HYDRAULIC REPORT
VOLUME 3

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

IL 72 (TOUHY AVENUE), SN: 016-0974,
I-90 (JANE ADDAMS MEMORIAL TOLLWAY), SN: 016-9975 (ISTHA 535) EB,
SN: 016-9869 (ISTHA 536) WB,
AND ELMHURST ROAD, SN: 016-0677
OVER HIGGINS CREEK

I-90 (JANE ADDAMS MEMORIAL TOLLWAY)
OVER HIGGINS CREEK TRIBUTARY A

PROPOSED WEST BYPASS
OVER HIGGINS CREEK AND TOUHY AVENUE RESERVOIR (TAR) CELL 2

COOK 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

FINAL – REV. NOVEMBER 2012

CH2MHILL

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Illinois Department of Transportation

Permit Summary for Floodway Construction in Northeast Illinois

Applicant Agency:	Illinois Department of Transportation	County:	Cook
Route:	Interstate 90 (Jane Addams Tollway)	Stream:	Higgins Creek Tributary A
Section:		SN:	

General Description (bridge length, bridge width, number of spans, abutment type, proposed scope of work within floodway, etc.):
Existing Facility: 168.75', two 9' W x 5.75' H reinforced concrete box culverts
Proposed Improvement: Abandon existing twin reinforced concrete box culverts. Replace with 320' twin 12' W x 9' H reinforced concrete box culverts, embedded 12" on skew to accommodate roadway widening and better align with channel.

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? Kirie WRP entrance, Elmhurst Road, low-head dam — ☒ Yes ☐ No

9a. Was the existing downstream structure used in the analysis for determining flood profile at the project site? years? (Attach documentation) — ☒ Yes ☐ No

9b. Is the downstream structure scheduled for improvement in the next 5 years? Elmhurst Road only — ☒ 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

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All engineering analysis has been performed by me or under my direct supervision.

Signature: Steve A Daily — IL/P.E. #: 062.047420

Date: 07/10/2012 — 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:	Cook
Route:	I-90 (Jane Addams Tollway)	Stream:	Higgins Creek Tributary A
Section:		SN:	

Provide the following information for Item 11:

a. Flood Water Elevations (Natural): 100-year 658.2' 10-year 656.5'
Normal 650.74', all NAVD 1988 datum

b. Determine the amount of fill or material being placed in the floodway:

1. Between the 100-year and 10-year flood elevation 1.22 ac-ft
2. Between the 10-year and normal water elevation 1.24 ac-ft

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 1.22 ac-ft (10.30 ac-ft provided for all floodplain fill)
2. Between the 10-year and normal water elevation 1.24 ac-ft (6.50 ac-ft provided for all floodplain fill)

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.

* The fill and compensatory storage volumes for the culvert are included with the calculations for the regional compensatory storage basins. See attached documentation.

All engineering analysis has been performed by me or under my direct supervision.

Signature:		IL/P.E. #:	062.063534
Date:	11/6/2012	P.E. Expiration Date:	11/30/2013

Illinois Department of Transportation

Permit Summary for Floodway Construction in Northeast Illinois

Applicant Agency:	Illinois Department of Transportation	County:	Cook
Route:	Elmhurst Road	Stream:	Higgins Creek
Section:		SN:	016-0677

General Description (bridge length, bridge width, number of spans, abutment type, proposed scope of work within floodway, etc.):
Existing Facility: 25' long, 70' wide single span concrete slab bridge with vertical abutments.
Proposed Improvement: 32' long, 112' wide single span P.P.C. deck beam bridge with vertical abutments (Alternate improvement is two 12' wide by 9' high RCBC embedded 12", flanked by two 12' wide by 6' high RCBC.)

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? Wille Road & Kirie WRP entrance — ☒ Yes ☐ No

9a. Was the existing downstream structure used in the analysis for determining flood profile at the project site? All 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

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All engineering analysis has been performed by me or under my direct supervision.

