20	659.71	657.08	660.10	0.000268	5.02	118.41	23.54	0.38
US Reach	8.943	500-Year	1163.00	654.20	668.04	658.70	668.05	0.000007	1.53	3515.50	1095.92	0.07
US Reach	8.952499		Culvert									
US Reach	8.962	100-Year	684.00	654.36	660.46	657.51	660.88	0.000250	5.22	131.12	24.99	0.37
US Reach	8.962	10-Year	392.00	654.36	658.54	656.54	658.83	0.000286	4.37	89.78	21.50	0.38
US Reach	8.962	2-Year	202.00	654.36	657.01	655.76	657.20	0.000301	3.55	56.88	21.50	0.38
US Reach	8.962	50-Year	594.00	654.36	659.93	657.24	660.31	0.000255	4.96	119.67	23.93	0.37
US Reach	8.962	500-Year	1163.00	654.36	668.04	658.86	668.06	0.000007	1.54	3495.08	1093.04	0.07

HEC-RAS Plan: ALP Alignm River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	8.972	100-Year	568.00	654.57	660.80		660.93	0.000720	2.87	200.33	54.23	0.25
US Reach	8.972	10-Year	319.00	654.57	658.73		658.88	0.001509	3.08	103.61	39.45	0.33
US Reach	8.972	2-Year	180.00	654.57	657.02		657.25	0.004540	3.92	45.91	27.93	0.54
US Reach	8.972	50-Year	485.00	654.57	660.23		660.36	0.000867	2.85	170.52	49.79	0.27
US Reach	8.972	500-Year	966.00	654.57	668.03		668.06	0.000050	1.49	794.29	87.00	0.08
US Reach	8.982	100-Year	568.00	654.96	660.86		660.97	0.000623	2.66	215.32	57.89	0.23
US Reach	8.982	10-Year	319.00	654.96	658.82		658.95	0.001306	2.85	112.10	43.32	0.31
US Reach	8.982	2-Year	180.00	654.96	657.28		657.45	0.003159	3.34	53.91	31.93	0.45
US Reach	8.982	50-Year	485.00	654.96	660.29		660.40	0.000749	2.65	183.63	54.00	0.25
US Reach	8.982	500-Year	966.00	654.96	668.04		668.07	0.000041	1.34	899.81	105.00	0.07
US Reach	9.001	100-Year	568.00	654.83	660.83		661.12	0.001755	5.44	161.38	49.25	0.41
US Reach	9.001	10-Year	319.00	654.83	658.84		659.24	0.004011	6.05	76.64	35.11	0.58
US Reach	9.001	2-Year	180.00	654.83	657.54		658.03	0.008294	6.31	37.42	25.17	0.77
US Reach	9.001	50-Year	485.00	654.83	660.27		660.58	0.002133	5.58	134.59	45.68	0.45
US Reach	9.001	500-Year	966.00	654.83	668.04		668.08	0.000101	2.30	708.34	89.00	0.11
US Reach	9.02	100-Year	568.00	654.90	661.11		661.25	0.000791	2.99	191.42	49.76	0.26
US Reach	9.02	10-Year	319.00	654.90	659.34		659.47	0.001147	2.83	112.66	39.39	0.30
US Reach	9.02	2-Year	180.00	654.90	658.23		658.32	0.001225	2.48	72.52	32.59	0.29
US Reach	9.02	50-Year	485.00	654.90	660.59		660.73	0.000869	2.92	166.63	46.78	0.27
US Reach	9.02	500-Year	966.00	654.90	668.05		668.09	0.000063	1.63	721.09	90.00	0.09
US Reach	9.039	100-Year	568.00	655.06	661.19		661.33	0.000863	3.03	189.62	52.70	0.27
US Reach	9.039	10-Year	319.00	655.06	659.46		659.59	0.001322	2.93	109.02	40.57	0.31
US Reach	9.039	2-Year	180.00	655.06	658.35		658.46	0.001502	2.63	68.38	32.92	0.32
US Reach	9.039	50-Year	485.00	655.06	660.68		660.82	0.000967	2.97	163.84	49.14	0.28
US Reach	9.039	500-Year	966.00	655.06	668.06		668.09	0.000062	1.59	745.32	98.00	0.09
US Reach	9.058	100-Year	568.00	655.35	661.25		661.44	0.001106	3.53	165.09	47.23	0.31
US Reach	9.058	10-Year	319.00	655.35	659.58		659.75	0.001787	3.34	95.53	36.28	0.36
US Reach	9.058	2-Year	180.00	655.35	658.50		658.64	0.001992	2.99	60.14	29.25	0.37
US Reach	9.058	50-Year	485.00	655.35	660.76		660.94	0.001245	3.44	142.68	43.99	0.32
US Reach	9.058	500-Year	966.00	655.35	668.06		668.10	0.000083	1.86	662.39	94.00	0.10
US Reach	9.078	100-Year	568.00	655.56	661.43		661.58	0.000795	3.11	187.43	50.51	0.26
US Reach	9.078	10-Year	319.00	655.56	659.84		659.96	0.001130	2.78	114.78	40.98	0.29
US Reach	9.078	2-Year	180.00	655.56	658.77		658.86	0.001173	2.41	74.63	34.02	0.29
US Reach	9.078	50-Year	485.00	655.56	660.95		661.09	0.000863	3.00	164.06	47.67	0.27
US Reach	9.078	500-Year	966.00	655.56	668.07		668.11	0.000076	1.79	661.63	100.91	0.10
US Reach	9.1	100-Year	568.00	655.63	661.49		661.68	0.001055	3.52	166.93	47.23	0.30
US Reach	9.1	10-Year	319.00	655.63	659.94		660.10	0.001532	3.15	101.41	37.64	0.34
US Reach	9.1	2-Year	180.00	655.63	658.88		659.00	0.001623	2.76	65.13	30.75	0.33
US Reach	9.1	50-Year	485.00	655.63	661.02		661.20	0.001150	3.39	145.55	44.33	0.31
US Reach	9.1	500-Year	966.00	655.63	668.07		668.12	0.000093	1.96	615.78	96.20	0.11
US Reach	9.121	100-Year	568.00	655.81	661.59		661.78	0.001061	3.52	167.81	48.66	0.30
US Reach	9.121	10-Year	319.00	655.81	660.09		660.25	0.001492	3.11	102.51	38.63	0.33
US Reach	9.121	2-Year	180.00	655.81	659.04		659.16	0.001628	2.74	65.64	31.50	0.33
US Reach	9.121	50-Year	485.00	655.81	661.13		661.31	0.001151	3.40	146.23	45.59	0.31
US Reach	9.121	500-Year	966.00	655.81	668.09		668.13	0.000091	1.92	643.44	97.27	0.10
US Reach	9.134	100-Year	568.00	655.54	661.73		661.87	0.000692	3.01	195.63	51.16	0.25
US Reach	9.134	10-Year	319.00	655.54	660.26		660.36	0.000819	2.52	126.64	42.51	0.25
US Reach	9.134	2-Year	180.00	655.54	659.21		659.27	0.000809	2.11	85.32	35.91	0.24
US Reach	9.134	50-Year	485.00	655.54	661.28		661.40	0.000723	2.87	173.06	48.50	0.25
US Reach	9.134	500-Year	966.00	655.54	668.10		668.14	0.000077	1.79	673.02	87.00	0.10
US Reach	9.153	100-Year	568.00	655.96	661.69		662.02	0.000954	4.62	129.69	38.55	0.40
US Reach	9.153	10-Year	319.00	655.96	660.27		660.52	0.001223	3.97	80.60	30.53	0.42
US Reach	9.153	2-Year	180.00	655.96	659.24		659.43	0.001338	3.45	52.15	24.86	0.42
US Reach	9.153	50-Year	485.00	655.96	661.25		661.56	0.001016	4.43	113.32	36.08	0.40
US Reach	9.153	500-Year	966.00	655.96	668.08		668.17	0.000088	2.59	529.87	74.00	0.14
US Reach	9.162	100-Year	568.00	656.18	661.80		662.05	0.000679	4.02	149.09	42.60	0.34
US Reach	9.162	10-Year	319.00	656.18	660.37		660.55	0.000826	3.40	94.12	34.17	0.35
US Reach	9.162	2-Year	180.00	656.18	659.33		659.46	0.000896	2.92	61.73	28.31	0.35
US Reach	9.162	50-Year	485.00	656.18	661.36		661.59	0.000715	3.84	130.82	39.99	0.34
US Reach	9.162	500-Year	966.00	656.18	668.09		668.17	0.000075	2.43	527.99	64.00	0.13
US Reach	9.171	100-Year	568.00	655.76	661.65	659.21	662.25	0.000505	6.23	91.23	15.50	0.45
US Reach	9.171	10-Year	319.00	655.76	660.32	658.12	660.64	0.000326	4.51	70.66	15.50	0.37
US Reach	9.171	2-Year	180.00	655.76	659.33	657.36	659.49	0.000210	3.25	55.31	15.50	0.30
US Reach	9.171	50-Year	485.00	655.76	661.24	658.86	661.75	0.000449	5.71	84.94	15.50	0.43
US Reach	9.171	500-Year	966.00	655.76	668.17	660.71	668.19	0.000021	1.88	1994.44	480.00	0.09

HEC-RAS Plan: ALP Alignm River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	9.178499		Culvert									
US Reach	9.186	100-Year	568.00	655.76	662.07	659.21	662.59	0.000417	5.81	97.80	15.50	0.41
US Reach	9.186	10-Year	319.00	655.76	660.53	658.12	660.82	0.000286	4.31	73.98	15.50	0.35
US Reach	9.186	2-Year	180.00	655.76	659.43	657.36	659.59	0.000193	3.16	56.94	15.50	0.29
US Reach	9.186	50-Year	485.00	655.76	661.59	658.86	662.04	0.000378	5.37	90.40	15.50	0.39
US Reach	9.186	500-Year	966.00	655.76	668.18	660.71	668.19	0.000017	1.71	2246.42	530.00	0.09
US Reach	9.189	100-Year	568.00	656.24	662.55		662.71	0.000125	3.18	178.49	48.69	0.29
US Reach	9.189	10-Year	319.00	656.24	660.71		660.87	0.000168	3.15	101.38	35.23	0.33
US Reach	9.189	2-Year	180.00	656.24	659.47		659.60	0.000187	2.86	63.01	27.47	0.33
US Reach	9.189	50-Year	485.00	656.24	661.97		662.13	0.000139	3.20	151.48	44.44	0.31
US Reach	9.189	500-Year	966.00	656.24	668.17		668.20	0.000008	1.40	1779.16	402.00	0.09
US Reach	9.197	100-Year	568.00	656.23	662.60		662.72	0.000578	2.78	217.34	59.69	0.23
US Reach	9.197	10-Year	319.00	656.23	660.78		660.89	0.000987	2.64	121.61	45.11	0.28
US Reach	9.197	2-Year	180.00	656.23	659.52		659.62	0.001399	2.52	71.40	34.82	0.31
US Reach	9.197	50-Year	485.00	656.23	662.03		662.15	0.000669	2.74	184.40	55.12	0.24
US Reach	9.197	500-Year	966.00	656.23	668.16		668.20	0.000083	1.78	681.17	92.00	0.10
US Reach	9.206	100-Year	568.00	656.27	662.61		662.76	0.000732	3.17	189.74	49.78	0.26
US Reach	9.206	10-Year	319.00	656.27	660.81		660.94	0.001156	2.93	109.81	39.00	0.30
US Reach	9.206	2-Year	180.00	656.27	659.58		659.69	0.001541	2.70	66.56	31.22	0.33
US Reach	9.206	50-Year	485.00	656.27	662.04		662.19	0.000832	3.10	162.45	46.40	0.27
US Reach	9.206	500-Year	966.00	656.27	668.19		668.21	0.000057	1.49	1090.30	215.00	0.08
US Reach	9.24	100-Year	568.00	657.00	662.71		662.85	0.000351	3.13	213.19	91.18	0.25
US Reach	9.24	10-Year	319.00	657.00	660.96		661.08	0.000535	2.87	113.79	42.00	0.29
US Reach	9.24	2-Year	180.00	657.00	659.79		659.89	0.000789	2.61	68.98	34.51	0.33
US Reach	9.24	50-Year	485.00	657.00	662.15		662.29	0.000401	3.09	170.40	61.98	0.26
US Reach	9.24	500-Year	966.00	657.00	668.20		668.21	0.000025	1.39	1511.16	300.00	0.08
US Reach	9.246	100-Year	568.00	656.02	662.62	659.73	662.94	0.000131	4.99	241.73	95.39	0.34
US Reach	9.246	10-Year	319.00	656.02	660.85	658.54	661.20	0.000178	4.72	67.62	46.53	0.38
US Reach	9.246	2-Year	180.00	656.02	659.75	657.74	659.93	0.000134	3.45	52.22	35.00	0.31
US Reach	9.246	50-Year	485.00	656.02	661.96	659.36	662.49	0.000206	5.83	83.15	59.75	0.42
US Reach	9.246	500-Year	966.00	656.02	668.20	661.32	668.22	0.000009	1.95	2629.89	545.00	0.10
US Reach	9.2505		Culvert									
US Reach	9.255	100-Year	568.00	656.02	663.26	659.73	663.49	0.000087	4.33	340.08	206.41	0.28
US Reach	9.255	10-Year	319.00	656.02	660.97	658.54	661.30	0.000163	4.60	69.36	48.02	0.36
US Reach	9.255	2-Year	180.00	656.02	659.80	657.74	659.98	0.000128	3.40	52.98	35.30	0.31
US Reach	9.255	50-Year	485.00	656.02	662.49	659.35	662.94	0.000155	5.35	90.60	82.93	0.37
US Reach	9.255	500-Year	966.00	656.02	668.21	661.32	668.22	0.000007	1.77	3366.73	962.50	0.09
US Reach	9.267	100-Year	568.00	656.69	663.45		663.51	0.000293	2.23	391.63	154.85	0.17
US Reach	9.267	10-Year	319.00	656.69	661.25		661.35	0.000752	2.55	147.05	75.32	0.25
US Reach	9.267	2-Year	180.00	656.69	659.91		660.01	0.001485	2.55	70.57	35.51	0.32
US Reach	9.267	50-Year	485.00	656.69	662.92		662.99	0.000333	2.23	315.85	133.14	0.18
US Reach	9.267	500-Year	966.00	656.69	668.21		668.22	0.000039	1.23	1494.80	260.00	0.07
US Reach	9.284	100-Year	568.00	656.98	663.46		663.56	0.000469	2.78	288.91	117.77	0.21
US Reach	9.284	10-Year	319.00	656.98	661.31		661.45	0.001073	3.00	115.62	50.27	0.29
US Reach	9.284	2-Year	180.00	656.98	660.06		660.18	0.001771	2.82	63.88	31.61	0.35
US Reach	9.284	50-Year	485.00	656.98	662.94		663.04	0.000525	2.75	232.37	99.22	0.22
US Reach	9.284	500-Year	966.00	656.98	668.22		668.23	0.000026	0.99	2394.42	590.00	0.06
US Reach	9.314	100-Year	568.00	657.16	663.56		663.63	0.000359	2.40	397.45	167.97	0.18
US Reach	9.314	10-Year	319.00	657.16	661.48		661.60	0.000994	2.86	136.20	83.88	0.28
US Reach	9.314	2-Year	180.00	657.16	660.32		660.43	0.001584	2.69	66.99	33.43	0.33
US Reach	9.314	50-Year	485.00	657.16	663.04		663.12	0.000422	2.42	316.17	147.06	0.20
US Reach	9.314	500-Year	966.00	657.16	668.22		668.23	0.000026	0.99	2174.58	469.00	0.06
US Reach	9.33	100-Year	568.00	657.34	663.57		663.68	0.000554	2.94	287.60	110.40	0.23
US Reach	9.33	10-Year	319.00	657.34	661.57		661.73	0.001257	3.20	115.48	61.70	0.32
US Reach	9.33	2-Year	180.00	657.34	660.48		660.61	0.001794	2.88	62.77	32.08	0.35
US Reach	9.33	50-Year	485.00	657.34	663.07		663.18	0.000626	2.92	234.72	98.05	0.24
US Reach	9.33	500-Year	966.00	657.34	668.23		668.23	0.000034	1.11	2054.57	502.23	0.06
US Reach	9.349	100-Year	568.00	657.36	663.61		663.75	0.000631	3.18	227.43	70.26	0.24
US Reach	9.349	10-Year	319.00	657.36	661.70		661.84	0.001092	3.10	112.45	49.94	0.30
US Reach	9.349	2-Year	180.00	657.36	660.65		660.76	0.001267	2.60	70.49	34.44	0.30
US Reach	9.349	50-Year	485.00	657.36	663.12		663.25	0.000675	3.08	193.93	65.00	0.25
US Reach	9.349	500-Year	966.00	657.36	668.23		668.24	0.000033	1.10	2238.13	600.00	0.06
US Reach	9.366	100-Year	573.00	657.59	663.57		663.90	0.001517	4.79	150.54	45.30	0.37
US Reach	9.366	10-Year	307.00	657.59	661.75		662.03	0.002215	4.31	79.18	32.89	0.42
US Reach	9.366	2-Year	179.00	657.59	660.75		660.96	0.002689	3.72	49.67	26.08	0.43

HEC-RAS Plan: ALP Alignm River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	9.366	50-Year	483.00	657.59	663.10		663.39	0.001558	4.55	129.74	42.06	0.37
US Reach	9.366	500-Year	974.00	657.59	668.16		668.28	0.000300	3.27	469.11	83.00	0.19
US Reach	9.39	100-Year	573.00	658.01	663.70		664.06	0.001629	5.00	141.76	40.68	0.39
US Reach	9.39	10-Year	307.00	658.01	661.96		662.24	0.002096	4.31	79.23	30.93	0.41
US Reach	9.39	2-Year	179.00	658.01	661.00		661.20	0.002231	3.58	52.26	25.60	0.40
US Reach	9.39	50-Year	483.00	658.01	663.24		663.56	0.001645	4.72	123.33	38.07	0.38
US Reach	9.39	500-Year	974.00	658.01	668.26		668.31	0.000151	2.32	1108.70	427.98	0.13
US Reach	9.394	100-Year	573.00	658.24	663.80		664.17	0.001776	5.14	138.26	40.10	0.40
US Reach	9.394	10-Year	307.00	658.24	662.08		662.38	0.002338	4.46	77.29	31.03	0.43
US Reach	9.394	2-Year	179.00	658.24	661.14		661.35	0.002594	3.75	50.40	26.03	0.43
US Reach	9.394	50-Year	483.00	658.24	663.33		663.67	0.001811	4.86	120.13	37.63	0.40
US Reach	9.394	500-Year	974.00	658.24	668.19		668.36	0.000423	3.82	382.53	77.00	0.22
US Reach	9.416	100-Year	573.00	658.30	663.98		664.35	0.001824	5.32	130.85	38.26	0.41
US Reach	9.416	10-Year	307.00	658.30	662.31		662.62	0.002325	4.65	74.52	29.35	0.44
US Reach	9.416	2-Year	179.00	658.30	661.39		661.61	0.002391	3.86	49.74	24.42	0.42
US Reach	9.416	50-Year	483.00	658.30	663.51		663.86	0.001878	5.07	113.58	35.76	0.41
US Reach	9.416	500-Year	974.00	658.30	668.25		668.40	0.000392	3.68	352.75	64.09	0.21
US Reach	9.439	100-Year	573.00	658.31	664.37		664.57	0.001172	3.74	165.72	47.88	0.32
US Reach	9.439	10-Year	307.00	658.31	662.71		662.88	0.001487	3.40	96.31	36.17	0.34
US Reach	9.439	2-Year	179.00	658.31	661.74		661.87	0.001492	2.91	64.27	30.04	0.33
US Reach	9.439	50-Year	483.00	658.31	663.89		664.08	0.001255	3.61	143.87	44.51	0.32
US Reach	9.439	500-Year	974.00	658.31	668.42		668.43	0.000058	1.30	1293.61	359.41	0.08
US Reach	9.459	100-Year	573.00	658.84	664.49		664.67	0.000857	3.66	189.23	67.13	0.28
US Reach	9.459	10-Year	307.00	658.84	662.87		663.01	0.001071	3.17	108.48	41.48	0.30
US Reach	9.459	2-Year	179.00	658.84	661.90		662.01	0.001180	2.68	71.50	34.99	0.30
US Reach	9.459	50-Year	483.00	658.84	664.02		664.19	0.000905	3.52	160.74	49.22	0.29
US Reach	9.459	500-Year	974.00	658.84	668.41		668.45	0.000125	2.04	799.85	255.99	0.12
US Reach	9.476	100-Year	573.00	658.57	664.48		664.87	0.002471	6.14	133.80	46.92	0.47
US Reach	9.476	10-Year	307.00	658.57	662.87		663.28	0.003759	5.91	69.35	33.37	0.55
US Reach	9.476	2-Year	179.00	658.57	661.93		662.31	0.004657	5.38	41.63	25.72	0.58
US Reach	9.476	50-Year	483.00	658.57	664.02		664.41	0.002700	6.03	113.01	42.71	0.49
US Reach	9.476	500-Year	974.00	658.57	668.45		668.46	0.000068	1.48	1256.66	346.00	0.09
US Reach	9.506	100-Year	573.00	656.52	664.77		665.01	0.000492	4.26	180.82	61.97	0.30
US Reach	9.506	10-Year	307.00	656.52	663.27		663.43	0.000412	3.25	113.00	36.01	0.26
US Reach	9.506	2-Year	179.00	656.52	662.35		662.43	0.000309	2.44	82.23	30.19	0.22
US Reach	9.506	50-Year	483.00	656.52	664.33		664.55	0.000472	3.98	156.04	50.60	0.29
US Reach	9.506	500-Year	974.00	656.52	668.40		668.50	0.000155	3.23	504.96	95.00	0.18
US Reach	9.517	100-Year	471.00	659.40	664.33	663.35	665.51	0.001342	8.71	54.08	11.54	0.71
US Reach	9.517	10-Year	253.00	659.40	663.06	662.01	663.69	0.000916	6.39	39.57	11.25	0.60
US Reach	9.517	2-Year	155.00	659.40	662.20	661.28	662.61	0.000753	5.16	30.04	11.05	0.55
US Reach	9.517	50-Year	396.00	659.40	663.98	662.92	664.95	0.001173	7.92	50.03	11.46	0.67
US Reach	9.517	500-Year	801.00	659.40	668.36	664.98	668.55	0.000204	4.61	609.44	407.08	0.28
US Reach	9.522		Culvert									
US Reach	9.527	100-Year	471.00	659.60	665.75	663.54	666.49	0.000715	6.89	68.37	11.83	0.50
US Reach	9.527	10-Year	253.00	659.60	663.22	662.22	663.87	0.000941	6.45	39.20	11.24	0.61
US Reach	9.527	2-Year	155.00	659.60	662.28	661.48	662.73	0.000857	5.40	28.72	11.02	0.59
US Reach	9.527	50-Year	396.00	659.60	664.31	663.12	665.22	0.001083	7.69	51.51	11.49	0.64
US Reach	9.527	500-Year	801.00	659.60	668.25	665.18	668.56	0.000300	5.45	486.07	386.34	0.34
US Reach	9.541	100-Year	471.00	659.94	666.56		666.58	0.000141	1.78	451.01	167.41	0.12
US Reach	9.541	10-Year	253.00	659.94	663.90		663.98	0.000830	3.06	124.87	77.82	0.27
US Reach	9.541	2-Year	155.00	659.94	662.72		662.84	0.001575	3.33	64.41	37.27	0.35
US Reach	9.541	50-Year	396.00	659.94	665.30		665.35	0.000349	2.43	267.57	125.17	0.18
US Reach	9.541	500-Year	801.00	659.94	668.58		668.60	0.000079	1.59	894.14	356.73	0.10
US Reach	9.555	100-Year	471.00	659.80	666.57	662.92	666.59	0.000111	1.38	533.89	253.00	0.10
US Reach	9.555	10-Year	253.00	659.80	663.94	662.06	664.06	0.001031	2.77	104.30	86.64	0.28
US Reach	9.555	2-Year	155.00	659.80	662.84	661.51	662.96	0.001786	2.80	55.37	27.44	0.35
US Reach	9.555	50-Year	396.00	659.80	665.32	662.66	665.37	0.000351	2.08	278.76	163.48	0.18
US Reach	9.555	500-Year	801.00	659.80	668.59	664.19	668.60	0.000046	1.10	1205.47	455.04	0.07
US Reach	9.556		Bridge									
US Reach	9.557	100-Year	471.00	659.80	666.57	662.92	666.59	0.000110	1.38	534.97	253.29	0.10
US Reach	9.557	10-Year	253.00	659.80	663.96	662.06	664.07	0.001009	2.75	105.47	87.40	0.28
US Reach	9.557	2-Year	155.00	659.80	662.86	661.51	662.98	0.001739	2.77	55.92	27.56	0.34
US Reach	9.557	50-Year	396.00	659.80	665.34	662.66	665.39	0.000343	2.06	281.47	164.46	0.17
US Reach	9.557	500-Year	801.00	659.80	668.59	664.19	668.60	0.000046	1.09	1206.20	455.32	0.07

HEC-RAS Plan: ALP Alignm River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	9.573	100-Year	471.00	660.19	666.58		666.62	0.000215	1.80	359.88	156.97	0.14
US Reach	9.573	10-Year	253.00	660.19	664.09		664.19	0.001078	2.55	99.94	50.02	0.28
US Reach	9.573	2-Year	155.00	660.19	663.07		663.17	0.001518	2.50	61.96	32.58	0.32
US Reach	9.573	50-Year	396.00	660.19	665.37		665.45	0.000543	2.38	200.99	106.04	0.21
US Reach	9.573	500-Year	801.00	660.19	668.59		668.61	0.000103	1.56	822.87	448.34	0.10
US Reach	9.588	100-Year	471.00	660.22	666.58		666.63	0.000314	2.05	300.18	147.94	0.17
US Reach	9.588	10-Year	253.00	660.22	664.13		664.25	0.001364	2.78	90.91	37.38	0.31
US Reach	9.588	2-Year	155.00	660.22	663.13		663.25	0.001808	2.71	57.15	30.25	0.35
US Reach	9.588	50-Year	396.00	660.22	665.38		665.49	0.000815	2.71	160.61	84.68	0.26
US Reach	9.588	500-Year	801.00	660.22	668.59		668.62	0.000133	1.70	742.64	379.16	0.12
US Reach	9.595	100-Year	471.00	660.38	666.58		666.66	0.000428	2.34	232.52	87.40	0.19
US Reach	9.595	10-Year	253.00	660.38	664.20		664.33	0.001605	2.93	86.44	37.30	0.34
US Reach	9.595	2-Year	155.00	660.38	663.22		663.35	0.002175	2.89	53.73	29.82	0.38
US Reach	9.595	50-Year	396.00	660.38	665.41		665.54	0.000967	2.87	145.34	61.77	0.28
US Reach	9.595	500-Year	801.00	660.38	668.58		668.64	0.000226	2.18	552.89	370.14	0.15
US Reach	9.623	100-Year	471.00	660.56	666.61		666.76	0.000786	3.16	159.16	46.21	0.26
US Reach	9.623	10-Year	253.00	660.56	664.43		664.61	0.002024	3.40	74.67	31.55	0.38
US Reach	9.623	2-Year	155.00	660.56	663.55		663.71	0.002473	3.15	49.26	26.18	0.40
US Reach	9.623	50-Year	396.00	660.56	665.54		665.73	0.001459	3.59	113.36	38.79	0.34
US Reach	9.623	500-Year	801.00	660.56	668.57		668.71	0.000507	3.23	350.51	279.12	0.22
US Reach	9.635	100-Year	471.00	661.41	666.53		666.89	0.002614	4.89	98.44	30.18	0.45
US Reach	9.635	10-Year	253.00	661.41	664.37		664.90	0.007829	5.84	43.34	21.03	0.72
US Reach	9.635	2-Year	155.00	661.41	663.53		664.04	0.010952	5.70	27.18	17.75	0.81
US Reach	9.635	50-Year	396.00	661.41	665.43		665.96	0.005301	5.85	67.94	25.39	0.62
US Reach	9.635	500-Year	801.00	661.41	668.45		668.82	0.001693	5.03	194.67	173.85	0.39

TAB 8

SECTION 8

BASELINE CONDITIONS ANALYSIS

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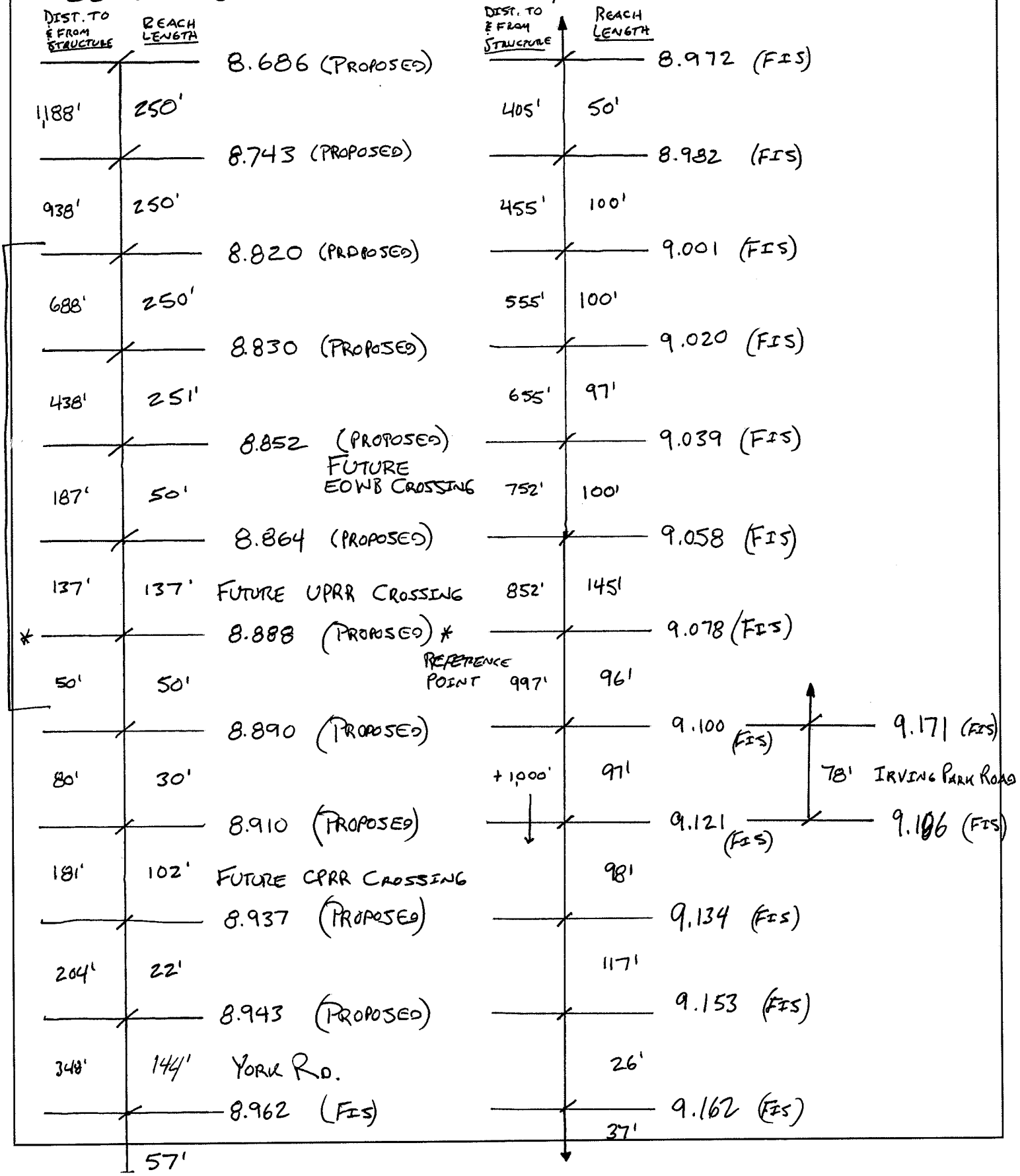
JOB 07-404 - BENSENVILLE DITCH
SHEET NO. 1 OF 1
CALCULATED BY DCO DATE 3/28/11
CHECKED BY JSG DATE 4/23/12
SCALE —

BENSENVILLE DITCH HEC-RAS NATURAL/EXISTING SCHEMATIC



BASELINE / NATURAL / EXISTING

NGVD '29

HEC-RAS Plan: EX_NAT River: Bensenville Ditc Reach: US Reach

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)	
US Reach	6.467	100-Year	1175.00	643.10	649.85	646.19	649.91	0.000508	2.57	908.89	614.01	0.18
US Reach	6.467	10-Year	519.00	643.10	648.55	644.90	648.62	0.000534	2.27	313.44	299.46	0.17
US Reach	6.467	2-Year	210.00	643.10	647.75	644.08	647.77	0.000176	1.18	179.84	69.65	0.10
US Reach	6.467	50-Year	954.00	643.10	649.47	645.79	649.54	0.000555	2.58	692.88	522.86	0.18
US Reach	6.481	100-Year	1175.00	643.10	649.81	646.20	649.98	0.000097	3.72	883.21	603.90	0.26
US Reach	6.481	10-Year	519.00	643.10	648.55	644.90	648.64	0.000054	2.41	314.30	300.30	0.19
US Reach	6.481	2-Year	210.00	643.10	647.75	644.09	647.77	0.000016	1.18	180.05	70.26	0.10
US Reach	6.481	50-Year	954.00	643.10	649.44	645.79	649.60	0.000087	3.40	678.20	516.08	0.24
US Reach	6.497		Bridge									
US Reach	6.513	100-Year	1175.00	642.39	649.88	646.12	650.02	0.000051	2.97	641.53	325.33	0.20
US Reach	6.513	10-Year	519.00	642.39	648.78	644.80	648.82	0.000020	1.64	418.26	144.54	0.12
US Reach	6.513	2-Year	210.00	642.39	647.81	643.98	647.82	0.000006	0.82	295.09	109.91	0.07
US Reach	6.513	50-Year	954.00	642.39	649.55	645.71	649.65	0.000041	2.58	547.58	231.65	0.18
US Reach	6.516	100-Year	1175.00	643.44	649.88		650.02	0.001583	3.18	428.65	103.76	0.23
US Reach	6.516	10-Year	519.00	643.44	648.77		648.82	0.000700	1.84	320.00	92.11	0.15
US Reach	6.516	2-Year	210.00	643.44	647.81		647.82	0.000273	0.98	235.85	81.96	0.09
US Reach	6.516	50-Year	954.00	643.44	649.54		649.65	0.001318	2.79	394.18	100.21	0.21
US Reach	6.518	100-Year	1175.00	642.59	649.91		650.03	0.001495	2.91	427.17	108.12	0.22
US Reach	6.518	10-Year	519.00	642.59	648.78		648.83	0.000668	1.67	318.75	87.66	0.14
US Reach	6.518	2-Year	210.00	642.59	647.81		647.82	0.000261	0.88	239.66	75.22	0.09
US Reach	6.518	50-Year	954.00	642.59	649.56		649.66	0.001251	2.55	391.49	100.42	0.20
US Reach	6.535	100-Year	1175.00	643.47	650.06		650.12	0.000611	2.09	609.85	122.39	0.15
US Reach	6.535	10-Year	519.00	643.47	648.84		648.86	0.000260	1.19	468.92	111.23	0.09
US Reach	6.535	2-Year	210.00	643.47	647.83		647.84	0.000095	0.62	360.11	103.55	0.05
US Reach	6.535	50-Year	954.00	643.47	649.69		649.74	0.000503	1.83	565.52	117.63	0.13
US Reach	6.538	100-Year	1175.00	642.78	650.11		650.16	0.000508	1.82	684.04	136.77	0.13
US Reach	6.538	10-Year	519.00	642.78	648.86		648.88	0.000230	1.05	520.17	126.67	0.08
US Reach	6.538	2-Year	210.00	642.78	647.84		647.84	0.000087	0.56	393.16	120.69	0.05
US Reach	6.538	50-Year	954.00	642.78	649.73		649.77	0.000426	1.59	632.45	133.37	0.12
US Reach	6.551	100-Year	1175.00	643.50	650.15		650.17	0.000224	1.27	1008.44	206.57	0.09
US Reach	6.551	10-Year	519.00	643.50	648.88		648.88	0.000099	0.73	763.02	184.09	0.06
US Reach	6.551	2-Year	210.00	643.50	647.84		647.84	0.000037	0.38	580.03	169.42	0.03
US Reach	6.551	50-Year	954.00	643.50	649.76		649.77	0.000187	1.11	930.51	196.55	0.08
US Reach	6.554	100-Year	1175.00	643.44	650.16	645.03	650.17	0.000155	1.07	1204.12	699.44	0.07
US Reach	6.554	10-Year	519.00	643.44	648.88	644.51	648.89	0.000070	0.62	903.93	635.97	0.05
US Reach	6.554	2-Year	210.00	643.44	647.84	644.17	647.84	0.000026	0.32	685.78	592.57	0.03
US Reach	6.554	50-Year	954.00	643.44	649.76	644.87	649.78	0.000130	0.94	1107.83	673.63	0.07
US Reach	6.557	100-Year	1175.00	644.30	650.17	645.62	650.18	0.000109	0.80	1512.06	936.24	0.06
US Reach	6.557	10-Year	519.00	644.30	648.89	645.19	648.89	0.000055	0.47	1125.15	916.81	0.04
US Reach	6.557	2-Year	210.00	644.30	647.85	644.91	647.85	0.000025	0.26	821.37	896.17	0.03
US Reach	6.557	50-Year	954.00	644.30	649.78	645.49	649.79	0.000094	0.71	1391.88	930.26	0.06
US Reach	6.573	100-Year	1175.00	643.53	650.18	644.72	650.18	0.000041	0.54	2283.72	962.67	0.04
US Reach	6.573	10-Year	519.00	643.53	648.89	644.40	648.89	0.000018	0.31	1763.67	925.22	0.02
US Reach	6.573	2-Year	210.00	643.53	647.85	644.19	647.85	0.000007	0.16	1361.14	895.63	0.01
US Reach	6.573	50-Year	954.00	643.53	649.78	644.62	649.79	0.000034	0.47	2121.36	950.55	0.03
US Reach	6.597	100-Year	1175.00	644.15	650.19	645.39	650.19	0.000025	0.37	3233.90	1249.27	0.03
US Reach	6.597	10-Year	519.00	644.15	648.89	645.08	648.89	0.000013	0.22	2387.87	1217.20	0.02
US Reach	6.597	2-Year	210.00	644.15	647.85	644.81	647.85	0.000006	0.12	1732.78	1189.93	0.01
US Reach	6.597	50-Year	954.00	644.15	649.79	645.33	649.79	0.000021	0.32	2972.14	1243.59	0.03
US Reach	6.611	100-Year	1175.00	643.59	650.19	644.64	650.19	0.000018	0.37	3375.78	1155.57	0.03
US Reach	6.611	10-Year	519.00	643.59	648.89	644.38	648.89	0.000008	0.21	2626.22	1122.08	0.02
US Reach	6.611	2-Year	210.00	643.59	647.85	644.18	647.85	0.000003	0.11	2036.88	1095.85	0.01
US Reach	6.611	50-Year	954.00	643.59	649.79	644.57	649.79	0.000015	0.32	3143.29	1145.07	0.02
US Reach	6.636	100-Year	1175.00	643.92	650.19		650.20	0.000162	0.90	1317.06	289.50	0.07
US Reach	6.636	10-Year	519.00	643.92	648.89		648.90	0.000090	0.55	955.51	275.66	0.05
US Reach	6.636	2-Year	210.00	643.92	647.85		647.85	0.000047	0.31	670.25	269.88	0.03
US Reach	6.636	50-Year	954.00	643.92	649.79		649.80	0.000142	0.80	1204.81	280.62	0.07
US Reach	6.648	100-Year	1175.00	643.65	650.20		650.21	0.000128	0.96	1274.44	236.13	0.07
US Reach	6.648	10-Year	519.00	643.65	648.90		648.90	0.000056	0.55	980.39	217.57	0.04
US Reach	6.648	2-Year	210.00	643.65	647.85		647.85	0.000020	0.28	759.90	203.87	0.02
US Reach	6.648	50-Year	954.00	643.65	649.80		649.81	0.000106	0.84	1181.72	230.16	0.06
US Reach	6.649	100-Year	1175.00	643.75	650.18		650.22	0.000362	1.63	782.70	169.71	0.11
US Reach	6.649	10-Year	519.00	643.75	648.89		648.91	0.000159	0.93	594.07	134.04	0.07

HEC-RAS Plan: EX_NAT River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	6.649	2-Year	210.00	643.75	647.85		647.85	0.000058	0.48	458.02	126.52	0.04
US Reach	6.649	50-Year	954.00	643.75	649.78		649.81	0.000301	1.42	719.95	149.25	0.10
US Reach	6.681	100-Year	1175.00	643.04	650.25		650.29	0.000433	1.55	758.60	141.89	0.12
US Reach	6.681	10-Year	519.00	643.04	648.92		648.94	0.000198	0.90	575.22	135.01	0.08
US Reach	6.681	2-Year	210.00	643.04	647.86		647.86	0.000078	0.48	434.57	129.49	0.05
US Reach	6.681	50-Year	954.00	643.04	649.84		649.87	0.000363	1.36	701.51	139.79	0.11
US Reach	6.686	100-Year	1175.00	644.75	650.25		650.30	0.000601	1.89	674.82	169.50	0.14
US Reach	6.686	10-Year	519.00	644.75	648.93		648.94	0.000321	1.15	479.65	132.77	0.10
US Reach	6.686	2-Year	210.00	644.75	647.86		647.87	0.000148	0.64	343.19	123.65	0.06
US Reach	6.686	50-Year	954.00	644.75	649.85		649.89	0.000526	1.68	609.15	149.36	0.13
US Reach	6.724	100-Year	1175.00	644.80	650.38		650.44	0.000729	2.10	610.81	160.18	0.16
US Reach	6.724	10-Year	519.00	644.80	648.99		649.02	0.000401	1.29	426.19	116.28	0.11
US Reach	6.724	2-Year	210.00	644.80	647.89		647.90	0.000190	0.73	302.49	108.60	0.07
US Reach	6.724	50-Year	954.00	644.80	649.95		650.01	0.000644	1.88	545.28	131.50	0.15
US Reach	6.772	100-Year	1175.00	645.51	650.57		650.62	0.000666	1.70	689.94	156.97	0.14
US Reach	6.772	10-Year	519.00	645.51	649.11		649.13	0.000448	1.11	465.68	149.06	0.11
US Reach	6.772	2-Year	210.00	645.51	647.95		647.96	0.000308	0.71	297.44	142.84	0.09
US Reach	6.772	50-Year	954.00	645.51	650.13		650.17	0.000610	1.54	621.02	154.58	0.14
US Reach	6.799	100-Year	1175.00	644.19	650.65		650.67	0.000236	1.32	936.18	163.00	0.09
US Reach	6.799	10-Year	519.00	644.19	649.15		649.16	0.000115	0.77	698.04	154.64	0.06
US Reach	6.799	2-Year	210.00	644.19	647.97		647.98	0.000048	0.42	520.41	148.09	0.04
US Reach	6.799	50-Year	954.00	644.19	650.19		650.21	0.000201	1.16	863.09	160.48	0.08
US Reach	6.838	100-Year	1175.00	645.72	650.71		650.75	0.000680	1.72	688.00	165.26	0.14
US Reach	6.838	10-Year	519.00	645.72	649.18		649.20	0.000546	1.17	444.22	154.17	0.12
US Reach	6.838	2-Year	210.00	645.72	647.99		648.00	0.000465	0.79	265.17	146.31	0.10
US Reach	6.838	50-Year	954.00	645.72	650.25		650.29	0.000651	1.56	612.89	161.93	0.14
US Reach	6.875	100-Year	1175.00	645.00	650.81		650.85	0.000331	1.46	849.56	165.21	0.11
US Reach	6.875	10-Year	519.00	645.00	649.25		649.26	0.000192	0.90	599.39	154.94	0.08
US Reach	6.875	2-Year	210.00	645.00	648.03		648.04	0.000100	0.52	415.53	146.94	0.05
US Reach	6.875	50-Year	954.00	645.00	650.35		650.37	0.000293	1.30	772.88	162.13	0.10
US Reach	6.894	100-Year	1175.00	645.03	650.85		650.88	0.000282	1.35	909.07	173.80	0.10
US Reach	6.894	10-Year	519.00	645.03	649.27		649.28	0.000164	0.83	643.51	163.47	0.07
US Reach	6.894	2-Year	210.00	645.03	648.04		648.05	0.000086	0.48	447.01	156.67	0.05
US Reach	6.894	50-Year	954.00	645.03	650.38		650.40	0.000250	1.20	827.70	170.29	0.09
US Reach	6.925	100-Year	1175.00	644.62	650.90		650.93	0.000331	1.24	946.91	205.49	0.10
US Reach	6.925	10-Year	519.00	644.62	649.30		649.31	0.000240	0.83	625.99	195.76	0.08
US Reach	6.925	2-Year	210.00	644.62	648.06		648.07	0.000183	0.54	387.82	188.22	0.07
US Reach	6.925	50-Year	954.00	644.62	650.42		650.44	0.000307	1.12	849.17	202.58	0.10
US Reach	6.932	100-Year	1175.00	645.08	650.92		650.94	0.000179	1.08	1134.49	212.62	0.08
US Reach	6.932	10-Year	519.00	645.08	649.31		649.32	0.000106	0.67	801.22	202.55	0.06
US Reach	6.932	2-Year	210.00	645.08	648.07		648.07	0.000057	0.39	554.01	194.74	0.04
US Reach	6.932	50-Year	954.00	645.08	650.44		650.45	0.000159	0.96	1033.03	209.61	0.07
US Reach	6.97	100-Year	1175.00	645.13	650.95		650.97	0.000128	0.91	1336.28	247.88	0.07
US Reach	6.97	10-Year	519.00	645.13	649.33		649.34	0.000076	0.56	942.76	237.61	0.05
US Reach	6.97	2-Year	210.00	645.13	648.08		648.08	0.000042	0.33	649.77	229.67	0.03
US Reach	6.97	50-Year	954.00	645.13	650.47		650.48	0.000114	0.81	1216.77	244.81	0.06
US Reach	7.001	100-Year	1175.00	644.63	650.98		650.99	0.000196	1.03	1164.56	239.64	0.08
US Reach	7.001	10-Year	519.00	644.63	649.35		649.35	0.000140	0.68	780.36	232.04	0.06
US Reach	7.001	2-Year	210.00	644.63	648.09		648.09	0.000103	0.44	491.77	226.16	0.05
US Reach	7.001	50-Year	954.00	644.63	650.49		650.50	0.000181	0.93	1048.37	237.37	0.08
US Reach	7.027	100-Year	1175.00	645.20	651.00		651.02	0.000130	0.91	1327.97	245.72	0.07
US Reach	7.027	10-Year	519.00	645.20	649.36		649.37	0.000079	0.57	933.21	236.20	0.05
US Reach	7.027	2-Year	210.00	645.20	648.10		648.10	0.000044	0.33	638.87	228.84	0.03
US Reach	7.027	50-Year	954.00	645.20	650.51		650.52	0.000116	0.81	1208.34	242.88	0.06
US Reach	7.058	100-Year	1175.00	645.25	651.02		651.04	0.000132	0.92	1321.49	245.74	0.07
US Reach	7.058	10-Year	519.00	645.25	649.38		649.38	0.000081	0.57	924.78	236.12	0.05
US Reach	7.058	2-Year	210.00	645.25	648.11		648.11	0.000046	0.34	629.25	228.69	0.04
US Reach	7.058	50-Year	954.00	645.25	650.53		650.54	0.000118	0.82	1201.31	242.86	0.06
US Reach	7.059	100-Year	1175.00	644.25	651.03		651.04	0.000077	0.78	1558.00	247.73	0.05
US Reach	7.059	10-Year	519.00	644.25	649.38		649.38	0.000039	0.46	1156.76	239.04	0.04
US Reach	7.059	2-Year	210.00	644.25	648.11		648.11	0.000017	0.25	856.82	232.33	0.02
US Reach	7.059	50-Year	954.00	644.25	650.54		650.54	0.000066	0.68	1436.62	245.13	0.05
US Reach	7.067	100-Year	1175.00	643.02	651.03		651.04	0.000094	0.86	1440.24	240.48	0.06

HEC-RAS Plan: EX_NAT River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	7.067	10-Year	519.00	643.02	649.38		649.38	0.000050	0.52	1050.24	232.25	0.04
US Reach	7.067	2-Year	210.00	643.02	648.11		648.11	0.000023	0.29	758.51	225.90	0.03
US Reach	7.067	50-Year	954.00	643.02	650.54		650.55	0.000081	0.76	1322.30	238.02	0.05
US Reach	7.07	100-Year	1175.00	644.25	651.03		651.04	0.000103	0.86	1419.73	247.53	0.06
US Reach	7.07	10-Year	519.00	644.25	649.38		649.39	0.000057	0.52	1020.60	236.10	0.04
US Reach	7.07	2-Year	210.00	644.25	648.11		648.11	0.000028	0.29	725.45	227.28	0.03
US Reach	7.07	50-Year	954.00	644.25	650.54		650.55	0.000090	0.76	1298.52	244.12	0.06
US Reach	7.077	100-Year	1175.00	644.05	650.59	648.35	651.50	0.000498	7.70	152.68	97.90	0.53
US Reach	7.077	10-Year	519.00	644.05	649.24	646.57	649.53	0.000210	4.28	121.18	74.56	0.33
US Reach	7.077	2-Year	210.00	644.05	648.07	645.44	648.15	0.000081	2.24	93.60	58.96	0.20
US Reach	7.077	50-Year	954.00	644.05	650.21	647.79	650.89	0.000401	6.63	143.81	91.33	0.47
US Reach	7.094		Culvert									
US Reach	7.111	100-Year	1175.00	644.40	651.65	648.66	652.39	0.000345	6.89	170.48	111.95	0.45
US Reach	7.111	10-Year	519.00	644.40	649.50	646.88	649.79	0.000218	4.33	119.87	87.62	0.34
US Reach	7.111	2-Year	210.00	644.40	648.14	645.75	648.23	0.000100	2.39	87.90	72.26	0.22
US Reach	7.111	50-Year	954.00	644.40	650.86	648.11	651.47	0.000334	6.28	151.82	102.98	0.44
US Reach	7.122	100-Year	1108.00	644.45	652.30		652.47	0.000307	4.00	349.90	70.13	0.25
US Reach	7.122	10-Year	540.00	644.45	649.68		649.82	0.000420	3.57	186.93	54.43	0.28
US Reach	7.122	2-Year	273.00	644.45	648.14		648.24	0.000478	3.02	110.15	45.18	0.28
US Reach	7.122	50-Year	917.00	644.45	651.36		651.54	0.000368	4.03	287.01	64.53	0.27
US Reach	7.141	100-Year	1032.00	644.72	652.39		652.54	0.000296	3.87	337.18	69.04	0.25
US Reach	7.141	10-Year	507.00	644.72	649.79		649.93	0.000423	3.51	178.30	53.47	0.28
US Reach	7.141	2-Year	250.00	644.72	648.27		648.36	0.000477	2.93	103.68	44.32	0.28
US Reach	7.141	50-Year	858.00	644.72	651.47		651.63	0.000358	3.91	276.19	63.51	0.27
US Reach	7.154	100-Year	1032.00	645.00	652.45		652.63	0.000335	4.04	322.71	67.77	0.26
US Reach	7.154	10-Year	507.00	645.00	649.90		650.05	0.000492	3.70	168.93	52.41	0.30
US Reach	7.154	2-Year	250.00	645.00	648.39		648.50	0.000581	3.14	96.70	43.36	0.30
US Reach	7.154	50-Year	858.00	645.00	651.55		651.73	0.000406	4.08	263.88	62.34	0.28
US Reach	7.25	100-Year	1032.00	645.27	652.53		652.72	0.000377	4.21	309.84	66.62	0.28
US Reach	7.25	10-Year	507.00	645.27	650.02		650.18	0.000561	3.87	161.18	51.52	0.31
US Reach	7.25	2-Year	250.00	645.27	648.53		648.66	0.000681	3.31	91.43	42.63	0.32
US Reach	7.25	50-Year	858.00	645.27	651.65		651.84	0.000455	4.24	253.17	61.30	0.30
US Reach	7.382	100-Year	1032.00	645.54	652.62		652.82	0.000420	4.38	297.86	65.53	0.29
US Reach	7.382	10-Year	507.00	645.54	650.15		650.34	0.000633	4.03	154.46	50.73	0.33
US Reach	7.382	2-Year	250.00	645.54	648.71		648.85	0.000775	3.47	87.32	42.04	0.34
US Reach	7.382	50-Year	858.00	645.54	651.76		651.96	0.000508	4.41	243.38	60.34	0.31
US Reach	7.426	100-Year	1032.00	645.81	652.72		652.94	0.000467	4.54	286.79	64.51	0.30
US Reach	7.426	10-Year	507.00	645.81	650.31		650.51	0.000704	4.18	148.76	50.05	0.35
US Reach	7.426	2-Year	250.00	645.81	648.90		649.05	0.000858	3.59	84.25	41.60	0.36
US Reach	7.426	50-Year	858.00	645.81	651.88		652.10	0.000563	4.56	234.54	59.45	0.33
US Reach	7.450	100-Year	1032.00	646.08	652.83		653.07	0.000516	4.69	276.62	63.55	0.32
US Reach	7.450	10-Year	507.00	646.08	650.49		650.69	0.000771	4.31	144.03	49.48	0.36
US Reach	7.450	2-Year	250.00	646.08	649.12		649.28	0.000925	3.68	82.04	41.28	0.37
US Reach	7.450	50-Year	858.00	646.08	652.01		652.25	0.000619	4.72	226.65	58.65	0.34
US Reach	7.50	100-Year	1032.00	646.35	652.96		653.21	0.000566	4.85	267.37	62.68	0.33
US Reach	7.50	10-Year	507.00	646.35	650.68		650.90	0.000832	4.43	140.20	49.01	0.38
US Reach	7.50	2-Year	250.00	646.35	649.35		649.52	0.000975	3.75	80.52	41.06	0.38
US Reach	7.50	50-Year	858.00	646.35	652.17		652.42	0.000675	4.86	219.69	57.93	0.36
US Reach	7.54	100-Year	1032.00	646.62	653.09		653.36	0.000618	4.99	259.06	61.87	0.35
US Reach	7.54	10-Year	507.00	646.62	650.89		651.12	0.000886	4.52	137.15	48.64	0.39
US Reach	7.54	2-Year	250.00	646.62	649.60		649.77	0.001010	3.80	79.50	40.91	0.39
US Reach	7.54	50-Year	858.00	646.62	652.33		652.60	0.000730	4.99	213.65	57.30	0.37
US Reach	7.57	100-Year	1032.00	646.75	653.16		653.44	0.000643	5.06	255.35	61.51	0.35
US Reach	7.57	10-Year	507.00	646.75	650.99		651.22	0.000909	4.56	135.90	48.48	0.39
US Reach	7.57	2-Year	250.00	646.75	649.72		649.89	0.001024	3.81	79.12	40.86	0.39
US Reach	7.57	50-Year	858.00	646.75	652.41		652.69	0.000755	5.05	211.02	57.03	0.37
US Reach	7.58	100-Year	1032.00	646.80	653.03	650.46	653.66	0.001450	6.37	161.89	62.39	0.45
US Reach	7.58	10-Year	507.00	646.80	650.99	649.08	651.33	0.001311	4.65	108.94	50.17	0.40
US Reach	7.58	2-Year	250.00	646.80	649.78	648.22	649.94	0.000998	3.23	77.36	42.88	0.33
US Reach	7.58	50-Year	858.00	646.80	652.33	650.04	652.88	0.001494	5.97	143.62	58.17	0.45
US Reach	8.000		Culvert									
US Reach	8.546	100-Year	963.00	651.62	658.06	655.13	658.58	0.001128	5.75	167.46	63.67	0.40

HEC-RAS Plan: EX_NAT River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	8.546	10-Year	479.00	651.62	655.66	653.82	655.99	0.001320	4.56	105.06	49.27	0.40
US Reach	8.546	2-Year	236.00	651.62	654.14	652.99	654.34	0.001550	3.60	65.48	40.13	0.40
US Reach	8.546	50-Year	805.00	651.62	657.34	654.73	657.79	0.001175	5.42	148.58	59.32	0.40
US Reach	8.555	100-Year	927.00	651.67	658.46		658.64	0.000402	4.16	281.33	64.89	0.28
US Reach	8.555	10-Year	467.00	651.67	655.84		656.05	0.000825	4.30	132.93	48.48	0.37
US Reach	8.555	2-Year	228.00	651.67	654.20		654.43	0.001671	4.38	62.29	34.48	0.49
US Reach	8.555	50-Year	776.00	651.67	657.67		657.86	0.000480	4.18	231.93	59.93	0.30
US Reach	8.579	100-Year	927.00	651.94	658.65		658.71	0.000123	2.29	491.65	99.82	0.16
US Reach	8.579	10-Year	467.00	651.94	656.11		656.16	0.000219	2.22	257.35	84.57	0.19
US Reach	8.579	2-Year	228.00	651.94	654.58		654.62	0.000379	2.14	134.85	75.38	0.23
US Reach	8.579	50-Year	776.00	651.94	657.87		657.93	0.000142	2.26	416.04	95.16	0.16
US Reach	8.642	100-Year	927.00	652.22	658.69		658.74	0.000104	2.04	544.66	111.94	0.14
US Reach	8.642	10-Year	467.00	652.22	656.17		656.21	0.000197	2.03	281.66	96.82	0.18
US Reach	8.642	2-Year	228.00	652.22	654.68		654.72	0.000379	2.04	143.96	85.98	0.23
US Reach	8.642	50-Year	776.00	652.22	657.92		657.96	0.000121	2.03	460.08	107.31	0.15
US Reach	8.686	100-Year	927.00	652.49	658.73		658.76	0.000062	1.54	723.11	150.82	0.11
US Reach	8.686	10-Year	467.00	652.49	656.23		656.26	0.000134	1.61	364.61	135.81	0.15
US Reach	8.686	2-Year	228.00	652.49	654.78		654.81	0.000328	1.81	174.40	125.23	0.21
US Reach	8.686	50-Year	776.00	652.49	657.96		657.99	0.000074	1.54	608.98	146.21	0.12
US Reach	8.743	100-Year	927.00	652.76	658.75	655.10	658.77	0.000073	1.63	690.74	178.06	0.12
US Reach	8.743	10-Year	467.00	652.76	656.27	654.65	656.30	0.000200	1.89	328.79	162.99	0.18
US Reach	8.743	2-Year	228.00	652.76	654.88	654.26	654.93	0.000711	2.53	135.75	146.00	0.31
US Reach	8.743	50-Year	776.00	652.76	657.98	654.97	658.01	0.000091	1.66	577.07	173.41	0.13
US Reach	8.820	100-Year	826.00	653.03	658.75	655.37	658.81	0.000160	2.34	414.66	236.00	0.17
US Reach	8.820	10-Year	432.00	653.03	656.31	654.85	656.38	0.000439	2.67	200.71	221.16	0.26
US Reach	8.820	2-Year	213.00	653.03	655.07	654.48	655.14	0.000968	2.88	100.15	138.73	0.36
US Reach	8.820	50-Year	700.00	653.03	657.99	655.22	658.05	0.000204	2.40	346.09	231.38	0.19
US Reach	8.830	100-Year	826.00	653.30	658.66		658.96	0.000882	5.26	194.91	55.92	0.40
US Reach	8.830	10-Year	432.00	653.30	656.22		656.75	0.003274	6.75	77.23	40.65	0.70
US Reach	8.830	2-Year	213.00	653.30	655.28		655.68	0.004037	5.76	44.00	31.14	0.73
US Reach	8.830	50-Year	700.00	653.30	657.89		658.24	0.001227	5.60	153.88	51.12	0.46
US Reach	8.852	100-Year	826.00	653.57	658.88		659.19	0.000918	5.33	192.10	55.61	0.41
US Reach	8.852	10-Year	432.00	653.57	657.01		657.33	0.001613	5.29	99.26	43.91	0.50
US Reach	8.852	2-Year	213.00	653.57	656.08		656.28	0.001518	4.15	61.45	34.33	0.46
US Reach	8.852	50-Year	700.00	653.57	658.21		658.54	0.001180	5.52	156.08	51.39	0.45
US Reach	8.864	100-Year	826.00	653.62	658.92	656.27	659.24	0.000928	4.59	180.11	65.79	0.35
US Reach	8.864	10-Year	432.00	653.62	657.24	655.34	657.43	0.000904	3.51	123.07	55.72	0.33
US Reach	8.864	2-Year	213.00	653.62	656.28	654.69	656.36	0.000615	2.36	90.38	49.95	0.25
US Reach	8.864	50-Year	700.00	653.62	658.31	655.97	658.61	0.001001	4.39	159.46	62.15	0.36
US Reach	8.87		Culvert									
US Reach	8.888	100-Year	757.00	653.77	659.13	656.26	659.39	0.000752	4.16	182.09	66.14	0.32
US Reach	8.888	10-Year	403.00	653.77	657.37	655.39	657.54	0.000798	3.29	122.55	55.63	0.31
US Reach	8.888	2-Year	199.00	653.77	656.34	654.80	656.42	0.000598	2.27	87.49	49.44	0.25
US Reach	8.888	50-Year	648.00	653.77	658.51	656.00	658.76	0.000828	4.02	161.11	62.44	0.33
US Reach	8.9	100-Year	757.00	653.90	659.34	655.81	659.43	0.000220	2.39	316.85	69.12	0.20
US Reach	8.9	10-Year	403.00	653.90	657.51	655.18	657.57	0.000258	2.04	197.70	61.56	0.20
US Reach	8.9	2-Year	199.00	653.90	656.41	654.71	656.45	0.000217	1.50	132.31	57.43	0.17
US Reach	8.9	50-Year	648.00	653.90	658.71	655.64	658.80	0.000248	2.36	274.36	66.07	0.20
US Reach	8.91	100-Year	757.00	653.90	659.31	656.03	659.48	0.000315	3.25	232.71	69.42	0.25
US Reach	8.91	10-Year	403.00	653.90	657.50	655.29	657.60	0.000349	2.61	154.69	62.24	0.24
US Reach	8.91	2-Year	199.00	653.90	656.41	654.77	656.46	0.000283	1.84	107.86	57.93	0.21
US Reach	8.91	50-Year	648.00	653.90	658.69	655.82	658.84	0.000348	3.15	205.78	66.94	0.25
US Reach	8.932		Culvert									
US Reach	8.937	100-Year	684.00	654.00	659.37	656.40	659.61	0.000125	3.92	174.61	43.00	0.30
US Reach	8.937	10-Year	392.00	654.00	657.53	655.66	657.71	0.000166	3.42	114.78	43.00	0.32
US Reach	8.937	2-Year	202.00	654.00	656.43	655.06	656.53	0.000154	2.56	78.92	43.00	0.29
US Reach	8.937	50-Year	594.00	654.00	658.74	656.19	658.97	0.000143	3.85	154.10	43.00	0.31
US Reach	8.943	100-Year	684.00	654.10	659.31	657.25	659.89	0.000507	6.11	111.95	22.74	0.47
US Reach	8.943	10-Year	392.00	654.10	657.48	656.28	657.93	0.000632	5.39	72.68	21.50	0.52
US Reach	8.943	2-Year	202.00	654.10	656.40	655.50	656.66	0.000545	4.09	49.45	21.50	0.47
US Reach	8.943	50-Year	594.00	654.10	658.68	656.97	659.24	0.000587	6.04	98.41	21.52	0.50
US Reach	8.952499		Culvert									

HEC-RAS Plan: EX_NAT River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	8.962	100-Year	684.00	654.36	659.71	657.51	660.26	0.000388	5.95	114.92	23.49	0.45
US Reach	8.962	10-Year	392.00	654.36	657.85	656.54	658.28	0.000488	5.22	75.07	21.50	0.49
US Reach	8.962	2-Year	202.00	654.36	656.65	655.76	656.91	0.000472	4.11	49.18	21.50	0.48
US Reach	8.962	50-Year	594.00	654.36	659.09	657.24	659.62	0.000440	5.84	101.67	22.27	0.47
US Reach	8.972	100-Year	568.00	654.57	660.15		660.33	0.001291	3.42	166.26	49.12	0.32
US Reach	8.972	10-Year	319.00	654.57	658.10		658.34	0.003057	3.98	80.07	35.21	0.47
US Reach	8.972	2-Year	180.00	654.57	656.61		657.02	0.009584	5.11	35.19	25.22	0.76
US Reach	8.972	50-Year	485.00	654.57	659.49		659.69	0.001671	3.57	135.82	44.60	0.36
US Reach	8.982	100-Year	568.00	654.96	660.23		660.39	0.001084	3.15	180.62	53.61	0.30
US Reach	8.982	10-Year	319.00	654.96	658.29		658.48	0.002385	3.54	90.04	39.40	0.41
US Reach	8.982	2-Year	180.00	654.96	657.13		657.34	0.004057	3.65	49.32	30.86	0.51
US Reach	8.982	50-Year	485.00	654.96	659.61		659.77	0.001405	3.27	148.34	49.10	0.33
US Reach	9.001	100-Year	568.00	654.83	660.20		660.65	0.003125	6.69	131.52	45.26	0.54
US Reach	9.001	10-Year	319.00	654.83	658.38		659.00	0.007159	7.34	61.24	31.59	0.75
US Reach	9.001	2-Year	180.00	654.83	657.49		658.01	0.008993	6.48	36.30	24.83	0.80
US Reach	9.001	50-Year	485.00	654.83	659.58		660.10	0.004135	7.02	105.03	40.83	0.61
US Reach	9.02	100-Year	568.00	654.90	660.68		660.85	0.001112	3.34	170.62	47.26	0.30
US Reach	9.02	10-Year	319.00	654.90	659.17		659.31	0.001361	3.01	105.81	38.31	0.32
US Reach	9.02	2-Year	180.00	654.90	658.22		658.32	0.001235	2.49	72.30	32.55	0.29
US Reach	9.02	50-Year	485.00	654.90	660.18		660.35	0.001246	3.29	147.67	44.41	0.32
US Reach	9.039	100-Year	568.00	655.06	660.79		660.97	0.001209	3.37	169.26	49.91	0.32
US Reach	9.039	10-Year	319.00	655.06	659.30		659.45	0.001550	3.10	102.82	39.50	0.34
US Reach	9.039	2-Year	180.00	655.06	658.34		658.45	0.001514	2.64	68.19	32.88	0.32
US Reach	9.039	50-Year	485.00	655.06	660.30		660.47	0.001356	3.33	145.75	46.46	0.33
US Reach	9.058	100-Year	568.00	655.35	660.88		661.12	0.001518	3.89	148.34	44.83	0.35
US Reach	9.058	10-Year	319.00	655.35	659.45		659.64	0.002049	3.51	90.81	35.42	0.39
US Reach	9.058	2-Year	180.00	655.35	658.50		658.64	0.002004	3.00	60.00	29.22	0.37
US Reach	9.058	50-Year	485.00	655.35	660.42		660.64	0.001734	3.80	128.14	41.75	0.37
US Reach	9.078	100-Year	568.00	655.56	661.13		661.30	0.001018	3.35	172.45	48.71	0.29
US Reach	9.078	10-Year	319.00	655.56	659.75		659.87	0.001242	2.88	110.86	40.35	0.31
US Reach	9.078	2-Year	180.00	655.56	658.77		658.86	0.001178	2.42	74.52	34.00	0.29
US Reach	9.078	50-Year	485.00	655.56	660.68		660.85	0.001103	3.23	151.41	46.07	0.30
US Reach	9.1	100-Year	568.00	655.63	661.21		661.43	0.001338	3.78	153.86	45.48	0.34
US Reach	9.1	10-Year	319.00	655.63	659.86		660.02	0.001671	3.25	98.21	37.08	0.35
US Reach	9.1	2-Year	180.00	655.63	658.88		659.00	0.001629	2.77	65.05	30.73	0.34
US Reach	9.1	50-Year	485.00	655.63	660.77		660.98	0.001449	3.64	134.77	42.80	0.34
US Reach	9.121	100-Year	568.00	655.81	661.34		661.56	0.001314	3.76	155.72	46.97	0.33
US Reach	9.121	10-Year	319.00	655.81	660.02		660.18	0.001629	3.20	99.83	38.17	0.35
US Reach	9.121	2-Year	180.00	655.81	659.04		659.16	0.001633	2.74	65.57	31.48	0.34
US Reach	9.121	50-Year	485.00	655.81	660.92		661.12	0.001411	3.61	136.51	44.14	0.34
US Reach	9.134	100-Year	568.00	655.54	661.51		661.66	0.000822	3.17	184.39	49.86	0.27
US Reach	9.134	10-Year	319.00	655.54	660.20		660.30	0.000872	2.57	124.23	42.18	0.26
US Reach	9.134	2-Year	180.00	655.54	659.20		659.27	0.000811	2.11	85.26	35.89	0.24
US Reach	9.134	50-Year	485.00	655.54	661.09		661.23	0.000848	3.01	164.07	47.40	0.27
US Reach	9.153	100-Year	568.00	655.96	661.47		661.84	0.001149	4.89	121.30	37.31	0.43
US Reach	9.153	10-Year	319.00	655.96	660.22		660.47	0.001305	4.05	78.97	30.23	0.43
US Reach	9.153	2-Year	180.00	655.96	659.24		659.43	0.001341	3.45	52.11	24.85	0.42
US Reach	9.153	50-Year	485.00	655.96	661.07		661.41	0.001206	4.66	106.77	35.04	0.43
US Reach	9.162	100-Year	568.00	656.18	661.60		661.87	0.000799	4.23	140.60	41.41	0.37
US Reach	9.162	10-Year	319.00	656.18	660.32		660.51	0.000873	3.46	92.49	33.89	0.36
US Reach	9.162	2-Year	180.00	656.18	659.33		659.46	0.000898	2.92	61.69	28.30	0.35
US Reach	9.162	50-Year	485.00	656.18	661.19		661.44	0.000829	4.02	124.21	39.01	0.37
US Reach	9.171	100-Year	568.00	655.76	661.44	659.21	662.08	0.000558	6.45	88.00	15.50	0.48
US Reach	9.171	10-Year	319.00	655.76	660.27	658.12	660.59	0.000336	4.56	69.92	15.50	0.38
US Reach	9.171	2-Year	180.00	655.76	659.33	657.36	659.49	0.000210	3.26	55.29	15.50	0.30
US Reach	9.171	50-Year	485.00	655.76	661.07	658.86	661.61	0.000490	5.89	82.30	15.50	0.45
US Reach	9.178499		Culvert									
US Reach	9.186	100-Year	568.00	655.76	661.90	659.21	662.46	0.000449	5.96	95.23	15.50	0.42
US Reach	9.186	10-Year	319.00	655.76	660.49	658.12	660.78	0.000293	4.35	73.33	15.50	0.35
US Reach	9.186	2-Year	180.00	655.76	659.43	657.36	659.59	0.000193	3.16	56.92	15.50	0.29
US Reach	9.186	50-Year	485.00	655.76	661.45	658.86	661.92	0.000404	5.50	88.22	15.50	0.41
US Reach	9.189	100-Year	568.00	656.24	662.40		662.58	0.000138	3.31	171.49	47.63	0.31

HEC-RAS Plan: EX_NAT River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	9.189	10-Year	319.00	656.24	660.67		660.83	0.000175	3.19	99.95	34.93	0.33
US Reach	9.189	2-Year	180.00	656.24	659.47		659.60	0.000188	2.86	62.98	27.46	0.33
US Reach	9.189	50-Year	485.00	656.24	661.84		662.01	0.000153	3.32	145.89	43.51	0.32
US Reach	9.197	100-Year	568.00	656.23	662.47		662.59	0.000643	2.88	209.13	58.58	0.24
US Reach	9.197	10-Year	319.00	656.23	660.74		660.85	0.001028	2.68	119.87	44.80	0.28
US Reach	9.197	2-Year	180.00	656.23	659.52		659.62	0.001402	2.52	71.35	34.81	0.31
US Reach	9.197	50-Year	485.00	656.23	661.91		662.03	0.000743	2.83	177.80	54.15	0.25
US Reach	9.206	100-Year	568.00	656.27	662.47		662.64	0.000811	3.27	182.98	48.97	0.27
US Reach	9.206	10-Year	319.00	656.27	660.77		660.91	0.001201	2.96	108.37	38.77	0.30
US Reach	9.206	2-Year	180.00	656.27	659.58		659.69	0.001543	2.71	66.52	31.21	0.33
US Reach	9.206	50-Year	485.00	656.27	661.92		662.08	0.000918	3.20	157.01	45.69	0.28
US Reach	9.24	100-Year	568.00	657.00	662.58		662.74	0.000388	3.24	201.97	84.51	0.26
US Reach	9.24	10-Year	319.00	657.00	660.93		661.05	0.000553	2.90	112.49	41.81	0.29
US Reach	9.24	2-Year	180.00	657.00	659.79		659.89	0.000790	2.61	68.95	34.50	0.33
US Reach	9.24	50-Year	485.00	657.00	662.04		662.19	0.000439	3.18	164.05	56.37	0.27
US Reach	9.246	100-Year	568.00	656.02	662.34	659.73	662.98	0.000230	6.42	88.49	68.83	0.45
US Reach	9.246	10-Year	319.00	656.02	660.82	658.54	661.17	0.000182	4.75	67.17	46.15	0.38
US Reach	9.246	2-Year	180.00	656.02	659.75	657.74	659.93	0.000134	3.45	52.21	35.00	0.31
US Reach	9.246	50-Year	485.00	656.02	661.85	659.36	662.40	0.000220	5.95	81.57	58.40	0.43
US Reach	9.2505		Culvert									
US Reach	9.255	100-Year	568.00	656.02	663.14	659.73	663.39	0.000094	4.45	317.21	190.27	0.29
US Reach	9.255	10-Year	319.00	656.02	660.97	658.54	661.30	0.000163	4.60	69.36	48.02	0.36
US Reach	9.255	2-Year	180.00	656.02	659.80	657.74	659.98	0.000128	3.40	52.96	35.30	0.31
US Reach	9.255	50-Year	485.00	656.02	662.36	659.35	662.82	0.000166	5.46	88.76	70.61	0.38
US Reach	9.267	100-Year	568.00	656.69	663.35		663.41	0.000319	2.30	376.01	150.63	0.17
US Reach	9.267	10-Year	319.00	656.69	661.25		661.35	0.000752	2.55	147.05	75.32	0.25
US Reach	9.267	2-Year	180.00	656.69	659.91		660.01	0.001487	2.55	70.54	35.50	0.32
US Reach	9.267	50-Year	485.00	656.69	662.81		662.88	0.000368	2.30	300.72	128.37	0.18
US Reach	9.284	100-Year	568.00	656.98	663.36		663.47	0.000509	2.86	277.22	114.18	0.22
US Reach	9.284	10-Year	319.00	656.98	661.31		661.45	0.001073	3.00	115.62	50.27	0.29
US Reach	9.284	2-Year	180.00	656.98	660.06		660.18	0.001773	2.82	63.85	31.60	0.35
US Reach	9.284	50-Year	485.00	656.98	662.82		662.94	0.000579	2.84	221.35	95.19	0.23
US Reach	9.314	100-Year	568.00	657.16	663.47		663.54	0.000390	2.47	381.93	164.19	0.19
US Reach	9.314	10-Year	319.00	657.16	661.48		661.60	0.000994	2.86	136.20	83.88	0.28
US Reach	9.314	2-Year	180.00	657.16	660.32		660.43	0.001586	2.69	66.97	33.43	0.33
US Reach	9.314	50-Year	485.00	657.16	662.94		663.02	0.000466	2.51	301.07	142.83	0.21
US Reach	9.33	100-Year	568.00	657.34	663.48		663.60	0.000598	3.02	277.65	108.18	0.24
US Reach	9.33	10-Year	319.00	657.34	661.57		661.73	0.001257	3.20	115.48	61.70	0.32
US Reach	9.33	2-Year	180.00	657.34	660.48		660.60	0.001795	2.88	62.76	32.07	0.35
US Reach	9.33	50-Year	485.00	657.34	662.97		663.09	0.000686	3.01	225.00	95.60	0.25
US Reach	9.349	100-Year	568.00	657.36	663.52		663.67	0.000673	3.25	221.38	69.34	0.25
US Reach	9.349	10-Year	319.00	657.36	661.70		661.84	0.001092	3.10	112.45	49.94	0.30
US Reach	9.349	2-Year	180.00	657.36	660.65		660.76	0.001268	2.60	70.48	34.44	0.30
US Reach	9.349	50-Year	485.00	657.36	663.02		663.16	0.000729	3.16	187.85	64.00	0.26
US Reach	9.366	100-Year	573.00	657.59	663.49		663.82	0.001618	4.89	146.66	44.71	0.38
US Reach	9.366	10-Year	307.00	657.59	661.75		662.03	0.002215	4.31	79.18	32.89	0.42
US Reach	9.366	2-Year	179.00	657.59	660.75		660.96	0.002690	3.72	49.66	26.08	0.43
US Reach	9.366	50-Year	483.00	657.59	663.00		663.32	0.001680	4.66	125.87	41.43	0.39
US Reach	9.39	100-Year	573.00	658.01	663.63		664.00	0.001721	5.09	138.68	40.26	0.40
US Reach	9.39	10-Year	307.00	658.01	661.96		662.24	0.002096	4.31	79.23	30.93	0.41
US Reach	9.39	2-Year	179.00	658.01	661.00		661.20	0.002232	3.58	52.26	25.60	0.40
US Reach	9.39	50-Year	483.00	658.01	663.15		663.49	0.001753	4.82	120.29	37.62	0.39
US Reach	9.394	100-Year	573.00	658.24	663.73		664.11	0.001872	5.23	135.46	39.73	0.41
US Reach	9.394	10-Year	307.00	658.24	662.08		662.38	0.002338	4.46	77.29	31.03	0.43
US Reach	9.394	2-Year	179.00	658.24	661.14		661.35	0.002595	3.75	50.39	26.03	0.43
US Reach	9.394	50-Year	483.00	658.24	663.26		663.61	0.001923	4.96	117.38	37.25	0.41
US Reach	9.416	100-Year	573.00	658.30	663.91		664.31	0.001910	5.41	128.54	37.94	0.42
US Reach	9.416	10-Year	307.00	658.30	662.31		662.62	0.002325	4.65	74.52	29.35	0.44
US Reach	9.416	2-Year	179.00	658.30	661.39		661.61	0.002392	3.86	49.74	24.42	0.42
US Reach	9.416	50-Year	483.00	658.30	663.45		663.81	0.001977	5.16	111.37	35.43	0.42
US Reach	9.439	100-Year	573.00	658.31	664.32		664.53	0.001216	3.79	163.64	47.57	0.32
US Reach	9.439	10-Year	307.00	658.31	662.71		662.88	0.001487	3.40	96.31	36.17	0.34
US Reach	9.439	2-Year	179.00	658.31	661.74		661.87	0.001492	2.91	64.27	30.04	0.33

HEC-RAS Plan: EX_NAT River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	9.439	50-Year	483.00	658.31	663.85		664.04	0.001302	3.66	141.91	44.19	0.33
US Reach	9.459	100-Year	573.00	658.84	664.45		664.63	0.000886	3.70	186.60	66.14	0.29
US Reach	9.459	10-Year	307.00	658.84	662.87		663.01	0.001071	3.17	108.48	41.48	0.30
US Reach	9.459	2-Year	179.00	658.84	661.90		662.01	0.001180	2.68	71.50	34.99	0.30
US Reach	9.459	50-Year	483.00	658.84	663.98		664.15	0.000935	3.56	158.83	48.95	0.29
US Reach	9.476	100-Year	573.00	658.57	664.44		664.85	0.002562	6.22	131.97	46.19	0.48
US Reach	9.476	10-Year	307.00	658.57	662.87		663.28	0.003759	5.91	69.35	33.37	0.55
US Reach	9.476	2-Year	179.00	658.57	661.93		662.31	0.004657	5.38	41.63	25.72	0.58
US Reach	9.476	50-Year	483.00	658.57	663.98		664.38	0.002803	6.11	111.34	42.40	0.50
US Reach	9.506	100-Year	573.00	656.52	664.74		664.99	0.000501	4.29	179.09	61.25	0.30
US Reach	9.506	10-Year	307.00	656.52	663.27		663.43	0.000412	3.25	113.00	36.01	0.26
US Reach	9.506	2-Year	179.00	656.52	662.35		662.43	0.000309	2.44	82.23	30.19	0.22
US Reach	9.506	50-Year	483.00	656.52	664.30		664.52	0.000481	4.00	154.70	49.91	0.29
US Reach	9.517	100-Year	471.00	659.40	664.30	663.35	665.49	0.001369	8.77	53.69	11.53	0.72
US Reach	9.517	10-Year	253.00	659.40	663.06	662.01	663.69	0.000916	6.39	39.57	11.25	0.60
US Reach	9.517	2-Year	155.00	659.40	662.20	661.28	662.61	0.000753	5.16	30.04	11.05	0.55
US Reach	9.517	50-Year	396.00	659.40	663.95	662.92	664.93	0.001196	7.97	49.67	11.45	0.67
US Reach	9.522		Culvert									
US Reach	9.527	100-Year	471.00	659.60	665.75	663.54	666.49	0.000715	6.89	68.37	11.83	0.50
US Reach	9.527	10-Year	253.00	659.60	663.22	662.22	663.87	0.000941	6.45	39.20	11.24	0.61
US Reach	9.527	2-Year	155.00	659.60	662.28	661.48	662.73	0.000857	5.40	28.72	11.02	0.59
US Reach	9.527	50-Year	396.00	659.60	664.28	663.12	665.21	0.001098	7.73	51.25	11.49	0.64
US Reach	9.541	100-Year	471.00	659.94	666.56		666.58	0.000141	1.78	451.01	167.41	0.12
US Reach	9.541	10-Year	253.00	659.94	663.90		663.98	0.000830	3.06	124.87	77.82	0.27
US Reach	9.541	2-Year	155.00	659.94	662.72		662.84	0.001575	3.33	64.41	37.27	0.35
US Reach	9.541	50-Year	396.00	659.94	665.29		665.34	0.000353	2.44	265.99	124.75	0.19
US Reach	9.555	100-Year	471.00	659.80	666.57	662.92	666.59	0.000111	1.38	533.89	253.00	0.10
US Reach	9.555	10-Year	253.00	659.80	663.94	662.06	664.06	0.001031	2.77	104.30	86.64	0.28
US Reach	9.555	2-Year	155.00	659.80	662.84	661.51	662.96	0.001786	2.80	55.37	27.44	0.35
US Reach	9.555	50-Year	396.00	659.80	665.31	662.66	665.36	0.000356	2.09	276.73	162.75	0.18
US Reach	9.556		Bridge									
US Reach	9.557	100-Year	471.00	659.80	666.57	662.92	666.59	0.000110	1.38	534.97	253.29	0.10
US Reach	9.557	10-Year	253.00	659.80	663.96	662.06	664.07	0.001009	2.75	105.47	87.40	0.28
US Reach	9.557	2-Year	155.00	659.80	662.86	661.51	662.98	0.001739	2.77	55.92	27.56	0.34
US Reach	9.557	50-Year	396.00	659.80	665.33	662.66	665.38	0.000349	2.08	279.49	163.75	0.17
US Reach	9.573	100-Year	471.00	660.19	666.58		666.62	0.000215	1.80	359.88	156.97	0.14
US Reach	9.573	10-Year	253.00	660.19	664.09		664.19	0.001078	2.55	99.94	50.02	0.28
US Reach	9.573	2-Year	155.00	660.19	663.07		663.17	0.001518	2.50	61.96	32.58	0.32
US Reach	9.573	50-Year	396.00	660.19	665.36		665.44	0.000550	2.39	199.78	105.56	0.22
US Reach	9.588	100-Year	471.00	660.22	666.58		666.63	0.000314	2.05	300.18	147.94	0.17
US Reach	9.588	10-Year	253.00	660.22	664.13		664.25	0.001364	2.78	90.91	37.38	0.31
US Reach	9.588	2-Year	155.00	660.22	663.13		663.25	0.001808	2.71	57.15	30.25	0.35
US Reach	9.588	50-Year	396.00	660.22	665.37		665.48	0.000826	2.72	159.67	84.09	0.26
US Reach	9.595	100-Year	471.00	660.38	666.58		666.66	0.000428	2.34	232.52	87.40	0.19
US Reach	9.595	10-Year	253.00	660.38	664.20		664.33	0.001605	2.93	86.44	37.30	0.34
US Reach	9.595	2-Year	155.00	660.38	663.22		663.35	0.002175	2.89	53.73	29.82	0.38
US Reach	9.595	50-Year	396.00	660.38	665.40		665.53	0.000978	2.88	144.69	61.54	0.28
US Reach	9.623	100-Year	471.00	660.56	666.61		666.76	0.000786	3.16	159.16	46.21	0.26
US Reach	9.623	10-Year	253.00	660.56	664.43		664.61	0.002024	3.40	74.67	31.55	0.38
US Reach	9.623	2-Year	155.00	660.56	663.55		663.71	0.002473	3.15	49.26	26.18	0.40
US Reach	9.623	50-Year	396.00	660.56	665.53		665.73	0.001472	3.60	113.02	38.72	0.34
US Reach	9.635	100-Year	471.00	661.41	666.53		666.89	0.002614	4.89	98.44	30.18	0.45
US Reach	9.635	10-Year	253.00	661.41	664.37		664.90	0.007829	5.84	43.34	21.03	0.72
US Reach	9.635	2-Year	155.00	661.41	663.53		664.04	0.010952	5.70	27.18	17.75	0.81
US Reach	9.635	50-Year	396.00	661.41	665.42		665.95	0.005356	5.87	67.70	25.35	0.62

500-Yr Natural/Exist.
NGVD '29

HEC-RAS Plan: Nat 500-Yr River: Bensenville Ditc Reach: US Reach Profile: 500-Year

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)	
US Reach	8.826	500-Year	1050.00	653.18	658.88	657.08	659.29	0.001100	6.12	213.10	57.24	0.45
US Reach	8.827	500-Year	1050.00	653.23	659.17		659.35	0.000678	3.41	307.92	69.66	0.29
US Reach	8.888	500-Year	1050.00	653.77	659.52		659.72	0.000765	3.56	294.92	68.53	0.30
US Reach	8.9	500-Year	1050.00	653.90	659.60	656.28	659.75	0.000358	3.14	334.86	74.19	0.25
US Reach	8.91	500-Year	1050.00	653.90	659.54	656.55	659.83	0.000528	4.33	242.53	70.32	0.32

HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp 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
```

NATURAL/EXISTING REACH

PROJECT DATA
Project Title: Permit_Model_Final_CP_Culvert
Project File : 112311.prj
Run Date and Time: 4/2/2012 9:39:16 AM

Project in English units

PLAN DATA

Plan Title: Ex_Nat_112311
Plan File : C:\Users\doliphant\Desktop\2007\Bensenville Ditch\models\HEC-RAS Updated 112311\112311.p02

Geometry Title: Ex_Nat_112311
Geometry File : C:\Users\doliphant\Desktop\2007\Bensenville Ditch\models\HEC-RAS Updated 112311\112311.g02

Flow Title : EX/NAT_Condition_Flows
Flow File : C:\Users\doliphant\Desktop\2007\Bensenville Ditch\models\HEC-RAS Updated 112311\112311.f02

Plan Description:
Flows From Burke's "ALP Alignment - Bensenville Ditch, 04/2010 - FINAL"

Plan Summary Information:
Number of: Cross Sections = 105 Multiple Openings = 0
Culverts = 8 Inline Structures = 0
Bridges = 2 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.003
Critical depth calculation tolerance = 0.003
Maximum number of iterations = 20
Maximum difference tolerance = 0.1
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: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: EX/NAT_Condition_Flows
Flow File : C:\Users\doliphant\Desktop\2007\Bensenville Ditch\models\HEC-RAS Updated 112311\112311.f02

Flow Data (cfs)

River	Reach	RS	100-Year	10-Year	2-Year	50-Year
Bensenville Ditc	US Reach	9.635	471	253	155	396
Bensenville Ditc	US Reach	9.506	573	307	179	483
Bensenville Ditc	US Reach	9.349	568	319	180	485
Bensenville Ditc	US Reach	8.962	684	392	202	594
Bensenville Ditc	US Reach	8.91	757	403	199	648
Bensenville Ditc	US Reach	8.864	826	432	213	700
Bensenville Ditc	US Reach	8.743	927	467	228	776
Bensenville Ditc	US Reach	8.546	963	479	236	805
Bensenville Ditc	US Reach	7.58	1032	507	250	858
Bensenville Ditc	US Reach	7.122	1108	540	273	917
Bensenville Ditc	US Reach	7.111	1175	519	210	954

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Bensenville Ditc	US Reach	100-Year	Critical	Known WS = 649.85
Bensenville Ditc	US Reach	10-Year	Critical	Known WS = 648.55
Bensenville Ditc	US Reach	2-Year	Critical	Known WS = 647.75
Bensenville Ditc	US Reach	50-Year	Critical	Known WS = 649.47

Inline Structure Gate Openings
River = Bensenville Ditc
Reach = US Reach RS = 8.4815
Gate = Gate #1

# Open	Open Ht	# Open	Open Ht	# Open	Open Ht	# Open	Open Ht
3	1	3	1	3	1	3	1

GEOMETRY DATA

Geometry Title: Ex_Nat_112311
Geometry File : C:\Users\doliphant\Desktop\2007\Bensenville Ditch\models\HEC-RAS Updated 112311\112311.g02

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.635

INPUT
Description: END OF PROJECT, OUTFALLS AT IRVING PK/PARKSIDE DR

Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
971	668.82	984	668.01	992	665	1000	661.41	1010	661.76
1020	667.63	1033	668.09	1649.48	670				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
971	.04	992	.035	1020	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
992	1020	50	50	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.623

INPUT
Description: SMG: TOOK FIRST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
805	670	961	668	971	666.95	979	666.84	986	665
1000	660.56	1010	661.14	1018	664	1029	667.56	1040	667.95
1550	670								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
805	.04	986	.035	1018	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
986	1018	150	150	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.595

INPUT
Description: SMG: TOOK FIRST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
505.51	670	919	668	974	664.9	984	664.38	1000	660.38
1008	660.38	1025	665	1033	666.91	1043	667.6	1350	670

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
505.51	.04	984	.035	1025	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
984	1025	50	50	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.588

INPUT
Description: SMG: TOOK FIRST AND LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
505.01	670	926	668	976	664.59	986	664.61	1000	660.22
1010	660.36	1027	664.66	1039	665.11	1149	668	1255	670

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
505.01	.04	986	.035	1027	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
986	1027	46	46	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.573

INPUT
Description: SMG: TOOK FIRST AND LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
  605.51     670     920     668     976  664.51     986   663.9    1000  660.26
    1011  660.19    1025  663.93    1037  664.17    1137     668 1604.91     670

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  605.51     .04     986    .035    1025     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           986    1025              114     114     114             .1      .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.557

INPUT
Description: This is a REPEATED section.

Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1780     670    1841     668    1879   666.3    1907     666    1926   665.4
    1951   664.5    1967   663.2    1977   659.8    1986   659.8    1996     663
    2000   663.4    2012   663.5    2039   663.8    2066   664.5    2097   665.5
    2118   666.4    2193     668    2480     670

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1780     .04    1967    .035    1996     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1967    1996              10      10      10             .1      .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    1780    1967   664.5       F
    1996    2480   663.5       F

BRIDGE


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.556

INPUT
Description: Foot Bridge (Bridge #11)
Removed errant point 674.5 changed to
          664.5 on roadway
Revised road section for half a foot thickness
          throughout and symmetrical shape
Distance from Upstream XS =       .1
Deck/Roadway Width        =      9.8
Weir Coefficient          =        3
Upstream  Deck/Roadway Coordinates
    num=      15
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1879   666.3   666.3    1907     666     666    1926   665.4   664.9
    1951   663.5     663    1967   664.5     664    1977   664.5     664
    1986   664.5     664    1996   664.5     664    1996   664.5     664
    2000   664.4   663.9    2012   663.5     663    2039   663.8   663.8
    2066   664.5   664.5    2097   665.5   665.5    2118   666.4   666.4

Upstream Bridge Cross Section Data
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1780     670    1841     668    1879   666.3    1907     666    1926   665.4
    1951   664.5    1967   663.2    1977   659.8    1986   659.8    1996     663
    2000   663.4    2012   663.5    2039   663.8    2066   664.5    2097   665.5
    2118   666.4    2193     668    2480     670

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1780     .04    1967    .035    1996     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
          1967    1996             .1      .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    1780    1967   664.5       F
    1996    2480   663.5       F

Downstream  Deck/Roadway Coordinates
    num=      15
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1879   666.3   666.3    1907     666     666    1926   665.4   665.4
    1951   663.5     663    1967   664.5     664    1977   664.5     664
    1986   664.5     664    1996   664.5     664    1996   664.5     664
    2000   664.4   663.9    2012   663.5     663    2039   663.8   663.8
    2066   664.5   664.5    2097   665.5   665.5    2118   666.4   666.4

Downstream Bridge Cross Section Data
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 1780.01     670    1841     668    1879   666.3    1907     666    1926   665.4
    1951   664.5    1967   663.2    1977   659.8    1986   659.8    1996     663
    2000   663.4    2012   663.5    2039   663.8    2066   664.5    2097   665.5
    2118   666.4    2193     668    2480     670

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 1780.01     .04    1967    .035    1996     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
```

```
         1967    1996             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 1780.01    1967   664.3       F
    1996    2480   663.5       F

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 =     .95
Elevation at which weir flow begins         =   664.5
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Energy

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: Bensenville Ditc
REACH: US Reach           RS: 9.555

INPUT
Description: SMG:  TOOK FIRST AND LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 1780.01     670    1841     668    1879   666.3    1907     666    1926   665.4
    1951   664.5    1967   663.2    1977   659.8    1986   659.8    1996     663
    2000   663.4    2012   663.5    2039   663.8    2066   664.5    2097   665.5
    2118   666.4    2193     668    2480     670

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 1780.01     .04    1967    .035    1996     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1967    1996              73      71      67             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 1780.01    1967   664.3       F
    1996    2480   663.5       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.541

INPUT
Description: SMG:  TOOK FIRST AND LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data     num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     805     670     905     668     975   663.77    982   663.62    1000   659.94
    1009   659.94    1028   663.55    1041   663.33    1121     668    1505     670

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     805     .04    1000    .035    1009     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1000    1009              65      65      65             .1       .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.527

INPUT
Description: This is a REPEATED section.
   CHURCH STREET, US SIDE, FROM 85
           SURVEY

Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1600   675.2    1847   666.9    1895   666.9    1950   667.4    1969   666.2
  1969.6   659.6    1980   659.6    1981   666.7    2012   667.4    2056   667.3
    2103   666.9    2162   667.4    2450   675.2

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1600     .04    1969    .012    1981     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1969    1981              50      50      50             .3       .5
Ineffective Flow     num=       2
```

Sta L	Sta R	Elev	Permanent
1600	1969	667.4	F
1981	2450	667.4	F

CULVERT

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.522

INPUT
Description: Church Street [Culvert #7 (10.5' x 5' Boxes)]
Originally modeled
as a triple box, exists only as a single box in reality

Distance from Upstream XS = .1
Deck/Roadway Width = 49.8
Weir Coefficient = 3
Upstream Deck/Roadway Coordinates
num= 12

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1600	675.2	659.4	1847	667.4	659.4	1950	667.4	659.4
1969	667.4	659.4	1969	667.4	659.4	1969.6	667.4	659.4
1980	667.4	659.4	1981	667.4	659.4	1981	667.4	659.4
2012	667.4	659.4	2162	667.4	659.4	2450	675.2	659.4

Upstream Bridge Cross Section Data
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1600	675.2	1847	666.9	1895	666.9	1950	667.4	1969	666.2
1969.6	659.6	1980	659.6	1981	666.7	2012	667.4	2056	667.3
2103	666.9	2162	667.4	2450	675.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1600	.04	1969	.012	1981	.04

Bank Sta: Left Right Coeff Contr. Expan.
1969 1981 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1600	1969	667.4	F
1981	2450	667.4	F

Downstream Deck/Roadway Coordinates
num= 12

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1600	675.2	659.4	1847	667.4	659.4	1950	667.4	659.4
1969	667.4	659.4	1969	667.4	659.4	1969.6	667.4	659.4
1980	667.4	659.4	1981	667.4	659.4	1981	667.4	659.4
2012	667.4	659.4	2162	667.4	659.4	2450	675.2	659.4

Downstream Bridge Cross Section Data
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1600	675	1847	666.7	1895	666.7	1950	667.2	1969	666
1969.6	659.4	1980	659.4	1981	666.5	2012	667.2	2056	667.1
2103	666.7	2162	667.2	2450	675				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1600	.04	1969	.012	1981	.04

Bank Sta: Left Right Coeff Contr. Expan.
1969 1981 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1600	1969	666	F
1981	2450	666	F

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 = .95
Elevation at which weir flow begins = 667.4
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Box7	Box	5	10.5

FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	.1	49.8	.012	.012	0	.2	1

Upstream Elevation = 659.41
Centerline Station = 1975
Downstream Elevation = 659.16
Centerline Station = 1975

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.517

INPUT
Description: CHURCH STREET, DS SIDE, FROM 85 SURVEY

Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1600	675	1847	666.7	1895	666.7	1950	667.2	1969	666
1969.6	659.4	1980	659.4	1981	666.5	2012	667.2	2056	667.1
2103	666.7	2162	667.2	2450	675				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1600	.04	1969	.012	1981	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1969	1981	40	40	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1600	1969	666	F
1981	2450	666	F

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.506

INPUT
Description: SMG: TOOK LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
982	666	985	665	994	660	1000	656.52	1012	660.56
1027	663.92	1077	666						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
982	.04	994	.025	1012	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
994	1012	128	128	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.476

INPUT
Description: SMG: TOOK LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
969	666.33	979	666.02	982	665	997	660	1000	658.57
1007	660	1030	664.47	1035	664.6	1315	666		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
969	.04	997	.035	1007	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
997	1007	105	105	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.459

INPUT
Description: SMG: TOOK LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
962	669.52	970	668.86	980	665	991	661	1000	658.9
1011	658.84	1016	660	1032	664.04	1040	664.11	1060	665
1304.99	670								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
962	.04	991	.035	1016	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
991	1016	100	100	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.439

INPUT
Description: SMG: TOOK LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
956	670.25	967	669.7	983	664	992	661	1000	658.31
1009	658.62	1014	660	1024	663	1030	664.4	1035	664.8
1330	666								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
956	.04	983	.035	1014	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
983	1014	135	135	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.416

INPUT
Description:

Station Elevation Data	num=	9							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
959	670.24	968	669.65	981	665	995	660	1000	658.3
1008	658.34	1012	660	1028	666.28	1036	666.62		

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
959	.04	995	.035	1012	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
995	1012	102	102	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.394

INPUT
Description:

Station Elevation Data	num=	9							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
967	667.25	978	666.8	983	665	997	660	1000	658.77
1012	658.24	1017	660	1034	666.81	1044	667.65		

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
967	.06	997	.035	1017	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
997	1017	62	62	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.39

INPUT
Description:

Station Elevation Data	num=	10							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
455.45	670	970	664.4	984	663.95	995	660	1000	658.01
1010	658.07	1015	660	1029	665	1035	667.1	1043	667.44

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
455.45	.06	995	.035	1015	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
995	1015	97	97	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.366

INPUT
Description:

Station Elevation Data	num=	10							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
962	665.69	975	665.39	977	665	993	660	1000	657.66
1006	657.59	1014	660	1032	665	1035	665.45	1045	665.94

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
962	.06	993	.035	1014	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
993	1014	96	96	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.349

INPUT
Description: SMG: TOOK LAST 2 GR CARDS FROM DUPAGE CO TOPO MAP

Station Elevation Data	num=	11							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
950	666.81	968	666.34	972	665	990	660	1000	657.36
1008	657.43	1020	660	1024	661.25	1033	661.58	1050	664
1550	666								

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
950	.06	990	.035	1020	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
990	1020	100	100	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.33

INPUT
Description: SMG: TOOK LAST 2 GR CARDS FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
959	668.68	968	667.2	975	665	991	660	1000	657.45
1009	657.34	1021	660.46	1029	660.69	1099	664	1464	666

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
959	.06	991	.035	1021	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
991	1021	100	100	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.314

INPUT
Description: SMG: TOOK LAST 2 GR CARDS FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
975	665.06	990	660	1000	657.19	1009	657.16	1023	660.44
1034	660.54	1164	664	1444	666				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
975	.06	990	.035	1023	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
990	1023	150	150	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.284

INPUT
Description: SMG: TOOK FIRST GR CARD AND LAST 2 GR CARDS FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
855	666	975	661.86	983	661.23	988	660	1000	656.99
1010	656.98	1020	660.26	1028	660.67	1050	664	1445	666

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
855	.06	988	.035	1020	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
988	1020	100	100	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.267

INPUT
Description: BEGIN CHANNEL IMPROVEMENT 10' BW & 3:1 SS
SMG: TOOK FIRST AND LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
903	666	968	662.57	978	662.15	987	660	1000	656.79
1009	656.69	1023	659.94	1033	660.17	1163	666		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
903	.06	987	.035	1023	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
987	1023	65	65	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.255

INPUT
Description: This is a REPEATED section.
MASON STREET, US SIDE, FROM 97 SUYVEY

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1267.51	670.01	1900	664.7	1916	663.5	1952	663.5	1978	663
2000	662.7	2019	662.9	2031	662.1	2050	660	2061	656.02

```
    2075  656.02    2093   662.3    2148     663    2192   663.5    2245     664
    2445     666

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 1267.51     .05    2061    .012    2075     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          2061    2075               44      44      44             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 1267.51    2061   663.1       F
    2075    2445   663.1       F

CULVERT


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.2505

INPUT
Description: Mason Street [Culvert #6 (2 7' x 5' Boxes)]

Distance from Upstream XS =       .1
Deck/Roadway Width        =     43.8
Weir Coefficient          =      2.5
Upstream  Deck/Roadway Coordinates
    num=      17
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1900   664.7  656.02    1916   663.5  656.02    1952   663.5  656.02
    1978   663.1  656.02    2000   663.1  656.02    2016   663.1  656.02
    2031   663.1  656.02    2050   663.1  656.02    2061   663.1  656.02
    2061   663.1  656.02    2075   663.1  656.02    2075   663.1  656.02
    2093   663.1  656.02    2148   663.1  656.02    2192   663.5  656.02
    2245     664  656.02    2445     666  656.02

Upstream Bridge Cross Section Data
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 1267.51  670.01    1900   664.7    1916   663.5    1952   663.5    1978     663
    2000   662.7    2019   662.9    2031   662.1    2050     660    2061  656.02
    2075  656.02    2093   662.3    2148     663    2192   663.5    2245     664
    2445     666

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 1267.51     .05    2061    .012    2075     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
          2061    2075             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 1267.51    2061   663.1       F
    2075    2445   663.1       F

Downstream  Deck/Roadway Coordinates
    num=      17
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1900   664.7  656.02    1916   663.5  656.02    1952   663.5  656.02
    1978   663.1  656.02    2000   663.1  656.02    2016   663.1  656.02
    2031   663.1  656.02    2050   663.1  656.02    2061   663.1  656.02
    2061   663.1  656.02    2075   663.1  656.02    2075   663.1  656.02
    2093   663.1  656.02    2148   663.1  656.02    2192   663.5  656.02
    2245     664  656.02    2445     666  656.02

Downstream Bridge Cross Section Data
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1900   664.7    1916   663.5    1952   663.5    1978     663    2000   662.7
    2019   662.9    2031   662.1    2050     660    2061  656.02    2075  656.02
    2093   662.3    2148     663    2192   663.5    2245     664    2445     666

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1900     .05    2061    .012    2075     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
          2061    2075             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    1900    2061   662.5       F
    2075    2445   662.5       F

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 =     .95
Elevation at which weir flow begins         =   663.1
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise     Span
Box6                 Box       5        7
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 3 - Wingwall flared 0 deg. (sides extended straight)
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 .1    43.8     .012     .012        0                  .2               1
Number of Barrels =  2
Upstream   Elevation =  656.11
```

Centerline Stations
Sta. Sta.
2064.5 2071.5
Downstream Elevation = 655.88
Centerline Stations
Sta. Sta.
2064.5 2071.5

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.246

INPUT
Description: MASON STREET, DS SIDE--5X7 TWIN BOX, FROM 97 SURVEY

Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1900	664.7	1916	663.5	1952	663.5	1978	663	2000	662.7
2019	662.9	2031	662.1	2050	660	2061	656.02	2075	656.02
2093	662.3	2148	663	2192	663.5	2245	664	2445	666

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1900	.05	2061	.012	2075	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2061	2075	10	10	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1900	2061	662.5	F
2075	2445	662.5	F

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.24

INPUT
Description: SMG: TOOK FIRST AND LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
905	666	971	663	983	661.77	989	660	1000	657
1015	657	1025	660	1030	661.73	1035	662	1205	666

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
905	.05	989	.025	1025	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
989	1025	185	185	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.206

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
965	665.39	974	664.09	987	660	1000	656.41	1010	656.27
1015	658	1024	661	1030	663.15	1044	664.06	1180	665

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
965	.05	987	.035	1024	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
987	1024	46	46	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.197

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
957	664.88	967	664.35	984	660	1000	656.23	1010	656.28
1015	658.12	1027	661	1038	663.71	1049	664.92		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
957	.05	984	.035	1027	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
984	1027	45	45	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.189

INPUT

Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
953	665.08	964	664.62	989	660	1000	656.24	1012	656.33
1025	663.13	1035	663.93	1355	665				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
953	.05	964	.012	1025	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
964	1025	18	18	.3	.5

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.186

INPUT
Description: This is a REPEATED section.
IRVING PARK RD,US SIDE

Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1600	665	1670.15	664.19	1726.12	664.19	1779.1	664.19	1832.09	664.19
1880	664	1980	664	1992	664	1992	655.76	2007.5	655.76
2007.5	664	2040	664	2080	664	2130	664.7		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1600	.05	1992	.012	2007.5	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1992	2007.5	78	78	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1600	1992	664.5	F
2007.5	2130	664	F

CULVERT

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.178499

INPUT
Description: Irving Park Road [Culvert #5 (2 7' x 6' Boxes)]

Distance from Upstream XS = .1
Deck/Roadway Width = 77.8
Weir Coefficient = 3
Upstream Deck/Roadway Coordinates
num= 10

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1600	665		1880	664.5	655.76	1980	664.5	655.76
1992	664.5	655.76	1992	664.5	655.76	2007.5	664.5	655.76
2007.5	664.5	655.76	2040	664.5	655.76	2080	664.5	655.76
2130	664.7	655.76						

Upstream Bridge Cross Section Data
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1600	665	1670.15	664.19	1726.12	664.19	1779.1	664.19	1832.09	664.19
1880	664	1980	664	1992	664	1992	655.76	2007.5	655.76
2007.5	664	2040	664	2080	664	2130	664.7		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1600	.05	1992	.012	2007.5	.05

Bank Sta: Left	Right	Coeff Contr.	Expan.
1992	2007.5	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1600	1992	664.5	F
2007.5	2130	664	F

Downstream Deck/Roadway Coordinates
num= 10

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1650	665		1880	664.5	655.76	1980	664.5	655.76
1992	664.5	655.76	1992	664.5	655.76	2007.5	664.5	655.76
2007.5	664.5	655.76	2040	664.5	655.76	2080	664.5	655.76
2130	664.7	655.76						

Downstream Bridge Cross Section Data
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1650	665	1880	664	1980	664	1992	664	1992	655.76
2007.5	655.76	2007.5	664	2040	664	2080	664	2130	664.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1650	.05	1992	.012	2007.5	.05

Bank Sta: Left	Right	Coeff Contr.	Expan.
1992	2007.5	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1650	1992	664	F
2007.5	2130	664	F

```
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 =     .95
Elevation at which weir flow begins         =   664.5
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Box5                Box       6       7
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 .1    77.8     .012     .012        0                  .2              1
Number of Barrels =  2
Upstream   Elevation =  655.84
Centerline Stations
    Sta.    Sta.
  1995.5    2004
Downstream Elevation =  655.67
Centerline Stations
    Sta.    Sta.
  1995.5    2004

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.171

INPUT
Description: IRVING PARK RD,DS SIDE--7X6 TWIN BOX, GENERATED X SECTION(VS
             6X6)

Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1650     665    1880     664    1980     664    1992     664    1992  655.76
  2007.5  655.76  2007.5     664    2040     664    2080     664    2130   664.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1650     .05    1992    .012  2007.5     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1992  2007.5              37      37      37             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    1650    1992     664       F
  2007.5    2130     664       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.162

INPUT
Description:    END RE-SURVEYED X-SECTIONS

Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     973     664     980  663.38     990     660    1000   656.2    1011  656.18
    1022     660    1028  662.05    1037     663

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     973     .05     990    .025    1022     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           990    1022              26      26      26             .1       .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.153

INPUT
Description:
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     965  664.99     977   664.9     990     660    1000  655.96    1008  656.07
    1010     657    1019     660    1028  663.01    1039  663.47

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     965     .05     990    .025    1019     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           990    1019             117     117     117             .1       .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.134

INPUT
```

Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
961	665.37	971	664.76	985	660	1000	655.54	1014	656.06
1026	660	1037	663.75	1048	664.05				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
961	.05	985	.035	1026	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
985	1026	98	98	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.121

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
952	668.28	961	667.81	970	665	986	660	1000	655.81
1010	655.95	1024	660	1042	665.14	1053	665.06		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
952	.05	986	.035	1024	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
986	1024	97	97	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.1

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
950	670.97	959	670.25	973	665	987	660	1000	655.63
1010	655.74	1025	660	1042	665	1051	667.59	1061	667.73

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
950	.05	987	.035	1025	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
987	1025	96	96	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.078

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
946	670.96	958	670.34	975	664	986	660	997	656
1000	655.65	1011	655.56	1013	656	1028	660	1044	665
1052	667.39	1065	667.48						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
946	.05	986	.035	1028	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
986	1028	145	145	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.058

INPUT
Description:
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
956	666.7	966	666.37	970	665	986	660	998	656
1000	655.35	1010	655.38	1011	656	1025	660	1040	664.41
1050	664.61								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
956	.05	986	.035	1025	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
986	1025	100	100	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.039

INPUT

```
Description:
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     952  665.42     963     665     964  664.94     978     661     989     658
    1000  655.27    1010  655.06    1013     656    1026     660    1040  664.11
    1050  664.28

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     952     .05     978    .035    1026     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           978    1026              97      97      97             .1      .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.02

INPUT
Description:
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     957   665.2     960     665     970  664.51     981     661     994     656
    1000  655.01    1010   654.9    1013     656    1027     660    1037  663.23
    1047  663.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     957     .05     981    .035    1027     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           981    1027              100     100     100             .1      .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.001

INPUT
Description:
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     955     665     967  664.57     982     660    1000  656.04    1010  654.83
    1026     660    1034  662.63    1044  662.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     955     .05    1000    .035    1010     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1000    1010              100     100     100             .1      .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.982

INPUT
Description: SMG:  TOOK LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     956  662.53     968  662.42     978     660    1000  654.96    1015     655
    1030     660    1034  661.46    1043   661.9    1061     664

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     956     .05     978    .035    1030     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           978    1030               50      50      50             .1      .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.972

INPUT
Description: REMOVED STORAGE IN OLD CHANNEL
   START NEW CHANNEL,12' BW,3:1
             SS,REMOVE 2-54"RCP

Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     960  661.91     973  662.08     981     660    1000  654.97    1013  654.57
    1029     660    1035  661.54    1047  662.63

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     960     .05     981    .035    1029     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           981    1029               56      56      56             .1      .3

CROSS SECTION
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```
RIVER: Bensenville Ditc
REACH: US Reach          RS: 8.962

INPUT
Description: This is a REPEATED section.
   YORK ROAD US SIDE
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     950  670.02    2000  662.42    2027  662.22    2053  661.72    2054  658.62
    2054  654.36  2075.5  654.36  2075.5  658.72    2082  662.62    2107  663.02
    2158  664.32    2400  670.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     950     .04    2054    .012  2075.5     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          2054  2075.5           136.73  136.73  136.73             .3      .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     950    2054   663.3       F
  2075.5    2400   663.3       F

CULVERT


RIVER: Bensenville Ditc
REACH: US Reach          RS: 8.952499

INPUT
Description: York Road [Culvert #4 (2 10' x 7' Boxes)]

Distance from Upstream XS =      .1
Deck/Roadway Width        =  136.53
Weir Coefficient          =       3
Upstream  Deck/Roadway Coordinates
    num=      12
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     950      670  654.32    2000   663.3  654.32    2027   663.3  654.32
    2053   663.3  654.32    2054   663.3  654.32    2054   663.3  654.32
  2075.5   663.3  654.32  2075.5   663.3  654.32    2082   663.3  654.32
    2107   663.3  654.32    2158   664.3  654.32    2400     670  654.32

Upstream Bridge Cross Section Data
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     950  670.02    2000  662.42    2027  662.22    2053  661.72    2054  658.62
    2054  654.36  2075.5  654.36  2075.5  658.72    2082  662.62    2107  663.02
    2158  664.32    2400  670.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     950     .04    2054    .012  2075.5     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
          2054  2075.5            .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     950    2054   663.3       F
  2075.5    2400   663.3       F

Downstream  Deck/Roadway Coordinates
    num=      12
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     950      670   654.2    2000   663.3   654.2    2027   663.3   654.2
    2053   663.3   654.2    2054   663.3   654.2    2054   663.3   654.2
  2075.5   663.3   654.2  2075.5   663.3   654.2    2082   663.3   654.2
    2107   663.3   654.2    2158   664.3   654.2    2400     670   654.2

Downstream Bridge Cross Section Data
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     950     670    2000   662.4    2027   662.2    2053   661.7    2054   658.6
    2054   654.1  2075.5   654.1  2075.5   658.7    2082   662.6    2107     663
    2158   664.3    2400     670

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     950    .013    2054    .013  2075.5    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
          2054  2075.5            .6       .8
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     950    2054   663.2       F
  2075.5    2400   663.2       F

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 =     .95
Elevation at which weir flow begins        =   663.3
Energy head used in spillway design        =
Spillway height used in design             =
Weir crest shape                           = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Box4                Box       7      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
```

```
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
              .1  136.62     .012     .012        0                  .2               1
Number of Barrels =  2
Upstream   Elevation =  654.46
Centerline Stations
    Sta.    Sta.
    2059  2070.5
Downstream Elevation =  654.12
Centerline Stations
    Sta.    Sta.
    2059  2070.5

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.943

INPUT
Description: Junction Box x section
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     950     670    2000   662.4    2027   662.2    2053   661.7    2054   658.6
    2054   654.1  2075.5   654.1  2075.5   658.7    2082   662.6    2107     663
    2158   664.3    2400     670

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     950    .013    2054    .013  2075.5    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          2054  2075.5               11      11      11              .6      .8
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     950    2054   663.2       F
  2075.5    2400   663.2       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.937

INPUT
Description:
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     900   670.2    1946   666.7    1992   666.9    2000   666.4    2000     654
    2043     654    2043     667    2090   667.3    2145   667.5    3800   675.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     900    .013    1992    .013    2043    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1992    2043            120.87  120.87  120.87              .6      .8
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     900 2005.25     672       F
 2037.75    3800     672       F

CULVERT


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.932

INPUT
Description: Proposed CP Cuvlert from HDR

Distance from Upstream XS =      .1
Deck/Roadway Width        =  120.62
Weir Coefficient          =       3
Upstream  Deck/Roadway Coordinates
    num=      12
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     900      682            1946     682            1992     682
    2000      682            2011     682            2014     682
    2029      682            2032     682            2037     682
    2090      682            2145     682            3800     682

Upstream Bridge Cross Section Data
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     900   670.2    1946   666.7    1992   666.9    2000   666.4    2000     654
    2043     654    2043     667    2090   667.3    2145   667.5    3800   675.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     900    .013    1992    .013    2043    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
          1992    2043              .6      .8
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     900 2005.25     672       F
 2037.75    3800     672       F

Downstream  Deck/Roadway Coordinates
    num=      12
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     900      682            1946     682            1992     682
```

```
    2000     682           2011     682           2014     682
    2029     682           2032     682           2037     682
    2090     682           2145     682           3800     682

Downstream Bridge Cross Section Data
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 1930.35  673.44 1955.54   661.3 1985.13   660.3  1997.5   653.9  2021.5   653.9
  2045.5   653.9 2070.61   666.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 1930.35     .05 1955.54    .025 2070.61     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
       1955.54 2070.61            .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 1930.35    2000   667.7       F
    2043 2070.61   667.7       F

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 =     .95
Elevation at which weir flow begins         =   667.7
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Culvert #1            Box       7      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 3 - Wingwall flared 0 deg. (sides extended straight)
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 .1  120.62     .013     .013        0                   .7               1
Number of Barrels =  4
Upstream   Elevation =  654.09
Centerline Stations
    Sta.    Sta.    Sta.    Sta.
    2005    2016    2027    2038
Downstream Elevation =  653.69
Centerline Stations
    Sta.    Sta.    Sta.    Sta.
    2005    2016    2027    2038

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach          RS: 8.91

INPUT
Description: STA 10+57.18 (D/S Face of Exiting CPRR Culvert)
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 1930.35  673.44 1955.54   661.3 1985.13   660.3  1997.5   653.9  2021.5   653.9
  2045.5   653.9 2070.61   666.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 1930.35     .05 1955.54    .025 2070.61     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1955.54 2070.61              30      30      30             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 1930.35    2000   667.7       F
    2043 2070.61   667.7       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach          RS: 8.9

INPUT
Description: STA 10+57.18 (D/S Face of Exiting CPRR Culvert)
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  1969.5   660.3  1987.5   659.3  1997.5   653.9  2021.5   653.9  2045.5   653.9
  2061.5   662.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  1969.5     .05  1987.5    .025  2061.5     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        1987.5  2061.5              50      50      50             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  1969.5    1985   667.7       F
    2058  2061.5   667.7       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach          RS: 8.888
```

```
INPUT
Description: STA 12+66.69 (U/S Face of UPRR Culvert)
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -63.87  669.39     -17  653.77       0  653.77      17  653.77   53.37  665.89

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -63.87     .03  -63.87     .03   53.37     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -63.87   53.37              137     137     137             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -63.87     -17  669.87       F
      17   53.37  669.87       F

CULVERT


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.87

INPUT
Description: Proposed UPRR Crossing (STA 12+66.69 to STA 14+03.69)
Distance from Upstream XS =      10
Deck/Roadway Width        =     100
Weir Coefficient          =       3
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      -70     670              70     670

Upstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -63.87  669.39     -17  653.77       0  653.77      17  653.77   53.37  665.89

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -63.87     .03  -63.87     .03   53.37     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        -63.87   53.37             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -63.87     -17  669.87       F
      17   53.37  669.87       F

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      -70     670              70     670

Downstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -63.87  669.24     -17  653.62       0  653.62      17  653.62   53.37  665.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -63.87     .03  -63.87     .03   53.37     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        -63.87   53.37             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -63.87     -17  669.86       F
      17   53.37  669.86       F

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 =     .95
Elevation at which weir flow begins        =     670
Energy head used in spillway design        =
Spillway height used in design             =
Weir crest shape                           = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       6      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 .3   136.5     .012     .012        0                  .2                1
Number of Barrels =  3
Upstream   Elevation =  653.77
Centerline Stations
    Sta.    Sta.    Sta.
   -11.5       0    11.5
Downstream Elevation =  653.62
Centerline Stations
    Sta.    Sta.    Sta.
   -11.5       0    11.5

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.864
```

INPUT
Description: STA 14+03.69 (D/S Face of UPRR Culvert)
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-63.87	669.24	-17	653.62	0	653.62	17	653.62	53.37	665.74

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-63.87	.03	-63.87	.03	53.37	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-63.87	53.37	50	50	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-63.87	-17	669.86	F
17	53.37	669.86	F

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 8.852

INPUT
Description: STA 14+53.69
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-34.02	660.95	-19.5	656.23	-17.5	656.19	-11.5	654.19	-5.5	654.07
-5	653.57	0	653.57	5	653.57	5.5	654.07	11.5	654.19
17.5	656.19	19.5	656.23	34.02	660.78				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-34.02	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	251.09	251.09	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 8.830

INPUT
Description: STA 17+04.78
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-34.02	660.68	-19.5	655.96	-17.5	655.92	-11.5	653.92	-5.5	653.8
-5	653.3	0	653.3	5	653.3	5.5	653.8	11.5	653.92
17.5	655.92	19.5	655.96	34.02	660.51				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-34.02	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 8.820

INPUT
Description: STA 19+54.78 (Flow is not fully expanded, 4:1)
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-34.02	660.41	-19.5	655.69	-17.5	655.65	-11.5	653.65	-5.5	653.53
-5	653.03	0	653.03	5	653.03	5.5	653.53	11.5	653.61
64	654.3	141	655.3	199	656.05	211.57	660.24		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-34.02	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
62.5	212	660	F

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 8.743

INPUT
Description: STA 22+04.78 (Flow is approx. fully expanded)
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-34.02	660.14	-19.5	655.42	-17.5	655.38	-11.5	653.38	-5.5	653.26
-5	652.76	0	652.76	5	652.76	5.5	653.26	11.5	653.34
85.3	654.3	137	654.97	152	659.97				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-34.02	.027	-5.5	.025	5.5	.027

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -5.5     5.5              250     250     250            .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
     120     200     660       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.686

INPUT
Description: STA 24+54.78
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -61.77  659.84  -47.34  655.03  -45.34  654.99   -41.5  653.71   -11.5  653.11
    -5.5  652.99      -5  652.49       0  652.49       5  652.49     5.5  652.99
    11.5  653.07    29.1   653.3      78  653.94   95.28   659.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -61.77    .027    -5.5    .025     5.5    .027

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -5.5     5.5              250     250     250            .1       .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.642

INPUT
Description: STA 27+04.78
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -61.86   659.6  -47.34  654.76  -45.34  654.72   -41.5  653.44   -11.5  652.84
    -5.5  652.72      -5  652.22       0  652.22       5  652.22     5.5  652.72
    11.5   652.8    36.1  653.12   55.03  659.43

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -61.86    .027    -5.5    .025     5.5    .027

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -5.5     5.5              250     250     250            .1       .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.579

INPUT
Description: STA 29+54.78
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -61.92  659.34  -47.34  654.48  -45.34  654.44   -41.5  653.16   -11.5  652.56
    -5.5  652.44      -5  651.94       0  651.94       5  651.94     5.5  652.44
    11.5  652.52      22  652.66   41.47  659.15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -61.92    .027    -5.5    .025     5.5    .027

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -5.5     5.5              250     250     250            .1       .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.555

INPUT
Description: STA 32+04.78
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -34.02  659.05   -19.5  654.33   -17.5  654.29   -11.5  652.29    -5.5  652.17
      -5  651.67       0  651.67       5  651.67     5.5  652.17    11.5  652.29
    17.5  654.29    19.5  654.33   34.02  658.88

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -34.02    .027    -5.5    .025     5.5    .027

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -5.5     5.5               50      50      50            .1       .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.546

INPUT
Description: STA 32+54.78 (U/S Face of OFA Culvert)
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -53.13  665.16   -12.5  651.62       0  651.62    12.5  651.62   47.13  663.16
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -53.13     .03  -53.13     .03   47.13     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -53.13   47.13          4445.22 4445.22 4445.22             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -53.13     -13  663.16        F
      13   47.13  663.16        F

CULVERT


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.000

INPUT
Description: OFA Culvert (STA 32+54.78 to STA 77+00)
Distance from Upstream XS =       2
Deck/Roadway Width        =    4443
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
  -53.09   665.3       0   47.09   663.3       0

Upstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -53.13  665.16   -12.5  651.62       0  651.62    12.5  651.62   47.13  663.16

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -53.13     .03  -53.13     .03   47.13     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        -53.13   47.13           .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -53.13     -13  663.16        F
      13   47.13  663.16        F

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
  -53.81   657.3       0   53.81   657.3       0

Downstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -43.65  657.18   -12.5   646.8       0   646.8    12.5   646.8   43.65  657.18

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -43.65     .03  -43.65     .03   43.65     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        -43.65   43.65           .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -43.65     -13   657.3        F
      13   43.65   657.3        F

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 =     .95
Elevation at which weir flow begins        =   665.3
Energy head used in spillway design        =
Spillway height used in design             =
Weir crest shape                           = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       7      11
FHWA Chart # 58- Rectangular concrete
FHWA Scale # 2 - Side tapered; More favorable edges
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                .11    4445     .012     .012        0                  .2               1
Number of Barrels =  2
Upstream   Elevation =  651.62
Centerline Stations
    Sta.    Sta.
    -6.5     6.5
Downstream Elevation =  646.8
Centerline Stations
    Sta.    Sta.
    -6.5     6.5

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 7.58

INPUT
Description: STA 77+00 (D/S Face of OFA Culvert)
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -43.65  657.18   -12.5   646.8       0   646.8    12.5   646.8   43.65  657.18
```

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-43.65	.03	-43.65	.03	43.65	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-43.65	43.65	50	50	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-43.65	-13	657.3	F
13	43.65	657.3	F

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.57

INPUT
Description: STA 77+50
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	655.59	-33.54	654.09	-19.5	649.41	-17.5	649.37	-11.5	647.37
-5.5	647.25	-5	646.75	0	646.75	5	646.75	5.5	647.25
11.5	647.37	17.5	649.37	19.5	649.41	33.03	653.92	38.04	655.59

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	119.51	119.51	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.54

INPUT
Description: STA 78+69.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	655.46	-33.54	653.96	-19.5	649.28	-17.5	649.24	-11.5	647.24
-5.5	647.12	-5	646.62	0	646.62	5	646.62	5.5	647.12
11.5	647.24	17.5	649.24	19.5	649.28	33.03	653.79	38.04	655.46

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.50

INPUT
Description: STA 81+19.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	655.19	-33.54	653.69	-19.5	649.01	-17.5	648.97	-11.5	646.97
-5.5	646.85	-5	646.35	0	646.35	5	646.35	5.5	646.85
11.5	646.97	17.5	648.97	19.5	649.01	33.03	653.52	38.04	655.19

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.450

INPUT
Description: STA 83+69.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	654.92	-33.54	653.42	-19.5	648.74	-17.5	648.7	-11.5	646.7
-5.5	646.58	-5	646.08	0	646.08	5	646.08	5.5	646.58
11.5	646.7	17.5	648.7	19.5	648.74	33.03	653.25	38.04	654.92

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.426

INPUT
Description: STA 86+19.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	654.65	-33.54	653.15	-19.5	648.47	-17.5	648.43	-11.5	646.43
-5.5	646.31	-5	645.81	0	645.81	5	645.81	5.5	646.31
11.5	646.43	17.5	648.43	19.5	648.47	33.03	652.98	38.04	654.65

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	250	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.382

INPUT
Description: STA 88+69.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	654.38	-33.54	652.88	-19.5	648.2	-17.5	648.16	-11.5	646.16
-5.5	646.04	-5	645.54	0	645.54	5	645.54	5.5	646.04
11.5	646.16	17.5	648.16	19.5	648.2	33.03	652.71	38.04	654.38

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	250	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.25

INPUT
Description: STA 91+19.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	654.11	-33.54	652.61	-19.5	647.93	-17.5	647.89	-11.5	645.89
-5.5	645.77	-5	645.27	0	645.27	5	645.27	5.5	645.77
11.5	645.89	17.5	647.89	19.5	647.93	33.03	652.44	38.04	654.11

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	250	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.154

INPUT
Description: STA 93+69.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	653.84	-33.54	652.34	-19.5	647.66	-17.5	647.62	-11.5	645.62
-5.5	645.5	-5	645	0	645	5	645	5.5	645.5
11.5	645.62	17.5	647.62	19.5	647.66	33.03	652.17	38.04	653.84

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	250	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.141

INPUT
Description: STA 96+19.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	653.56	-33.54	652.06	-19.5	647.38	-17.5	647.34	-11.5	645.34
-5.5	645.22	-5	644.72	0	644.72	5	644.72	5.5	645.22
11.5	645.34	17.5	647.34	19.5	647.38	33.03	651.89	38.04	653.56

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	250	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.122

INPUT
Description: STA 98+69.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	653.29	-33.54	651.79	-19.5	647.11	-17.5	647.07	-11.5	645.07
-5.5	644.95	-5	644.45	0	644.45	5	644.45	5.5	644.95
11.5	645.07	17.5	647.07	19.5	647.11	33.03	651.62	38.04	653.29

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	50	50	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.111

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-72.05	654.5	-15	644.4	15	644.4	72.05	654.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-72.05	.015	-72.05	.015	72.05	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-72.05	72.05	178	178	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-72.05	-11.75	654.86	F
11.75	72.05	654.67	F

CULVERT

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.094

INPUT
Description: Taft Road (Bridge #2) CBBEL Cross-Section and Brodge Overtopping
Elevations used per Thomson Survey and Visual Inspection 4/2003

Distance from Upstream XS = .1
Deck/Roadway Width = 177.8
Weir Coefficient = 2.5
Upstream Deck/Roadway Coordinates
num= 10

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-302.5	655.62		-184	655.62		-125	655.36	
-73	655.11		-20	654.86		7	654.74	
33	654.61		86	654.46		138	654.76	
166	655.08							

Upstream Bridge Cross Section Data
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-72.05	654.5	-15	644.4	15	644.4	72.05	654.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-72.05	.015	-72.05	.015	72.05	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
-72.05	72.05	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-72.05	-11.75	654.86	F
11.75	72.05	654.67	F

Downstream Deck/Roadway Coordinates
num= 10

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-302.5	655.62		-180	655.61		-125	655.31	
-75	655.18		-23	654.82		5	654.69	
28	654.58		78	654.46		128	654.57	
179	655.45							

Downstream Bridge Cross Section Data
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-80	655.3	-34	648.59	-11	644.12	7	644.05	12	644.12
30	648.67	100	655.3						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-80	.015	-34	.015	30	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
-34	30	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-80	-11.75	654.77	F
11.75	100	654.66	F

```
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 =     .95
Elevation at which weir flow begins         =  654.46
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  2

Culvert Name      Shape      Rise    Span
Culvert #1           Box    6.33    11.5
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  1     177     .012     .012        0                  .5               1
Upstream   Elevation =  644.4
           Centerline Station = -6
Downstream Elevation =  644.25
           Centerline Station = -6

Culvert Name      Shape      Rise    Span
Culvert #2           Box    6.33    11.5
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  1     177     .012     .012        0                  .5               1
Upstream   Elevation =  644.4
           Centerline Station =  6
Downstream Elevation =  644.25
           Centerline Station =  6

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach          RS: 7.077

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -80   655.3     -34  648.59     -11  644.12       7  644.05      12  644.12
      30  648.67     100   655.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -80    .015     -34    .015      30    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -34      30              35      35      35              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     -80  -11.75  654.77       F
   11.75     100  654.66       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach          RS: 7.07

INPUT
Description:
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     655      30     646      32  645.25     105  644.25     240  645.25
     275     655

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06      32     .06     240     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           32     240              16      16      16              .1       .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach          RS: 7.067

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -142  654.98     -141  654.97     -118  654.96     -102  654.71     -100  655.01
     -94  655.09      -85  653.71      -74  647.76      -73  646.27      -50  643.02
      11  643.65       84  645.78      109  645.66      145  646.48      147  646.75
     162  651.53      181   657.5      184  657.62

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -142     .06     -74     .06      84     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -74      84              48      48      48              .1       .3

CROSS SECTION
```

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.059

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	655	28	644.25	240	644.25	266	654

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	28	.06	240	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28	240	.1	.1	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.058

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	655	28	645.25	240	645.25	266	654

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	28	.06	240	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28	240	165	165	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.027

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	655	28	645.2	240	645.2	266	654

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	28	.06	240	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28	240	137	137	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.001

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-211	656.83	-197	656.56	-183	656.55	-181	656.94	-173	656.12
-161	653.18	-146	646.4	-126	646.31	-113	645.98	-108	644.8
-102	644.63	-95	645.98	-38	646.1	5	645.2	44	645.94
71	646.49	74	647.1	86	651.99				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-211	.06	-126	.06	71	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-126	71	163	163	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.97

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	657	31	645.13	242	645.13	275	654	300	655

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	31	.06	242	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
31	242	200	200	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.932

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	657	32	645.08	208	645.08	240	654	265	655

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	32	.06	208	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
32	208	35	35	35	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.925

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-149	657.65	-138	657.75	-126	657.65	-118	657.63	-105	652.8
-90	646.83	-89	646.58	-55	646.18	-12	645.94	-10	645.17
0	644.62	9	645.73	15	645.73	34	645.6	67	645.99
89	646.57	92	647.19	107	651.39	120	654.68	123	655.41

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-149	.06	-105	.06	107	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-105	107	140	165	185	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.894

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	656	32	645.03	172	645.03	185	650	194	652
220	653	235	655						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	32	.06	172	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
32	172	85	98	114	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.875

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	656	33	645	160	645	185	652	210	653

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	33	.06	160	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
33	160	195	195	195	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.838

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-132	655.61	-130	656.15	-128	656.2	-118	655.34	-106	655.24
-103	655.68	-99	655.58	-90	654.3	-78	649.9	-68	646.27
-38	646.16	-3	645.72	32	646.23	63	646.33	67	646.27
78	649.15	98	653.57	102	653.92				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-132	.06	-78	.06	78	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-78	78	205	205	205	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.799

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	654	23	644.19	150	644.19	172	651	212	652
228	654								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	23	.06	150	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
23	150	143	143	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.772

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-115	653.63	-104	653.33	-93	653	-91	653.01	-90	653.75
-85	653.28	-81	652.36	-64	645.85	-43	645.81	-14	645.78
6	645.76	32	645.81	45	645.51	67	646.03	71	647.11
87	652.86								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-115	.06	-81	.06	87	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-81	87	247	255	262	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.724

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	652	28	644.8	115	644.8	128	649	140	650
165	650	181	654						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	28	.06	115	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28	115	200	200	200	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.686

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	652	28	644.75	125	644.75	145	649	160	650
175	650	190	653						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	28	.06	125	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28	125	26	26	26	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.681

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-90	653.83	-89	653.47	-77	653.31	-64	653.12	-63	653.49
-60	653.05	-49	651.19	-45	650.8	-31	644.71	-19	643.67
-16	644.65	-9	644.3	-8	643.04	0	644.29	8	644.45
15	644.39	16	643.56	24	644.49	32	644.23	40	644.32
48	644.12	52	643.2	55	644.36	64	644.47	77	644.61
78	644.6	80	644.6	82	644.66	101	651.23	106	651.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-90	.06	-45	.06	101	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-45	101	174	174	174	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.649

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	652	28	643.75	125	643.75	145	649	160	650
175	650	190	653						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	28	.06	125	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28	125	.1	.1	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.648

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	652	7	650	15	648	25	646	35	644
140	643.65	210	644	220	648	240	650	265	652

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	35	.06	210	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35	210	70	70	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.636

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-194	651.39	-186	650.61	-174	647.18	-168	646	-122	645.2
-60	645.09	-4	645.06	0	643.92	8	644.58	11	645.27
31	645.46	72	645.54	75	645.71	90	646.1	98	650.04
120	650.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-194	.06	-174	.06	90	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-174	90	130	130	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.611

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	652	40	647	145	646	470	645	560	645
590	652	625	652	635	650	655	644	800	644
905	644.5	1045	644	1105	643.59	1175	644	1200	648
1230	651	1240	652						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1045	.06	1175	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1045	1175	74	74	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	590	652	F

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.597

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1156	651.3	-1152	650.3	-1148	649.3	-1144	648.3	-1139	647.3
-959	646.3	-684	645.3	-644	645.3	-579	646.3	-575	647.3
-571	648.3	-567	649.3	-563	649.93	-560	653	-552	652.25
-535	647.29	-477	645.21	-402	644.65	-306	644.55	-237	644.15
-181	645.27	-125	645.05	-68	645.29	-3	644.94	0	644.26
3	644.45	8	644.6	11	645.06	28	645.53	50	645.35