Signature: Steve A Daily — IL/P.E. #: 062.047420

Date: 07/10/2012 — 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:	Cook
Route:	Elmhurst Road	Stream:	Higgins Creek
Section:		SN:	016-0677

Provide the following information for Item 11:

a. Flood Water Elevations (Natural): 100-year 657.8' 10-year 653.9'
Normal 647.69', all 1988 NAVD Datum

b. Determine the amount of fill or material being placed in the floodway:

1. Between the 100-year and 10-year flood elevation 0.13 ac-ft
2. Between the 10-year and normal water elevation 0.01 ac-ft

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 0.13 ac-ft (10.30 ac-ft provided for all floodplain fill)
2. Between the 10-year and normal water elevation 0.01 ac-ft (6.50 ac-ft provided for all floodplain fill)

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.

* The fill and compensatory storage volumes for the bridge are included with the calculations for the regional compensatory storage basins. See attached documentation.

All engineering analysis has been performed by me or under my direct supervision.

Signature:		IL/P.E. #:	062.063534
Date:	11/6/2012	P.E. Expiration Date:	11/30/2013

Illinois Department of Transportation

Permit Summary for Floodway Construction in Northeast Illinois

Applicant Agency:	Illinois Department of Transportation	County:	Cook
Route:	Interstate 90 (Jane Addams Tollway)	Stream:	Higgins Creek
Section:		SN:	ISTHA 535,536

General Description (bridge length, bridge width, number of spans, abutment type, proposed scope of work within floodway, etc.):
Existing Facility: 83.6' long, 125' wide, two-span bridge with spill-through abutments
Proposed Improvement: 83.6' long, widen to 301' to accommodate roadway widening, two-span bridge with spill-through abutments

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? MWRD crossing at TAR Cell 1 — ☒ Yes ☐ No

9a. Was the existing downstream structure used in the analysis for determining flood profile at the project site? All 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

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All engineering analysis has been performed by me or under my direct supervision.

Signature: Marc A Darby — IL/P.E. #: 062.047420

Date: 07/10/2012 — 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:	Cook
Route:	I-90 (Jane Addams Tollway)	Stream:	Higgins Creek
Section:		SN:	ISTHA 535,536

Provide the following information for Item 11:

a. Flood Water Elevations (Natural): 100-year 652.7' 10-year 650.6'
Normal 646.12', all NAVD 1988 datum

b. Determine the amount of fill or material being placed in the floodway:

1. Between the 100-year and 10-year flood elevation 0.0 ac-ft
2. Between the 10-year and normal water elevation 0.0 ac-ft

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 0.0 ac-ft (10.30 ac-ft provided for all floodplain fill)
2. Between the 10-year and normal water elevation 0.0 ac-ft (6.50 ac-ft provided for all floodplain fill)

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.

* The fill and compensatory storage volumes for the bridge are included with the calculations for the regional compensatory storage basins. See attached documentation.

All engineering analysis has been performed by me or under my direct supervision.

Signature:		IL/P.E. #:	062.063534
Date:	11/6/2012	P.E. Expiration Date:	11/30/2013

Illinois Department of Transportation

Permit Summary for Floodway Construction in Northeast Illinois

Applicant Agency:	Illinois Department of Transportation	County:	Cook
Route:	IL 72 (Touhy Avenue)	Stream:	Higgins Creek
Section:		SN:	016-0974

General Description (bridge length, bridge width, number of spans, abutment type, proposed scope of work within floodway, etc.):
Existing Facility: 124.4', two 13.5' W x 8' H reinforced concrete box culverts
Proposed Improvement: No change. Touhy Avenue will be elevated over the existing culvert and railroad.

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? Mt. Prospect Road — ☒ Yes ☐ No

9a. Was the existing downstream structure used in the analysis for determining flood profile at the project site? All 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

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All engineering analysis has been performed by me or under my direct supervision.

Signature: Steve A Daley — IL/P.E. #: 062.047420

Date: 07/10/2012 — 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:	Cook
Route:	IL 72 (Touhy Avenue)	Stream:	Higgins Creek
Section:		SN:	016-0974

Provide the following information for Item 11:

a. Flood Water Elevations (Natural): 100-year 647.0' 10-year 645.4'
Normal , all NAVD 1988 datum

b. Determine the amount of fill or material being placed in the floodway:

1. Between the 100-year and 10-year flood elevation 0 cu. yds.
2. Between the 10-year and normal water elevation 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 0 cu. yds.
2. Between the 10-year and normal water elevation 0 cu. yds.

d. Mark on the exhibits the location and amount of compensatory storage to be excavated. Also show the location of floodway and floodplain boundaries. (Include a set of plans and cross sections)

Attach copy of calculations and Exhibit(s) reflecting the above finding.