```
      73  645.57      78  646.26      87   648.6      96   648.8     112   649.3
     116   650.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -1156     .06    -535     .06      78     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -535      78             126     126     126             .1      .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   -1156    -560     653       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 6.573

INPUT
Description:
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     653      20     651      60     647     145     646     470     645
     560     645     580     651     675     651     685     650     715     644
     845     644     890   644.5     935     644     990  643.53    1050     644
    1055     646    1105     651

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06     890     .06    1050     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          890    1050              16      16      16             .1      .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
      20     580     651       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 6.557

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -896   653.3    -892   652.3    -888   651.3    -884   650.3    -880   649.3
    -876   648.3    -862   647.3    -762   646.3    -470   645.3    -430   645.3
    -355   645.6    -265   646.3    -262   647.3    -259   648.3    -256   649.3
    -253   650.3    -250   651.3    -247   652.3    -238   653.3    -228   653.3
    -218   652.3    -210   651.3    -206   650.3    -202   649.3    -198   648.3
    -194   647.3    -190   646.3    -186   645.3    -151   644.3     -96  644.52
     -60  644.63     -11   644.7      -5  644.59       2  644.51       6  644.72
      61  645.61      66  646.28      73   646.3      88   647.3      93   648.3
      97   649.3     102   650.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -896     .06    -186     .06      61     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -186      61              84      84      84             .1      .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    -896    -238   653.3       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 6.554

INPUT
Description:
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     652      30     651      95     646     420     645     440     645
     490     651     655     651     710     650     745     646     770     644
     785     644     850  643.44     910     644     915     646     930     648
     955     650     980     651

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06     785     .06     910     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          785     910              10      10      10             .1      .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
      30     490     651       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 6.551

INPUT
Description:
Station Elevation Data    num=      12
```

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	652	215	652	440	651	465	651	485	650
510	644	540	644	580	643.5	635	644	645	646
685	650	710	651						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	510	.06	635	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
510	635	20	20	20	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.538

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-72	651.23	-62	649.19	-53	644.24	-46	643.08	-33	642.96
-31	642.98	-29	644.2	-15	644.27	-14	643.25	-1	642.81
3	642.78	6	644.11	31	645.3	39	646.3	44	646.3
49	646.3	59	647.3	63	648.3	67	649.3	71	650.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-72	.06	-62	.06	31	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-62	31	85	69	50	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.535

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	652	105	651	110	650	118	644	140	643.47
192	644	205	646	230	650	265	651		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	118	.06	192	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
118	192	90	90	85	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.518

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-42	650.3	-27	646.98	-14	645.72	-6	642.59	8	643.02
27	643.37	29	644.67	37	646.26	45	647.92	57	649.3
75	650.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-42	.06	-27	.06	45	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-27	45	20	10	10	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.516

INPUT
Description: BEGINNING OF US POSTAL FACILITY IMPROVEMENTS
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	652	5	651	10	650	50	645	86	643.44
100	644	115	650	130	651				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	50	.06	100	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
50	100	35	17	5	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.513

INPUT

```
Description: CBBEL Cross-Section 4/2003
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300   650.3     -47   649.3     -22  647.04     -20  647.35     -18  642.45
      -9  642.39       0  643.83      13  642.84      28  643.16      36  646.05
     141   650.3     300   650.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300     .05     -20    .012      36     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            -20      36             165     165     165             .3      .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    -300  -19.78   647.8       F
      19     300   647.8       F

BRIDGE


RIVER: Bensenville Ditc
REACH: US Reach           RS: 6.497

INPUT
Description: Irving Park Road (Bridge #1)

Distance from Upstream XS =       .1
Deck/Roadway Width        =   164.8
Weir Coefficient          =       3
Upstream  Deck/Roadway Coordinates
    num=      14
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -1049   655.4            -299   650.4            -49     648
     -31   648.3             -30   648.2     647      0   648.3     647
       0   648.3     647       1   648.3     647     19   648.4     647
      20   648.8              51   648.5             104   648.7
     161     649             351   650.4

Upstream Bridge Cross Section Data
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300   650.3     -47   649.3     -22  647.04     -20  647.35     -18  642.45
      -9  642.39       0  643.83      13  642.84      28  643.16      36  646.05
     141   650.3     300   650.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300     .05     -20    .012      36     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
            -20      36             .3      .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    -300  -19.78   647.8       F
      19     300   647.8       F

Downstream  Deck/Roadway Coordinates
    num=      15
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    2000   655.4            2750   650.4            3000     648
    3029   648.3            3030   648.2   646.6    3049   648.3   646.6
    3050   648.3   646.6    3050   648.3   646.6    3068   648.4   646.6
    3069   648.8            3100   648.5            3153   648.7
    3210     649            3400   650.4            3600   655.4

Downstream Bridge Cross Section Data
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    2000     655    2750     650    3000   647.6    3029   647.9    3030   646.6
    3030   643.1    3068   643.1    3068   646.6    3069   648.4    3100   648.1
    3153   648.3    3210   648.6    3400     650    3600     655

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    2000     .05    3029    .012    3069     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
          3029    3069             .3      .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    2000    3029   647.4       F
    3069    3600   647.4       F

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 =     .95
Elevation at which weir flow begins        =   648.2
Energy head used in spillway design        =
Spillway height used in design             =
Weir crest shape                           = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=    3049    Downstream=    3049
Upstream     num=       2
    Width   Elev    Width   Elev
       .5   643.5      .5     647
Downstream     num=       2
    Width   Elev    Width   Elev
       .5   643.1      .5     647
```

```
Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
      Yarnell                KVal =    1.25
Selected Low Flow Methods = Yarnell

High Flow Method
      Pressure and Weir flow
          Submerged Inlet Cd          =
          Submerged Inlet + Outlet Cd =.8006408
          Max Low Cord                =     647

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: Bensenville Ditc
REACH: US Reach           RS: 6.481

INPUT
Description:    DS SIDE IRVING PARK ROAD

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    2000     655    2750     650    3000   647.6    3029   647.9    3030   646.6
    3030   643.1    3068   643.1    3068   646.6    3069   648.4    3100   648.1
    3153   648.3    3210   648.6    3400     650    3600     655

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    2000     .05    3029    .012    3069     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          3029    3069               80      80      80             .3      .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    2000    3029   647.4       F
    3069    3600   647.4       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 6.467

INPUT
Description: WAT10.DATA(BND1037) PLAN8 PLAN OF IMPROVEMENT
   INCLUDES
            LATEST CHANNEL RE-ALIGNMENT & REMOVED FERRARI X-SECT
   STREAM
            STATIONING USED - DESIGN CENTERLINE
   STREAM STATION 6.05 AT
            CONFLUENCE W/ SILVER CREEK
   CROSS SECTIONS CODED LOOKING
            DOWNSTREAM
   STARTING WSE FROM STR 102 INFLOW RATING CURVE

            IMPROVEMENTS AT O'HARE AIRPORT ARE IN PLACE
   SECTIONS 6.467 TO
            7.479 FROM 85 SURVEY DATA
   SECTIONS 7.811 TO END FROM 88 SURVEY
            UNLESS NOTED
   POSTAL FACILITY IMPROVEMENTS AFTER 6.513 THRU
            7.479

Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    2000     655    2750     650    3000   647.6    3029   647.9    3030   646.6
    3030   643.1    3068   643.1    3068   646.6    3069   648.4    3100   648.1
    3153   648.3    3210   648.6    3400     650    3600     655

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    2000     .05    3029     .04    3069     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          3029    3069                 0       0       0             .1      .3