All engineering analysis has been performed by me or under my direct supervision.

Signature: Steven A Daley IL/P.E. #: 062.047420

Date: 11/05/2012 P.E. Expiration Date: 11/30/2013

Illinois Department of Transportation

Permit Summary for Floodway Construction in Northeast Illinois

Applicant Agency:	Illinois Department of Transportation	County:	Cook
Route:	Mount Prospect Road	Stream:	Higgins Creek
Section:		SN:	

General Description (bridge length, bridge width, number of spans, abutment type, proposed scope of work within floodway, etc.):
Existing Facility: 154', 12' W x 8' H reinforced concrete box culvert
Proposed Improvement: 154', 12' W x 8' H reinforced concrete box culvert unchanged, add twin 10' W x 3.5' H RCBC approximately 285' east to provide 500-year flow path in existing ditch under relocated road.

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? No change to the existing structure. Relief structure will be added in existing ditch to accommodate 500-year flow. ☐ 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? Willow-Higgins Creek. ☒ Yes ☐ No

   If yes, list frequency of starting elevation for analysis: 10-, 50-, 100-, and 500-year

9. Is backwater from a downstream structure affecting the flood profile at the project site? Culvert on O'Hare Airport property upstream of Lee Street affects only the 500-year profile. ☒ Yes ☐ No

9a. Was the existing downstream structure used in the analysis for determining flood profile at the project site? All 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

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All engineering analysis has been performed by me or under my direct supervision.

Signature: Steve A Daisley IL/P.E. #: 062.047420

Date: 07/10/2012 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:	Cook
Route:	Mount Prospect Road	Stream:	Higgins Creek
Section:		SN:	

Provide the following information for Item 11:

a. Flood Water Elevations (Natural): 100-year 646.61' 10-year 644.36'
Normal all NAVD 1988 datum

b. Determine the amount of fill or material being placed in the floodway:

1. Between the 100-year and 10-year flood elevation 0 cu. yds.
2. Between the 10-year and normal water elevation 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 0 cu. yds.
2. Between the 10-year and normal water elevation 0 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:	Irene A Dailey	IL/P.E. #:	062.047420
Date:	07/10/2012	P.E. Expiration Date:	11/30/2013

PROPOSED CONDITION

COMPENSATORY STORAGE CALCULATIONS

Initial Construction Plan - Project C (same as Full-Build)
Required Compensatory Storage Summary Sheet

11/19/2012

Initial Construction Plan - Project C
Calculations of Fill in Floodplain and Compensatory Storage Requirements based on Natural Water Surface Elevations

Floodplain

*WATERWAY	CROSSING	From Station	To Station	Normal Elevation	10-YR Elevation	100-YR Elevation	LOCATION ID	Normal - 10 YR		10 YR - 100 YR	
								Fill Volume (AC-FT)	Required Storage (AC-FT)	Fill Volume (AC-FT)	Required Storage (AC-FT)
Higgins Creek	Elmhurst	105+00	119+50	647.69	653.90	657.80	CS6 & CS7	0.03	0.05	1.28	1.92
Higgins Creek, HC Tributary A	I-90 West	3826+00	3848+50	650.74	656.50	658.20		2.38	3.57	3.97	5.96
Higgins Creek	I-90 East	3854+00	3884+00	646.12	650.60	652.70		0.37	0.56	1.89	2.84
						TOTALS =		**2.78**	**4.17**	**7.14**	**10.71**

*Crossings subject to compensatory storage requirements at 1.5:1 fill in the floodplain

Floodway

*WATERWAY	CROSSING	From Station	To Station	Normal Elevation	10-YR Elevation	100-YR Elevation	LOCATION ID	Normal - 10 YR		10 YR - 100 YR	
								Fill Volume (AC-FT)	Required Storage (AC-FT)	Fill Volume (AC-FT)	Required Storage (AC-FT)
Higgins Creek	Elmhurst	105+00	119+50	647.69	653.90	657.80	CS6 & CS7	0.01	0.01	0.13	0.13
Higgins Creek, HC Tributary A	I-90 West	3826+00	3848+50	650.74	656.50	658.20		1.24	1.24	1.22	1.22
Higgins Creek	I-90 East	3854+00	3884+00	646.12	650.60	652.70		0.00	0.00	0.00	0.00
						TOTALS =		**1.25**	**1.25**	**1.35**	**1.35**