SUMMARY OF MANNING'S N VALUES

River:Bensenville Ditc

      Reach          River Sta.       n1        n2        n3

 US Reach              9.635              .04       .035      .04
 US Reach              9.623              .04       .035      .04
 US Reach              9.595              .04       .035      .04
 US Reach              9.588              .04       .035      .04
 US Reach              9.573              .04       .035      .04
 US Reach              9.557              .04       .035      .04
 US Reach              9.556        Bridge
 US Reach              9.555              .04       .035      .04
 US Reach              9.541              .04       .035      .04
```

US Reach	9.527	.04	.012	.04
US Reach	9.522	Culvert		
US Reach	9.517	.04	.012	.04
US Reach	9.506	.04	.025	.04
US Reach	9.476	.04	.035	.04
US Reach	9.459	.04	.035	.04
US Reach	9.439	.04	.035	.04
US Reach	9.416	.04	.035	.04
US Reach	9.394	.06	.035	.06
US Reach	9.39	.06	.035	.06
US Reach	9.366	.06	.035	.06
US Reach	9.349	.06	.035	.06
US Reach	9.33	.06	.035	.06
US Reach	9.314	.06	.035	.06
US Reach	9.284	.06	.035	.06
US Reach	9.267	.06	.035	.06
US Reach	9.255	.05	.012	.05
US Reach	9.2505	Culvert		
US Reach	9.246	.05	.012	.05
US Reach	9.24	.05	.025	.05
US Reach	9.206	.05	.035	.05
US Reach	9.197	.05	.035	.05
US Reach	9.189	.05	.012	.05
US Reach	9.186	.05	.012	.05
US Reach	9.178499	Culvert		
US Reach	9.171	.05	.012	.05
US Reach	9.162	.05	.025	.05
US Reach	9.153	.05	.025	.05
US Reach	9.134	.05	.035	.05
US Reach	9.121	.05	.035	.05
US Reach	9.1	.05	.035	.05
US Reach	9.078	.05	.035	.05
US Reach	9.058	.05	.035	.05
US Reach	9.039	.05	.035	.05
US Reach	9.02	.05	.035	.05
US Reach	9.001	.05	.035	.05
US Reach	8.982	.05	.035	.05
US Reach	8.972	.05	.035	.05
US Reach	8.962	.04	.012	.04
US Reach	8.952499	Culvert		
US Reach	8.943	.013	.013	.013
US Reach	8.937	.013	.013	.013
US Reach	8.932	Culvert		
US Reach	8.91	.05	.025	.05
US Reach	8.9	.05	.025	.05
US Reach	8.888	.03	.03	.03
US Reach	8.87	Culvert		
US Reach	8.864	.03	.03	.03
US Reach	8.852	.027	.025	.027
US Reach	8.830	.027	.025	.027
US Reach	8.820	.027	.025	.027
US Reach	8.743	.027	.025	.027
US Reach	8.686	.027	.025	.027
US Reach	8.642	.027	.025	.027
US Reach	8.579	.027	.025	.027
US Reach	8.555	.027	.025	.027
US Reach	8.546	.03	.03	.03
US Reach	8.000	Culvert		
US Reach	7.58	.03	.03	.03
US Reach	7.57	.027	.025	.027
US Reach	7.54	.027	.025	.027
US Reach	7.50	.027	.025	.027
US Reach	7.450	.027	.025	.027
US Reach	7.426	.027	.025	.027
US Reach	7.382	.027	.025	.027
US Reach	7.25	.027	.025	.027
US Reach	7.154	.027	.025	.027
US Reach	7.141	.027	.025	.027
US Reach	7.122	.027	.025	.027
US Reach	7.111	.015	.015	.015
US Reach	7.094	Culvert		
US Reach	7.077	.015	.015	.015
US Reach	7.07	.06	.06	.06
US Reach	7.067	.06	.06	.06
US Reach	7.059	.06	.06	.06
US Reach	7.058	.06	.06	.06
US Reach	7.027	.06	.06	.06
US Reach	7.001	.06	.06	.06
US Reach	6.97	.06	.06	.06
US Reach	6.932	.06	.06	.06
US Reach	6.925	.06	.06	.06
US Reach	6.894	.06	.06	.06
US Reach	6.875	.06	.06	.06
US Reach	6.838	.06	.06	.06
US Reach	6.799	.06	.06	.06
US Reach	6.772	.06	.06	.06
US Reach	6.724	.06	.06	.06
US Reach	6.686	.06	.06	.06
US Reach	6.681	.06	.06	.06
US Reach	6.649	.06	.06	.06
US Reach	6.648	.06	.06	.06
US Reach	6.636	.06	.06	.06
US Reach	6.611	.06	.06	.06
US Reach	6.597	.06	.06	.06
US Reach	6.573	.06	.06	.06
US Reach	6.557	.06	.06	.06
US Reach	6.554	.06	.06	.06
US Reach	6.551	.06	.06	.06
US Reach	6.538	.06	.06	.06
US Reach	6.535	.06	.06	.06
US Reach	6.518	.06	.06	.06
US Reach	6.516	.06	.06	.06

US Reach	6.513	.05	.012	.05
US Reach	6.497	Bridge		
US Reach	6.481	.05	.012	.05
US Reach	6.467	.05	.04	.05

SUMMARY OF REACH LENGTHS

River: Bensenville Ditc

Reach	River Sta.	Left	Channel	Right
US Reach	9.635	50	50	50
US Reach	9.623	150	150	150
US Reach	9.595	50	50	50
US Reach	9.588	46	46	46
US Reach	9.573	114	114	114
US Reach	9.557	10	10	10
US Reach	9.556	Bridge		
US Reach	9.555	73	71	67
US Reach	9.541	65	65	65
US Reach	9.527	50	50	50
US Reach	9.522	Culvert		
US Reach	9.517	40	40	40
US Reach	9.506	128	128	128
US Reach	9.476	105	105	105
US Reach	9.459	100	100	100
US Reach	9.439	135	135	135
US Reach	9.416	102	102	102
US Reach	9.394	62	62	62
US Reach	9.39	97	97	97
US Reach	9.366	96	96	96
US Reach	9.349	100	100	100
US Reach	9.33	100	100	100
US Reach	9.314	150	150	150
US Reach	9.284	100	100	100
US Reach	9.267	65	65	65
US Reach	9.255	44	44	44
US Reach	9.2505	Culvert		
US Reach	9.246	10	10	10
US Reach	9.24	185	185	185
US Reach	9.206	46	46	46
US Reach	9.197	45	45	45
US Reach	9.189	18	18	18
US Reach	9.186	78	78	78
US Reach	9.178499	Culvert		
US Reach	9.171	37	37	37
US Reach	9.162	26	26	26
US Reach	9.153	117	117	117
US Reach	9.134	98	98	98
US Reach	9.121	97	97	97
US Reach	9.1	96	96	96
US Reach	9.078	145	145	145
US Reach	9.058	100	100	100
US Reach	9.039	97	97	97
US Reach	9.02	100	100	100
US Reach	9.001	100	100	100
US Reach	8.982	50	50	50
US Reach	8.972	56	56	56
US Reach	8.962	136.73	136.73	136.73
US Reach	8.952499	Culvert		
US Reach	8.943	11	11	11
US Reach	8.937	120.87	120.87	120.87
US Reach	8.932	Culvert		
US Reach	8.91	30	30	30
US Reach	8.9	50	50	50
US Reach	8.888	137	137	137
US Reach	8.87	Culvert		
US Reach	8.864	50	50	50
US Reach	8.852	251.09	251.09	251.09
US Reach	8.830	250	250	250
US Reach	8.820	250	250	250
US Reach	8.743	250	250	250
US Reach	8.686	250	250	250
US Reach	8.642	250	250	250
US Reach	8.579	250	250	250
US Reach	8.555	50	50	50
US Reach	8.546	4445.22	4445.22	4445.22
US Reach	8.000	Culvert		
US Reach	7.58	50	50	50
US Reach	7.57	119.51	119.51	119.51
US Reach	7.54	250	250	250
US Reach	7.50	250	250	250
US Reach	7.450	250	250	250
US Reach	7.426	250	250	250
US Reach	7.382	250	250	250
US Reach	7.25	250	250	250
US Reach	7.154	250	250	250
US Reach	7.141	250	250	250
US Reach	7.122	50	50	50
US Reach	7.111	178	178	178
US Reach	7.094	Culvert		
US Reach	7.077	35	35	35
US Reach	7.07	16	16	16
US Reach	7.067	48	48	48
US Reach	7.059	.1	.1	.1
US Reach	7.058	165	165	165
US Reach	7.027	137	137	137
US Reach	7.001	163	163	163
US Reach	6.97	200	200	200

US Reach	6.932	35	35	35
US Reach	6.925	140	165	185
US Reach	6.894	85	98	114
US Reach	6.875	195	195	195
US Reach	6.838	205	205	205
US Reach	6.799	143	143	143
US Reach	6.772	247	255	262
US Reach	6.724	200	200	200
US Reach	6.686	26	26	26
US Reach	6.681	174	174	174
US Reach	6.649	.1	.1	.1
US Reach	6.648	70	70	70
US Reach	6.636	130	130	130
US Reach	6.611	74	74	74
US Reach	6.597	126	126	126
US Reach	6.573	16	16	16
US Reach	6.557	84	84	84
US Reach	6.554	10	10	10
US Reach	6.551	20	20	20
US Reach	6.538	85	69	50
US Reach	6.535	90	90	85
US Reach	6.518	20	10	10
US Reach	6.516	35	17	5
US Reach	6.513	165	165	165
US Reach	6.497	Bridge		
US Reach	6.481	80	80	80
US Reach	6.467	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Bensenville Ditc

Reach	River Sta.	Contr.	Expan.
US Reach	9.635	.1	.3
US Reach	9.623	.1	.3
US Reach	9.595	.1	.3
US Reach	9.588	.1	.3
US Reach	9.573	.1	.3
US Reach	9.557	.1	.3
US Reach	9.556	Bridge	
US Reach	9.555	.1	.3
US Reach	9.541	.1	.3
US Reach	9.527	.3	.5
US Reach	9.522	Culvert	
US Reach	9.517	.3	.5
US Reach	9.506	.1	.3
US Reach	9.476	.1	.3
US Reach	9.459	.1	.3
US Reach	9.439	.1	.3
US Reach	9.416	.1	.3
US Reach	9.394	.1	.3
US Reach	9.39	.1	.3
US Reach	9.366	.1	.3
US Reach	9.349	.1	.3
US Reach	9.33	.1	.3
US Reach	9.314	.1	.3
US Reach	9.284	.1	.3
US Reach	9.267	.1	.3
US Reach	9.255	.3	.5
US Reach	9.2505	Culvert	
US Reach	9.246	.3	.5
US Reach	9.24	.1	.3
US Reach	9.206	.1	.3
US Reach	9.197	.1	.3
US Reach	9.189	.3	.5
US Reach	9.186	.3	.5
US Reach	9.178499	Culvert	
US Reach	9.171	.3	.5
US Reach	9.162	.1	.3
US Reach	9.153	.1	.3
US Reach	9.134	.1	.3
US Reach	9.121	.1	.3
US Reach	9.1	.1	.3
US Reach	9.078	.1	.3
US Reach	9.058	.1	.3
US Reach	9.039	.1	.3
US Reach	9.02	.1	.3
US Reach	9.001	.1	.3
US Reach	8.982	.1	.3
US Reach	8.972	.1	.3
US Reach	8.962	.3	.5
US Reach	8.952499	Culvert	
US Reach	8.943	.6	.8
US Reach	8.937	.6	.8
US Reach	8.932	Culvert	
US Reach	8.91	.3	.5
US Reach	8.9	.1	.3
US Reach	8.888	.3	.5
US Reach	8.87	Culvert	
US Reach	8.864	.3	.5
US Reach	8.852	.1	.3
US Reach	8.830	.1	.3
US Reach	8.820	.1	.3
US Reach	8.743	.1	.3
US Reach	8.686	.1	.3
US Reach	8.642	.1	.3
US Reach	8.579	.1	.3
US Reach	8.555	.1	.3

US Reach	8.546		.3	.5
US Reach	8.000	Culvert		
US Reach	7.58		.3	.5
US Reach	7.57		.1	.3
US Reach	7.54		.1	.3
US Reach	7.50		.1	.3
US Reach	7.450		.1	.3
US Reach	7.426		.1	.3
US Reach	7.382		.1	.3
US Reach	7.25		.1	.3
US Reach	7.154		.1	.3
US Reach	7.141		.1	.3
US Reach	7.122		.1	.3
US Reach	7.111		.3	.5
US Reach	7.094	Culvert		
US Reach	7.077		.3	.5
US Reach	7.07		.1	.3
US Reach	7.067		.1	.3
US Reach	7.059		.1	.3
US Reach	7.058		.1	.3
US Reach	7.027		.1	.3
US Reach	7.001		.1	.3
US Reach	6.97		.1	.3
US Reach	6.932		.1	.3
US Reach	6.925		.1	.3
US Reach	6.894		.1	.3
US Reach	6.875		.1	.3
US Reach	6.838		.1	.3
US Reach	6.799		.1	.3
US Reach	6.772		.1	.3
US Reach	6.724		.1	.3
US Reach	6.686		.1	.3
US Reach	6.681		.1	.3
US Reach	6.649		.1	.3
US Reach	6.648		.1	.3
US Reach	6.636		.1	.3
US Reach	6.611		.1	.3
US Reach	6.597		.1	.3
US Reach	6.573		.1	.3
US Reach	6.557		.1	.3
US Reach	6.554		.1	.3
US Reach	6.551		.1	.3
US Reach	6.538		.1	.3
US Reach	6.535		.1	.3
US Reach	6.518		.1	.3
US Reach	6.516		.1	.3
US Reach	6.513		.3	.5
US Reach	6.497	Bridge		
US Reach	6.481		.3	.5
US Reach	6.467		.1	.3

Profile Output Table - Standard Table 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	Fro
ude # Chl												
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
US Reach	6.467	100-Year	1175.00	643.10	649.85	646.19	649.91	0.000508	2.57	908.89	614.01	
0.18												
US Reach	6.481	100-Year	1175.00	643.10	649.81	646.20	649.98	0.000097	3.72	883.21	603.90	
0.26												
US Reach	6.497		Bridge									
US Reach	6.513	100-Year	1175.00	642.39	649.88	646.12	650.02	0.000051	2.97	641.53	325.33	
0.20												
US Reach	6.516	100-Year	1175.00	643.44	649.88		650.02	0.001583	3.18	428.65	103.76	
0.23												
US Reach	6.518	100-Year	1175.00	642.59	649.91		650.03	0.001495	2.91	427.17	108.12	
0.22												
US Reach	6.535	100-Year	1175.00	643.47	650.06		650.12	0.000611	2.09	609.85	122.39	
0.15												
US Reach	6.538	100-Year	1175.00	642.78	650.11		650.16	0.000508	1.82	684.04	136.77	
0.13												
US Reach	6.551	100-Year	1175.00	643.50	650.15		650.17	0.000224	1.27	1008.44	206.57	
0.09												
US Reach	6.554	100-Year	1175.00	643.44	650.16	645.03	650.17	0.000155	1.07	1204.12	699.44	
0.07												
US Reach	6.557	100-Year	1175.00	644.30	650.17	645.62	650.18	0.000109	0.80	1512.06	936.24	
0.06												
US Reach	6.573	100-Year	1175.00	643.53	650.18	644.72	650.18	0.000041	0.54	2283.72	962.67	
0.04												
US Reach	6.597	100-Year	1175.00	644.15	650.19	645.39	650.19	0.000025	0.37	3233.90	1249.27	
0.03												
US Reach	6.611	100-Year	1175.00	643.59	650.19	644.64	650.19	0.000018	0.37	3375.78	1155.57	
0.03												
US Reach	6.636	100-Year	1175.00	643.92	650.19		650.20	0.000162	0.90	1317.06	289.50	
0.07												
US Reach	6.648	100-Year	1175.00	643.65	650.20		650.21	0.000128	0.96	1274.44	236.13	
0.07												
US Reach	6.649	100-Year	1175.00	643.75	650.18		650.22	0.000362	1.63	782.70	169.71	
0.11												
US Reach	6.681	100-Year	1175.00	643.04	650.25		650.29	0.000433	1.55	758.60	141.89	
0.12												
US Reach	6.686	100-Year	1175.00	644.75	650.25		650.30	0.000601	1.89	674.82	169.50	
0.14												
US Reach	6.724	100-Year	1175.00	644.80	650.38		650.44	0.000729	2.10	610.81	160.18	
0.16												
US Reach	6.772	100-Year	1175.00	645.51	650.57		650.62	0.000666	1.70	689.94	156.97	
0.14												
US Reach	6.799	100-Year	1175.00	644.19	650.65		650.67	0.000236	1.32	936.18	163.00	
0.09												
US Reach	6.838	100-Year	1175.00	645.72	650.71		650.75	0.000680	1.72	688.00	165.26	

0.14											
US Reach	6.875	100-Year	1175.00	645.00	650.81		650.85	0.000331	1.46	849.56	165.21
0.11											
US Reach	6.894	100-Year	1175.00	645.03	650.85		650.88	0.000282	1.35	909.07	173.80
0.10											
US Reach	6.925	100-Year	1175.00	644.62	650.90		650.93	0.000331	1.24	946.91	205.49
0.10											
US Reach	6.932	100-Year	1175.00	645.08	650.92		650.94	0.000179	1.08	1134.49	212.62
0.08											
US Reach	6.97	100-Year	1175.00	645.13	650.95		650.97	0.000128	0.91	1336.28	247.88
0.07											
US Reach	7.001	100-Year	1175.00	644.63	650.98		650.99	0.000196	1.03	1164.56	239.64
0.08											
US Reach	7.027	100-Year	1175.00	645.20	651.00		651.02	0.000130	0.91	1327.97	245.72
0.07											
US Reach	7.058	100-Year	1175.00	645.25	651.02		651.04	0.000132	0.92	1321.49	245.74
0.07											
US Reach	7.059	100-Year	1175.00	644.25	651.03		651.04	0.000077	0.78	1558.00	247.73
0.05											
US Reach	7.067	100-Year	1175.00	643.02	651.03		651.04	0.000094	0.86	1440.24	240.48
0.06											
US Reach	7.07	100-Year	1175.00	644.25	651.03		651.04	0.000103	0.86	1419.73	247.53
0.06											
US Reach	7.077	100-Year	1175.00	644.05	650.59	648.35	651.50	0.000498	7.70	152.68	97.90
0.53											
US Reach	7.094		Culvert								
US Reach	7.111	100-Year	1175.00	644.40	651.65	648.66	652.39	0.000345	6.89	170.48	111.95
0.45											
US Reach	7.122	100-Year	1108.00	644.45	652.30		652.47	0.000307	4.00	349.90	70.13
0.25											
US Reach	7.141	100-Year	1032.00	644.72	652.39		652.54	0.000296	3.87	337.18	69.04
0.25											
US Reach	7.154	100-Year	1032.00	645.00	652.45		652.63	0.000335	4.04	322.71	67.77
0.26											
US Reach	7.25	100-Year	1032.00	645.27	652.53		652.72	0.000377	4.21	309.84	66.62
0.28											
US Reach	7.382	100-Year	1032.00	645.54	652.62		652.82	0.000420	4.38	297.86	65.53
0.29											
US Reach	7.426	100-Year	1032.00	645.81	652.72		652.94	0.000467	4.54	286.79	64.51
0.30											
US Reach	7.450	100-Year	1032.00	646.08	652.83		653.07	0.000516	4.69	276.62	63.55
0.32											
US Reach	7.50	100-Year	1032.00	646.35	652.96		653.21	0.000566	4.85	267.37	62.68
0.33											
US Reach	7.54	100-Year	1032.00	646.62	653.09		653.36	0.000618	4.99	259.06	61.87
0.35											
US Reach	7.57	100-Year	1032.00	646.75	653.16		653.44	0.000643	5.06	255.35	61.51
0.35											
US Reach	7.58	100-Year	1032.00	646.80	653.03	650.46	653.66	0.001450	6.37	161.89	62.39
0.45											
US Reach	8.000		Culvert								
US Reach	8.546	100-Year	963.00	651.62	658.06	655.13	658.58	0.001128	5.75	167.46	63.67
0.40											
US Reach	8.555	100-Year	927.00	651.67	658.46		658.64	0.000402	4.16	281.33	64.89
0.28											
US Reach	8.579	100-Year	927.00	651.94	658.65		658.71	0.000123	2.29	491.65	99.82
0.16											
US Reach	8.642	100-Year	927.00	652.22	658.69		658.74	0.000104	2.04	544.66	111.94
0.14											
US Reach	8.686	100-Year	927.00	652.49	658.73		658.76	0.000062	1.54	723.11	150.82
0.11											
US Reach	8.743	100-Year	927.00	652.76	658.75	655.10	658.77	0.000073	1.63	690.74	178.06
0.12											
US Reach	8.820	100-Year	826.00	653.03	658.75	655.37	658.81	0.000160	2.34	414.66	236.00
0.17											
US Reach	8.830	100-Year	826.00	653.30	658.66		658.96	0.000882	5.26	194.91	55.92
0.40											
US Reach	8.852	100-Year	826.00	653.57	658.88		659.19	0.000918	5.33	192.10	55.61
0.41											
US Reach	8.864	100-Year	826.00	653.62	658.92	656.27	659.24	0.000928	4.59	180.11	65.79
0.35											
US Reach	8.87		Culvert								
US Reach	8.888	100-Year	757.00	653.77	659.13	656.26	659.39	0.000752	4.16	182.09	66.14
0.32											
US Reach	8.9	100-Year	757.00	653.90	659.34	655.81	659.43	0.000220	2.39	316.85	69.12
0.20											
US Reach	8.91	100-Year	757.00	653.90	659.31	656.03	659.48	0.000315	3.25	232.71	69.42
0.25											
US Reach	8.932		Culvert								
US Reach	8.937	100-Year	684.00	654.00	659.37	656.40	659.61	0.000125	3.92	174.61	43.00
0.30											
US Reach	8.943	100-Year	684.00	654.10	659.31	657.25	659.89	0.000507	6.11	111.95	22.74
0.47											
US Reach	8.952499		Culvert								
US Reach	8.962	100-Year	684.00	654.36	659.71	657.51	660.26	0.000388	5.95	114.92	23.49
0.45											
US Reach	8.972	100-Year	568.00	654.57	660.15		660.33	0.001291	3.42	166.26	49.12
0.32											
US Reach	8.982	100-Year	568.00	654.96	660.23		660.39	0.001084	3.15	180.62	53.61
0.30											
US Reach	9.001	100-Year	568.00	654.83	660.20		660.65	0.003125	6.69	131.52	45.26
0.54											
US Reach	9.02	100-Year	568.00	654.90	660.68		660.85	0.001112	3.34	170.62	47.26
0.30											
US Reach	9.039	100-Year	568.00	655.06	660.79		660.97	0.001209	3.37	169.26	49.91
0.32											
US Reach	9.058	100-Year	568.00	655.35	660.88		661.12	0.001518	3.89	148.34	44.83
0.35											
US Reach	9.078	100-Year	568.00	655.56	661.13		661.30	0.001018	3.35	172.45	48.71
0.29											
US Reach	9.1	100-Year	568.00	655.63	661.21		661.43	0.001338	3.78	153.86	45.48
0.34											

US Reach	9.121	100-Year	568.00	655.81	661.34		661.56	0.001314	3.76	155.72	46.97
0.33											
US Reach	9.134	100-Year	568.00	655.54	661.51		661.66	0.000822	3.17	184.39	49.86
0.27											
US Reach	9.153	100-Year	568.00	655.96	661.47		661.84	0.001149	4.89	121.30	37.31
0.43											
US Reach	9.162	100-Year	568.00	656.18	661.60		661.87	0.000799	4.23	140.60	41.41
0.37											
US Reach	9.171	100-Year	568.00	655.76	661.44	659.21	662.08	0.000558	6.45	88.00	15.50
0.48											
US Reach	9.178499		Culvert								
US Reach	9.186	100-Year	568.00	655.76	661.90	659.21	662.46	0.000449	5.96	95.23	15.50
0.42											
US Reach	9.189	100-Year	568.00	656.24	662.40		662.58	0.000138	3.31	171.49	47.63
0.31											
US Reach	9.197	100-Year	568.00	656.23	662.47		662.59	0.000643	2.88	209.13	58.58
0.24											
US Reach	9.206	100-Year	568.00	656.27	662.47		662.64	0.000811	3.27	182.98	48.97
0.27											
US Reach	9.24	100-Year	568.00	657.00	662.58		662.74	0.000388	3.24	201.97	84.51
0.26											
US Reach	9.246	100-Year	568.00	656.02	662.34	659.73	662.98	0.000230	6.42	88.49	68.83
0.45											
US Reach	9.2505		Culvert								
US Reach	9.255	100-Year	568.00	656.02	663.14	659.73	663.39	0.000094	4.45	317.21	190.27
0.29											
US Reach	9.267	100-Year	568.00	656.69	663.35		663.41	0.000319	2.30	376.01	150.63
0.17											
US Reach	9.284	100-Year	568.00	656.98	663.36		663.47	0.000509	2.86	277.22	114.18
0.22											
US Reach	9.314	100-Year	568.00	657.16	663.47		663.54	0.000390	2.47	381.93	164.19
0.19											
US Reach	9.33	100-Year	568.00	657.34	663.48		663.60	0.000598	3.02	277.65	108.18
0.24											
US Reach	9.349	100-Year	568.00	657.36	663.52		663.67	0.000673	3.25	221.38	69.34
0.25											
US Reach	9.366	100-Year	573.00	657.59	663.49		663.82	0.001618	4.89	146.66	44.71
0.38											
US Reach	9.39	100-Year	573.00	658.01	663.63		664.00	0.001721	5.09	138.68	40.26
0.40											
US Reach	9.394	100-Year	573.00	658.24	663.73		664.11	0.001872	5.23	135.46	39.73
0.41											
US Reach	9.416	100-Year	573.00	658.30	663.91		664.31	0.001910	5.41	128.54	37.94
0.42											
US Reach	9.439	100-Year	573.00	658.31	664.32		664.53	0.001216	3.79	163.64	47.57
0.32											
US Reach	9.459	100-Year	573.00	658.84	664.45		664.63	0.000886	3.70	186.60	66.14
0.29											
US Reach	9.476	100-Year	573.00	658.57	664.44		664.85	0.002562	6.22	131.97	46.19
0.48											
US Reach	9.506	100-Year	573.00	656.52	664.74		664.99	0.000501	4.29	179.09	61.25
0.30											
US Reach	9.517	100-Year	471.00	659.40	664.30	663.35	665.49	0.001369	8.77	53.69	11.53
0.72											
US Reach	9.522		Culvert								
US Reach	9.527	100-Year	471.00	659.60	665.75	663.54	666.49	0.000715	6.89	68.37	11.83
0.50											
US Reach	9.541	100-Year	471.00	659.94	666.56		666.58	0.000141	1.78	451.01	167.41
0.12											
US Reach	9.555	100-Year	471.00	659.80	666.57	662.92	666.59	0.000111	1.38	533.89	253.00
0.10											
US Reach	9.556		Bridge								
US Reach	9.557	100-Year	471.00	659.80	666.57	662.92	666.59	0.000110	1.38	534.97	253.29
0.10											
US Reach	9.573	100-Year	471.00	660.19	666.58		666.62	0.000215	1.80	359.88	156.97
0.14											
US Reach	9.588	100-Year	471.00	660.22	666.58		666.63	0.000314	2.05	300.18	147.94
0.17											
US Reach	9.595	100-Year	471.00	660.38	666.58		666.66	0.000428	2.34	232.52	87.40
0.19											
US Reach	9.623	100-Year	471.00	660.56	666.61		666.76	0.000786	3.16	159.16	46.21
0.26											
US Reach	9.635	100-Year	471.00	661.41	666.53		666.89	0.002614	4.89	98.44	30.18
0.45											

Profile Output Table - Standard Table 2

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
US Reach	6.467	100-Year	649.91	649.85	0.06			257.89	671.09	246.01	614.01
US Reach	6.481	100-Year	649.98	649.81	0.18	0.02	0.06	107.49	965.93	101.58	603.90
US Reach	6.497		Bridge								
US Reach	6.513	100-Year	650.02	649.88	0.13			19.22	1096.26	59.52	325.33
US Reach	6.516	100-Year	650.02	649.88	0.13	0.00	0.00	169.40	922.36	83.24	103.76
US Reach	6.518	100-Year	650.03	649.91	0.13	0.02	0.00	23.49	1132.47	19.05	108.12
US Reach	6.535	100-Year	650.12	650.06	0.06	0.08	0.01	27.21	979.49	168.31	122.39
US Reach	6.538	100-Year	650.16	650.11	0.05	0.04	0.00	0.68	1018.01	156.30	136.77
US Reach	6.551	100-Year	650.17	650.15	0.02	0.01	0.00	61.42	1004.73	108.85	206.57
US Reach	6.554	100-Year	650.17	650.16	0.02	0.00	0.00	252.79	858.58	63.63	699.44
US Reach	6.557	100-Year	650.18	650.17	0.01	0.01	0.00	25.82	1080.75	68.43	936.24
US Reach	6.573	100-Year	650.18	650.18	0.00	0.00	0.00	599.26	541.51	34.23	962.67
US Reach	6.597	100-Year	650.19	650.19	0.00	0.00	0.00	2.21	1162.22	10.57	1249.27
US Reach	6.611	100-Year	650.19	650.19	0.00	0.00	0.00	840.33	303.40	31.27	1155.57
US Reach	6.636	100-Year	650.20	650.19	0.01	0.01	0.00	6.37	1160.42	8.21	289.50
US Reach	6.648	100-Year	650.21	650.20	0.01	0.01	0.00	65.22	1073.16	36.63	236.13
US Reach	6.649	100-Year	650.22	650.18	0.04	0.00	0.01	69.98	1015.52	89.50	169.71
US Reach	6.681	100-Year	650.29	650.25	0.04	0.07	0.00		1175.00		141.89
US Reach	6.686	100-Year	650.30	650.25	0.05	0.01	0.00	68.15	1009.37	97.48	169.50
US Reach	6.724	100-Year	650.44	650.38	0.06	0.13	0.00	78.36	1019.85	76.79	160.18
US Reach	6.772	100-Year	650.62	650.57	0.05	0.18	0.00		1175.00		156.97

US Reach	6.799	100-Year	650.67	650.65	0.03	0.05	0.00	38.43	1082.27	54.30	163.00
US Reach	6.838	100-Year	650.75	650.71	0.05	0.08	0.01	0.30	1171.74	2.96	165.26
US Reach	6.875	100-Year	650.85	650.81	0.03	0.09	0.00	44.95	1076.01	54.04	165.21
US Reach	6.894	100-Year	650.88	650.85	0.03	0.03	0.00	40.33	1095.86	38.81	173.80
US Reach	6.925	100-Year	650.93	650.90	0.02	0.05	0.00		1175.00		205.49
US Reach	6.932	100-Year	650.94	650.92	0.02	0.01	0.00	29.68	1104.92	40.40	212.62
US Reach	6.97	100-Year	650.97	650.95	0.01	0.03	0.00	24.20	1115.55	35.25	247.88
US Reach	7.001	100-Year	650.99	650.98	0.02	0.03	0.00	101.92	1052.52	20.56	239.64
US Reach	7.027	100-Year	651.02	651.00	0.01	0.02	0.00	26.57	1120.90	27.54	245.72
US Reach	7.058	100-Year	651.04	651.02	0.01	0.02	0.00	26.58	1120.85	27.57	245.74
US Reach	7.059	100-Year	651.04	651.03	0.01	0.00	0.00	28.02	1118.24	28.74	247.73
US Reach	7.067	100-Year	651.04	651.03	0.01	0.00	0.00	3.03	933.12	238.85	240.48
US Reach	7.07	100-Year	651.04	651.03	0.01	0.00	0.00	27.08	1118.07	29.85	247.53
US Reach	7.077	100-Year	651.50	650.59	0.92	0.01	0.45		1175.00		97.90
US Reach	7.094		Culvert								
US Reach	7.111	100-Year	652.39	651.65	0.74				1175.00		111.95
US Reach	7.122	100-Year	652.47	652.30	0.17	0.02	0.06	381.19	344.55	382.26	70.13
US Reach	7.141	100-Year	652.54	652.39	0.16	0.08	0.00	352.80	325.30	353.90	69.04
US Reach	7.154	100-Year	652.63	652.45	0.17	0.08	0.00	350.07	330.61	351.32	67.77
US Reach	7.25	100-Year	652.72	652.53	0.19	0.09	0.00	347.89	335.47	348.64	66.62
US Reach	7.382	100-Year	652.82	652.62	0.20	0.10	0.00	346.13	339.74	346.13	65.53
US Reach	7.426	100-Year	652.94	652.72	0.22	0.11	0.00	344.18	343.65	344.18	64.51
US Reach	7.450	100-Year	653.07	652.83	0.23	0.12	0.00	342.29	347.41	342.29	63.55
US Reach	7.50	100-Year	653.21	652.96	0.25	0.13	0.00	340.50	351.00	340.50	62.68
US Reach	7.54	100-Year	653.36	653.09	0.27	0.15	0.00	338.82	354.36	338.82	61.87
US Reach	7.57	100-Year	653.44	653.16	0.27	0.08	0.00	338.05	355.90	338.05	61.51
US Reach	7.58	100-Year	653.66	653.03	0.63	0.05	0.18		1032.00		62.39
US Reach	8.000		Culvert								
US Reach	8.546	100-Year	658.58	658.06	0.51				963.00		63.67
US Reach	8.555	100-Year	658.64	658.46	0.18	0.03	0.03	307.68	309.84	309.48	64.89
US Reach	8.579	100-Year	658.71	658.65	0.06	0.05	0.01	487.67	168.09	271.24	99.82
US Reach	8.642	100-Year	658.74	658.69	0.05	0.03	0.00	414.29	144.95	367.77	111.94
US Reach	8.686	100-Year	658.76	658.73	0.03	0.02	0.00	296.43	105.28	525.28	150.82
US Reach	8.743	100-Year	658.77	658.75	0.03	0.02	0.00	97.02	106.98	723.00	178.06
US Reach	8.820	100-Year	658.81	658.75	0.06	0.03	0.01	128.66	146.70	550.64	236.00
US Reach	8.830	100-Year	658.96	658.66	0.30	0.08	0.07	258.19	308.77	259.04	55.92
US Reach	8.852	100-Year	659.19	658.88	0.31	0.23	0.00	257.51	310.14	258.35	55.61
US Reach	8.864	100-Year	659.24	658.92	0.33	0.05	0.01		826.00		65.79
US Reach	8.87		Culvert								
US Reach	8.888	100-Year	659.39	659.13	0.27				757.00		66.14
US Reach	8.9	100-Year	659.43	659.34	0.09	0.02	0.02	0.00	757.00		69.12
US Reach	8.91	100-Year	659.48	659.31	0.16	0.01	0.04		757.00		69.42
US Reach	8.932		Culvert								
US Reach	8.937	100-Year	659.61	659.37	0.24				684.00		43.00
US Reach	8.943	100-Year	659.89	659.31	0.58	0.00	0.27		684.00		22.74
US Reach	8.952499		Culvert								
US Reach	8.962	100-Year	660.26	659.71	0.55				684.00		23.49
US Reach	8.972	100-Year	660.33	660.15	0.18	0.03	0.04	0.01	567.99	0.01	49.12
US Reach	8.982	100-Year	660.39	660.23	0.15	0.06	0.00	0.03	567.96	0.02	53.61
US Reach	9.001	100-Year	660.65	660.20	0.45	0.17	0.09	107.80	318.53	141.67	45.26
US Reach	9.02	100-Year	660.85	660.68	0.17	0.17	0.03		567.67	0.33	47.26
US Reach	9.039	100-Year	660.97	660.79	0.18	0.11	0.00		567.43	0.57	49.91
US Reach	9.058	100-Year	661.12	660.88	0.23	0.14	0.02	0.81	566.32	0.87	44.83
US Reach	9.078	100-Year	661.30	661.13	0.17	0.18	0.01	1.09	565.64	1.28	48.71
US Reach	9.1	100-Year	661.43	661.21	0.22	0.11	0.01	1.52	564.61	1.87	45.48
US Reach	9.121	100-Year	661.56	661.34	0.22	0.13	0.00	2.29	563.20	2.52	46.97
US Reach	9.134	100-Year	661.66	661.51	0.15	0.10	0.01	2.28	563.45	2.27	49.86
US Reach	9.153	100-Year	661.84	661.47	0.37	0.11	0.06	2.26	563.18	2.57	37.31
US Reach	9.162	100-Year	661.87	661.60	0.28	0.02	0.01	2.64	562.75	2.61	41.41
US Reach	9.171	100-Year	662.08	661.44	0.65	0.02	0.19		568.00		15.50
US Reach	9.178499		Culvert								
US Reach	9.186	100-Year	662.46	661.90	0.55				568.00		15.50
US Reach	9.189	100-Year	662.58	662.40	0.17	0.00	0.11		568.00		47.63
US Reach	9.197	100-Year	662.59	662.47	0.13	0.01	0.00	10.07	555.31	2.62	58.58
US Reach	9.206	100-Year	662.64	662.47	0.16	0.03	0.01	9.18	556.82	2.01	48.97
US Reach	9.24	100-Year	662.74	662.58	0.16	0.10	0.00	9.25	548.34	10.42	84.51
US Reach	9.246	100-Year	662.98	662.34	0.64	0.00	0.24		568.00		68.83
US Reach	9.2505		Culvert								
US Reach	9.255	100-Year	663.39	663.14	0.24			68.76	444.20	55.04	190.27
US Reach	9.267	100-Year	663.41	663.35	0.07	0.01	0.02	21.04	446.96	100.00	150.63
US Reach	9.284	100-Year	663.47	663.36	0.11	0.04	0.01	41.71	483.96	42.33	114.18
US Reach	9.314	100-Year	663.54	663.47	0.07	0.07	0.00	12.12	421.43	134.45	164.19
US Reach	9.33	100-Year	663.60	663.48	0.12	0.05	0.01	16.47	460.59	90.94	108.18
US Reach	9.349	100-Year	663.67	663.52	0.15	0.06	0.01	20.45	504.50	43.06	69.34
US Reach	9.366	100-Year	663.82	663.49	0.34	0.10	0.06	27.22	514.96	30.82	44.71
US Reach	9.39	100-Year	664.00	663.63	0.37	0.16	0.01	26.88	519.08	27.04	40.26
US Reach	9.394	100-Year	664.11	663.73	0.39	0.11	0.01	30.29	515.97	26.74	39.73
US Reach	9.416	100-Year	664.31	663.91	0.39	0.19	0.00	52.38	473.33	47.29	37.94
US Reach	9.439	100-Year	664.53	664.32	0.20	0.20	0.02	0.05	498.37	74.58	47.57
US Reach	9.459	100-Year	664.63	664.45	0.18	0.10	0.00	24.97	469.73	78.29	66.14
US Reach	9.476	100-Year	664.85	664.44	0.40	0.15	0.07	91.51	320.93	160.57	46.19
US Reach	9.506	100-Year	664.99	664.74	0.25	0.12	0.02	27.33	485.45	60.23	61.25
US Reach	9.517	100-Year	665.49	664.30	1.20	0.03	0.47		471.00		11.53
US Reach	9.522		Culvert								
US Reach	9.527	100-Year	666.49	665.75	0.74				471.00		11.83
US Reach	9.541	100-Year	666.58	666.56	0.02	0.02	0.07	159.30	105.84	205.86	167.41
US Reach	9.555	100-Year	666.59	666.57	0.02	0.01	0.00	63.52	225.78	181.69	253.00
US Reach	9.556		Bridge								
US Reach	9.557	100-Year	666.59	666.57	0.02	0.00	0.00	63.65	225.54	181.81	253.29
US Reach	9.573	100-Year	666.62	666.58	0.04	0.02	0.01	41.93	351.98	77.09	156.97
US Reach	9.588	100-Year	666.63	666.58	0.06	0.01	0.00	39.43	390.69	40.88	147.94
US Reach	9.595	100-Year	666.66	666.58	0.08	0.02	0.01	40.22	427.42	3.36	87.40
US Reach	9.623	100-Year	666.76	666.61	0.15	0.08	0.02	4.37	453.92	12.71	46.21
US Reach	9.635	100-Year	666.89	666.53	0.37	0.07	0.07	4.70	466.30		30.18

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : EX_NAT

River: Bensenville Ditc Reach: US Reach RS: 9.635 Profile: 100-Year

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.
River: Bensenville Ditc Reach: US Reach RS: 9.557 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.556 Profile: 100-Year Upstream
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.556 Profile: 100-Year 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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.555 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.541 Profile: 100-Year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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.
River: Bensenville Ditc Reach: US Reach RS: 9.527 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.522 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.522 Profile: 100-Year Culv: Box7
Warning:During the supercritical analysis, the program could not balance the energy equation during the forewater calculations inside of the culvert. The program assumed critical depth at the outlet and continued on.
Warning:During supercritical flow in the culvert, a comparison of the energy at the outlet to the energy at critical depth in the downstream cross section reveals that a supercritical answer is not possible. The downstream cross section has defaulted to critical depth. For best results, this profile should be run in a mixed flow regime.
Note: The flow in the culvert is entirely supercritical.
River: Bensenville Ditc Reach: US Reach RS: 9.517 Profile: 100-Year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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.
River: Bensenville Ditc Reach: US Reach RS: 9.506 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.476 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.366 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.267 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.255 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.2505 Profile: 100-Year Culv: Box6
Warning:During the culvert inlet computations, the program could not balance the culvert/weir flow. The reported inlet energy grade answer may not be valid.
River: Bensenville Ditc Reach: US Reach RS: 9.246 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.24 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.197 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.189 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.186 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.171 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.02 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.001 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.972 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.962 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.943 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.937 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.932 Profile: 100-Year Culv: Culvert #1
Warning:During subcritical analysis, with the exit loss set =1.0, the projected WSEL in culvert has a lower energy than the downstream energy. Most likely, the downstream cross section blocks part of the culvert or the ineffective area is set too far in. Instead of projecting the WSEL, the program did an energy balance to get the WSEL inside the culvert at the downstream end.
River: Bensenville Ditc Reach: US Reach RS: 8.91 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.9 Profile: 100-Year
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, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 8.888 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.864 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.830 Profile: 100-Year
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.

River: Bensenville Ditc Reach: US Reach RS: 8.820 Profile: 100-Year
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, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 8.743 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 8.579 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.555 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.546 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 7.58 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 7.122 Profile: 100-Year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: Bensenville Ditc Reach: US Reach RS: 7.111 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 7.077 Profile: 100-Year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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.
River: Bensenville Ditc Reach: US Reach RS: 6.875 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.838 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.799 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.649 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.636 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.611 Profile: 100-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.597 Profile: 100-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.573 Profile: 100-Year
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, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.557 Profile: 100-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.554 Profile: 100-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.551 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.535 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.516 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.513 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 6.497 Profile: 100-Year
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: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
River: Bensenville Ditc Reach: US Reach RS: 6.497 Profile: 100-Year Upstream
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.
River: Bensenville Ditc Reach: US Reach RS: 6.497 Profile: 100-Year Downstream
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.
River: Bensenville Ditc Reach: US Reach RS: 6.481 Profile: 100-Year
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.

TAB 9

SECTION 9

EXISTING CONDITIONS ANALYSIS

The natural, existing, and baseline conditions models will be identical since there is no structure at the future location of the EOWB crossing.

TAB 10

SECTION 10

NATURAL CONDITIONS ANALYSIS

The natural, existing, and baseline conditions models will be identical since there is no structure at the future location of the EOWB crossing.

TAB 11

SECTION 11

PROPOSED CONDITIONS ANALYSIS

CHRISTOPHER B. BURKE
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JOB 07-404 - BENSENVILLE DITCH
SHEET NO. 1 OF 1
CALCULATED BY DCO DATE 4/2/12
CHECKED BY JSG DATE 4/24/12
SCALE —

BENSENVILLE DITCH HEC-RAS PROPOSED SCHEMATIC

DIST. TO & FROM STRUCTURE	REACH LENGTH	
		CONTINUES, IDENTICAL TO EXISTING / NATURAL
		8.820
688'	133.1'	
		8.826 (ADDED X-SEC)
555'	50'	
		8.827 (ADDED X-SEC)
505'	505'	FUTURE EOWB/UPRR CROSSING
		* 8.888 * REFERENCE POINT
		CONTINUES, IDENTICAL TO EXISTING/NATURAL

CROSS-SECTIONS REMOVED

* 8.830
* 8.852
* 8.864

PROPOSED CONDITIONS
NGVD '29

HEC-RAS Plan: PROP 101612 River: Bensenville Ditc Reach: US Reach

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)	
US Reach	6.467	100-Year	1175.00	643.10	649.85	646.19	649.91	0.000508	2.57	908.89	614.01	0.18
US Reach	6.467	10-Year	519.00	643.10	648.55	644.90	648.62	0.000534	2.27	313.44	299.46	0.17
US Reach	6.467	2-Year	210.00	643.10	647.75	644.08	647.77	0.000176	1.18	179.84	69.65	0.10
US Reach	6.467	50-Year	954.00	643.10	649.47	645.79	649.54	0.000555	2.58	692.88	522.86	0.18
US Reach	6.481	100-Year	1175.00	643.10	649.81	646.20	649.98	0.000097	3.72	883.21	603.90	0.26
US Reach	6.481	10-Year	519.00	643.10	648.55	644.90	648.64	0.000054	2.41	314.30	300.30	0.19
US Reach	6.481	2-Year	210.00	643.10	647.75	644.09	647.77	0.000016	1.18	180.05	70.26	0.10
US Reach	6.481	50-Year	954.00	643.10	649.44	645.79	649.60	0.000087	3.40	678.20	516.08	0.24
US Reach	6.497		Bridge									
US Reach	6.513	100-Year	1175.00	642.39	649.88	646.12	650.02	0.000051	2.97	641.53	325.33	0.20
US Reach	6.513	10-Year	519.00	642.39	648.78	644.80	648.82	0.000020	1.64	418.26	144.54	0.12
US Reach	6.513	2-Year	210.00	642.39	647.81	643.98	647.82	0.000006	0.82	295.09	109.91	0.07
US Reach	6.513	50-Year	954.00	642.39	649.55	645.71	649.65	0.000041	2.58	547.58	231.65	0.18
US Reach	6.516	100-Year	1175.00	643.44	649.88		650.02	0.001583	3.18	428.65	103.76	0.23
US Reach	6.516	10-Year	519.00	643.44	648.77		648.82	0.000700	1.84	320.00	92.11	0.15
US Reach	6.516	2-Year	210.00	643.44	647.81		647.82	0.000273	0.98	235.85	81.96	0.09
US Reach	6.516	50-Year	954.00	643.44	649.54		649.65	0.001318	2.79	394.18	100.21	0.21
US Reach	6.518	100-Year	1175.00	642.59	649.91		650.03	0.001495	2.91	427.17	108.12	0.22
US Reach	6.518	10-Year	519.00	642.59	648.78		648.83	0.000668	1.67	318.75	87.66	0.14
US Reach	6.518	2-Year	210.00	642.59	647.81		647.82	0.000261	0.88	239.66	75.22	0.09
US Reach	6.518	50-Year	954.00	642.59	649.56		649.66	0.001251	2.55	391.49	100.42	0.20
US Reach	6.535	100-Year	1175.00	643.47	650.06		650.12	0.000611	2.09	609.85	122.39	0.15
US Reach	6.535	10-Year	519.00	643.47	648.84		648.86	0.000260	1.19	468.92	111.23	0.09
US Reach	6.535	2-Year	210.00	643.47	647.83		647.84	0.000095	0.62	360.11	103.55	0.05
US Reach	6.535	50-Year	954.00	643.47	649.69		649.74	0.000503	1.83	565.52	117.63	0.13
US Reach	6.538	100-Year	1175.00	642.78	650.11		650.16	0.000508	1.82	684.04	136.77	0.13
US Reach	6.538	10-Year	519.00	642.78	648.86		648.88	0.000230	1.05	520.17	126.67	0.08
US Reach	6.538	2-Year	210.00	642.78	647.84		647.84	0.000087	0.56	393.16	120.69	0.05
US Reach	6.538	50-Year	954.00	642.78	649.73		649.77	0.000426	1.59	632.45	133.37	0.12
US Reach	6.551	100-Year	1175.00	643.50	650.15		650.17	0.000224	1.27	1008.44	206.57	0.09
US Reach	6.551	10-Year	519.00	643.50	648.88		648.88	0.000099	0.73	763.02	184.09	0.06
US Reach	6.551	2-Year	210.00	643.50	647.84		647.84	0.000037	0.38	580.03	169.42	0.03
US Reach	6.551	50-Year	954.00	643.50	649.76		649.77	0.000187	1.11	930.51	196.55	0.08
US Reach	6.554	100-Year	1175.00	643.44	650.16	645.03	650.17	0.000155	1.07	1204.12	699.44	0.07
US Reach	6.554	10-Year	519.00	643.44	648.88	644.51	648.89	0.000070	0.62	903.93	635.97	0.05
US Reach	6.554	2-Year	210.00	643.44	647.84	644.17	647.84	0.000026	0.32	685.78	592.57	0.03
US Reach	6.554	50-Year	954.00	643.44	649.76	644.87	649.78	0.000130	0.94	1107.83	673.63	0.07
US Reach	6.557	100-Year	1175.00	644.30	650.17	645.62	650.18	0.000109	0.80	1512.06	936.24	0.06
US Reach	6.557	10-Year	519.00	644.30	648.89	645.19	648.89	0.000055	0.47	1125.15	916.81	0.04
US Reach	6.557	2-Year	210.00	644.30	647.85	644.91	647.85	0.000025	0.26	821.37	896.17	0.03
US Reach	6.557	50-Year	954.00	644.30	649.78	645.49	649.79	0.000094	0.71	1391.88	930.26	0.06
US Reach	6.573	100-Year	1175.00	643.53	650.18	644.72	650.18	0.000041	0.54	2283.72	962.67	0.04
US Reach	6.573	10-Year	519.00	643.53	648.89	644.40	648.89	0.000018	0.31	1763.67	925.22	0.02
US Reach	6.573	2-Year	210.00	643.53	647.85	644.19	647.85	0.000007	0.16	1361.14	895.63	0.01
US Reach	6.573	50-Year	954.00	643.53	649.78	644.62	649.79	0.000034	0.47	2121.36	950.55	0.03
US Reach	6.597	100-Year	1175.00	644.15	650.19	645.39	650.19	0.000025	0.37	3233.90	1249.27	0.03
US Reach	6.597	10-Year	519.00	644.15	648.89	645.08	648.89	0.000013	0.22	2387.87	1217.20	0.02
US Reach	6.597	2-Year	210.00	644.15	647.85	644.81	647.85	0.000006	0.12	1732.78	1189.93	0.01
US Reach	6.597	50-Year	954.00	644.15	649.79	645.33	649.79	0.000021	0.32	2972.14	1243.59	0.03
US Reach	6.611	100-Year	1175.00	643.59	650.19	644.64	650.19	0.000018	0.37	3375.78	1155.57	0.03
US Reach	6.611	10-Year	519.00	643.59	648.89	644.38	648.89	0.000008	0.21	2626.22	1122.08	0.02
US Reach	6.611	2-Year	210.00	643.59	647.85	644.18	647.85	0.000003	0.11	2036.88	1095.85	0.01
US Reach	6.611	50-Year	954.00	643.59	649.79	644.57	649.79	0.000015	0.32	3143.29	1145.07	0.02
US Reach	6.636	100-Year	1175.00	643.92	650.19		650.20	0.000162	0.90	1317.06	289.50	0.07
US Reach	6.636	10-Year	519.00	643.92	648.89		648.90	0.000090	0.55	955.51	275.66	0.05
US Reach	6.636	2-Year	210.00	643.92	647.85		647.85	0.000047	0.31	670.25	269.88	0.03
US Reach	6.636	50-Year	954.00	643.92	649.79		649.80	0.000142	0.80	1204.81	280.62	0.07
US Reach	6.648	100-Year	1175.00	643.65	650.20		650.21	0.000128	0.96	1274.44	236.13	0.07
US Reach	6.648	10-Year	519.00	643.65	648.90		648.90	0.000056	0.55	980.39	217.57	0.04
US Reach	6.648	2-Year	210.00	643.65	647.85		647.85	0.000020	0.28	759.90	203.87	0.02
US Reach	6.648	50-Year	954.00	643.65	649.80		649.81	0.000106	0.84	1181.72	230.16	0.06
US Reach	6.649	100-Year	1175.00	643.75	650.18		650.22	0.000362	1.63	782.70	169.71	0.11
US Reach	6.649	10-Year	519.00	643.75	648.89		648.91	0.000159	0.93	594.07	134.04	0.07

HEC-RAS Plan: PROP 101612 River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	6.649	2-Year	210.00	643.75	647.85		647.85	0.000058	0.48	458.02	126.52	0.04
US Reach	6.649	50-Year	954.00	643.75	649.78		649.81	0.000301	1.42	719.95	149.25	0.10
US Reach	6.681	100-Year	1175.00	643.04	650.25		650.29	0.000433	1.55	758.60	141.89	0.12
US Reach	6.681	10-Year	519.00	643.04	648.92		648.94	0.000198	0.90	575.22	135.01	0.08
US Reach	6.681	2-Year	210.00	643.04	647.86		647.86	0.000078	0.48	434.57	129.49	0.05
US Reach	6.681	50-Year	954.00	643.04	649.84		649.87	0.000363	1.36	701.51	139.79	0.11
US Reach	6.686	100-Year	1175.00	644.75	650.25		650.30	0.000601	1.89	674.82	169.50	0.14
US Reach	6.686	10-Year	519.00	644.75	648.93		648.94	0.000321	1.15	479.65	132.77	0.10
US Reach	6.686	2-Year	210.00	644.75	647.86		647.87	0.000148	0.64	343.19	123.65	0.06
US Reach	6.686	50-Year	954.00	644.75	649.85		649.89	0.000526	1.68	609.15	149.36	0.13
US Reach	6.724	100-Year	1175.00	644.80	650.38		650.44	0.000729	2.10	610.81	160.18	0.16
US Reach	6.724	10-Year	519.00	644.80	648.99		649.02	0.000401	1.29	426.19	116.28	0.11
US Reach	6.724	2-Year	210.00	644.80	647.89		647.90	0.000190	0.73	302.49	108.60	0.07
US Reach	6.724	50-Year	954.00	644.80	649.95		650.01	0.000644	1.88	545.28	131.50	0.15
US Reach	6.772	100-Year	1175.00	645.51	650.57		650.62	0.000666	1.70	689.94	156.97	0.14
US Reach	6.772	10-Year	519.00	645.51	649.11		649.13	0.000448	1.11	465.68	149.06	0.11
US Reach	6.772	2-Year	210.00	645.51	647.95		647.96	0.000308	0.71	297.44	142.84	0.09
US Reach	6.772	50-Year	954.00	645.51	650.13		650.17	0.000610	1.54	621.02	154.58	0.14
US Reach	6.799	100-Year	1175.00	644.19	650.65		650.67	0.000236	1.32	936.18	163.00	0.09
US Reach	6.799	10-Year	519.00	644.19	649.15		649.16	0.000115	0.77	698.04	154.64	0.06
US Reach	6.799	2-Year	210.00	644.19	647.97		647.98	0.000048	0.42	520.41	148.09	0.04
US Reach	6.799	50-Year	954.00	644.19	650.19		650.21	0.000201	1.16	863.09	160.48	0.08
US Reach	6.838	100-Year	1175.00	645.72	650.71		650.75	0.000680	1.72	688.00	165.26	0.14
US Reach	6.838	10-Year	519.00	645.72	649.18		649.20	0.000546	1.17	444.22	154.17	0.12
US Reach	6.838	2-Year	210.00	645.72	647.99		648.00	0.000465	0.79	265.17	146.31	0.10
US Reach	6.838	50-Year	954.00	645.72	650.25		650.29	0.000651	1.56	612.89	161.93	0.14
US Reach	6.875	100-Year	1175.00	645.00	650.81		650.85	0.000331	1.46	849.56	165.21	0.11
US Reach	6.875	10-Year	519.00	645.00	649.25		649.26	0.000192	0.90	599.39	154.94	0.08
US Reach	6.875	2-Year	210.00	645.00	648.03		648.04	0.000100	0.52	415.53	146.94	0.05
US Reach	6.875	50-Year	954.00	645.00	650.35		650.37	0.000293	1.30	772.88	162.13	0.10
US Reach	6.894	100-Year	1175.00	645.03	650.85		650.88	0.000282	1.35	909.07	173.80	0.10
US Reach	6.894	10-Year	519.00	645.03	649.27		649.28	0.000164	0.83	643.51	163.47	0.07
US Reach	6.894	2-Year	210.00	645.03	648.04		648.05	0.000086	0.48	447.01	156.67	0.05
US Reach	6.894	50-Year	954.00	645.03	650.38		650.40	0.000250	1.20	827.70	170.29	0.09
US Reach	6.925	100-Year	1175.00	644.62	650.90		650.93	0.000331	1.24	946.91	205.49	0.10
US Reach	6.925	10-Year	519.00	644.62	649.30		649.31	0.000240	0.83	625.99	195.76	0.08
US Reach	6.925	2-Year	210.00	644.62	648.06		648.07	0.000183	0.54	387.82	188.22	0.07
US Reach	6.925	50-Year	954.00	644.62	650.42		650.44	0.000307	1.12	849.17	202.58	0.10
US Reach	6.932	100-Year	1175.00	645.08	650.92		650.94	0.000179	1.08	1134.49	212.62	0.08
US Reach	6.932	10-Year	519.00	645.08	649.31		649.32	0.000106	0.67	801.22	202.55	0.06
US Reach	6.932	2-Year	210.00	645.08	648.07		648.07	0.000057	0.39	554.01	194.74	0.04
US Reach	6.932	50-Year	954.00	645.08	650.44		650.45	0.000159	0.96	1033.03	209.61	0.07
US Reach	6.97	100-Year	1175.00	645.13	650.95		650.97	0.000128	0.91	1336.28	247.88	0.07
US Reach	6.97	10-Year	519.00	645.13	649.33		649.34	0.000076	0.56	942.76	237.61	0.05
US Reach	6.97	2-Year	210.00	645.13	648.08		648.08	0.000042	0.33	649.77	229.67	0.03
US Reach	6.97	50-Year	954.00	645.13	650.47		650.48	0.000114	0.81	1216.77	244.81	0.06
US Reach	7.001	100-Year	1175.00	644.63	650.98		650.99	0.000196	1.03	1164.56	239.64	0.08
US Reach	7.001	10-Year	519.00	644.63	649.35		649.35	0.000140	0.68	780.36	232.04	0.06
US Reach	7.001	2-Year	210.00	644.63	648.09		648.09	0.000103	0.44	491.77	226.16	0.05
US Reach	7.001	50-Year	954.00	644.63	650.49		650.50	0.000181	0.93	1048.37	237.37	0.08
US Reach	7.027	100-Year	1175.00	645.20	651.00		651.02	0.000130	0.91	1327.97	245.72	0.07
US Reach	7.027	10-Year	519.00	645.20	649.36		649.37	0.000079	0.57	933.21	236.20	0.05
US Reach	7.027	2-Year	210.00	645.20	648.10		648.10	0.000044	0.33	638.87	228.84	0.03
US Reach	7.027	50-Year	954.00	645.20	650.51		650.52	0.000116	0.81	1208.34	242.88	0.06
US Reach	7.058	100-Year	1175.00	645.25	651.02		651.04	0.000132	0.92	1321.49	245.74	0.07
US Reach	7.058	10-Year	519.00	645.25	649.38		649.38	0.000081	0.57	924.78	236.12	0.05
US Reach	7.058	2-Year	210.00	645.25	648.11		648.11	0.000046	0.34	629.25	228.69	0.04
US Reach	7.058	50-Year	954.00	645.25	650.53		650.54	0.000118	0.82	1201.31	242.86	0.06
US Reach	7.059	100-Year	1175.00	644.25	651.03		651.04	0.000077	0.78	1558.00	247.73	0.05
US Reach	7.059	10-Year	519.00	644.25	649.38		649.38	0.000039	0.46	1156.76	239.04	0.04
US Reach	7.059	2-Year	210.00	644.25	648.11		648.11	0.000017	0.25	856.82	232.33	0.02
US Reach	7.059	50-Year	954.00	644.25	650.54		650.54	0.000066	0.68	1436.62	245.13	0.05
US Reach	7.067	100-Year	1175.00	643.02	651.03		651.04	0.000094	0.86	1440.24	240.48	0.06

HEC-RAS Plan: PROP 101612 River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	7.067	10-Year	519.00	643.02	649.38		649.38	0.000050	0.52	1050.24	232.25	0.04
US Reach	7.067	2-Year	210.00	643.02	648.11		648.11	0.000023	0.29	758.51	225.90	0.03
US Reach	7.067	50-Year	954.00	643.02	650.54		650.55	0.000081	0.76	1322.30	238.02	0.05
US Reach	7.07	100-Year	1175.00	644.25	651.03		651.04	0.000103	0.86	1419.73	247.53	0.06
US Reach	7.07	10-Year	519.00	644.25	649.38		649.39	0.000057	0.52	1020.60	236.10	0.04
US Reach	7.07	2-Year	210.00	644.25	648.11		648.11	0.000028	0.29	725.45	227.28	0.03
US Reach	7.07	50-Year	954.00	644.25	650.54		650.55	0.000090	0.76	1298.52	244.12	0.06
US Reach	7.077	100-Year	1175.00	644.05	650.59	648.35	651.50	0.000498	7.70	152.68	97.90	0.53
US Reach	7.077	10-Year	519.00	644.05	649.24	646.57	649.53	0.000210	4.28	121.18	74.56	0.33
US Reach	7.077	2-Year	210.00	644.05	648.07	645.44	648.15	0.000081	2.24	93.60	58.96	0.20
US Reach	7.077	50-Year	954.00	644.05	650.21	647.79	650.89	0.000401	6.63	143.81	91.33	0.47
US Reach	7.094		Culvert									
US Reach	7.111	100-Year	1175.00	644.40	651.65	648.66	652.39	0.000345	6.89	170.48	111.95	0.45
US Reach	7.111	10-Year	519.00	644.40	649.50	646.88	649.79	0.000218	4.33	119.87	87.62	0.34
US Reach	7.111	2-Year	210.00	644.40	648.14	645.75	648.23	0.000100	2.39	87.90	72.26	0.22
US Reach	7.111	50-Year	954.00	644.40	650.86	648.11	651.47	0.000334	6.28	151.82	102.98	0.44
US Reach	7.122	100-Year	1108.00	644.45	652.30		652.47	0.000307	4.00	349.90	70.13	0.25
US Reach	7.122	10-Year	540.00	644.45	649.68		649.82	0.000420	3.57	186.93	54.43	0.28
US Reach	7.122	2-Year	273.00	644.45	648.14		648.24	0.000478	3.02	110.15	45.18	0.28
US Reach	7.122	50-Year	917.00	644.45	651.36		651.54	0.000368	4.03	287.01	64.53	0.27
US Reach	7.141	100-Year	1032.00	644.72	652.39		652.54	0.000296	3.87	337.18	69.04	0.25
US Reach	7.141	10-Year	507.00	644.72	649.79		649.93	0.000423	3.51	178.30	53.47	0.28
US Reach	7.141	2-Year	250.00	644.72	648.27		648.36	0.000477	2.93	103.68	44.32	0.28
US Reach	7.141	50-Year	858.00	644.72	651.47		651.63	0.000358	3.91	276.19	63.51	0.27
US Reach	7.154	100-Year	1032.00	645.00	652.45		652.63	0.000335	4.04	322.71	67.77	0.26
US Reach	7.154	10-Year	507.00	645.00	649.90		650.05	0.000492	3.70	168.93	52.41	0.30
US Reach	7.154	2-Year	250.00	645.00	648.39		648.50	0.000581	3.14	96.70	43.36	0.30
US Reach	7.154	50-Year	858.00	645.00	651.55		651.73	0.000406	4.08	263.88	62.34	0.28
US Reach	7.25	100-Year	1032.00	645.27	652.53		652.72	0.000377	4.21	309.84	66.62	0.28
US Reach	7.25	10-Year	507.00	645.27	650.02		650.18	0.000561	3.87	161.18	51.52	0.31
US Reach	7.25	2-Year	250.00	645.27	648.53		648.66	0.000681	3.31	91.43	42.63	0.32
US Reach	7.25	50-Year	858.00	645.27	651.65		651.84	0.000455	4.24	253.17	61.30	0.30
US Reach	7.382	100-Year	1032.00	645.54	652.62		652.82	0.000420	4.38	297.86	65.53	0.29
US Reach	7.382	10-Year	507.00	645.54	650.15		650.34	0.000633	4.03	154.46	50.73	0.33
US Reach	7.382	2-Year	250.00	645.54	648.71		648.85	0.000775	3.47	87.32	42.04	0.34
US Reach	7.382	50-Year	858.00	645.54	651.76		651.96	0.000508	4.41	243.38	60.34	0.31
US Reach	7.426	100-Year	1032.00	645.81	652.72		652.94	0.000467	4.54	286.79	64.51	0.30
US Reach	7.426	10-Year	507.00	645.81	650.31		650.51	0.000704	4.18	148.76	50.05	0.35
US Reach	7.426	2-Year	250.00	645.81	648.90		649.05	0.000858	3.59	84.25	41.60	0.36
US Reach	7.426	50-Year	858.00	645.81	651.88		652.10	0.000563	4.56	234.54	59.45	0.33
US Reach	7.450	100-Year	1032.00	646.08	652.83		653.07	0.000516	4.69	276.62	63.55	0.32
US Reach	7.450	10-Year	507.00	646.08	650.49		650.69	0.000771	4.31	144.03	49.48	0.36
US Reach	7.450	2-Year	250.00	646.08	649.12		649.28	0.000925	3.68	82.04	41.28	0.37
US Reach	7.450	50-Year	858.00	646.08	652.01		652.25	0.000619	4.72	226.65	58.65	0.34
US Reach	7.50	100-Year	1032.00	646.35	652.96		653.21	0.000566	4.85	267.37	62.68	0.33
US Reach	7.50	10-Year	507.00	646.35	650.68		650.90	0.000832	4.43	140.20	49.01	0.38
US Reach	7.50	2-Year	250.00	646.35	649.35		649.52	0.000975	3.75	80.52	41.06	0.38
US Reach	7.50	50-Year	858.00	646.35	652.17		652.42	0.000675	4.86	219.69	57.93	0.36
US Reach	7.54	100-Year	1032.00	646.62	653.09		653.36	0.000618	4.99	259.06	61.87	0.35
US Reach	7.54	10-Year	507.00	646.62	650.89		651.12	0.000886	4.52	137.15	48.64	0.39
US Reach	7.54	2-Year	250.00	646.62	649.60		649.77	0.001010	3.80	79.50	40.91	0.39
US Reach	7.54	50-Year	858.00	646.62	652.33		652.60	0.000730	4.99	213.65	57.30	0.37
US Reach	7.57	100-Year	1032.00	646.75	653.16		653.44	0.000643	5.06	255.35	61.51	0.35
US Reach	7.57	10-Year	507.00	646.75	650.99		651.22	0.000909	4.56	135.90	48.48	0.39
US Reach	7.57	2-Year	250.00	646.75	649.72		649.89	0.001024	3.81	79.12	40.86	0.39
US Reach	7.57	50-Year	858.00	646.75	652.41		652.69	0.000755	5.05	211.02	57.03	0.37
US Reach	7.58	100-Year	1032.00	646.80	653.03	650.46	653.66	0.001450	6.37	161.89	62.39	0.45
US Reach	7.58	10-Year	507.00	646.80	650.99	649.08	651.33	0.001311	4.65	108.94	50.17	0.40
US Reach	7.58	2-Year	250.00	646.80	649.78	648.22	649.94	0.000998	3.23	77.36	42.88	0.33
US Reach	7.58	50-Year	858.00	646.80	652.33	650.04	652.88	0.001494	5.97	143.62	58.17	0.45
US Reach	8.000		Culvert									
US Reach	8.546	100-Year	963.00	651.62	658.06	655.13	658.58	0.001128	5.75	167.46	63.67	0.40

HEC-RAS Plan: PROP 101612 River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	8.546	10-Year	479.00	651.62	655.66	653.82	655.99	0.001320	4.56	105.06	49.27	0.40
US Reach	8.546	2-Year	236.00	651.62	654.14	652.99	654.34	0.001550	3.60	65.48	40.13	0.40
US Reach	8.546	50-Year	805.00	651.62	657.34	654.73	657.79	0.001175	5.42	148.58	59.32	0.40
US Reach	8.555	100-Year	927.00	651.67	658.46		658.64	0.000402	4.16	281.33	64.89	0.28
US Reach	8.555	10-Year	467.00	651.67	655.84		656.05	0.000825	4.30	132.93	48.48	0.37
US Reach	8.555	2-Year	228.00	651.67	654.20		654.43	0.001671	4.38	62.29	34.48	0.49
US Reach	8.555	50-Year	776.00	651.67	657.67		657.86	0.000480	4.18	231.93	59.93	0.30
US Reach	8.579	100-Year	927.00	651.94	658.65		658.71	0.000123	2.29	491.65	99.82	0.16
US Reach	8.579	10-Year	467.00	651.94	656.11		656.16	0.000219	2.22	257.35	84.57	0.19
US Reach	8.579	2-Year	228.00	651.94	654.58		654.62	0.000379	2.14	134.85	75.38	0.23
US Reach	8.579	50-Year	776.00	651.94	657.87		657.93	0.000142	2.26	416.04	95.16	0.16
US Reach	8.642	100-Year	927.00	652.22	658.69		658.74	0.000104	2.04	544.66	111.94	0.14
US Reach	8.642	10-Year	467.00	652.22	656.17		656.21	0.000197	2.03	281.66	96.82	0.18
US Reach	8.642	2-Year	228.00	652.22	654.68		654.72	0.000379	2.04	143.96	85.98	0.23
US Reach	8.642	50-Year	776.00	652.22	657.92		657.96	0.000121	2.03	460.08	107.31	0.15
US Reach	8.686	100-Year	927.00	652.49	658.73		658.76	0.000062	1.54	723.11	150.82	0.11
US Reach	8.686	10-Year	467.00	652.49	656.23		656.26	0.000134	1.61	364.61	135.81	0.15
US Reach	8.686	2-Year	228.00	652.49	654.78		654.81	0.000328	1.81	174.40	125.23	0.21
US Reach	8.686	50-Year	776.00	652.49	657.96		657.99	0.000074	1.54	608.98	146.21	0.12
US Reach	8.743	100-Year	927.00	652.76	658.75	655.10	658.77	0.000073	1.63	690.74	178.06	0.12
US Reach	8.743	10-Year	467.00	652.76	656.27	654.65	656.30	0.000200	1.89	328.79	162.99	0.18
US Reach	8.743	2-Year	228.00	652.76	654.88	654.26	654.93	0.000711	2.53	135.75	146.00	0.31
US Reach	8.743	50-Year	776.00	652.76	657.98	654.97	658.01	0.000091	1.66	577.07	173.41	0.13
US Reach	8.820	100-Year	826.00	653.03	658.75	655.37	658.81	0.000160	2.34	414.66	236.00	0.17
US Reach	8.820	10-Year	432.00	653.03	656.31	654.85	656.38	0.000439	2.67	200.71	221.16	0.26
US Reach	8.820	2-Year	213.00	653.03	655.07	654.48	655.14	0.000968	2.88	100.15	138.73	0.36
US Reach	8.820	50-Year	700.00	653.03	657.99	655.22	658.05	0.000204	2.40	346.09	231.38	0.19
US Reach	8.826	100-Year	826.00	653.18	658.63		658.92	0.000825	5.14	198.98	55.75	0.39
US Reach	8.826	10-Year	432.00	653.18	656.12		656.64	0.003202	6.70	77.84	40.67	0.69
US Reach	8.826	2-Year	213.00	653.18	655.04		655.52	0.005214	6.28	40.34	30.42	0.82
US Reach	8.826	50-Year	700.00	653.18	657.86		658.19	0.001141	5.46	157.56	51.09	0.45
US Reach	8.827	100-Year	826.00	653.23	658.66	655.88	658.97	0.000854	4.47	184.68	66.60	0.34
US Reach	8.827	10-Year	432.00	653.23	656.60	654.95	656.82	0.001148	3.77	114.55	54.22	0.36
US Reach	8.827	2-Year	213.00	653.23	655.61	654.30	655.72	0.000890	2.63	80.90	48.28	0.30
US Reach	8.827	50-Year	700.00	653.23	657.95	655.58	658.25	0.000976	4.36	160.63	62.35	0.35
US Reach	8.85		Culvert									
US Reach	8.888	100-Year	757.00	653.77	659.00	656.26	659.28	0.000813	4.26	177.88	65.40	0.33
US Reach	8.888	10-Year	403.00	653.77	656.92	655.39	657.14	0.001249	3.76	107.12	52.91	0.37
US Reach	8.888	2-Year	199.00	653.77	655.81	654.80	655.94	0.001287	2.86	69.52	46.27	0.35
US Reach	8.888	50-Year	648.00	653.77	658.32	656.00	658.59	0.000951	4.19	154.60	61.29	0.35
US Reach	8.9	100-Year	757.00	653.90	659.23	655.81	659.32	0.000237	2.45	309.11	68.02	0.20
US Reach	8.9	10-Year	403.00	653.90	657.10	655.18	657.19	0.000388	2.33	172.93	60.03	0.24
US Reach	8.9	2-Year	199.00	653.90	655.93	654.71	655.98	0.000445	1.89	105.10	55.62	0.24
US Reach	8.9	50-Year	648.00	653.90	658.54	655.64	658.63	0.000282	2.46	262.97	65.42	0.22
US Reach	8.91	100-Year	757.00	653.90	659.20	656.03	659.37	0.000338	3.32	227.81	68.97	0.25
US Reach	8.91	10-Year	403.00	653.90	657.09	655.29	657.22	0.000520	2.94	137.18	60.63	0.29
US Reach	8.91	2-Year	199.00	653.90	655.93	654.77	656.01	0.000571	2.28	87.34	56.04	0.28
US Reach	8.91	50-Year	648.00	653.90	658.51	655.82	658.68	0.000394	3.27	198.28	66.25	0.27
US Reach	8.932		Culvert									
US Reach	8.937	100-Year	684.00	654.00	659.26	656.40	659.51	0.000134	4.00	171.00	43.00	0.31
US Reach	8.937	10-Year	392.00	654.00	657.15	655.66	657.38	0.000244	3.83	102.29	43.00	0.38
US Reach	8.937	2-Year	202.00	654.00	655.97	655.06	656.12	0.000311	3.16	63.89	43.00	0.40
US Reach	8.937	50-Year	594.00	654.00	658.57	656.19	658.82	0.000161	4.00	148.58	43.00	0.33
US Reach	8.943	100-Year	684.00	654.10	659.19	657.25	659.80	0.000546	6.25	109.49	22.51	0.49
US Reach	8.943	10-Year	392.00	654.10	657.08	656.28	657.66	0.000924	6.11	64.11	21.50	0.62
US Reach	8.943	2-Year	202.00	654.10	655.92	655.50	656.33	0.001131	5.16	39.13	21.50	0.67
US Reach	8.943	50-Year	594.00	654.10	658.50	656.97	659.11	0.000660	6.28	94.65	21.50	0.53
US Reach	8.952499		Culvert									
US Reach	8.962	100-Year	684.00	654.36	659.62	657.51	660.19	0.000409	6.05	113.05	23.32	0.47
US Reach	8.962	10-Year	392.00	654.36	657.65	656.54	658.13	0.000582	5.53	70.83	21.50	0.54
US Reach	8.962	2-Year	202.00	654.36	656.51	655.76	656.80	0.000576	4.38	46.12	21.50	0.53
US Reach	8.962	50-Year	594.00	654.36	658.97	657.24	659.53	0.000480	6.00	99.06	22.02	0.49

HEC-RAS Plan: PROP 101612 River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	8.972	100-Year	568.00	654.57	660.07		660.26	0.001387	3.49	162.67	48.55	0.33
US Reach	8.972	10-Year	319.00	654.57	657.92		658.21	0.003799	4.31	73.97	34.02	0.52
US Reach	8.972	2-Year	180.00	654.57	656.42	656.34	656.96	0.014524	5.92	30.39	23.91	0.93
US Reach	8.972	50-Year	485.00	654.57	659.39		659.60	0.001831	3.69	131.31	43.92	0.38
US Reach	8.982	100-Year	568.00	654.96	660.17		660.33	0.001157	3.21	177.03	53.15	0.31
US Reach	8.982	10-Year	319.00	654.96	658.16		658.38	0.002790	3.75	85.06	38.45	0.44
US Reach	8.982	2-Year	180.00	654.96	657.14		657.34	0.004016	3.64	49.49	30.90	0.51
US Reach	8.982	50-Year	485.00	654.96	659.52		659.69	0.001526	3.37	143.90	48.43	0.34
US Reach	9.001	100-Year	568.00	654.83	660.13		660.61	0.003345	6.85	128.43	44.82	0.56
US Reach	9.001	10-Year	319.00	654.83	658.28		658.96	0.008125	7.65	58.33	30.87	0.80
US Reach	9.001	2-Year	180.00	654.83	657.49		658.01	0.008974	6.47	36.32	24.84	0.80
US Reach	9.001	50-Year	485.00	654.83	659.50		660.05	0.004520	7.23	101.44	40.15	0.63
US Reach	9.02	100-Year	568.00	654.90	660.64		660.82	0.001146	3.37	168.86	47.05	0.31
US Reach	9.02	10-Year	319.00	654.90	659.15		659.29	0.001384	3.03	105.17	38.21	0.32
US Reach	9.02	2-Year	180.00	654.90	658.22		658.32	0.001235	2.49	72.30	32.55	0.29
US Reach	9.02	50-Year	485.00	654.90	660.14		660.31	0.001295	3.33	145.79	44.17	0.32
US Reach	9.039	100-Year	568.00	655.06	660.75		660.93	0.001244	3.41	167.57	49.67	0.32
US Reach	9.039	10-Year	319.00	655.06	659.29		659.44	0.001573	3.12	102.25	39.40	0.34
US Reach	9.039	2-Year	180.00	655.06	658.34		658.45	0.001514	2.64	68.20	32.88	0.32
US Reach	9.039	50-Year	485.00	655.06	660.26		660.44	0.001405	3.37	144.01	46.19	0.33
US Reach	9.058	100-Year	568.00	655.35	660.85		661.09	0.001561	3.92	146.98	44.63	0.36
US Reach	9.058	10-Year	319.00	655.35	659.44		659.63	0.002075	3.53	90.38	35.34	0.39
US Reach	9.058	2-Year	180.00	655.35	658.50		658.64	0.002004	3.00	60.00	29.22	0.37
US Reach	9.058	50-Year	485.00	655.35	660.38		660.61	0.001793	3.84	126.79	41.54	0.38
US Reach	9.078	100-Year	568.00	655.56	661.10		661.28	0.001039	3.37	171.28	48.57	0.30
US Reach	9.078	10-Year	319.00	655.56	659.74		659.87	0.001253	2.89	110.51	40.29	0.31
US Reach	9.078	2-Year	180.00	655.56	658.77		658.86	0.001178	2.42	74.53	34.00	0.29
US Reach	9.078	50-Year	485.00	655.56	660.66		660.82	0.001129	3.25	150.29	45.92	0.30
US Reach	9.1	100-Year	568.00	655.63	661.18		661.41	0.001364	3.80	152.85	45.34	0.34
US Reach	9.1	10-Year	319.00	655.63	659.85		660.02	0.001684	3.26	97.93	37.03	0.35
US Reach	9.1	2-Year	180.00	655.63	658.88		659.00	0.001629	2.77	65.05	30.73	0.34
US Reach	9.1	50-Year	485.00	655.63	660.75		660.96	0.001481	3.66	133.82	42.66	0.35
US Reach	9.121	100-Year	568.00	655.81	661.32		661.54	0.001337	3.78	154.81	46.84	0.34
US Reach	9.121	10-Year	319.00	655.81	660.02		660.18	0.001641	3.20	99.59	38.13	0.35
US Reach	9.121	2-Year	180.00	655.81	659.04		659.16	0.001633	2.74	65.58	31.48	0.34
US Reach	9.121	50-Year	485.00	655.81	660.90		661.10	0.001437	3.63	135.68	44.01	0.34
US Reach	9.134	100-Year	568.00	655.54	661.49		661.65	0.000834	3.18	183.55	49.76	0.27
US Reach	9.134	10-Year	319.00	655.54	660.20		660.30	0.000877	2.57	124.02	42.15	0.26
US Reach	9.134	2-Year	180.00	655.54	659.20		659.27	0.000811	2.11	85.26	35.89	0.24
US Reach	9.134	50-Year	485.00	655.54	661.07		661.22	0.000859	3.02	163.31	47.31	0.27
US Reach	9.153	100-Year	568.00	655.96	661.46		661.83	0.001166	4.91	120.68	37.21	0.44
US Reach	9.153	10-Year	319.00	655.96	660.21		660.47	0.001313	4.05	78.83	30.20	0.43
US Reach	9.153	2-Year	180.00	655.96	659.24		659.43	0.001341	3.45	52.11	24.85	0.42
US Reach	9.153	50-Year	485.00	655.96	661.05		661.39	0.001224	4.68	106.23	34.95	0.44
US Reach	9.162	100-Year	568.00	656.18	661.58		661.86	0.000809	4.24	139.98	41.32	0.37
US Reach	9.162	10-Year	319.00	656.18	660.32		660.50	0.000877	3.46	92.35	33.86	0.36
US Reach	9.162	2-Year	180.00	656.18	659.33		659.46	0.000898	2.92	61.69	28.30	0.35
US Reach	9.162	50-Year	485.00	656.18	661.18		661.43	0.000840	4.04	123.67	38.93	0.37
US Reach	9.171	100-Year	568.00	655.76	661.42	659.21	662.07	0.000562	6.47	87.76	15.50	0.48
US Reach	9.171	10-Year	319.00	655.76	660.27	658.12	660.59	0.000337	4.57	69.86	15.50	0.38
US Reach	9.171	2-Year	180.00	655.76	659.33	657.36	659.49	0.000210	3.26	55.29	15.50	0.30
US Reach	9.171	50-Year	485.00	655.76	661.06	658.86	661.60	0.000494	5.91	82.08	15.50	0.45
US Reach	9.178499		Culvert									
US Reach	9.186	100-Year	568.00	655.76	661.89	659.21	662.45	0.000451	5.98	95.05	15.50	0.43
US Reach	9.186	10-Year	319.00	655.76	660.49	658.12	660.78	0.000294	4.35	73.27	15.50	0.35
US Reach	9.186	2-Year	180.00	655.76	659.43	657.36	659.59	0.000193	3.16	56.92	15.50	0.29
US Reach	9.186	50-Year	485.00	655.76	661.44	658.86	661.91	0.000406	5.51	88.05	15.50	0.41
US Reach	9.189	100-Year	568.00	656.24	662.39		662.57	0.000139	3.32	170.99	47.55	0.31
US Reach	9.189	10-Year	319.00	656.24	660.67		660.83	0.000175	3.20	99.82	34.91	0.33
US Reach	9.189	2-Year	180.00	656.24	659.47		659.60	0.000188	2.86	62.98	27.46	0.33
US Reach	9.189	50-Year	485.00	656.24	661.83		662.01	0.000154	3.33	145.44	43.44	0.32
US Reach	9.197	100-Year	568.00	656.23	662.46		662.58	0.000648	2.89	208.54	58.50	0.24

HEC-RAS Plan: PROP 101612 River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	9.197	10-Year	319.00	656.23	660.74		660.85	0.001032	2.68	119.72	44.77	0.28
US Reach	9.197	2-Year	180.00	656.23	659.52		659.62	0.001402	2.52	71.35	34.81	0.31
US Reach	9.197	50-Year	485.00	656.23	661.90		662.02	0.000749	2.84	177.27	54.08	0.25
US Reach	9.206	100-Year	568.00	656.27	662.46		662.63	0.000817	3.28	182.50	48.91	0.27
US Reach	9.206	10-Year	319.00	656.27	660.77		660.91	0.001205	2.97	108.25	38.75	0.30
US Reach	9.206	2-Year	180.00	656.27	659.58		659.69	0.001543	2.71	66.52	31.21	0.33
US Reach	9.206	50-Year	485.00	656.27	661.91		662.07	0.000926	3.21	156.56	45.63	0.28
US Reach	9.24	100-Year	568.00	657.00	662.57		662.73	0.000391	3.25	201.21	84.03	0.26
US Reach	9.24	10-Year	319.00	657.00	660.92		661.05	0.000555	2.90	112.38	41.79	0.29
US Reach	9.24	2-Year	180.00	657.00	659.79		659.89	0.000790	2.61	68.95	34.50	0.33
US Reach	9.24	50-Year	485.00	657.00	662.03		662.19	0.000442	3.18	163.56	55.92	0.28
US Reach	9.246	100-Year	568.00	656.02	662.33	659.73	662.97	0.000231	6.43	88.36	67.92	0.45
US Reach	9.246	10-Year	319.00	656.02	660.82	658.54	661.17	0.000182	4.75	67.13	46.12	0.38
US Reach	9.246	2-Year	180.00	656.02	659.75	657.74	659.93	0.000134	3.45	52.21	35.00	0.31
US Reach	9.246	50-Year	485.00	656.02	661.84	659.36	662.39	0.000221	5.96	81.44	58.29	0.44
US Reach	9.2505		Culvert									
US Reach	9.255	100-Year	568.00	656.02	663.14	659.73	663.38	0.000095	4.46	316.30	189.60	0.29
US Reach	9.255	10-Year	319.00	656.02	660.97	658.54	661.30	0.000163	4.60	69.36	48.02	0.36
US Reach	9.255	2-Year	180.00	656.02	659.80	657.74	659.98	0.000128	3.40	52.96	35.30	0.31
US Reach	9.255	50-Year	485.00	656.02	662.35	659.35	662.81	0.000167	5.47	88.61	69.60	0.38
US Reach	9.267	100-Year	568.00	656.69	663.34		663.41	0.000320	2.30	375.37	150.46	0.17
US Reach	9.267	10-Year	319.00	656.69	661.25		661.35	0.000752	2.55	147.05	75.32	0.25
US Reach	9.267	2-Year	180.00	656.69	659.91		660.01	0.001487	2.55	70.54	35.50	0.32
US Reach	9.267	50-Year	485.00	656.69	662.80		662.87	0.000371	2.31	299.49	127.97	0.18
US Reach	9.284	100-Year	568.00	656.98	663.35		663.46	0.000510	2.86	276.74	114.03	0.22
US Reach	9.284	10-Year	319.00	656.98	661.31		661.45	0.001073	3.00	115.62	50.27	0.29
US Reach	9.284	2-Year	180.00	656.98	660.06		660.18	0.001773	2.82	63.85	31.60	0.35
US Reach	9.284	50-Year	485.00	656.98	662.82		662.93	0.000583	2.85	220.47	94.85	0.23
US Reach	9.314	100-Year	568.00	657.16	663.46		663.53	0.000392	2.47	381.30	164.03	0.19
US Reach	9.314	10-Year	319.00	657.16	661.48		661.60	0.000994	2.86	136.20	83.88	0.28
US Reach	9.314	2-Year	180.00	657.16	660.32		660.43	0.001586	2.69	66.97	33.43	0.33
US Reach	9.314	50-Year	485.00	657.16	662.93		663.01	0.000470	2.52	299.86	142.49	0.21
US Reach	9.33	100-Year	568.00	657.34	663.48		663.60	0.000599	3.02	277.24	108.09	0.24
US Reach	9.33	10-Year	319.00	657.34	661.57		661.73	0.001257	3.20	115.48	61.70	0.32
US Reach	9.33	2-Year	180.00	657.34	660.48		660.60	0.001795	2.88	62.76	32.07	0.35
US Reach	9.33	50-Year	485.00	657.34	662.96		663.08	0.000691	3.02	224.22	95.41	0.25
US Reach	9.349	100-Year	568.00	657.36	663.52		663.67	0.000675	3.25	221.13	69.30	0.25
US Reach	9.349	10-Year	319.00	657.36	661.70		661.84	0.001092	3.10	112.45	49.94	0.30
US Reach	9.349	2-Year	180.00	657.36	660.65		660.76	0.001268	2.60	70.48	34.44	0.30
US Reach	9.349	50-Year	485.00	657.36	663.01		663.16	0.000734	3.17	187.36	63.92	0.26
US Reach	9.366	100-Year	573.00	657.59	663.48		663.82	0.001623	4.89	146.50	44.69	0.39
US Reach	9.366	10-Year	307.00	657.59	661.75		662.03	0.002215	4.31	79.18	32.89	0.42
US Reach	9.366	2-Year	179.00	657.59	660.75		660.96	0.002690	3.72	49.66	26.08	0.43
US Reach	9.366	50-Year	483.00	657.59	663.00		663.31	0.001690	4.67	125.57	41.38	0.39
US Reach	9.39	100-Year	573.00	658.01	663.62		663.99	0.001725	5.10	138.55	40.24	0.40
US Reach	9.39	10-Year	307.00	658.01	661.96		662.24	0.002096	4.31	79.23	30.93	0.41
US Reach	9.39	2-Year	179.00	658.01	661.00		661.20	0.002232	3.58	52.26	25.60	0.40
US Reach	9.39	50-Year	483.00	658.01	663.15		663.48	0.001762	4.82	120.05	37.58	0.40
US Reach	9.394	100-Year	573.00	658.24	663.72		664.11	0.001876	5.23	135.34	39.72	0.42
US Reach	9.394	10-Year	307.00	658.24	662.08		662.38	0.002338	4.46	77.29	31.03	0.43
US Reach	9.394	2-Year	179.00	658.24	661.14		661.35	0.002595	3.75	50.39	26.03	0.43
US Reach	9.394	50-Year	483.00	658.24	663.25		663.60	0.001932	4.96	117.16	37.21	0.41
US Reach	9.416	100-Year	573.00	658.30	663.91		664.30	0.001914	5.41	128.45	37.92	0.42
US Reach	9.416	10-Year	307.00	658.30	662.31		662.62	0.002325	4.65	74.52	29.35	0.44
US Reach	9.416	2-Year	179.00	658.30	661.39		661.61	0.002392	3.86	49.74	24.42	0.42
US Reach	9.416	50-Year	483.00	658.30	663.44		663.81	0.001985	5.17	111.20	35.41	0.42
US Reach	9.439	100-Year	573.00	658.31	664.32		664.53	0.001218	3.79	163.56	47.56	0.32
US Reach	9.439	10-Year	307.00	658.31	662.71		662.88	0.001487	3.40	96.31	36.17	0.34
US Reach	9.439	2-Year	179.00	658.31	661.74		661.87	0.001492	2.91	64.27	30.04	0.33
US Reach	9.439	50-Year	483.00	658.31	663.85		664.04	0.001306	3.66	141.76	44.16	0.33
US Reach	9.459	100-Year	573.00	658.84	664.45		664.63	0.000887	3.70	186.49	66.10	0.29
US Reach	9.459	10-Year	307.00	658.84	662.87		663.01	0.001071	3.17	108.48	41.48	0.30
US Reach	9.459	2-Year	179.00	658.84	661.90		662.01	0.001180	2.68	71.50	34.99	0.30

HEC-RAS Plan: PROP 101612 River: Bensenville Ditc Reach: US Reach (Continued)

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)	
US Reach	9.459	50-Year	483.00	658.84	663.98		664.15	0.000938	3.56	158.68	48.93	0.29
US Reach	9.476	100-Year	573.00	658.57	664.44		664.85	0.002565	6.23	131.90	46.18	0.48
US Reach	9.476	10-Year	307.00	658.57	662.87		663.28	0.003759	5.91	69.35	33.37	0.55
US Reach	9.476	2-Year	179.00	658.57	661.93		662.31	0.004657	5.38	41.63	25.72	0.58
US Reach	9.476	50-Year	483.00	658.57	663.97		664.38	0.002812	6.12	111.21	42.37	0.50
US Reach	9.506	100-Year	573.00	656.52	664.74		664.98	0.000501	4.29	179.02	61.22	0.30
US Reach	9.506	10-Year	307.00	656.52	663.27		663.43	0.000412	3.25	113.00	36.01	0.26
US Reach	9.506	2-Year	179.00	656.52	662.35		662.43	0.000309	2.44	82.23	30.19	0.22
US Reach	9.506	50-Year	483.00	656.52	664.30		664.52	0.000482	4.00	154.59	49.85	0.29
US Reach	9.517	100-Year	471.00	659.40	664.29	663.35	665.49	0.001370	8.78	53.67	11.53	0.72
US Reach	9.517	10-Year	253.00	659.40	663.06	662.01	663.69	0.000916	6.39	39.57	11.25	0.60
US Reach	9.517	2-Year	155.00	659.40	662.20	661.28	662.61	0.000753	5.16	30.04	11.05	0.55
US Reach	9.517	50-Year	396.00	659.40	663.94	662.92	664.93	0.001198	7.98	49.64	11.45	0.68
US Reach	9.522		Culvert									
US Reach	9.527	100-Year	471.00	659.60	665.75	663.54	666.49	0.000715	6.89	68.37	11.83	0.50
US Reach	9.527	10-Year	253.00	659.60	663.22	662.22	663.87	0.000941	6.45	39.20	11.24	0.61
US Reach	9.527	2-Year	155.00	659.60	662.28	661.48	662.73	0.000857	5.40	28.72	11.02	0.59
US Reach	9.527	50-Year	396.00	659.60	664.28	663.12	665.21	0.001099	7.73	51.23	11.48	0.65
US Reach	9.541	100-Year	471.00	659.94	666.56		666.58	0.000141	1.78	451.01	167.41	0.12
US Reach	9.541	10-Year	253.00	659.94	663.90		663.98	0.000830	3.06	124.87	77.82	0.27
US Reach	9.541	2-Year	155.00	659.94	662.72		662.84	0.001575	3.33	64.41	37.27	0.35
US Reach	9.541	50-Year	396.00	659.94	665.29		665.34	0.000354	2.44	265.87	124.72	0.19
US Reach	9.555	100-Year	471.00	659.80	666.57	662.92	666.59	0.000111	1.38	533.89	253.00	0.10
US Reach	9.555	10-Year	253.00	659.80	663.94	662.06	664.06	0.001031	2.77	104.30	86.64	0.28
US Reach	9.555	2-Year	155.00	659.80	662.84	661.51	662.96	0.001786	2.80	55.37	27.44	0.35
US Reach	9.555	50-Year	396.00	659.80	665.31	662.66	665.36	0.000357	2.09	276.59	162.70	0.18
US Reach	9.556		Bridge									
US Reach	9.557	100-Year	471.00	659.80	666.57	662.92	666.59	0.000110	1.38	534.97	253.29	0.10
US Reach	9.557	10-Year	253.00	659.80	663.96	662.06	664.07	0.001009	2.75	105.47	87.40	0.28
US Reach	9.557	2-Year	155.00	659.80	662.86	661.51	662.98	0.001739	2.77	55.92	27.56	0.34
US Reach	9.557	50-Year	396.00	659.80	665.33	662.66	665.38	0.000349	2.08	279.34	163.69	0.17
US Reach	9.573	100-Year	471.00	660.19	666.58		666.62	0.000215	1.80	359.88	156.97	0.14
US Reach	9.573	10-Year	253.00	660.19	664.09		664.19	0.001078	2.55	99.94	50.02	0.28
US Reach	9.573	2-Year	155.00	660.19	663.07		663.17	0.001518	2.50	61.96	32.58	0.32
US Reach	9.573	50-Year	396.00	660.19	665.36		665.44	0.000550	2.39	199.69	105.52	0.22
US Reach	9.588	100-Year	471.00	660.22	666.58		666.63	0.000314	2.05	300.18	147.94	0.17
US Reach	9.588	10-Year	253.00	660.22	664.13		664.25	0.001364	2.78	90.91	37.38	0.31
US Reach	9.588	2-Year	155.00	660.22	663.13		663.25	0.001808	2.71	57.15	30.25	0.35
US Reach	9.588	50-Year	396.00	660.22	665.36		665.48	0.000826	2.72	159.60	84.05	0.26
US Reach	9.595	100-Year	471.00	660.38	666.58		666.66	0.000428	2.34	232.52	87.40	0.19
US Reach	9.595	10-Year	253.00	660.38	664.20		664.33	0.001605	2.93	86.44	37.30	0.34
US Reach	9.595	2-Year	155.00	660.38	663.22		663.35	0.002175	2.89	53.73	29.82	0.38
US Reach	9.595	50-Year	396.00	660.38	665.40		665.53	0.000979	2.88	144.64	61.52	0.28
US Reach	9.623	100-Year	471.00	660.56	666.61		666.76	0.000786	3.16	159.16	46.21	0.26
US Reach	9.623	10-Year	253.00	660.56	664.43		664.61	0.002024	3.40	74.67	31.55	0.38
US Reach	9.623	2-Year	155.00	660.56	663.55		663.71	0.002473	3.15	49.26	26.18	0.40
US Reach	9.623	50-Year	396.00	660.56	665.53		665.73	0.001473	3.60	113.00	38.72	0.34
US Reach	9.635	100-Year	471.00	661.41	666.53		666.89	0.002614	4.89	98.44	30.18	0.45
US Reach	9.635	10-Year	253.00	661.41	664.37		664.90	0.007829	5.84	43.34	21.03	0.72
US Reach	9.635	2-Year	155.00	661.41	663.53		664.04	0.010952	5.70	27.18	17.75	0.81
US Reach	9.635	50-Year	396.00	661.41	665.42		665.95	0.005360	5.87	67.68	25.35	0.62

PROPOSED CONDITIONS
500-YEAR TRUNCATED
NGVD '29.

HEC-RAS Plan: Prop 500 River: Bensenville Ditc Reach: US Reach Profile: 500-Year

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)	
US Reach	8.826	500-Year	1050.00	653.18	658.88	657.08	659.29	0.001100	6.12	213.10	57.24	0.45
US Reach	8.827	500-Year	1050.00	653.23	658.91	656.32	659.37	0.001188	5.44	193.17	68.10	0.40
US Reach	8.85		Culvert									
US Reach	8.888	500-Year	1050.00	653.77	659.54	656.87	659.99	0.001126	5.35	196.28	68.65	0.39
US Reach	8.9	500-Year	1050.00	653.90	659.91	656.28	660.04	0.000294	2.95	357.25	80.41	0.23
US Reach	8.91	500-Year	1050.00	653.90	659.86	656.55	660.12	0.000441	4.10	256.13	71.58	0.30

HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp 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
```