*Crossings subject to compensatory storage requirements at 1.5:1 fill in the floodplain

EOWB
CBBEL Proj. # 07-0404
Available Storage Volumes
Rev. 07/10/2012 Rev. 10/29/2012, Rev. 11/19/2012
Compensatory Storage Volume

WATERWAY	Comp. Storage Site	Notes[a,b]	NWL - 10 YR				10 YR - 100 YR				Total
			Fill Volume (AC-FT)	Required Storage (AC-FT)	Available Storage	Excess Storage	Fill Volume (AC-FT)	Required Storage (AC-FT)	Available Storage	Excess Storage	Excess Storage
			(A-F)	(A-F)	(A-F)	(A-F)	(A-F)	(A-F)	(A-F)	(A-F)	(A-F)
Higgins Creek	CS6-E	Northwest corner of intersection	2.78	4.17	1.14	2.33	7.14	10.71	1.01	-0.41	1.92
	CS7-W	10- to 100-year access pool			0.00				6.91		
	CS7-E	East of Elmhurst			5.36				2.38		

a) All road cross-sections modified to slope downward from the guard rail at 3:1 side slopes into the compensatory storage area.
b) Incremental 1:1 compensatory storage to fill ratio satisfied. Total 1.5:1 compensatory storage to fill ratio satisfied.

Available Compensatory Storage Volume
ELEVATION-STORAGE RELATIONSHIP

POND: Compensatory Storage Area 6 East (CS6-E) - Higgins Creek
JOB NO. 07-0404
PROJECT: Elgin O'Hare - West Bypass
FILE: Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage Calcs\[Fill Calculation Summary_092112.xlsx]compensatory storage
DATE: 19-Nov-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)
650.74	* NWL	0	0.000				0.00
				0.000	3.26	0.000	
654.00		0	0.000				0.00
				0.197	0.00	0.000	
654.00		17,167	0.394				0.00
				0.419	1.00	0.419	
655.00		19,372	0.445				0.42
				0.483	1.50	0.724	
656.50	* 10-year	22,679	0.521				1.14
				0.533	0.50	0.267	
657.00		23,781	0.546				1.41
				0.608	1.00	0.608	
658.00		29,155	0.669				2.02
				0.682	0.20	0.136	
658.20	HWL	30,229	0.694				2.15
				0.743	0.80	0.595	
659.00		34,528	0.793				2.75

0 to 10-year storage = **1.14**
10 to 100-year storage = **1.01**

Available Compensatory Storage Volume
ELEVATION-STORAGE RELATIONSHIP

POND: Compensatory Storage Area 7 West (CS7-W) - Higgins Creek
JOB NO. 07-0404
PROJECT: Elgin O'Hare - West Bypass
FILE: Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage Calcs\[Fill Calculation Summary_092112.xlsx]compensatory storage
DATE: 19-Nov-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)
646.12	* NWL	0	0.000				0.00
				0.000	1.88	0.000	
648.00		0	0.000				0.00
				0.000	1.00	0.000	
649.00		0	0.000				0.00
				1.126	1.00	1.126	
650.00		98,054	2.251				1.13
				2.282	0.60	1.369	
650.60	10-yr	100,757	2.313				2.49
				2.334	0.40	0.933	
651.00		102,559	2.354				3.43
				2.383	1.00	2.383	
652.00		105,018	2.411				5.81
				1.572	0.70	1.100	
652.70	HWL	31,910	0.733				6.91
				0.589	0.30	0.177	
653.00		19,443	0.446				7.09

0 to 10-year storage =	**2.49**
10 to 100-year storage =	**4.42**
* storage basin used as 10- to 100-year level pool =	**6.91**

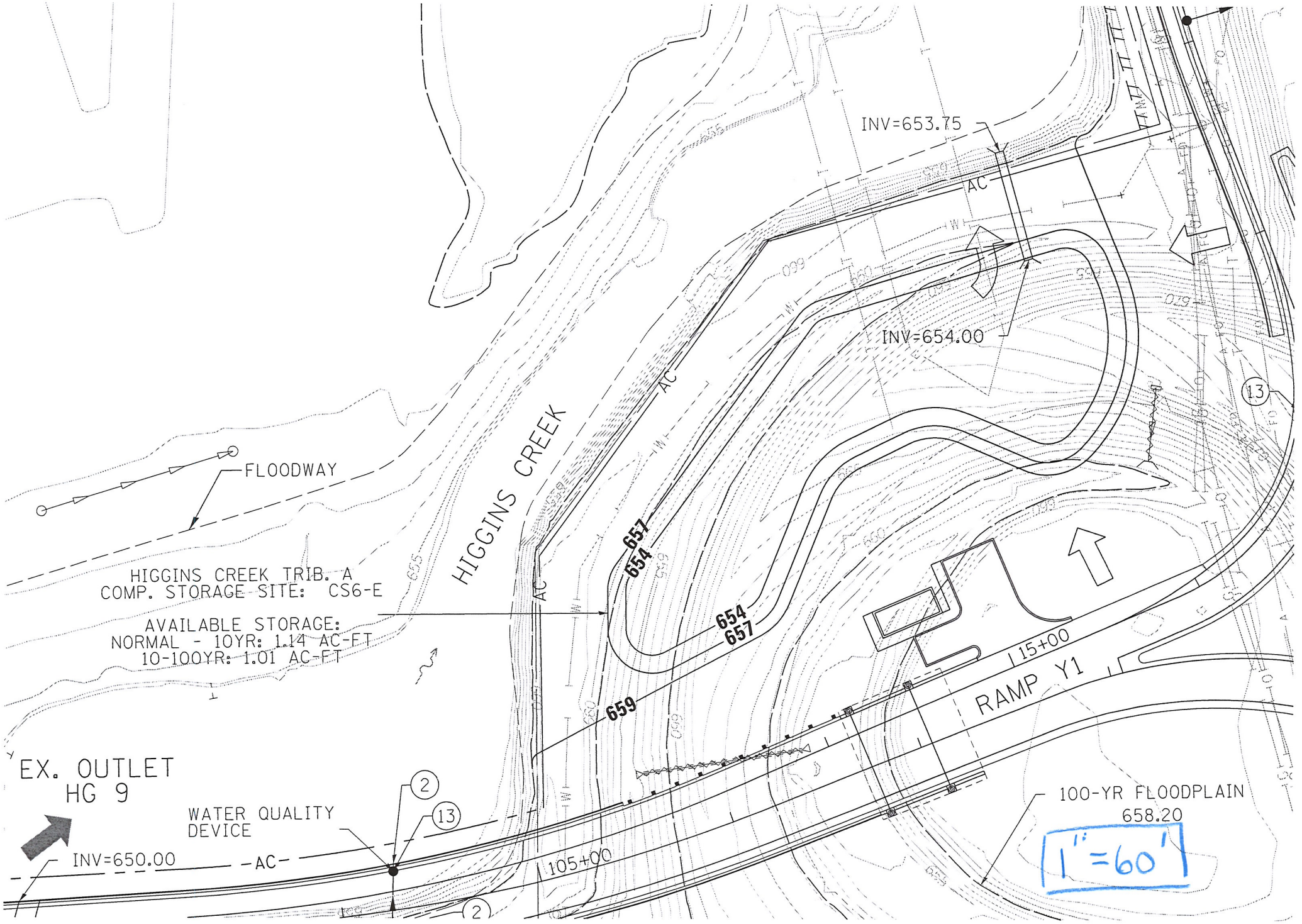
Available Compensatory Storage Volume
ELEVATION-STORAGE RELATIONSHIP

POND: Compensatory Storage Area 7 East (CS7-E) - Higgins Creek
JOB NO. 07-0404
PROJECT: Elgin O'Hare - West Bypass
FILE: Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage Calcs\[Fill Calculation Summary_092112.xlsx]compensatory storage
DATE: 19-Nov-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)
646.12	* NWL	0	0.000				0.00
				0.000	1.88	0.000	
648.00		0	0.000				0.00
				0.000	0.00	0.000	
648.00		0	0.000				0.00
				1.508	1.00	1.508	
649.00		131,389	3.016				1.51
				2.405	1.60	3.848	
650.60	10-yr	78,112	1.793				5.36
				1.640	0.40	0.656	
651.00		64,793	1.487				6.01
				1.011	1.70	1.719	
652.70	HWL	23,305	0.535				7.73
				0.451	0.30	0.135	
653.00		15,984	0.367				7.87