HEC-RAS Output Report

PROJECT DATA
Project Title: Permit_Model_Final_CP_Culvert
Project File : 112311.prj
Run Date and Time: 10/16/2012 2:28:56 PM

Project in English units

PLAN DATA

Plan Title: Proposed Conditions 101612
Plan File : c:\Users\doliphant\Desktop\2007\Bensenville Ditch\models\HEC-RAS Updated 112311\112311.p08

Geometry Title: Prop_101612
Geometry File : c:\Users\doliphant\Desktop\2007\Bensenville Ditch\models\HEC-RAS Updated 112311\112311.g08

Flow Title : Final_Condition_Flows
Flow File : c:\Users\doliphant\Desktop\2007\Bensenville Ditch\models\HEC-RAS Updated 112311\112311.f01

Plan Description:
Flows From Burke's "ALP Alignment - Bensenville Ditch, 04/2010 - FINAL"

Plan Summary Information:
Number of: Cross Sections = 104 Multiple Openings = 0
Culverts = 8 Inline Structures = 0
Bridges = 2 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.003
Critical depth calculation tolerance = 0.003
Maximum number of iterations = 20
Maximum difference tolerance = 0.1
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: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Final_Condition_Flows
Flow File : c:\Users\doliphant\Desktop\2007\Bensenville Ditch\models\HEC-RAS Updated 112311\112311.f01

Flow Data (cfs)

River	Reach	RS	100-Year	10-Year	2-Year	50-Year
Bensenville Ditch	US Reach	9.635	471	253	155	396
Bensenville Ditch	US Reach	9.506	573	307	179	483
Bensenville Ditch	US Reach	9.349	568	319	180	485
Bensenville Ditch	US Reach	8.962	684	392	202	594
Bensenville Ditch	US Reach	8.91	757	403	199	648
Bensenville Ditch	US Reach	8.827	826	432	213	700
Bensenville Ditch	US Reach	8.743	927	467	228	776
Bensenville Ditch	US Reach	8.546	963	479	236	805
Bensenville Ditch	US Reach	7.58	1032	507	250	858
Bensenville Ditch	US Reach	7.122	1108	540	273	917
Bensenville Ditch	US Reach	7.111	1175	519	210	954

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Bensenville Ditch	US Reach	100-Year	Critical	Known WS = 649.85
Bensenville Ditch	US Reach	10-Year	Critical	Known WS = 648.55
Bensenville Ditch	US Reach	2-Year	Critical	Known WS = 647.75
Bensenville Ditch	US Reach	50-Year	Critical	Known WS = 649.47

Inline Structure Gate Openings
River = Bensenville Ditch
Reach = US Reach RS = 8.4815
Gate = Gate #1

# Open	Open Ht	# Open	Open Ht	# Open	Open Ht	# Open	Open Ht
3	1	3	1	3	1	3	1

GEOMETRY DATA

Geometry Title: Prop_101612
Geometry File : c:\Users\doliphant\Desktop\2007\Bensenville Ditch\models\HEC-RAS Updated 112311\112311.g08

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.635

INPUT
Description: END OF PROJECT, OUTFALLS AT IRVING PK/PARKSIDE DR

Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
971	668.82	984	668.01	992	665	1000	661.41	1010	661.76
1020	667.63	1033	668.09	1649.48	670				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
971	.04	992	.035	1020	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
992	1020	50	50	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.623

INPUT
Description: SMG: TOOK FIRST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
805	670	961	668	971	666.95	979	666.84	986	665
1000	660.56	1010	661.14	1018	664	1029	667.56	1040	667.95
1550	670								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
805	.04	986	.035	1018	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
986	1018	150	150	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.595

INPUT
Description: SMG: TOOK FIRST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
505.51	670	919	668	974	664.9	984	664.38	1000	660.38
1008	660.38	1025	665	1033	666.91	1043	667.6	1350	670

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
505.51	.04	984	.035	1025	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
984	1025	50	50	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.588

INPUT
Description: SMG: TOOK FIRST AND LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
505.01	670	926	668	976	664.59	986	664.61	1000	660.22
1010	660.36	1027	664.66	1039	665.11	1149	668	1255	670

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
505.01	.04	986	.035	1027	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
986	1027	46	46	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.573

INPUT
Description: SMG: TOOK FIRST AND LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
  605.51     670     920     668     976  664.51     986   663.9    1000  660.26
    1011  660.19    1025  663.93    1037  664.17    1137     668 1604.91     670

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  605.51     .04     986    .035    1025     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           986    1025              114     114     114             .1       .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.557

INPUT
Description: This is a REPEATED section.

Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1780     670    1841     668    1879   666.3    1907     666    1926   665.4
    1951   664.5    1967   663.2    1977   659.8    1986   659.8    1996     663
    2000   663.4    2012   663.5    2039   663.8    2066   664.5    2097   665.5
    2118   666.4    2193     668    2480     670

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1780     .04    1967    .035    1996     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1967    1996              10      10      10             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    1780    1967   664.5        F
    1996    2480   663.5        F

BRIDGE


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.556

INPUT
Description: Foot Bridge (Bridge #11)
Removed errant point 674.5 changed to
           664.5 on roadway
Revised road section for half a foot thickness
           throughout and symmetrical shape
Distance from Upstream XS =       .1
Deck/Roadway Width        =      9.8
Weir Coefficient          =        3
Upstream  Deck/Roadway Coordinates
    num=       15
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1879   666.3   666.3    1907     666     666    1926   665.4   664.9
    1951   663.5     663    1967   664.5     664    1977   664.5     664
    1986   664.5     664    1996   664.5     664    1996   664.5     664
    2000   664.4   663.9    2012   663.5     663    2039   663.8   663.8
    2066   664.5   664.5    2097   665.5   665.5    2118   666.4   666.4

Upstream Bridge Cross Section Data
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1780     670    1841     668    1879   666.3    1907     666    1926   665.4
    1951   664.5    1967   663.2    1977   659.8    1986   659.8    1996     663
    2000   663.4    2012   663.5    2039   663.8    2066   664.5    2097   665.5
    2118   666.4    2193     668    2480     670

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1780     .04    1967    .035    1996     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
          1967    1996             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    1780    1967   664.5        F
    1996    2480   663.5        F

Downstream  Deck/Roadway Coordinates
    num=       15
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1879   666.3   666.3    1907     666     666    1926   665.4   665.4
    1951   663.5     663    1967   664.5     664    1977   664.5     664
    1986   664.5     664    1996   664.5     664    1996   664.5     664
    2000   664.4   663.9    2012   663.5     663    2039   663.8   663.8
    2066   664.5   664.5    2097   665.5   665.5    2118   666.4   666.4

Downstream Bridge Cross Section Data
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 1780.01     670    1841     668    1879   666.3    1907     666    1926   665.4
    1951   664.5    1967   663.2    1977   659.8    1986   659.8    1996     663
    2000   663.4    2012   663.5    2039   663.8    2066   664.5    2097   665.5
    2118   666.4    2193     668    2480     670

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 1780.01     .04    1967    .035    1996     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
```

```
          1967    1996              .1       .3
Ineffective Flow      num=        2
   Sta L    Sta R    Elev  Permanent
 1780.01     1967   664.3        F
    1996     2480   663.5        F

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 =     .95
Elevation at which weir flow begins         =   664.5
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Energy

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: Bensenville Ditc
REACH: US Reach           RS: 9.555

INPUT
Description: SMG:  TOOK FIRST AND LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data     num=       18
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 1780.01      670     1841      668     1879    666.3     1907      666     1926    665.4
    1951    664.5     1967    663.2     1977    659.8     1986    659.8     1996      663
    2000    663.4     2012    663.5     2039    663.8     2066    664.5     2097    665.5
    2118    666.4     2193      668     2480      670

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 1780.01      .04     1967     .035     1996      .04

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
          1967     1996                  73       71       67              .1       .3
Ineffective Flow      num=        2
   Sta L    Sta R    Elev  Permanent
 1780.01     1967   664.3        F
    1996     2480   663.5        F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.541

INPUT
Description: SMG:  TOOK FIRST AND LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data     num=       10
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     805      670      905      668      975   663.77      982   663.62     1000   659.94
    1009   659.94     1028   663.55     1041   663.33     1121      668     1505      670

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
     805      .04     1000     .035     1009      .04

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
          1000     1009                  65       65       65              .1       .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.527

INPUT
Description: This is a REPEATED section.
   CHURCH STREET, US SIDE, FROM 85
            SURVEY

Station Elevation Data     num=       13
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    1600    675.2     1847    666.9     1895    666.9     1950    667.4     1969    666.2
  1969.6    659.6     1980    659.6     1981    666.7     2012    667.4     2056    667.3
    2103    666.9     2162    667.4     2450    675.2

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
    1600      .04     1969     .012     1981      .04

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
          1969     1981                  50       50       50              .3       .5
Ineffective Flow      num=        2
```

Sta L	Sta R	Elev	Permanent
1600	1969	667.4	F
1981	2450	667.4	F

CULVERT

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.522

INPUT
Description: Church Street [Culvert #7 (10.5' x 5' Boxes)]
Originally modeled
as a triple box, exists only as a single box in reality

Distance from Upstream XS = .1
Deck/Roadway Width = 49.8
Weir Coefficient = 3
Upstream Deck/Roadway Coordinates
num= 12

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1600	675.2	659.4	1847	667.4	659.4	1950	667.4	659.4
1969	667.4	659.4	1969	667.4	659.4	1969.6	667.4	659.4
1980	667.4	659.4	1981	667.4	659.4	1981	667.4	659.4
2012	667.4	659.4	2162	667.4	659.4	2450	675.2	659.4

Upstream Bridge Cross Section Data
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1600	675.2	1847	666.9	1895	666.9	1950	667.4	1969	666.2
1969.6	659.6	1980	659.6	1981	666.7	2012	667.4	2056	667.3
2103	666.9	2162	667.4	2450	675.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1600	.04	1969	.012	1981	.04

Bank Sta: Left Right Coeff Contr. Expan.
1969 1981 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1600	1969	667.4	F
1981	2450	667.4	F

Downstream Deck/Roadway Coordinates
num= 12

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1600	675.2	659.4	1847	667.4	659.4	1950	667.4	659.4
1969	667.4	659.4	1969	667.4	659.4	1969.6	667.4	659.4
1980	667.4	659.4	1981	667.4	659.4	1981	667.4	659.4
2012	667.4	659.4	2162	667.4	659.4	2450	675.2	659.4

Downstream Bridge Cross Section Data
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1600	675	1847	666.7	1895	666.7	1950	667.2	1969	666
1969.6	659.4	1980	659.4	1981	666.5	2012	667.2	2056	667.1
2103	666.7	2162	667.2	2450	675				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1600	.04	1969	.012	1981	.04

Bank Sta: Left Right Coeff Contr. Expan.
1969 1981 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1600	1969	666	F
1981	2450	666	F

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 = .95
Elevation at which weir flow begins = 667.4
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Box7	Box	5	10.5

FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	.1	49.8	.012	.012	0	.2	1

Upstream Elevation = 659.41
Centerline Station = 1975
Downstream Elevation = 659.16
Centerline Station = 1975

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.517

INPUT
Description: CHURCH STREET, DS SIDE, FROM 85 SURVEY

Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1600	675	1847	666.7	1895	666.7	1950	667.2	1969	666
1969.6	659.4	1980	659.4	1981	666.5	2012	667.2	2056	667.1
2103	666.7	2162	667.2	2450	675				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1600	.04	1969	.012	1981	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1969	1981	40	40	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1600	1969	666	F
1981	2450	666	F

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.506

INPUT
Description: SMG: TOOK LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
982	666	985	665	994	660	1000	656.52	1012	660.56
1027	663.92	1077	666						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
982	.04	994	.025	1012	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
994	1012	128	128	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.476

INPUT
Description: SMG: TOOK LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
969	666.33	979	666.02	982	665	997	660	1000	658.57
1007	660	1030	664.47	1035	664.6	1315	666		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
969	.04	997	.035	1007	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
997	1007	105	105	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.459

INPUT
Description: SMG: TOOK LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
962	669.52	970	668.86	980	665	991	661	1000	658.9
1011	658.84	1016	660	1032	664.04	1040	664.11	1060	665
1304.99	670								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
962	.04	991	.035	1016	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
991	1016	100	100	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.439

INPUT
Description: SMG: TOOK LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
956	670.25	967	669.7	983	664	992	661	1000	658.31
1009	658.62	1014	660	1024	663	1030	664.4	1035	664.8
1330	666								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
956	.04	983	.035	1014	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
983	1014	135	135	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.416

INPUT
Description:

Station Elevation Data	num=	9							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
959	670.24	968	669.65	981	665	995	660	1000	658.3
1008	658.34	1012	660	1028	666.28	1036	666.62		

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
959	.04	995	.035	1012	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
995	1012	102	102	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.394

INPUT
Description:

Station Elevation Data	num=	9							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
967	667.25	978	666.8	983	665	997	660	1000	658.77
1012	658.24	1017	660	1034	666.81	1044	667.65		

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
967	.06	997	.035	1017	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
997	1017	62	62	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.39

INPUT
Description:

Station Elevation Data	num=	10							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
455.45	670	970	664.4	984	663.95	995	660	1000	658.01
1010	658.07	1015	660	1029	665	1035	667.1	1043	667.44

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
455.45	.06	995	.035	1015	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
995	1015	97	97	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.366

INPUT
Description:

Station Elevation Data	num=	10							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
962	665.69	975	665.39	977	665	993	660	1000	657.66
1006	657.59	1014	660	1032	665	1035	665.45	1045	665.94

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
962	.06	993	.035	1014	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
993	1014	96	96	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.349

INPUT
Description: SMG: TOOK LAST 2 GR CARDS FROM DUPAGE CO TOPO MAP

Station Elevation Data	num=	11							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
950	666.81	968	666.34	972	665	990	660	1000	657.36
1008	657.43	1020	660	1024	661.25	1033	661.58	1050	664
1550	666								

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
950	.06	990	.035	1020	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
990	1020	100	100	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.33

INPUT
Description: SMG: TOOK LAST 2 GR CARDS FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
959	668.68	968	667.2	975	665	991	660	1000	657.45
1009	657.34	1021	660.46	1029	660.69	1099	664	1464	666

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
959	.06	991	.035	1021	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
991	1021	100	100	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.314

INPUT
Description: SMG: TOOK LAST 2 GR CARDS FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
975	665.06	990	660	1000	657.19	1009	657.16	1023	660.44
1034	660.54	1164	664	1444	666				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
975	.06	990	.035	1023	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
990	1023	150	150	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.284

INPUT
Description: SMG: TOOK FIRST GR CARD AND LAST 2 GR CARDS FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
855	666	975	661.86	983	661.23	988	660	1000	656.99
1010	656.98	1020	660.26	1028	660.67	1050	664	1445	666

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
855	.06	988	.035	1020	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
988	1020	100	100	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.267

INPUT
Description: BEGIN CHANNEL IMPROVEMENT 10' BW & 3:1 SS
SMG: TOOK FIRST AND LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
903	666	968	662.57	978	662.15	987	660	1000	656.79
1009	656.69	1023	659.94	1033	660.17	1163	666		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
903	.06	987	.035	1023	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
987	1023	65	65	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.255

INPUT
Description: This is a REPEATED section.
MASON STREET, US SIDE, FROM 97 SUYVEY

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1267.51	670.01	1900	664.7	1916	663.5	1952	663.5	1978	663
2000	662.7	2019	662.9	2031	662.1	2050	660	2061	656.02

```
    2075  656.02    2093   662.3    2148     663    2192   663.5    2245     664
    2445     666

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 1267.51     .05    2061    .012    2075     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          2061    2075               44      44      44             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 1267.51    2061   663.1        F
    2075    2445   663.1        F

CULVERT


RIVER: Bensenville Ditc
REACH: US Reach            RS: 9.2505

INPUT
Description: Mason Street [Culvert #6 (2 7' x 5' Boxes)]

Distance from Upstream XS =       .1
Deck/Roadway Width        =    43.8
Weir Coefficient          =     2.5
Upstream  Deck/Roadway Coordinates
    num=       17
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1900   664.7  656.02    1916   663.5  656.02    1952   663.5  656.02
    1978   663.1  656.02    2000   663.1  656.02    2016   663.1  656.02
    2031   663.1  656.02    2050   663.1  656.02    2061   663.1  656.02
    2061   663.1  656.02    2075   663.1  656.02    2075   663.1  656.02
    2093   663.1  656.02    2148   663.1  656.02    2192   663.5  656.02
    2245     664  656.02    2445     666  656.02

Upstream Bridge Cross Section Data
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 1267.51  670.01    1900   664.7    1916   663.5    1952   663.5    1978     663
    2000   662.7    2019   662.9    2031   662.1    2050     660    2061  656.02
    2075  656.02    2093   662.3    2148     663    2192   663.5    2245     664
    2445     666

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 1267.51     .05    2061    .012    2075     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
          2061    2075             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 1267.51    2061   663.1        F
    2075    2445   663.1        F

Downstream  Deck/Roadway Coordinates
    num=       17
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1900   664.7  656.02    1916   663.5  656.02    1952   663.5  656.02
    1978   663.1  656.02    2000   663.1  656.02    2016   663.1  656.02
    2031   663.1  656.02    2050   663.1  656.02    2061   663.1  656.02
    2061   663.1  656.02    2075   663.1  656.02    2075   663.1  656.02
    2093   663.1  656.02    2148   663.1  656.02    2192   663.5  656.02
    2245     664  656.02    2445     666  656.02

Downstream Bridge Cross Section Data
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1900   664.7    1916   663.5    1952   663.5    1978     663    2000   662.7
    2019   662.9    2031   662.1    2050     660    2061  656.02    2075  656.02
    2093   662.3    2148     663    2192   663.5    2245     664    2445     666

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1900     .05    2061    .012    2075     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
          2061    2075             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    1900    2061   662.5        F
    2075    2445   662.5        F

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 =     .95
Elevation at which weir flow begins         =   663.1
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Box6                 Box       5       7
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 3 - Wingwall flared 0 deg. (sides extended straight)
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                .1    43.8     .012     .012        0                  .2               1
Number of Barrels =  2
Upstream   Elevation =  656.11
```

Centerline Stations
Sta. Sta.
2064.5 2071.5
Downstream Elevation = 655.88
Centerline Stations
Sta. Sta.
2064.5 2071.5

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.246

INPUT
Description: MASON STREET, DS SIDE--5X7 TWIN BOX, FROM 97 SURVEY

Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1900	664.7	1916	663.5	1952	663.5	1978	663	2000	662.7
2019	662.9	2031	662.1	2050	660	2061	656.02	2075	656.02
2093	662.3	2148	663	2192	663.5	2245	664	2445	666

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1900	.05	2061	.012	2075	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2061	2075	10	10	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1900	2061	662.5	F
2075	2445	662.5	F

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.24

INPUT
Description: SMG: TOOK FIRST AND LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
905	666	971	663	983	661.77	989	660	1000	657
1015	657	1025	660	1030	661.73	1035	662	1205	666

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
905	.05	989	.025	1025	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
989	1025	185	185	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.206

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
965	665.39	974	664.09	987	660	1000	656.41	1010	656.27
1015	658	1024	661	1030	663.15	1044	664.06	1180	665

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
965	.05	987	.035	1024	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
987	1024	46	46	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.197

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
957	664.88	967	664.35	984	660	1000	656.23	1010	656.28
1015	658.12	1027	661	1038	663.71	1049	664.92		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
957	.05	984	.035	1027	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
984	1027	45	45	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.189

INPUT

Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
953	665.08	964	664.62	989	660	1000	656.24	1012	656.33
1025	663.13	1035	663.93	1355	665				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
953	.05	964	.012	1025	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
964	1025	18	18	.3	.5

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.186

INPUT
Description: This is a REPEATED section.
IRVING PARK RD,US SIDE

Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1600	665	1670.15	664.19	1726.12	664.19	1779.1	664.19	1832.09	664.19		
1880	664	1980	664	1992	664	1992	655.76	2007.5	655.76		
2007.5	664	2040	664	2080	664	2130	664.7				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1600	.05	1992	.012	2007.5	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1992	2007.5	78	78	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1600	1992	664.5	F
2007.5	2130	664	F

CULVERT

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.178499

INPUT
Description: Irving Park Road [Culvert #5 (2 7' x 6' Boxes)]

Distance from Upstream XS = .1
Deck/Roadway Width = 77.8
Weir Coefficient = 3
Upstream Deck/Roadway Coordinates
num= 10

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1600	665		1880	664.5	655.76	1980	664.5	655.76
1992	664.5	655.76	1992	664.5	655.76	2007.5	664.5	655.76
2007.5	664.5	655.76	2040	664.5	655.76	2080	664.5	655.76
2130	664.7	655.76						

Upstream Bridge Cross Section Data
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1600	665	1670.15	664.19	1726.12	664.19	1779.1	664.19	1832.09	664.19		
1880	664	1980	664	1992	664	1992	655.76	2007.5	655.76		
2007.5	664	2040	664	2080	664	2130	664.7				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1600	.05	1992	.012	2007.5	.05

Bank Sta: Left	Right	Coeff Contr.	Expan.
1992	2007.5	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1600	1992	664.5	F
2007.5	2130	664	F

Downstream Deck/Roadway Coordinates
num= 10

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1650	665		1880	664.5	655.76	1980	664.5	655.76
1992	664.5	655.76	1992	664.5	655.76	2007.5	664.5	655.76
2007.5	664.5	655.76	2040	664.5	655.76	2080	664.5	655.76
2130	664.7	655.76						

Downstream Bridge Cross Section Data
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1650	665	1880	664	1980	664	1992	664	1992	655.76
2007.5	655.76	2007.5	664	2040	664	2080	664	2130	664.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1650	.05	1992	.012	2007.5	.05

Bank Sta: Left	Right	Coeff Contr.	Expan.
1992	2007.5	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1650	1992	664	F
2007.5	2130	664	F

```
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 =     .95
Elevation at which weir flow begins         =   664.5
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Box5                Box       6       7
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                .1    77.8     .012     .012        0                  .2                1
Number of Barrels =  2
Upstream   Elevation =  655.84
Centerline Stations
    Sta.    Sta.
  1995.5    2004
Downstream Elevation =  655.67
Centerline Stations
    Sta.    Sta.
  1995.5    2004

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.171

INPUT
Description: IRVING PARK RD,DS SIDE--7X6 TWIN BOX, GENERATED X SECTION(VS
             6X6)

Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1650     665    1880     664    1980     664    1992     664    1992  655.76
  2007.5  655.76  2007.5     664    2040     664    2080     664    2130   664.7

Manning's n Values        num=       3
     Sta   n Val     Sta    n Val     Sta   n Val
    1650    .05    1992     .012  2007.5     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1992  2007.5               37      37      37             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    1650    1992     664       F
  2007.5    2130     664       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.162

INPUT
Description:    END RE-SURVEYED X-SECTIONS

Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     973     664     980  663.38     990     660    1000   656.2    1011  656.18
    1022     660    1028  662.05    1037     663

Manning's n Values        num=       3
     Sta   n Val     Sta    n Val     Sta   n Val
     973    .05     990     .025    1022     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           990    1022               26      26      26             .1       .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.153

INPUT
Description:
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     965  664.99     977   664.9     990     660    1000  655.96    1008  656.07
    1010     657    1019     660    1028  663.01    1039  663.47

Manning's n Values        num=       3
     Sta   n Val     Sta    n Val     Sta   n Val
     965    .05     990     .025    1019     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           990    1019               117     117     117            .1       .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 9.134

INPUT
```

Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
961	665.37	971	664.76	985	660	1000	655.54	1014	656.06
1026	660	1037	663.75	1048	664.05				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
961	.05	985	.035	1026	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
985	1026	98	98	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.121

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
952	668.28	961	667.81	970	665	986	660	1000	655.81
1010	655.95	1024	660	1042	665.14	1053	665.06		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
952	.05	986	.035	1024	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
986	1024	97	97	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.1

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
950	670.97	959	670.25	973	665	987	660	1000	655.63
1010	655.74	1025	660	1042	665	1051	667.59	1061	667.73

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
950	.05	987	.035	1025	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
987	1025	96	96	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.078

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
946	670.96	958	670.34	975	664	986	660	997	656
1000	655.65	1011	655.56	1013	656	1028	660	1044	665
1052	667.39	1065	667.48						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
946	.05	986	.035	1028	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
986	1028	145	145	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.058

INPUT
Description:
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
956	666.7	966	666.37	970	665	986	660	998	656
1000	655.35	1010	655.38	1011	656	1025	660	1040	664.41
1050	664.61								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
956	.05	986	.035	1025	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
986	1025	100	100	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.039

INPUT

Description:
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
952	665.42	963	665	964	664.94	978	661	989	658
1000	655.27	1010	655.06	1013	656	1026	660	1040	664.11
1050	664.28								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
952	.05	978	.035	1026	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
978	1026	97	97	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.02

INPUT
Description:
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
957	665.2	960	665	970	664.51	981	661	994	656
1000	655.01	1010	654.9	1013	656	1027	660	1037	663.23
1047	663.29								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
957	.05	981	.035	1027	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
981	1027	100	100	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 9.001

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
955	665	967	664.57	982	660	1000	656.04	1010	654.83
1026	660	1034	662.63	1044	662.87				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
955	.05	1000	.035	1010	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1010	100	100	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 8.982

INPUT
Description: SMG: TOOK LAST GR CARD FROM DUPAGE CO TOPO MAP

Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
956	662.53	968	662.42	978	660	1000	654.96	1015	655
1030	660	1034	661.46	1043	661.9	1061	664		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
956	.05	978	.035	1030	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
978	1030	50	50	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 8.972

INPUT
Description: REMOVED STORAGE IN OLD CHANNEL
START NEW CHANNEL,12' BW,3:1
SS,REMOVE 2-54"RCP

Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
960	661.91	973	662.08	981	660	1000	654.97	1013	654.57
1029	660	1035	661.54	1047	662.63				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
960	.05	981	.035	1029	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
981	1029	56	56	.1	.3

CROSS SECTION

```
RIVER: Bensenville Ditc
REACH: US Reach            RS: 8.962

INPUT
Description: This is a REPEATED section.
   YORK ROAD US SIDE
Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     950  670.02    2000  662.42    2027  662.22    2053  661.72    2054  658.62
    2054  654.36  2075.5  654.36  2075.5  658.72    2082  662.62    2107  663.02
    2158  664.32    2400  670.02