0 to 10-year storage = **5.36**
10 to 100-year storage = **2.38**


INV=653.75
AC
INV=654.00
HIGGINS CREEK
AC
FLOODWAY
HIGGINS CREEK TRIB. A
COMP. STORAGE SITE: CS6-E
AVAILABLE STORAGE:
NORMAL - 10YR: 1.14 AC-FT
10-100YR: 1.01 AC-FT
657
654
654
657
659
15+00
RAMP Y1
EX. OUTLET
HG 9
WATER QUALITY
DEVICE
INV=650.00
AC
105+00
100-YR FLOODPLAIN
658.20
1"=60'
13
2
13
2

CD

JANE ADDAMS MEM TOLLWAY (I-90) EB

RAMP Y3

JANE ADDAMS MEM TOLLWAY (I-90) WB

DRAINAGE SYSTEM BY OTHERS AND FOR GENERAL REFERENCE ONLY. NO PROFILES ARE PROVIDED FOR THIS FUTURE CONDITION.

HIGGINS CREEK

HIGGINS CREEK

WATER QUALITY DEVICE

ULTIMATE ICP POND SIZE, TO BE COORDINATED WITH I-90 ICP CONTRACT

100-YR FLOODPLAIN 652.70

100-YR FLOODPLAIN 652.79

WB CD

50-YR DESIGN HWL=652.57 (EX.)

MAINTAIN TWO-SPAN BRIDGE

I-90 OVER HIGGINS CREEK D.A. = 6.8 SQ MI

JAWA ESMT

EB CD

INV=648.50

BMR DETENTION SITE: DS-W
ULTIMATE AVAILABLE DETENTION
15.99 AC-FT
13.46 AC-FT INITIAL CONSTRUCTION)
HWL = 655
BERM = 656
NWL = 650
DOES NOT DRAWDOWN WITHIN 48 HRS

COMPENSATORY STORAGE
SITE: CS7-W
AVAILABLE STORAGE:
NORMAL - 10YR: 0.0 AC-FT
10-100YR: 6.91 AC-FT

POND DESIGNED TO BE ACCESSED ABOVE 10-YEAR WSEL
100 YR = 652.70
10 YR = 650.60
BASIN BOTTOM = 649.00

COMPENSATORY STORAGE BASIN BOTTOM SLOPES TO OUTLET INV.=649.0

OUTLET CONTROL STRUCTURE INV=649.50 6" RESTRICTOR

BACKFLOW PREVENTION DEVICE INV=649.00

COMPENSATORY STORAGE
SITE: CS7-E
AVAILABLE STORAGE:
NORMAL - 10YR: 5.36 AC-FT
10-100YR: 2.38 AC-FT
100 YR = 652.70
10 YR = 650.60
BASIN BOTOM = 648.00

COMPENSATORY STORAGE
SITE: CS7-E
AVAILABLE STORAGE:
NORMAL - 10YR: 5.36 AC-FT
10-100YR: 2.38 AC-FT
100 YR = 652.70
10 YR = 650.60
BASIN BOTOM = 648.00

100-YR FLOODPLAIN 652.70

COMPENSATORY STORAGE BASIN BOTTOM SLOPES TO OUTLET INV.=648.0

EX. OUTLET HG 11

JAWA ESMT

AC

BUCKEYE PARTNERS 372LL

NATURAL GAS PIPELINE CO. OF AMERICA

COMCAST

NICOR

1"=100'

I-90 West (STA. 3826+00 TO STA. 3848+50)

Normal Elevation	650.74 ft
10-Year Elevation	656.50 ft
100-Year Elevation	658.20 ft