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     950     .04    2054    .012  2075.5     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          2054  2075.5           136.73  136.73  136.73             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     950    2054   663.3        F
  2075.5    2400   663.3        F

CULVERT


RIVER: Bensenville Ditc
REACH: US Reach            RS: 8.952499

INPUT
Description: York Road [Culvert #4 (2 10' x 7' Boxes)]

Distance from Upstream XS =       .1
Deck/Roadway Width        =  136.53
Weir Coefficient          =       3
Upstream  Deck/Roadway Coordinates
    num=      12
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     950      670  654.32    2000   663.3  654.32    2027   663.3  654.32
    2053   663.3  654.32    2054   663.3  654.32    2054   663.3  654.32
  2075.5   663.3  654.32  2075.5   663.3  654.32    2082   663.3  654.32
    2107   663.3  654.32    2158   664.3  654.32    2400     670  654.32

Upstream Bridge Cross Section Data
Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     950  670.02    2000  662.42    2027  662.22    2053  661.72    2054  658.62
    2054  654.36  2075.5  654.36  2075.5  658.72    2082  662.62    2107  663.02
    2158  664.32    2400  670.02

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     950     .04    2054    .012  2075.5     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
          2054  2075.5             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     950    2054   663.3        F
  2075.5    2400   663.3        F

Downstream  Deck/Roadway Coordinates
    num=      12
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     950      670   654.2    2000   663.3   654.2    2027   663.3   654.2
    2053   663.3   654.2    2054   663.3   654.2    2054   663.3   654.2
  2075.5   663.3   654.2  2075.5   663.3   654.2    2082   663.3   654.2
    2107   663.3   654.2    2158   664.3   654.2    2400     670   654.2

Downstream Bridge Cross Section Data
Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     950     670    2000   662.4    2027   662.2    2053   661.7    2054   658.6
    2054   654.1  2075.5   654.1  2075.5   658.7    2082   662.6    2107     663
    2158   664.3    2400     670

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     950    .013    2054    .013  2075.5    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
          2054  2075.5             .6       .8
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     950    2054   663.2        F
  2075.5    2400   663.2        F

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 =     .95
Elevation at which weir flow begins         =   663.3
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Box4                Box         7      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
```

```
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                .1  136.62     .012      .012        0                  .2              1
Number of Barrels =  2
Upstream   Elevation =  654.46
Centerline Stations
    Sta.    Sta.
    2059  2070.5
Downstream Elevation =  654.12
Centerline Stations
    Sta.    Sta.
    2059  2070.5

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.943

INPUT
Description: Junction Box x section
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     950     670    2000   662.4    2027   662.2    2053   661.7    2054   658.6
    2054   654.1  2075.5   654.1  2075.5   658.7    2082   662.6    2107     663
    2158   664.3    2400     670

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     950    .013    2054    .013  2075.5    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          2054  2075.5               11      11      11             .6       .8
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     950    2054   663.2        F
  2075.5    2400   663.2        F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.937

INPUT
Description:
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     900   670.2    1946   666.7    1992   666.9    2000   666.4    2000     654
    2043     654    2043     667    2090   667.3    2145   667.5    3800   675.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     900    .013    1992    .013    2043    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1992    2043           120.87  120.87  120.87             .6       .8
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     900 2005.25     672        F
 2037.75    3800     672        F

CULVERT


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.932

INPUT
Description: Proposed CP Cuvlert from HDR

Distance from Upstream XS =       .1
Deck/Roadway Width        =    120.62
Weir Coefficient          =         3
Upstream  Deck/Roadway Coordinates
    num=       12
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      900      682           1946      682           1992      682
     2000      682           2011      682           2014      682
     2029      682           2032      682           2037      682
     2090      682           2145      682           3800      682

Upstream Bridge Cross Section Data
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     900   670.2    1946   666.7    1992   666.9    2000   666.4    2000     654
    2043     654    2043     667    2090   667.3    2145   667.5    3800   675.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     900    .013    1992    .013    2043    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
          1992    2043             .6       .8
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     900 2005.25     672        F
 2037.75    3800     672        F

Downstream  Deck/Roadway Coordinates
    num=       12
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      900      682           1946      682           1992      682
```

```
    2000     682            2011     682            2014     682
    2029     682            2032     682            2037     682
    2090     682            2145     682            3800     682

Downstream Bridge Cross Section Data
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 1930.35  673.44 1955.54   661.3 1985.13   660.3  1997.5   653.9  2021.5   653.9
  2045.5   653.9 2070.61   666.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 1930.35     .05 1955.54    .025 2070.61     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
       1955.54 2070.61            .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 1930.35    2000   667.7       F
    2043 2070.61   667.7       F

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 =     .95
Elevation at which weir flow begins         =   667.7
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       7      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 3 - Wingwall flared 0 deg. (sides extended straight)
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                .1  120.62     .013     .013        0                  .7                1
Number of Barrels =  4
Upstream   Elevation =  654.09
Centerline Stations
    Sta.    Sta.    Sta.    Sta.
    2005    2016    2027    2038
Downstream Elevation =  653.69
Centerline Stations
    Sta.    Sta.    Sta.    Sta.
    2005    2016    2027    2038

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.91

INPUT
Description: STA 10+57.18 (D/S Face of Exiting CPRR Culvert)
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 1930.35  673.44 1955.54   661.3 1985.13   660.3  1997.5   653.9  2021.5   653.9
  2045.5   653.9 2070.61   666.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 1930.35     .05 1955.54    .025 2070.61     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1955.54 2070.61              30      30      30             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 1930.35    2000   667.7       F
    2043 2070.61   667.7       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.9

INPUT
Description: STA 10+57.18 (D/S Face of Exiting CPRR Culvert)
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  1969.5   660.3  1987.5   659.3  1997.5   653.9  2021.5   653.9  2045.5   653.9
  2061.5   662.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  1969.5     .05  1987.5    .025  2061.5     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        1987.5  2061.5              50      50      50             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  1969.5    1985   667.7       F
    2058  2061.5   667.7       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.888
```

```
INPUT
Description: STA 12+66.69 (U/S Face of UPRR Culvert)
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -63.87  669.39     -17  653.77       0  653.77      17  653.77   53.37  665.89

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -63.87     .03  -63.87     .03   53.37     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -63.87   53.37              505     505     505             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -63.87     -17  669.87       F
      17   53.37  669.87       F

CULVERT


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.85

INPUT
Description: Proposed UPRR Crossing/Future EOWB Crossing
Distance from Upstream XS =      20
Deck/Roadway Width        =     480
Weir Coefficient          =       3
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     -70   682.5               70   682.5

Upstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -63.87  669.39     -17  653.77       0  653.77      17  653.77   53.37  665.89

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -63.87     .03  -63.87     .03   53.37     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        -63.87   53.37             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -63.87     -17  669.87       F
      17   53.37  669.87       F

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     -70   682.5               70   682.5

Downstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -63.87  668.85     -17  653.23       0  653.23      17  653.23   53.37  665.35

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -63.87     .03  -63.87     .03   53.37     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        -63.87   53.37             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -63.87     -17  669.47       F
      17   53.37  669.47       F

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 =     .95
Elevation at which weir flow begins         =     670
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Culvert #1            Box       6      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 .5     504     .012      .012        0                  .2                1
Number of Barrels =  3
Upstream   Elevation =  653.77
Centerline Stations
    Sta.    Sta.    Sta.
   -11.5       0    11.5
Downstream Elevation =  653.23
Centerline Stations
    Sta.    Sta.    Sta.
   -11.5       0    11.5

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.827
```

```
INPUT
Description: STA 17+71.69 (D/S Face of UPRR Culvert)
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -63.87  668.85     -17  653.23       0  653.23      17  653.23   53.37  665.35

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -63.87     .03  -63.87     .03   53.37     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -63.87   53.37             50      50      50             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -63.87     -17  669.47       F
      17   53.37  669.47       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.826

INPUT
Description: STA 18+21.69
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -38.04  662.02  -33.54  660.52   -19.5  655.84   -17.5   655.8   -11.5   653.8
    -5.5  653.68      -5  653.18       0  653.18       5  653.18     5.5  653.68
    11.5   653.8    17.5   655.8    19.5  655.84   33.03  660.35   38.04  662.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -38.04    .027    -5.5    .025     5.5    .027

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -5.5     5.5           133.09  133.09  133.09             .1       .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.820

INPUT
Description: STA 19+54.78 (Flow is not fully expanded, 4:1)
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -34.02  660.41   -19.5  655.69   -17.5  655.65   -11.5  653.65    -5.5  653.53
      -5  653.03       0  653.03       5  653.03     5.5  653.53    11.5  653.61
      64   654.3     141   655.3     199  656.05  211.57  660.24

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -34.02    .027    -5.5    .025     5.5    .027

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -5.5     5.5             250     250     250             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    62.5     212     660       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.743

INPUT
Description: STA 22+04.78 (Flow is approx. fully expanded)
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -34.02  660.14   -19.5  655.42   -17.5  655.38   -11.5  653.38    -5.5  653.26
      -5  652.76       0  652.76       5  652.76     5.5  653.26    11.5  653.34
    85.3   654.3     137  654.97     152  659.97

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -34.02    .027    -5.5    .025     5.5    .027

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -5.5     5.5             250     250     250             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
     120     200     660       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.686

INPUT
Description: STA 24+54.78
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -61.77  659.84  -47.34  655.03  -45.34  654.99   -41.5  653.71   -11.5  653.11
    -5.5  652.99      -5  652.49       0  652.49       5  652.49     5.5  652.99
    11.5  653.07    29.1   653.3      78  653.94   95.28   659.7

Manning's n Values        num=       3
```

```
     Sta   n Val     Sta   n Val     Sta   n Val
  -61.77    .027    -5.5    .025     5.5    .027

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -5.5     5.5              250     250     250             .1       .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.642

INPUT
Description: STA 27+04.78
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -61.86   659.6  -47.34  654.76  -45.34  654.72   -41.5  653.44   -11.5  652.84
    -5.5  652.72      -5  652.22       0  652.22       5  652.22     5.5  652.72
    11.5   652.8    36.1  653.12   55.03  659.43

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -61.86    .027    -5.5    .025     5.5    .027

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -5.5     5.5              250     250     250             .1       .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.579

INPUT
Description: STA 29+54.78
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -61.92   659.34  -47.34  654.48  -45.34  654.44   -41.5  653.16   -11.5  652.56
    -5.5  652.44      -5  651.94       0  651.94       5  651.94     5.5  652.44
    11.5  652.52      22  652.66   41.47  659.15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -61.92    .027    -5.5    .025     5.5    .027

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -5.5     5.5              250     250     250             .1       .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.555

INPUT
Description: STA 32+04.78
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -34.02   659.05  -19.5  654.33  -17.5  654.29   -11.5  652.29    -5.5  652.17
      -5   651.67      0  651.67       5  651.67     5.5  652.17    11.5  652.29
    17.5   654.29   19.5  654.33   34.02  658.88

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -34.02    .027    -5.5    .025     5.5    .027

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -5.5     5.5               50      50      50             .1       .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.546

INPUT
Description: STA 32+54.78 (U/S Face of OFA Culvert)
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -53.13   665.16   -12.5  651.62       0  651.62    12.5  651.62   47.13  663.16

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -53.13     .03  -53.13     .03   47.13     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -53.13   47.13          4445.22 4445.22 4445.22             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -53.13      -13  663.16       F
      13   47.13  663.16       F

CULVERT


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.000

INPUT
Description: OFA Culvert (STA 32+54.78 to STA 77+00)
Distance from Upstream XS =       2
Deck/Roadway Width        =    4443
```

```
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
  -53.09   665.3       0   47.09   663.3       0

Upstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -53.13  665.16   -12.5  651.62       0  651.62    12.5  651.62   47.13  663.16

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -53.13     .03  -53.13     .03   47.13     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        -53.13   47.13             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -53.13     -13  663.16       F
      13   47.13  663.16       F

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
  -53.81   657.3       0   53.81   657.3       0

Downstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -43.65  657.18   -12.5   646.8       0   646.8    12.5   646.8   43.65  657.18

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -43.65     .03  -43.65     .03   43.65     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        -43.65   43.65             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -43.65     -13   657.3       F
      13   43.65   657.3       F

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 =     .95
Elevation at which weir flow begins        =   665.3
Energy head used in spillway design        =
Spillway height used in design             =
Weir crest shape                           = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       7      11
FHWA Chart # 58- Rectangular concrete
FHWA Scale # 2 - Side tapered; More favorable edges
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
               .11    4445     .012     .012        0                  .2               1
Number of Barrels =  2
Upstream   Elevation =  651.62
Centerline Stations
    Sta.    Sta.
    -6.5     6.5
Downstream Elevation =  646.8
Centerline Stations
    Sta.    Sta.
    -6.5     6.5

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 7.58

INPUT
Description: STA 77+00 (D/S Face of OFA Culvert)
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -43.65  657.18   -12.5   646.8       0   646.8    12.5   646.8   43.65  657.18

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -43.65     .03  -43.65     .03   43.65     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -43.65   43.65              50      50      50             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -43.65     -13   657.3       F
      13   43.65   657.3       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 7.57

INPUT
Description: STA 77+50
Station Elevation Data    num=      15
```

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	655.59	-33.54	654.09	-19.5	649.41	-17.5	649.37	-11.5	647.37
-5.5	647.25	-5	646.75	0	646.75	5	646.75	5.5	647.25
11.5	647.37	17.5	649.37	19.5	649.41	33.03	653.92	38.04	655.59

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	119.51	119.51	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.54

INPUT
Description: STA 78+69.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	655.46	-33.54	653.96	-19.5	649.28	-17.5	649.24	-11.5	647.24
-5.5	647.12	-5	646.62	0	646.62	5	646.62	5.5	647.12
11.5	647.24	17.5	649.24	19.5	649.28	33.03	653.79	38.04	655.46

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.50

INPUT
Description: STA 81+19.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	655.19	-33.54	653.69	-19.5	649.01	-17.5	648.97	-11.5	646.97
-5.5	646.85	-5	646.35	0	646.35	5	646.35	5.5	646.85
11.5	646.97	17.5	648.97	19.5	649.01	33.03	653.52	38.04	655.19

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.450

INPUT
Description: STA 83+69.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	654.92	-33.54	653.42	-19.5	648.74	-17.5	648.7	-11.5	646.7
-5.5	646.58	-5	646.08	0	646.08	5	646.08	5.5	646.58
11.5	646.7	17.5	648.7	19.5	648.74	33.03	653.25	38.04	654.92

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.426

INPUT
Description: STA 86+19.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	654.65	-33.54	653.15	-19.5	648.47	-17.5	648.43	-11.5	646.43
-5.5	646.31	-5	645.81	0	645.81	5	645.81	5.5	646.31
11.5	646.43	17.5	648.43	19.5	648.47	33.03	652.98	38.04	654.65

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.382

INPUT
Description: STA 88+69.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	654.38	-33.54	652.88	-19.5	648.2	-17.5	648.16	-11.5	646.16
-5.5	646.04	-5	645.54	0	645.54	5	645.54	5.5	646.04
11.5	646.16	17.5	648.16	19.5	648.2	33.03	652.71	38.04	654.38

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	250	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.25

INPUT
Description: STA 91+19.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	654.11	-33.54	652.61	-19.5	647.93	-17.5	647.89	-11.5	645.89
-5.5	645.77	-5	645.27	0	645.27	5	645.27	5.5	645.77
11.5	645.89	17.5	647.89	19.5	647.93	33.03	652.44	38.04	654.11

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	250	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.154

INPUT
Description: STA 93+69.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	653.84	-33.54	652.34	-19.5	647.66	-17.5	647.62	-11.5	645.62
-5.5	645.5	-5	645	0	645	5	645	5.5	645.5
11.5	645.62	17.5	647.62	19.5	647.66	33.03	652.17	38.04	653.84

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	250	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.141

INPUT
Description: STA 96+19.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	653.56	-33.54	652.06	-19.5	647.38	-17.5	647.34	-11.5	645.34
-5.5	645.22	-5	644.72	0	644.72	5	644.72	5.5	645.22
11.5	645.34	17.5	647.34	19.5	647.38	33.03	651.89	38.04	653.56

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	250	250	250	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.122

INPUT
Description: STA 98+69.51
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-38.04	653.29	-33.54	651.79	-19.5	647.11	-17.5	647.07	-11.5	645.07
-5.5	644.95	-5	644.45	0	644.45	5	644.45	5.5	644.95
11.5	645.07	17.5	647.07	19.5	647.11	33.03	651.62	38.04	653.29

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-38.04	.027	-5.5	.025	5.5	.027

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.5	5.5	50	50	50	.1	.3

CROSS SECTION

```
RIVER: Bensenville Ditc
REACH: US Reach           RS: 7.111

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -72.05   654.5     -15   644.4      15   644.4   72.05   654.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -72.05    .015  -72.05    .015   72.05    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -72.05   72.05              178     178     178             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -72.05  -11.75  654.86       F
   11.75   72.05  654.67       F

CULVERT


RIVER: Bensenville Ditc
REACH: US Reach           RS: 7.094

INPUT
Description: Taft Road (Bridge #2)  CBBEL Cross-Section and Brodge Overtopping
             Elevations used per Thomson Survey and Visual Inspection 4/2003

Distance from Upstream XS =       .1
Deck/Roadway Width        =    177.8
Weir Coefficient          =      2.5
Upstream  Deck/Roadway Coordinates
    num=      10
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
  -302.5  655.62            -184  655.62            -125  655.36
    -73  655.11              -20  654.86               7  654.74
     33  654.61               86  654.46             138  654.76
    166  655.08

Upstream Bridge Cross Section Data
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -72.05   654.5     -15   644.4      15   644.4   72.05   654.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -72.05    .015  -72.05    .015   72.05    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
        -72.05   72.05             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -72.05  -11.75  654.86       F
   11.75   72.05  654.67       F

Downstream  Deck/Roadway Coordinates
    num=      10
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
  -302.5  655.62            -180  655.61            -125  655.31
    -75  655.18              -23  654.82               5  654.69
     28  654.58               78  654.46             128  654.57
    179  655.45

Downstream Bridge Cross Section Data
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -80   655.3     -34  648.59     -11  644.12       7  644.05      12  644.12
      30  648.67     100   655.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -80    .015     -34    .015      30    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          -34      30             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     -80  -11.75  654.77       F
   11.75     100  654.66       F

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 =     .95
Elevation at which weir flow begins         =  654.46
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  2

Culvert Name     Shape      Rise    Span
Culvert #1           Box    6.33    11.5
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  1     177     .012      .012              0                  .5                 1
Upstream   Elevation =  644.4
           Centerline Station = -6
Downstream Elevation =  644.25
```

```
          Centerline Station = -6

Culvert Name     Shape      Rise    Span
Culvert #2         Box     6.33    11.5
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  1     177     .012     .012        0                  .5               1
Upstream   Elevation =  644.4
          Centerline Station =  6
Downstream Elevation =  644.25
          Centerline Station =  6

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 7.077

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -80   655.3     -34  648.59     -11  644.12       7  644.05      12  644.12
      30  648.67     100   655.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -80    .015     -34    .015      30    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -34      30               35      35      35             .3      .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     -80  -11.75  654.77       F
   11.75     100  654.66       F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 7.07

INPUT
Description:
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     655      30     646      32  645.25     105  644.25     240  645.25
     275     655

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06      32     .06     240     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           32     240               16      16      16             .1      .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 7.067

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -142  654.98     -141  654.97     -118  654.96     -102  654.71     -100  655.01
     -94  655.09      -85  653.71      -74  647.76      -73  646.27      -50  643.02
      11  643.65       84  645.78      109  645.66      145  646.48      147  646.75
     162  651.53      181   657.5      184  657.62

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -142    .06     -74     .06      84     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -74      84               48      48      48             .1      .3

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 7.059

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     655      28  644.25     240  644.25     266     654

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06      28     .06     240     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           28     240                .1      .1      .1             .1      .3

CROSS SECTION
```

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.058

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	655	28	645.25	240	645.25	266	654

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	28	.06	240	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28	240	165	165	165	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.027

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	655	28	645.2	240	645.2	266	654

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	28	.06	240	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28	240	137	137	137	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 7.001

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-211	656.83	-197	656.56	-183	656.55	-181	656.94	-173	656.12
-161	653.18	-146	646.4	-126	646.31	-113	645.98	-108	644.8
-102	644.63	-95	645.98	-38	646.1	5	645.2	44	645.94
71	646.49	74	647.1	86	651.99				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-211	.06	-126	.06	71	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-126	71	163	163	163	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.97

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	657	31	645.13	242	645.13	275	654	300	655

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	31	.06	242	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
31	242	200	200	200	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.932

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	657	32	645.08	208	645.08	240	654	265	655

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	32	.06	208	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
32	208	35	35	35	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.925

INPUT

Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-149	657.65	-138	657.75	-126	657.65	-118	657.63	-105	652.8
-90	646.83	-89	646.58	-55	646.18	-12	645.94	-10	645.17
0	644.62	9	645.73	15	645.73	34	645.6	67	645.99
89	646.57	92	647.19	107	651.39	120	654.68	123	655.41

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-149	.06	-105	.06	107	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-105	107	140	165	185	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.894

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	656	32	645.03	172	645.03	185	650	194	652
220	653	235	655						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	32	.06	172	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
32	172	85	98	114	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.875

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	656	33	645	160	645	185	652	210	653

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	33	.06	160	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
33	160	195	195	195	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.838

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-132	655.61	-130	656.15	-128	656.2	-118	655.34	-106	655.24
-103	655.68	-99	655.58	-90	654.3	-78	649.9	-68	646.27
-38	646.16	-3	645.72	32	646.23	63	646.33	67	646.27
78	649.15	98	653.57	102	653.92				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-132	.06	-78	.06	78	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-78	78	205	205	205	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.799

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	654	23	644.19	150	644.19	172	651	212	652
228	654								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	23	.06	150	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
23	150	143	143	143	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.772

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-115	653.63	-104	653.33	-93	653	-91	653.01	-90	653.75
-85	653.28	-81	652.36	-64	645.85	-43	645.81	-14	645.78
6	645.76	32	645.81	45	645.51	67	646.03	71	647.11
87	652.86								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-115	.06	-81	.06	87	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-81	87	247	255	262	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.724

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	652	28	644.8	115	644.8	128	649	140	650
165	650	181	654						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	28	.06	115	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28	115	200	200	200	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.686

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	652	28	644.75	125	644.75	145	649	160	650
175	650	190	653						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	28	.06	125	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28	125	26	26	26	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.681

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-90	653.83	-89	653.47	-77	653.31	-64	653.12	-63	653.49
-60	653.05	-49	651.19	-45	650.8	-31	644.71	-19	643.67
-16	644.65	-9	644.3	-8	643.04	0	644.29	8	644.45
15	644.39	16	643.56	24	644.49	32	644.23	40	644.32
48	644.12	52	643.2	55	644.36	64	644.47	77	644.61
78	644.6	80	644.6	82	644.66	101	651.23	106	651.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-90	.06	-45	.06	101	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-45	101	174	174	174	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.649

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	652	28	643.75	125	643.75	145	649	160	650
175	650	190	653						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	28	.06	125	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28	125	.1	.1	.1	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.648

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	652	7	650	15	648	25	646	35	644
140	643.65	210	644	220	648	240	650	265	652

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	35	.06	210	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35	210	70	70	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.636

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-194	651.39	-186	650.61	-174	647.18	-168	646	-122	645.2
-60	645.09	-4	645.06	0	643.92	8	644.58	11	645.27
31	645.46	72	645.54	75	645.71	90	646.1	98	650.04
120	650.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-194	.06	-174	.06	90	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-174	90	130	130	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.611

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	652	40	647	145	646	470	645	560	645
590	652	625	652	635	650	655	644	800	644
905	644.5	1045	644	1105	643.59	1175	644	1200	648
1230	651	1240	652						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	1045	.06	1175	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1045	1175	74	74	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	590	652	F

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.597

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1156	651.3	-1152	650.3	-1148	649.3	-1144	648.3	-1139	647.3
-959	646.3	-684	645.3	-644	645.3	-579	646.3	-575	647.3
-571	648.3	-567	649.3	-563	649.93	-560	653	-552	652.25
-535	647.29	-477	645.21	-402	644.65	-306	644.55	-237	644.15
-181	645.27	-125	645.05	-68	645.29	-3	644.94	0	644.26
3	644.45	8	644.6	11	645.06	28	645.53	50	645.35
73	645.57	78	646.26	87	648.6	96	648.8	112	649.3
116	650.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-1156	.06	-535	.06	78	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-535	78	126	126	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
-1156	-560	653	F

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.573

INPUT
Description:

Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	653	20	651	60	647	145	646	470	645
560	645	580	651	675	651	685	650	715	644
845	644	890	644.5	935	644	990	643.53	1050	644
1055	646	1105	651						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	890	.06	1050	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
890	1050	16	16	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
20	580	651	F

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.557

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-896	653.3	-892	652.3	-888	651.3	-884	650.3	-880	649.3
-876	648.3	-862	647.3	-762	646.3	-470	645.3	-430	645.3
-355	645.6	-265	646.3	-262	647.3	-259	648.3	-256	649.3
-253	650.3	-250	651.3	-247	652.3	-238	653.3	-228	653.3
-218	652.3	-210	651.3	-206	650.3	-202	649.3	-198	648.3
-194	647.3	-190	646.3	-186	645.3	-151	644.3	-96	644.52
-60	644.63	-11	644.7	-5	644.59	2	644.51	6	644.72
61	645.61	66	646.28	73	646.3	88	647.3	93	648.3
97	649.3	102	650.5						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-896	.06	-186	.06	61	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-186	61	84	84	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
-896	-238	653.3	F

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.554

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	652	30	651	95	646	420	645	440	645
490	651	655	651	710	650	745	646	770	644
785	644	850	643.44	910	644	915	646	930	648
955	650	980	651						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	785	.06	910	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
785	910	10	10	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
30	490	651	F

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.551

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	652	215	652	440	651	465	651	485	650
510	644	540	644	580	643.5	635	644	645	646
685	650	710	651						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	510	.06	635	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
510	635	20	20	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.538

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-72	651.23	-62	649.19	-53	644.24	-46	643.08	-33	642.96
-31	642.98	-29	644.2	-15	644.27	-14	643.25	-1	642.81
3	642.78	6	644.11	31	645.3	39	646.3	44	646.3
49	646.3	59	647.3	63	648.3	67	649.3	71	650.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-72	.06	-62	.06	31	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-62	31	85	69	50	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.535

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	652	105	651	110	650	118	644	140	643.47
192	644	205	646	230	650	265	651		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	118	.06	192	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
118	192	90	90	85	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.518

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-42	650.3	-27	646.98	-14	645.72	-6	642.59	8	643.02
27	643.37	29	644.67	37	646.26	45	647.92	57	649.3
75	650.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-42	.06	-27	.06	45	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-27	45	20	10	10	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.516

INPUT
Description: BEGINNING OF US POSTAL FACILITY IMPROVEMENTS
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	652	5	651	10	650	50	645	86	643.44
100	644	115	650	130	651				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	50	.06	100	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
50	100	35	17	5	.1	.3

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.513

INPUT
Description: CBBEL Cross-Section 4/2003
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-300	650.3	-47	649.3	-22	647.04	-20	647.35	-18	642.45
-9	642.39	0	643.83	13	642.84	28	643.16	36	646.05
141	650.3	300	650.3						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-300	.05	-20	.012	36	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-20	36	165	165	165	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-300	-19.78	647.8	F
19	300	647.8	F

BRIDGE

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.497

INPUT
Description: Irving Park Road (Bridge #1)

Distance from Upstream XS = .1
Deck/Roadway Width = 164.8
Weir Coefficient = 3
Upstream Deck/Roadway Coordinates
num= 14

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-1049	655.4		-299	650.4		-49	648	
-31	648.3		-30	648.2	647	0	648.3	647
0	648.3	647	1	648.3	647	19	648.4	647
20	648.8		51	648.5		104	648.7	
161	649		351	650.4				

Upstream Bridge Cross Section Data
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-300	650.3	-47	649.3	-22	647.04	-20	647.35	-18	642.45
-9	642.39	0	643.83	13	642.84	28	643.16	36	646.05
141	650.3	300	650.3						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-300	.05	-20	.012	36	.05

Bank Sta: Left Right Coeff Contr. Expan.
-20 36 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-300	-19.78	647.8	F
19	300	647.8	F

Downstream Deck/Roadway Coordinates
num= 15

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
2000	655.4		2750	650.4		3000	648	
3029	648.3		3030	648.2	646.6	3049	648.3	646.6
3050	648.3	646.6	3050	648.3	646.6	3068	648.4	646.6
3069	648.8		3100	648.5		3153	648.7	
3210	649		3400	650.4		3600	655.4	

Downstream Bridge Cross Section Data
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2000	655	2750	650	3000	647.6	3029	647.9	3030	646.6
3030	643.1	3068	643.1	3068	646.6	3069	648.4	3100	648.1
3153	648.3	3210	648.6	3400	650	3600	655		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2000	.05	3029	.012	3069	.05

Bank Sta: Left Right Coeff Contr. Expan.
3029 3069 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
2000	3029	647.4	F
3069	3600	647.4	F

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 = .95
Elevation at which weir flow begins = 648.2
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data
Pier Station Upstream= 3049 Downstream= 3049
Upstream num= 2

Width	Elev	Width	Elev
.5	643.5	.5	647

Downstream num= 2

Width	Elev	Width	Elev
.5	643.1	.5	647

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Yarnell KVal = 1.25
Selected Low Flow Methods = Yarnell

High Flow Method
Pressure and Weir flow
Submerged Inlet Cd =
Submerged Inlet + Outlet Cd =.8006408
Max Low Cord = 647

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: Bensenville Ditc
REACH: US Reach RS: 6.481

INPUT
Description: DS SIDE IRVING PARK ROAD

Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2000	655	2750	650	3000	647.6	3029	647.9	3030	646.6
3030	643.1	3068	643.1	3068	646.6	3069	648.4	3100	648.1
3153	648.3	3210	648.6	3400	650	3600	655		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2000	.05	3029	.012	3069	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
3029	3069	80	80	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
2000	3029	647.4	F
3069	3600	647.4	F

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 6.467

INPUT
Description: WAT10.DATA(BND1037) PLAN8 PLAN OF IMPROVEMENT
INCLUDES
LATEST CHANNEL RE-ALIGNMENT & REMOVED FERRARI X-SECT
STREAM
STATIONING USED - DESIGN CENTERLINE
STREAM STATION 6.05 AT
CONFLUENCE W/ SILVER CREEK
CROSS SECTIONS CODED LOOKING
DOWNSTREAM
STARTING WSE FROM STR 102 INFLOW RATING CURVE

IMPROVEMENTS AT O'HARE AIRPORT ARE IN PLACE
SECTIONS 6.467 TO
7.479 FROM 85 SURVEY DATA
SECTIONS 7.811 TO END FROM 88 SURVEY
UNLESS NOTED
POSTAL FACILITY IMPROVEMENTS AFTER 6.513 THRU
7.479

Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2000	655	2750	650	3000	647.6	3029	647.9	3030	646.6
3030	643.1	3068	643.1	3068	646.6	3069	648.4	3100	648.1
3153	648.3	3210	648.6	3400	650	3600	655		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2000	.05	3029	.04	3069	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
3029	3069	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Bensenville Ditc

Reach	River Sta.	n1	n2	n3
US Reach	9.635	.04	.035	.04
US Reach	9.623	.04	.035	.04
US Reach	9.595	.04	.035	.04
US Reach	9.588	.04	.035	.04
US Reach	9.573	.04	.035	.04
US Reach	9.557	.04	.035	.04
US Reach	9.556	Bridge		
US Reach	9.555	.04	.035	.04
US Reach	9.541	.04	.035	.04
US Reach	9.527	.04	.012	.04
US Reach	9.522	Culvert		
US Reach	9.517	.04	.012	.04
US Reach	9.506	.04	.025	.04
US Reach	9.476	.04	.035	.04
US Reach	9.459	.04	.035	.04
US Reach	9.439	.04	.035	.04
US Reach	9.416	.04	.035	.04
US Reach	9.394	.06	.035	.06
US Reach	9.39	.06	.035	.06
US Reach	9.366	.06	.035	.06
US Reach	9.349	.06	.035	.06
US Reach	9.33	.06	.035	.06
US Reach	9.314	.06	.035	.06
US Reach	9.284	.06	.035	.06
US Reach	9.267	.06	.035	.06
US Reach	9.255	.05	.012	.05
US Reach	9.2505	Culvert		
US Reach	9.246	.05	.012	.05
US Reach	9.24	.05	.025	.05
US Reach	9.206	.05	.035	.05

US Reach	9.197	.05	.035	.05
US Reach	9.189	.05	.012	.05
US Reach	9.186	.05	.012	.05
US Reach	9.178499	Culvert		
US Reach	9.171	.05	.012	.05
US Reach	9.162	.05	.025	.05
US Reach	9.153	.05	.025	.05
US Reach	9.134	.05	.035	.05
US Reach	9.121	.05	.035	.05
US Reach	9.1	.05	.035	.05
US Reach	9.078	.05	.035	.05
US Reach	9.058	.05	.035	.05
US Reach	9.039	.05	.035	.05
US Reach	9.02	.05	.035	.05
US Reach	9.001	.05	.035	.05
US Reach	8.982	.05	.035	.05
US Reach	8.972	.05	.035	.05
US Reach	8.962	.04	.012	.04
US Reach	8.952499	Culvert		
US Reach	8.943	.013	.013	.013
US Reach	8.937	.013	.013	.013
US Reach	8.932	Culvert		
US Reach	8.91	.05	.025	.05
US Reach	8.9	.05	.025	.05
US Reach	8.888	.03	.03	.03
US Reach	8.85	Culvert		
US Reach	8.827	.03	.03	.03
US Reach	8.826	.027	.025	.027
US Reach	8.820	.027	.025	.027
US Reach	8.743	.027	.025	.027
US Reach	8.686	.027	.025	.027
US Reach	8.642	.027	.025	.027
US Reach	8.579	.027	.025	.027
US Reach	8.555	.027	.025	.027
US Reach	8.546	.03	.03	.03
US Reach	8.000	Culvert		
US Reach	7.58	.03	.03	.03
US Reach	7.57	.027	.025	.027
US Reach	7.54	.027	.025	.027
US Reach	7.50	.027	.025	.027
US Reach	7.450	.027	.025	.027
US Reach	7.426	.027	.025	.027
US Reach	7.382	.027	.025	.027
US Reach	7.25	.027	.025	.027
US Reach	7.154	.027	.025	.027
US Reach	7.141	.027	.025	.027
US Reach	7.122	.027	.025	.027
US Reach	7.111	.015	.015	.015
US Reach	7.094	Culvert		
US Reach	7.077	.015	.015	.015
US Reach	7.07	.06	.06	.06
US Reach	7.067	.06	.06	.06
US Reach	7.059	.06	.06	.06
US Reach	7.058	.06	.06	.06
US Reach	7.027	.06	.06	.06
US Reach	7.001	.06	.06	.06
US Reach	6.97	.06	.06	.06
US Reach	6.932	.06	.06	.06
US Reach	6.925	.06	.06	.06
US Reach	6.894	.06	.06	.06
US Reach	6.875	.06	.06	.06
US Reach	6.838	.06	.06	.06
US Reach	6.799	.06	.06	.06
US Reach	6.772	.06	.06	.06
US Reach	6.724	.06	.06	.06
US Reach	6.686	.06	.06	.06
US Reach	6.681	.06	.06	.06
US Reach	6.649	.06	.06	.06
US Reach	6.648	.06	.06	.06
US Reach	6.636	.06	.06	.06
US Reach	6.611	.06	.06	.06
US Reach	6.597	.06	.06	.06
US Reach	6.573	.06	.06	.06
US Reach	6.557	.06	.06	.06
US Reach	6.554	.06	.06	.06
US Reach	6.551	.06	.06	.06
US Reach	6.538	.06	.06	.06
US Reach	6.535	.06	.06	.06
US Reach	6.518	.06	.06	.06
US Reach	6.516	.06	.06	.06
US Reach	6.513	.05	.012	.05
US Reach	6.497	Bridge		
US Reach	6.481	.05	.012	.05
US Reach	6.467	.05	.04	.05

SUMMARY OF REACH LENGTHS

River: Bensenville Ditc

Reach	River Sta.	Left	Channel	Right
US Reach	9.635	50	50	50
US Reach	9.623	150	150	150
US Reach	9.595	50	50	50
US Reach	9.588	46	46	46
US Reach	9.573	114	114	114
US Reach	9.557	10	10	10
US Reach	9.556	Bridge		
US Reach	9.555	73	71	67

US Reach	9.541	65	65	65
US Reach	9.527	50	50	50
US Reach	9.522	Culvert		
US Reach	9.517	40	40	40
US Reach	9.506	128	128	128
US Reach	9.476	105	105	105
US Reach	9.459	100	100	100
US Reach	9.439	135	135	135
US Reach	9.416	102	102	102
US Reach	9.394	62	62	62
US Reach	9.39	97	97	97
US Reach	9.366	96	96	96
US Reach	9.349	100	100	100
US Reach	9.33	100	100	100
US Reach	9.314	150	150	150
US Reach	9.284	100	100	100
US Reach	9.267	65	65	65
US Reach	9.255	44	44	44
US Reach	9.2505	Culvert		
US Reach	9.246	10	10	10
US Reach	9.24	185	185	185
US Reach	9.206	46	46	46
US Reach	9.197	45	45	45
US Reach	9.189	18	18	18
US Reach	9.186	78	78	78
US Reach	9.178499	Culvert		
US Reach	9.171	37	37	37
US Reach	9.162	26	26	26
US Reach	9.153	117	117	117
US Reach	9.134	98	98	98
US Reach	9.121	97	97	97
US Reach	9.1	96	96	96
US Reach	9.078	145	145	145
US Reach	9.058	100	100	100
US Reach	9.039	97	97	97
US Reach	9.02	100	100	100
US Reach	9.001	100	100	100
US Reach	8.982	50	50	50
US Reach	8.972	56	56	56
US Reach	8.962	136.73	136.73	136.73
US Reach	8.952499	Culvert		
US Reach	8.943	11	11	11
US Reach	8.937	120.87	120.87	120.87
US Reach	8.932	Culvert		
US Reach	8.91	30	30	30
US Reach	8.9	50	50	50
US Reach	8.888	505	505	505
US Reach	8.85	Culvert		
US Reach	8.827	50	50	50
US Reach	8.826	133.09	133.09	133.09
US Reach	8.820	250	250	250
US Reach	8.743	250	250	250
US Reach	8.686	250	250	250
US Reach	8.642	250	250	250
US Reach	8.579	250	250	250
US Reach	8.555	50	50	50
US Reach	8.546	4445.22	4445.22	4445.22
US Reach	8.000	Culvert		
US Reach	7.58	50	50	50
US Reach	7.57	119.51	119.51	119.51
US Reach	7.54	250	250	250
US Reach	7.50	250	250	250
US Reach	7.450	250	250	250
US Reach	7.426	250	250	250
US Reach	7.382	250	250	250
US Reach	7.25	250	250	250
US Reach	7.154	250	250	250
US Reach	7.141	250	250	250
US Reach	7.122	50	50	50
US Reach	7.111	178	178	178
US Reach	7.094	Culvert		
US Reach	7.077	35	35	35
US Reach	7.07	16	16	16
US Reach	7.067	48	48	48
US Reach	7.059	.1	.1	.1
US Reach	7.058	165	165	165
US Reach	7.027	137	137	137
US Reach	7.001	163	163	163
US Reach	6.97	200	200	200
US Reach	6.932	35	35	35
US Reach	6.925	140	165	185
US Reach	6.894	85	98	114
US Reach	6.875	195	195	195
US Reach	6.838	205	205	205
US Reach	6.799	143	143	143
US Reach	6.772	247	255	262
US Reach	6.724	200	200	200
US Reach	6.686	26	26	26
US Reach	6.681	174	174	174
US Reach	6.649	.1	.1	.1
US Reach	6.648	70	70	70
US Reach	6.636	130	130	130
US Reach	6.611	74	74	74
US Reach	6.597	126	126	126
US Reach	6.573	16	16	16
US Reach	6.557	84	84	84
US Reach	6.554	10	10	10
US Reach	6.551	20	20	20
US Reach	6.538	85	69	50
US Reach	6.535	90	90	85
US Reach	6.518	20	10	10
US Reach	6.516	35	17	5

US Reach	6.513	165	165	165
US Reach	6.497	Bridge		
US Reach	6.481	80	80	80
US Reach	6.467	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Bensenville Ditc

Reach	River Sta.	Contr.	Expan.
US Reach	9.635	.1	.3
US Reach	9.623	.1	.3
US Reach	9.595	.1	.3
US Reach	9.588	.1	.3
US Reach	9.573	.1	.3
US Reach	9.557	.1	.3
US Reach	9.556	Bridge	
US Reach	9.555	.1	.3
US Reach	9.541	.1	.3
US Reach	9.527	.3	.5
US Reach	9.522	Culvert	
US Reach	9.517	.3	.5
US Reach	9.506	.1	.3
US Reach	9.476	.1	.3
US Reach	9.459	.1	.3
US Reach	9.439	.1	.3
US Reach	9.416	.1	.3
US Reach	9.394	.1	.3
US Reach	9.39	.1	.3
US Reach	9.366	.1	.3
US Reach	9.349	.1	.3
US Reach	9.33	.1	.3
US Reach	9.314	.1	.3
US Reach	9.284	.1	.3
US Reach	9.267	.1	.3
US Reach	9.255	.3	.5
US Reach	9.2505	Culvert	
US Reach	9.246	.3	.5
US Reach	9.24	.1	.3
US Reach	9.206	.1	.3
US Reach	9.197	.1	.3
US Reach	9.189	.3	.5
US Reach	9.186	.3	.5
US Reach	9.178499	Culvert	
US Reach	9.171	.3	.5
US Reach	9.162	.1	.3
US Reach	9.153	.1	.3
US Reach	9.134	.1	.3
US Reach	9.121	.1	.3
US Reach	9.1	.1	.3
US Reach	9.078	.1	.3
US Reach	9.058	.1	.3
US Reach	9.039	.1	.3
US Reach	9.02	.1	.3
US Reach	9.001	.1	.3
US Reach	8.982	.1	.3
US Reach	8.972	.1	.3
US Reach	8.962	.3	.5
US Reach	8.952499	Culvert	
US Reach	8.943	.6	.8
US Reach	8.937	.6	.8
US Reach	8.932	Culvert	
US Reach	8.91	.3	.5
US Reach	8.9	.1	.3
US Reach	8.888	.3	.5
US Reach	8.85	Culvert	
US Reach	8.827	.3	.5
US Reach	8.826	.1	.3
US Reach	8.820	.1	.3
US Reach	8.743	.1	.3
US Reach	8.686	.1	.3
US Reach	8.642	.1	.3
US Reach	8.579	.1	.3
US Reach	8.555	.1	.3
US Reach	8.546	.3	.5
US Reach	8.000	Culvert	
US Reach	7.58	.3	.5
US Reach	7.57	.1	.3
US Reach	7.54	.1	.3
US Reach	7.50	.1	.3
US Reach	7.450	.1	.3
US Reach	7.426	.1	.3
US Reach	7.382	.1	.3
US Reach	7.25	.1	.3
US Reach	7.154	.1	.3
US Reach	7.141	.1	.3
US Reach	7.122	.1	.3
US Reach	7.111	.3	.5
US Reach	7.094	Culvert	
US Reach	7.077	.3	.5
US Reach	7.07	.1	.3
US Reach	7.067	.1	.3
US Reach	7.059	.1	.3
US Reach	7.058	.1	.3
US Reach	7.027	.1	.3
US Reach	7.001	.1	.3
US Reach	6.97	.1	.3
US Reach	6.932	.1	.3

US Reach	6.925		.1	.3
US Reach	6.894		.1	.3
US Reach	6.875		.1	.3
US Reach	6.838		.1	.3
US Reach	6.799		.1	.3
US Reach	6.772		.1	.3
US Reach	6.724		.1	.3
US Reach	6.686		.1	.3
US Reach	6.681		.1	.3
US Reach	6.649		.1	.3
US Reach	6.648		.1	.3
US Reach	6.636		.1	.3
US Reach	6.611		.1	.3
US Reach	6.597		.1	.3
US Reach	6.573		.1	.3
US Reach	6.557		.1	.3
US Reach	6.554		.1	.3
US Reach	6.551		.1	.3
US Reach	6.538		.1	.3
US Reach	6.535		.1	.3
US Reach	6.518		.1	.3
US Reach	6.516		.1	.3
US Reach	6.513		.3	.5
US Reach	6.497	Bridge		
US Reach	6.481		.3	.5
US Reach	6.467		.1	.3

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : PROP 101612

River: Bensenville Ditc Reach: US Reach RS: 9.635 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.635 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.635 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.635 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.557 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.557 Profile: 10-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.557 Profile: 2-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.557 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.556 Profile: 100-Year Upstream
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.556 Profile: 100-Year 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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.556 Profile: 10-Year Upstream
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.556 Profile: 10-Year Downstream
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.556 Profile: 2-Year Upstream
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.556 Profile: 2-Year Downstream
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.556 Profile: 50-Year Upstream
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.556 Profile: 50-Year 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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.555 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.555 Profile: 10-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.555 Profile: 2-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.555 Profile: 50-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.541 Profile: 100-Year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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.
River: Bensenville Ditc Reach: US Reach RS: 9.541 Profile: 10-Year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: Bensenville Ditc Reach: US Reach RS: 9.541 Profile: 50-Year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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.
River: Bensenville Ditc Reach: US Reach RS: 9.527 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.527 Profile: 10-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.527 Profile: 2-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.527 Profile: 50-Year

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.522 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.522 Profile: 100-Year Culv: Box7
Warning:During the supercritical analysis, the program could not balance the energy equation during the forewater calculations inside of the culvert. The program assumed critical depth at the outlet and continued on.
Warning:During supercritical flow in the culvert, a comparison of the energy at the outlet to the energy at critical depth in the downstream cross section reveals that a supercritical answer is not possible. The downstream cross section has defaulted to critical depth. For best results, this profile should be run in a mixed flow regime.
Note: The flow in the culvert is entirely supercritical.
River: Bensenville Ditc Reach: US Reach RS: 9.522 Profile: 10-Year Culv: Box7
Warning:During subcritical analysis, with the exit loss set =1.0, the projected WSEL in culvert has a lower energy than the downstream energy. Most likely, the downstream cross section blocks part of the culvert or the ineffective area is set too far in. Instead of projecting the WSEL, the program did an energy balance to get the WSEL inside the culvert at the downstream end.
River: Bensenville Ditc Reach: US Reach RS: 9.522 Profile: 2-Year Culv: Box7
Warning:During subcritical analysis, with the exit loss set =1.0, the projected WSEL in culvert has a lower energy than the downstream energy. Most likely, the downstream cross section blocks part of the culvert or the ineffective area is set too far in. Instead of projecting the WSEL, the program did an energy balance to get the WSEL inside the culvert at the downstream end.
River: Bensenville Ditc Reach: US Reach RS: 9.522 Profile: 50-Year Culv: Box7
Warning:During subcritical analysis, with the exit loss set =1.0, the projected WSEL in culvert has a lower energy than the downstream energy. Most likely, the downstream cross section blocks part of the culvert or the ineffective area is set too far in. Instead of projecting the WSEL, the program did an energy balance to get the WSEL inside the culvert at the downstream end.
River: Bensenville Ditc Reach: US Reach RS: 9.517 Profile: 100-Year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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.
River: Bensenville Ditc Reach: US Reach RS: 9.517 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.517 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.517 Profile: 50-Year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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.
River: Bensenville Ditc Reach: US Reach RS: 9.506 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.506 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.506 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.506 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.476 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.476 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.476 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.476 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.366 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.366 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.366 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.366 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.267 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.267 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.267 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.267 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.255 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.255 Profile: 10-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.255 Profile: 2-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.255 Profile: 50-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.2505 Profile: 100-Year Culv: Box6
Warning:During the culvert inlet computations, the program could not balance the culvert/weir flow. The reported inlet energy grade answer may not be valid.

River: Bensenville Ditc Reach: US Reach RS: 9.2505 Profile: 10-Year Culv: Box6
Warning:During subcritical analysis, with the exit loss set =1.0, the projected WSEL in culvert has a lower energy than the downstream energy. Most likely, the downstream cross section blocks part of the culvert or the ineffective area is set too far in. Instead of projecting the WSEL, the program did an energy balance to get the WSEL inside the culvert at the downstream end.
River: Bensenville Ditc Reach: US Reach RS: 9.2505 Profile: 2-Year Culv: Box6
Warning:During subcritical analysis, with the exit loss set =1.0, the projected WSEL in culvert has a lower energy than the downstream energy. Most likely, the downstream cross section blocks part of the culvert or the ineffective area is set too far in. Instead of projecting the WSEL, the program did an energy balance to get the WSEL inside the culvert at the downstream end.
River: Bensenville Ditc Reach: US Reach RS: 9.246 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.246 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.246 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.246 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.24 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.24 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.24 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.197 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.197 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.197 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.197 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.189 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.189 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.186 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.186 Profile: 10-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.186 Profile: 2-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.186 Profile: 50-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.171 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.171 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.171 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.171 Profile: 50-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 9.134 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.02 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.02 Profile: 10-Year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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.
River: Bensenville Ditc Reach: US Reach RS: 9.02 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.02 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.001 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.001 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.001 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 9.001 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.982 Profile: 2-Year
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.

River: Bensenville Ditc Reach: US Reach RS: 8.972 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.972 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.972 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.972 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.962 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.962 Profile: 10-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.962 Profile: 2-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.962 Profile: 50-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.943 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.943 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.943 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.943 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.937 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.937 Profile: 10-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.937 Profile: 2-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.937 Profile: 50-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.932 Profile: 100-Year Culv: Culvert #1
Warning:During subcritical analysis, with the exit loss set =1.0, the projected WSEL in culvert has a lower energy than the downstream energy. Most likely, the downstream cross section blocks part of the culvert or the ineffective area is set too far in. Instead of projecting the WSEL, the program did an energy balance to get the WSEL inside the culvert at the downstream end.
River: Bensenville Ditc Reach: US Reach RS: 8.932 Profile: 10-Year Culv: Culvert #1
Warning:During subcritical analysis, with the exit loss set =1.0, the projected WSEL in culvert has a lower energy than the downstream energy. Most likely, the downstream cross section blocks part of the culvert or the ineffective area is set too far in. Instead of projecting the WSEL, the program did an energy balance to get the WSEL inside the culvert at the downstream end.
River: Bensenville Ditc Reach: US Reach RS: 8.932 Profile: 2-Year Culv: Culvert #1
Warning:During subcritical analysis, with the exit loss set =1.0, the projected WSEL in culvert has a lower energy than the downstream energy. Most likely, the downstream cross section blocks part of the culvert or the ineffective area is set too far in. Instead of projecting the WSEL, the program did an energy balance to get the WSEL inside the culvert at the downstream end.
River: Bensenville Ditc Reach: US Reach RS: 8.932 Profile: 50-Year Culv: Culvert #1
Warning:During subcritical analysis, with the exit loss set =1.0, the projected WSEL in culvert has a lower energy than the downstream energy. Most likely, the downstream cross section blocks part of the culvert or the ineffective area is set too far in. Instead of projecting the WSEL, the program did an energy balance to get the WSEL inside the culvert at the downstream end.
River: Bensenville Ditc Reach: US Reach RS: 8.91 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.91 Profile: 10-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.91 Profile: 2-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.91 Profile: 50-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.9 Profile: 100-Year
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, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 8.9 Profile: 10-Year
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, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 8.9 Profile: 2-Year
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, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 8.9 Profile: 50-Year
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, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 8.888 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.888 Profile: 10-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.888 Profile: 2-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.888 Profile: 50-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.827 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: Bensenville Ditc Reach: US Reach RS: 8.827 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.827 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.827 Profile: 50-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.826 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.826 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.826 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.826 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.820 Profile: 100-Year
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, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 8.820 Profile: 10-Year
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, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 8.820 Profile: 2-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 8.820 Profile: 50-Year
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, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 8.743 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 8.743 Profile: 10-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 8.743 Profile: 2-Year
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, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 8.743 Profile: 50-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 8.579 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.579 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.579 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.579 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.555 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.555 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 8.546 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.546 Profile: 10-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.546 Profile: 2-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.546 Profile: 50-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.000 Profile: 10-Year Culv: Culvert #1
Note: During subcritical analysis, the culvert direct step method, the solution went to normal depth.
River: Bensenville Ditc Reach: US Reach RS: 8.000 Profile: 2-Year Culv: Culvert #1
Note: During subcritical analysis, the culvert direct step method, the solution went to normal depth.
River: Bensenville Ditc Reach: US Reach RS: 8.000 Profile: 50-Year Culv: Culvert #1
Note: During subcritical analysis, the culvert direct step method, the solution went to normal depth.
River: Bensenville Ditc Reach: US Reach RS: 7.58 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 7.58 Profile: 10-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 7.58 Profile: 2-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 7.58 Profile: 50-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 7.122 Profile: 100-Year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: Bensenville Ditc Reach: US Reach RS: 7.122 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 7.111 Profile: 100-Year

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 7.111 Profile: 10-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 7.111 Profile: 2-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 7.111 Profile: 50-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 7.077 Profile: 100-Year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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.
River: Bensenville Ditc Reach: US Reach RS: 7.077 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 7.077 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 7.077 Profile: 50-Year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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.
River: Bensenville Ditc Reach: US Reach RS: 7.059 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 7.059 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 7.027 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 7.001 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.932 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.932 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.925 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.875 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.875 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.875 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.875 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.838 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.838 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.838 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.838 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.799 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.799 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.799 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.799 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.649 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.649 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.649 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.649 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.648 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.636 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.636 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.636 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.636 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.611 Profile: 100-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.611 Profile: 10-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.611 Profile: 2-Year
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, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.611 Profile: 50-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.597 Profile: 100-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.597 Profile: 10-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.597 Profile: 2-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.597 Profile: 50-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.573 Profile: 100-Year
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, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.573 Profile: 10-Year
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, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.573 Profile: 2-Year
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, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.573 Profile: 50-Year
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, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.557 Profile: 100-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.557 Profile: 10-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.557 Profile: 2-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.557 Profile: 50-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.554 Profile: 100-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.554 Profile: 10-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.554 Profile: 2-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.554 Profile: 50-Year
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 6.551 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.551 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.551 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.551 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.535 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.535 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.535 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.535 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.516 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.516 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.516 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.516 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.513 Profile: 100-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 6.513 Profile: 10-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 6.513 Profile: 2-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 6.513 Profile: 50-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 6.497 Profile: 100-Year
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: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
River: Bensenville Ditc Reach: US Reach RS: 6.497 Profile: 100-Year Upstream
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.
River: Bensenville Ditc Reach: US Reach RS: 6.497 Profile: 100-Year Downstream
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.
River: Bensenville Ditc Reach: US Reach RS: 6.497 Profile: 10-Year
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: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
River: Bensenville Ditc Reach: US Reach RS: 6.497 Profile: 10-Year Upstream
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.
River: Bensenville Ditc Reach: US Reach RS: 6.497 Profile: 10-Year Downstream
Note: For the cross section inside the bridge at the downstream end, the water surface and energy are based on critical depth over the weir.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 6.497 Profile: 2-Year
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: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
River: Bensenville Ditc Reach: US Reach RS: 6.497 Profile: 2-Year Upstream
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 6.497 Profile: 2-Year Downstream
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 6.497 Profile: 50-Year
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: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
River: Bensenville Ditc Reach: US Reach RS: 6.497 Profile: 50-Year Upstream
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.
River: Bensenville Ditc Reach: US Reach RS: 6.497 Profile: 50-Year Downstream
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.
River: Bensenville Ditc Reach: US Reach RS: 6.481 Profile: 100-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.481 Profile: 10-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.481 Profile: 2-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.481 Profile: 50-Year
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.
River: Bensenville Ditc Reach: US Reach RS: 6.467 Profile: 2-Year
Warning:Divided flow computed for this cross-section.

HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp 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
```

500-YR OUTPUT SUMMARY

PROJECT DATA
Project Title: Permit_Model_Final_CP_Culvert
Project File : 112311.prj
Run Date and Time: 10/16/2012 2:55:42 PM

Project in English units

PLAN DATA

Plan Title: Proposed 500-Yr
Plan File : c:\Users\doliphant\Desktop\2007\Bensenville Ditch\models\HEC-RAS Updated 112311\112311.p05

Geometry Title: Prop_032812 500 Yr
Geometry File : c:\Users\doliphant\Desktop\2007\Bensenville Ditch\models\HEC-RAS Updated 112311\112311.g06

Flow Title : 500-Yr
Flow File : c:\Users\doliphant\Desktop\2007\Bensenville Ditch\models\HEC-RAS Updated 112311\112311.f03

Plan Description:
Flows From Burke's "ALP Alignment - Bensenville Ditch, 04/2010 - FINAL"

Plan Summary Information:
Number of: Cross Sections = 5 Multiple Openings = 0
Culverts = 1 Inline Structures = 0
Bridges = 0 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.003
Critical depth calculation tolerance = 0.003
Maximum number of iterations = 20
Maximum difference tolerance = 0.1
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: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 500-Yr
Flow File : c:\Users\doliphant\Desktop\2007\Bensenville Ditch\models\HEC-RAS Updated 112311\112311.f03

Flow Data (cfs)

River	Reach	RS	500-Year
Bensenville Ditc	US Reach	8.91	1050

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Bensenville Ditc	US Reach	500-Year	Critical	Normal S = 0.0011

Inline Structure Gate Openings
River = Bensenville Ditc
Reach = US Reach RS = 8.4815
Gate = Gate #1

# Open	Open Ht
3	1

GEOMETRY DATA

Geometry Title: Prop_032812 500 Yr
Geometry File : c:\Users\doliphant\Desktop\2007\Bensenville Ditch\models\HEC-RAS Updated 112311\112311.g06

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 8.91

INPUT

Description: STA 10+57.18 (D/S Face of Exiting CPRR Culvert)
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1930.35	673.44	1955.54	661.3	1985.13	660.3	1997.5	653.9	2021.5	653.9
2045.5	653.9	2070.61	666.3						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1930.35	.05	1955.54	.025	2070.61	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1955.54 2070.61 30 30 30 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1930.35	2000	667.7	F
2043	2070.61	667.7	F

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 8.9

INPUT
Description: STA 10+57.18 (D/S Face of Exiting CPRR Culvert)
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1969.5	660.3	1987.5	659.3	1997.5	653.9	2021.5	653.9	2045.5	653.9
2061.5	662.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1969.5	.05	1987.5	.025	2061.5	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1987.5 2061.5 50 50 50 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1969.5	1985	667.7	F
2058	2061.5	667.7	F

CROSS SECTION

RIVER: Bensenville Ditc
REACH: US Reach RS: 8.888

INPUT
Description: STA 12+66.69 (U/S Face of UPRR Culvert)
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-63.87	669.39	-17	653.77	0	653.77	17	653.77	53.37	665.89

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-63.87	.03	-63.87	.03	53.37	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
-63.87 53.37 505 505 505 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-63.87	-17	669.87	F
17	53.37	669.87	F

CULVERT

RIVER: Bensenville Ditc
REACH: US Reach RS: 8.85

INPUT
Description: Proposed UPRR Crossing/Future EOWB Crossing
Distance from Upstream XS = 20
Deck/Roadway Width = 480
Weir Coefficient = 3
Upstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
-70	682.5	70	682.5

Upstream Bridge Cross Section Data
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-63.87	669.39	-17	653.77	0	653.77	17	653.77	53.37	665.89

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-63.87	.03	-63.87	.03	53.37	.03

Bank Sta: Left Right Coeff Contr. Expan.
-63.87 53.37 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-63.87	-17	669.87	F
17	53.37	669.87	F

Downstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
-70	682.5	70	682.5

Downstream Bridge Cross Section Data

```
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
  -63.87   668.85      -17   653.23        0   653.23       17   653.23    53.37   665.35

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
  -63.87      .03   -63.87      .03    53.37      .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        -63.87   53.37            .3        .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -63.87     -17  669.47        F
      17   53.37  669.47        F

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 =     .95
Elevation at which weir flow begins         =   682.5
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Culvert #1            Box       6      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 .5     504     .012     .012        0                    .2                1
Number of Barrels =  3
Upstream   Elevation =  653.77
Centerline Stations
    Sta.    Sta.    Sta.
   -11.5       0    11.5
Downstream Elevation =  653.23
Centerline Stations
    Sta.    Sta.    Sta.
   -11.5       0    11.5

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.827

INPUT
Description: STA 17+71.69 (D/S Face of UPRR Culvert)
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
  -63.87   668.85      -17   653.23        0   653.23       17   653.23    53.37   665.35

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
  -63.87      .03   -63.87      .03    53.37      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -63.87   53.37               50      50      50             .3        .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -63.87     -17  669.47        F
      17   53.37  669.47        F

CROSS SECTION


RIVER: Bensenville Ditc
REACH: US Reach           RS: 8.826

INPUT
Description: STA 18+21.69
Station Elevation Data    num=      15
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
  -38.04   662.02   -33.54   660.52   -19.5   655.84   -17.5    655.8   -11.5   653.8
    -5.5   653.68       -5   653.18       0   653.18       5   653.18     5.5   653.68
    11.5    653.8     17.5    655.8    19.5   655.84    33.03   660.35   38.04   662.02

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
  -38.04     .027     -5.5     .025      5.5     .027

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -5.5     5.5         11495.0211497.0211504.02             .1        .3


SUMMARY OF MANNING'S N VALUES

River:Bensenville Ditc

      Reach          River Sta.       n1        n2        n3

 US Reach             8.91              .05      .025      .05
 US Reach             8.9               .05      .025      .05
 US Reach             8.888             .03       .03      .03
 US Reach             8.85          Culvert
 US Reach             8.827             .03       .03      .03
 US Reach             8.826            .027      .025     .027
```

SUMMARY OF REACH LENGTHS

River: Bensenville Ditc

Reach	River Sta.	Left	Channel	Right
US Reach	8.91	30	30	30
US Reach	8.9	50	50	50
US Reach	8.888	505	505	505
US Reach	8.85	Culvert		
US Reach	8.827	50	50	50
US Reach	8.826	11495.02	11497.02	11504.02

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Bensenville Ditc

Reach	River Sta.	Contr.	Expan.
US Reach	8.91	.3	.5
US Reach	8.9	.1	.3
US Reach	8.888	.3	.5
US Reach	8.85	Culvert	
US Reach	8.827	.3	.5
US Reach	8.826	.1	.3

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Prop 500

River: Bensenville Ditc Reach: US Reach RS: 8.91 Profile: 500-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 8.9 Profile: 500-Year
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, water surface was used.
River: Bensenville Ditc Reach: US Reach RS: 8.888 Profile: 500-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Bensenville Ditc Reach: US Reach RS: 8.827 Profile: 500-Year
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

TAB 12

SECTION 12

IDNR-OWR FLOODWAY PERMIT SUMMARY AND COMPENSATORY STORAGE SUMMARY

Illinois Department of Transportation

Permit Summary for Floodway Construction in Northeast Illinois

Applicant Agency:	Illinois Department of Transportation	County:	DuPage
Route:	Elgin O'Hare-West Bypass	Stream:	Bensenville Ditch
Section:	EOWB over Bensenville Ditch	SN:	TBD

General Description (bridge length, bridge width, number of spans, abutment type, proposed scope of work within floodway, etc.): Extend existing 3 – 10'W by 6'H RCBC 367 ft. downstream.
Existing Facility: No existing structure
Proposed Improvement: Extend the existing UPRR culvert 367 ft. downstream.

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 ☐ 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) ☒ Yes ☐ No

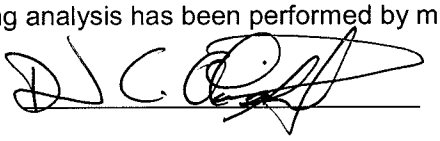
11b. If the answer to 11a is no, is compensatory storage provided at another location? If yes, give location and attach a copy of completed Attachment A. ☐ Yes ☐ No

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

---

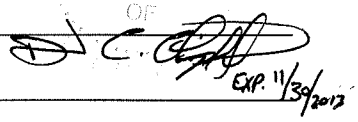
All engineering analysis has been performed by me or under my direct supervision.

Signature: 

IL/P.E. #: 062-059516

Date: 12/01/2011

P.E. Expiration Date: 11/30/2013



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:	DuPage
Route:	EOWB	Stream:	Bensenville Ditch
Section:	13	SN:	TBD

Provide the following information for Item 11:

a. Flood Water Elevations (Natural): (D/S Face, NGVD '29) 100-year 658.66 ft. 10-year 656.22 ft. Normal No NWL anticipated, No 7Q10 Flow

b. Determine the amount of fill or material being placed in the floodway:

1. Between the 100-year and 10-year flood elevation 548.5 cu. yds.
2. Between the 10-year and normal water elevation 0.0 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 1113.2 cu. yds.
2. Between the 10-year and normal water elevation 258.1 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: _____ IL/P.E. #: 062-059516

Date: 06/21/12 P.E. Expiration Date: 11/30/2013

062-059516 LICENSED PROFESSIONAL ENGINEER OF ILLINOIS

EXP. 11/30/2013

CHRISTOPHER B. BURKE
ENGINEERING, LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500 Fax (847) 823-0520

JOB 07-0404
SHEET NO. 1 OF
CALCULATED BY DCO DATE 12/1/11
CHECKED BY CTA DATE 12/13/11
SCALE

EOWB Culvert Extension

* Existing UPRR Culvert → +/- 136.5 ft.
* Extension for EOWB → +/- 367.5 ft
  * 3 - 6'H x 10'W RCBC to be maintained
  * Assume Typical Section for calculations

			Taken from HEC-RAS Output: 10-YR Area	10-100 YR Area
Natural/Existing	U/S X-Section	8.852	99.3 ft²	192.1 - 99.3 = 92.8 ft²
	D/S X-Section	8.830	77.2 ft²	194.9 - 77.2 = 117.7 ft²

Floodplain Fill (Floodway & Floodplain are concurrent)

10-YR $\frac{(99.3+77.2)}{2}$ = 88.3 ft² * 367.5 ft = 32,450.3 ft³
0.74 AC-FT

100-YR $\frac{(92.8+117.7)}{2}$ = 105.3 ft² * 367.5 ft = 38,697.8 ft³
0.89 AC-FT

Compensatory Storage

* 10-YR
  (XS 8.852 → 657.01 - 653.57)
  U/S Face → 3.44 FT. DEEP
  D/S Face → 2.92 FT. DEEP
  (XS 8.830 → 656.22 - 653.30)
  $\frac{(3.44+2.92)}{2}$ = Average 3.18 FT
  3.18 FT x 3 BARRELS * 10 FT WIDE * 367.5 FT LONG = 35,059.5 FT³
  0.80 AF
* 100-YR
  (XS 8.852 →)
  U/S Face → 658.88 - 657.01 = 1.87 FT DEEP
  D/S Face → 658.66 - 656.22 = 2.44 FT DEEP
  (XS 8.830 →)
  Average = 2.16 FT
  2.16 FT * 3 BARRELS * 10 FT WIDE * 367.5 FT LONG = 23,814 FT³
  0.55 AF

CHRISTOPHER B. BURKE
ENGINEERING, LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500 Fax (847) 823-0520

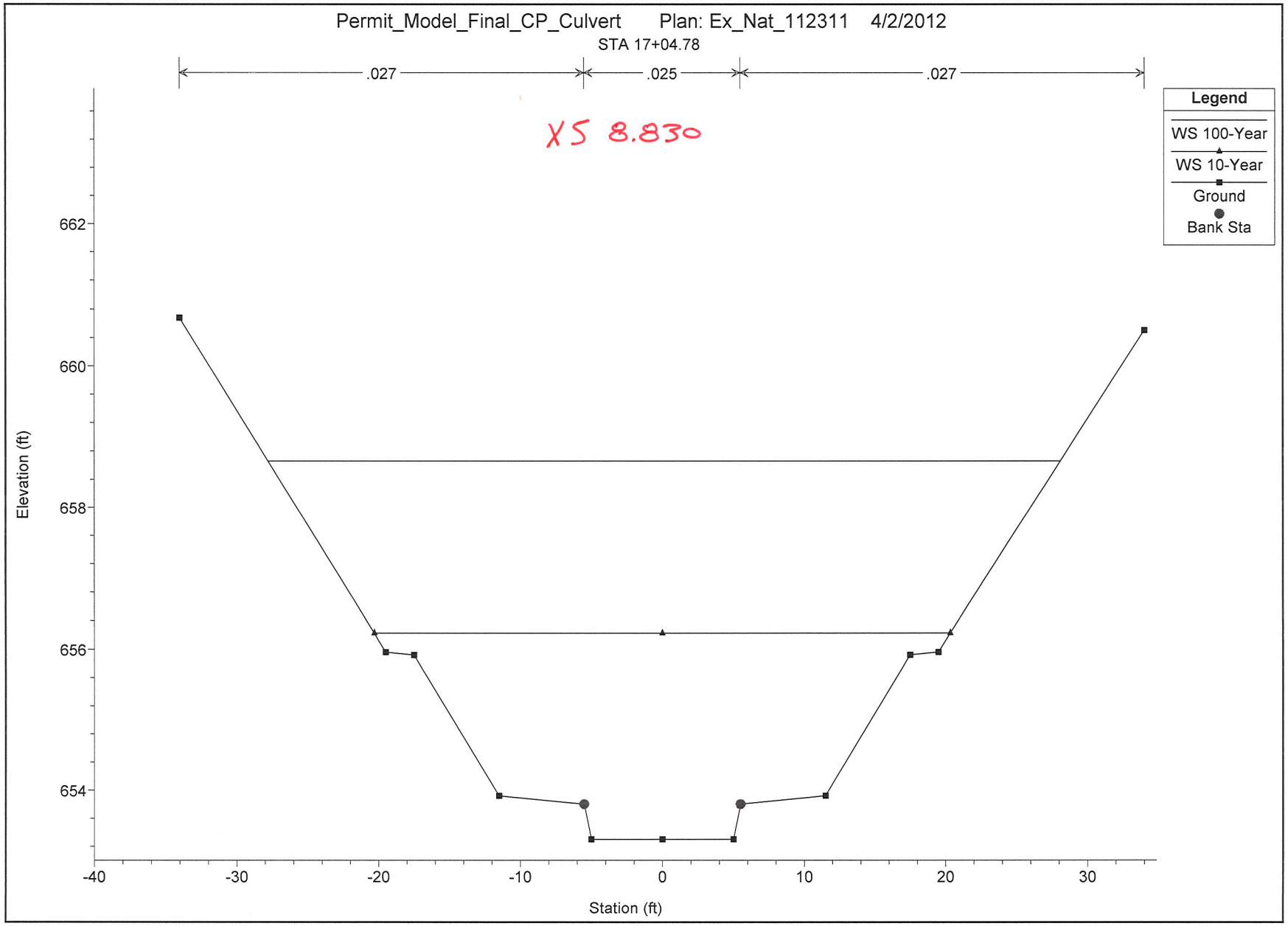
JOB 07-0464
SHEET NO. 2 OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE

EOWB CULVERT EXTENSION

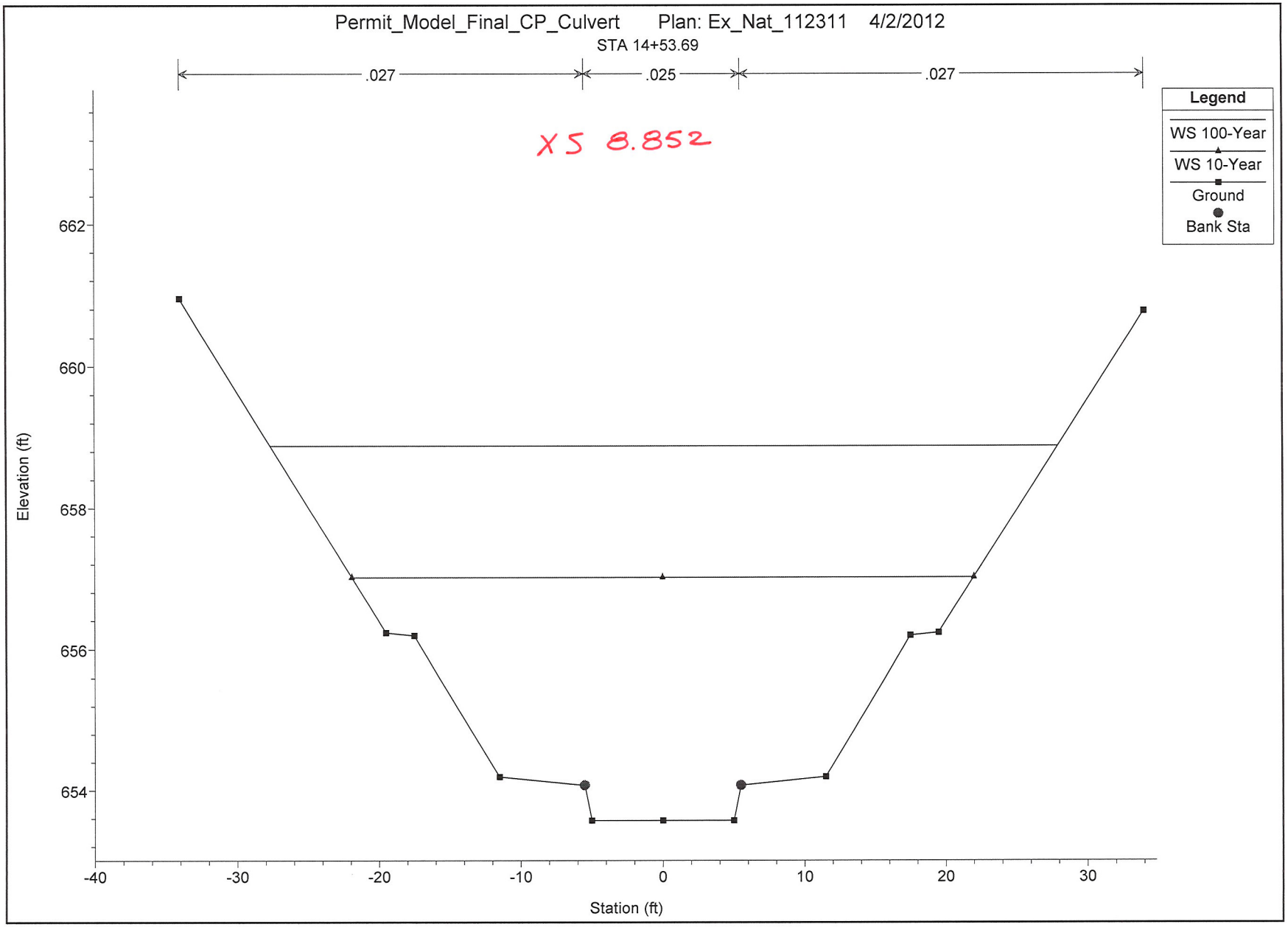
∴ REQUIRED COMPENSATORY STORAGE =

NORMAL-10 YR = **0 AC-FT**

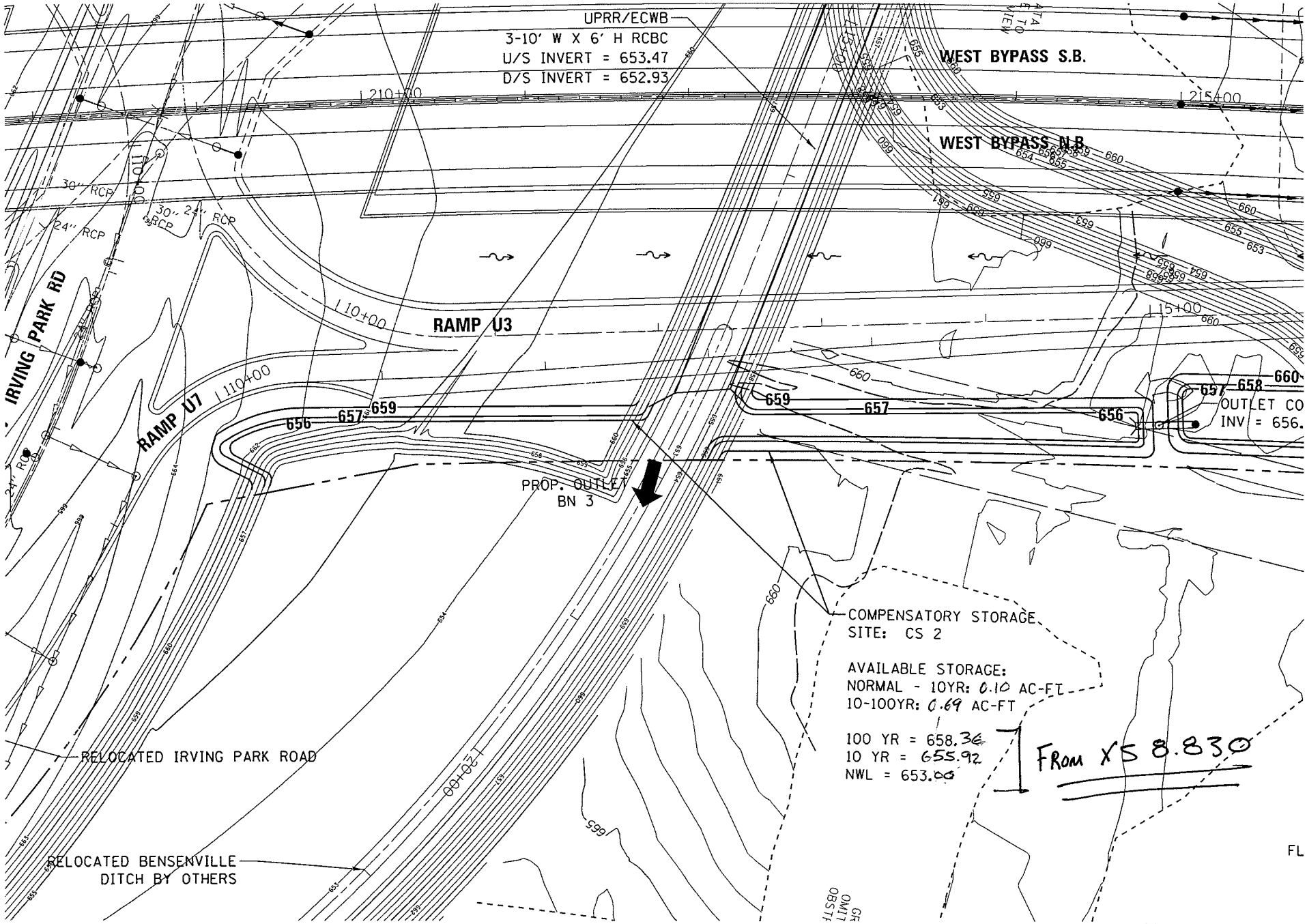
10-100 YR = 0.89 AC-FT − 0.55 AC-FT
= 0.34 AC-FT
× 1.5 RATIO
= **0.51 AC-FT REQUIRED**



1 in Horiz. = 10 ft 1 in Vert. = 2 ft



1 in Horiz. = 10 ft 1 in Vert. = 2 ft


UPRR/ECWB
3-10' W X 6' H RCBC
U/S INVERT = 653.47
D/S INVERT = 652.93
WEST BYPASS S.B.
WEST BYPASS N.B.
210+00
215+00
110+00
115+00
120+00
IRVING PARK RD
RAMP U3
RAMP U7
30" RCP
24" RCP
PROP. OUTLET
BN 3
COMPENSATORY STORAGE
SITE: CS 2
AVAILABLE STORAGE:
NORMAL - 10YR: 0.10 AC-FT
10-100YR: 0.69 AC-FT
100 YR = 658.36
10 YR = 655.92
NWL = 653.00
FROM XS 8.830
RELOCATED IRVING PARK ROAD
RELOCATED BENSENVILLE
DITCH BY OTHERS
OUTLET CO
INV = 656.
1"=80'

Available Compensatory Storage Volume
ELEVATION-STORAGE RELATIONSHIP

POND: Compensatory Storage Area 2 South (CS2-S) - Bensenville Ditch
JOB NO. 07-0404
PROJECT: Elgin O'Hare - West Bypass
FILE: Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models Geometric Full Build\Drainage Calculations\Available storage volume\[02_Comp STORAGE VOL_0312.xls]CS2-N
DATE: 21-Jun-12

SIDE SLOPES: 3:1 (H:V)

ELEVATION (ft)		AREA (s.f.)	AREA (ac)	AVERAGE AREA (ac)	Δ ELEVATION (ft)	INCREMENTAL STORAGE (ac-ft)	CUMULATIVE STORAGE (ac-ft)
653.00	NWL		0.000				0.00
				0.000	2.00	0.000	
655.00		0	0.000				0.00
				0.070	0.92	0.064	
655.92	10-year	6,068	0.139				0.06
				0.145	0.08	0.012	
656.00		6,596	0.151				0.08
				0.152	1.00	0.152	
657.00		6,677	0.153				0.23
				0.154	1.36	0.209	
658.36	100-yr	6,712	0.154				0.44
				0.154	0.64	0.099	
659.00		6,729	0.154				0.54

0 to 10-year storage = **0.06**
10 to 100-year storage = **0.37**

Available Compensatory Storage Volume
ELEVATION-STORAGE RELATIONSHIP

POND: Compensatory Storage Area 2 North (CS2-N) - Bensenville Ditch
JOB NO. 07-0404
PROJECT: Elgin O'Hare - West Bypass
FILE: Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models Geometric Full Build\Drainage Calculations\Available storage volume\[02 Comp STORAGE VOL 0312.xls]CS2-N
DATE: 21-Jun-12

SIDE SLOPES: 3:1 (H:V)

ELEVATION (ft)		AREA (s.f.)	AREA (ac)	AVERAGE AREA (ac)	Δ ELEVATION (ft)	INCREMENTAL STORAGE (ac-ft)	CUMULATIVE STORAGE (ac-ft)
653.00	NWL		0.000				0.00
				0.000	2.00	0.000	
655.00		0	0.000				0.00
				0.046	0.92	0.043	
655.92	10-year	4,044	0.093				0.04
				0.097	0.08	0.008	
656.00		4,396	0.101				0.05
				0.113	1.00	0.113	
657.00		5,426	0.125				0.16
				0.148	1.36	0.201	
658.36	100-yr	7,480	0.172				0.36
				0.183	0.64	0.117	
659.00		8,446	0.194				0.48

0 to 10-year storage = **0.04**
10 to 100-year storage = **0.32**

TAB 13

SECTION 13

CORRESPONDENCE AND NOTES

Illinois Department of
Natural Resources
One Natural Resources Way Springfield, Illinois 62702-1271
http://dnr.state.il.us

Pat Quinn, Governor
Marc Miller, Director

Office of Water Resources • 2050 West Stearns Road • Bartlett, Illinois 60103

November 24, 2010

SUBJECT: Permit No. NE2010055
Channel/Floodway Relocation, Stream Enclosure and Culvert Crossing
Bensenville Ditch, Cook and DuPage Counties, Application No. 2010120

John Sisco
City of Chicago, O'Hare Modernization Program
P.O. Box 66848
10510 W. Zemke Road
Chicago, Illinois 60666

Dear Mr. Sisco:

Enclosed is Illinois Department of Natural Resources, Office of Water Resources Permit No. NE2010055 authorizing the subject project. This permit does not supersede any other federal, state or local authorizations that may be required for the project. Upon receipt and review of this permit and all conditions included therein, please properly execute and return the attached acceptance slip within sixty (60) days from the date of this permit.

Please be advised that the Illinois Department of Natural Resources, Office of Realty and Environmental Planning (OREP) participates in the regulatory programs of the U.S. Army, Corps of Engineers (USACE) and may review this project if a USACE Section 10 or 404 permit is required. Issuance of a permit by the Office of Water Resources does not preclude OREP's provision of comments and/or recommendations, primarily related to biological effects of the proposed action, to the USACE and other federal agencies concerning your project.

If any changes of the permitted work are found necessary, revised plans should be submitted promptly to this office for review and approval. Also, this permit expires on the date indicated in Condition (13). If unable to complete the work by that date, the permittee may make a written request for a time extension.

Please contact Bill Boyd of my staff at 847/608-3100, ext. 2025 if you have any questions.

Sincerely,

Gary Jereb

Gary W. Jereb, P.E., Chief
Northeastern Illinois Regulatory Programs Section

GJ/WB:crw
Enclosure
cc: Chicago District, U.S. Army Corps of Engineers
Donald Dressel, Christopher B. Burke Engineering, Ltd.
Jim Daum, BPC Airport Partners
City of Chicago, Department of Environment
City of Chicago, Department of Transportation
Clayton Heffter, DuPage County, EDP

PERMIT NO. NE2010055
DATE: November 24, 2010

State of Illinois
Department of Natural Resources, Office of Water Resources

Permission is hereby granted to:

City of Chicago, O'Hare Modernization Program
P.O. Box 66848
10510 W. Zemke Road
Chicago, Illinois 60666

to relocate 9800 ft. of the channel and floodway, to construct a 4450 ft. long twin box stream enclosure, to construct a triple box culvert railroad crossing, and to construct a temporary channel on Bensenville Ditch in Section 13, Township 40 North, Range 11 East of the Third Principal Meridian in DuPage County and in the Southwest Quarter of Section 18, Township 40 North, Range 12 East of the Third Principal Meridian in Cook County,

in accordance with an undated application, and the plans and specifications entitled:

CHICAGO – O'HARE INTERNATIONAL AIRPORT, CITY OF CHICAGO, O'HARE MODERNIZATION PROGRAM, UPRR CENTRAL, IRVING PARK ROAD AND BENSENVILLE DITCH RELOCATIONS, COVER SHEET AND SHEETS CS-501 TO CS-512, CG-501 TO CG-512, ST-506, ST-508, ST-521, ST-522, AND XS-501 TO XS-530, DATED JULY 30, 2010, RECEIVED JULY 27, 2010, UPRR RELOCATION SOUTH OF IRVING PARK ROAD TO NORTH CONTRACT LIMIT, TITLE SHEET AND SHEETS CS-201 TO CS-203, DATED JUNE 11, 2010, RECEIVED JULY 27, 2010.

Examined and Recommended:

Gary W. Jereb, Chief
Northeastern IL Regulatory
Programs Section

Approval Recommended:

Gary R. Clark, Director
Office of Water Resources

Approved:

Marc Miller, Director
Department of Natural Resources

This PERMIT is subject to the terms and special conditions contained herein.

PERMIT NO. NE2010055

THIS PERMIT IS SUBJECT TO THE FOLLOWING CONDITIONS:

1) This permit is granted in accordance with the Rivers, Lakes and Streams Act "615 ILCS 5."

2) This permit does not convey title to the permittee or recognize title of the permittee to any submerged or other lands, and furthermore, does not convey, lease or provide any right or rights of occupancy or use of the public or private property on which the activity or any part thereof will be located, or otherwise grant to the permittee any right or interest in or to the property, whether the property is owned or possessed by the State of Illinois or by any private or public party or parties.

3) This permit does not release the permittee from liability for damage to persons or property resulting from the work covered by this permit, and does not authorize any injury to private property or invasion of private rights.

4) This permit does not relieve the permittee of the responsibility to obtain other federal, state or local authorizations required for the construction of the permitted activity; and if the permittee is required by law to obtain approvals from any federal or state agency to do the work, this permit is not effective until the federal and state approvals are obtained.

5) The permittee shall, at the permittee's own expense, remove all temporary piling, cofferdams, false work, and material incidental to the construction of the project. If the permittee fails to remove such structures or materials, the Department may have removal made at the expense of the permittee.

6) In public waters, if future need for public navigation or other public interest by the state or federal government necessitates changes in any part of the structure or structures, such changes shall be made by and at the expense of the permittee or the permittee's successors as required by the Department or other properly constituted agency, within sixty (60) days from receipt of written notice of the necessity from the Department or other agency, unless a longer period of time is specifically authorized.

7) The execution and details of the work authorized shall be subject to the review and approval of the Department. Department personnel shall have the right of access to accomplish this purpose.

8) Starting work on the activity authorized will be considered full acceptance by the permittee of the terms and conditions of the permit.

9) The Department in issuing this permit has relied upon the statements and representations made by the permittee; if any substantive statement or representation made by the permittee is found to be false, this permit will be revoked; and when revoked, all rights of the permittee under the permit are voided.

10) In public waters, the permittee and the permittee's successors shall make no claim whatsoever to any interest in any accretions caused by the activity.

11) In issuing this permit, the Department does not ensure the adequacy of the design or structural strength of the structure or improvement.

12) Noncompliance with the conditions of this permit will be considered grounds for revocation.

13) If the construction activity permitted is not completed on or before December 31, 2013 this permit shall cease and be null and void.

THIS PERMIT IS SUBJECT TO THE FOLLOWING SPECIAL CONDITIONS:

a) After completion of the work herein authorized, the permittee must submit to the Illinois Department of Natural Resources, Office of Water Resources Bartlett office and to the Federal Emergency Management Agency all the analyses, drawings, maps and other information needed for a Letter of Map Revision.

b) Stream flows shall not be diverted into the final relocated channel until it is vegetated and stabilized from erosion.

TAB 14

SECTION 14

SURVEY NOTES

Questions concerning the VERTCON process may be mailed to _NGS

Latitude: 41 57.7112

Longitude: 87 56.301

NGVD 29 height: FT

Datum shift(NAVD 88 minus NGVD 29): -0.295 feet

TAB 15

SECTION 15

CD (HYDRAULIC MODELING AND SURVEY DATA)


C
D