	Normal - 10 YR (SF)	10 YR -100 YR (SF)	Normal - 10 YR (AC-FT)	10 YR - 100 YR (AC-FT)
3826+00	0	0		
			0.00	0.00
3826+50	0	0		
			0.00	0.00
3827+00	0	0		
			0.00	0.00
3827+50	0	2.6		
			0.00	0.00
3828+00	0	3.7		
			0.00	0.00
3828+50	0	3.0		
			0.00	0.01
3829+00	0.3	10.1		
			0.00	0.02
3829+50	1.3	28.9		
			0.00	0.03
3830+00	5.1	31.0		
			0.01	0.04
3830+50	9.6	43.4		
			0.01	0.05
3831+00	12.9	46.3		
			0.02	0.06
3831+50	14.1	59.6		
			0.01	0.07
3832+00	1.8	59.7		
			0.00	0.06
3832+50	2.2	44.1		
			0.00	0.05
3833+00	4.2	44.3		
			0.01	0.07
3833+50	12.6	74.6		
			0.01	0.07
3834+00	13.5	54.5		
			0.02	0.07
3834+50	12.7	55.2		
			0.02	0.06
3835+00	18.1	55.4		
			0.02	0.06
3835+50	23.9	56.7		
			0.03	0.07
3836+00	32	61		
			0.04	0.07
3836+50	39.7	64.9		
			0.04	0.08
3837+00	38	68.4		
			0.07	0.10
3837+50	75.9	114.3		
			0.07	0.12
3838+00	51.3	87.6		
			0.06	0.10
3838+50	49.5	83.1		
			0.06	0.10
3839+00	48	85.90		
			0.06	0.10
3839+50	51.9	89.20		
			0.07	0.11
3840+00	68.1	106.8		
			0.11	0.17
3840+50	127.5	181.7		
			0.27	0.22
3841+00	336.1	203.7		
			0.26	0.21
3841+50	109.1	157.9		
			0.14	0.18
3842+00	129.3	158.0		
			0.15	0.18
3842+50	124.8	158.1		
			0.15	0.18
3843+00	131.4	158.4		
			0.16	0.18
3843+50	145.7	161.5		
			0.14	0.18
3844+00	94.6	143.9		
			0.08	0.14
3844+50	48	94.7		
			0.04	0.08

ex. culvert fill less, but similar to pr. culvert excavation
*difference insignificant compared to roadway comp storage mitigation

FP 1/6

3845+00	13.6	42.0		
			0.02	0.06
3845+50	17.4	65.8		
			0.10	0.16
3846+00	151.9	215.1		
			0.11	0.22
3846+50	44.9	175.9		
			0.03	0.12
3847+00	0	27.3		
			0.01	0.06
3847+50	10.4	79.1		
			0.01	0.05
3848+00	0	0		
			0.00	0.00
3848+50	0	0		
		Total	**2.38**	**3.97**

FP 2/6

Elmhurst Road (STA. 105+00 TO STA. 119+50)

Normal Elevation	647.69 ft
10-Year Elevation	653.90 ft
100-Year Elevation	657.80 ft

	Normal - 10 YR (SF)	10 YR -100 YR (SF)	Normal - 10 YR (AC-FT)	10 YR - 100 YR (AC-FT)	
105+00	0	0			
			0.00	0.00	
105+50	0	0			
			0.00	0.01	
106+00	0	13.1			
			0.00	0.02	
106+50	0	19.8			
			0.00	0.03	
107+00	0	29.7			
			0.00	0.06	
107+50	0	66.7			
			0.00	0.09	
108+00	0	83.6			
			0.00	0.05	
108+50	0	8.4			
			0.00	0.00	
108+65	0	10			
			0.00	0.04	
109+00	0.8	82			
			0.00	0.12	
109+50	0.8	120.5			
			0.00	0.15	
110+00	0.8	134.1			
			0.00	0.17	
110+50	1.1	157.8			
			0.00	0.19	
111+00	2.4	175.1			
			0.01	0.17	
111+50	16.6	123.7			
			0.00	0.02	
111+58	16.6	123.7			bridge opening
					no fill in bridge opening
111+92	8.3	87			bridge opening
			0.00	0.02	
112+00	8.3	87			
			0.00	0.08	47' apart
107+00	0	53.5			
			0.00	0.05	
107+50	0	26.7			
			0.00	0.02	
108+00	0	11.5			
			0.00	0.01	
108+50	0	4.9			
			0.00	0.00	
108+86	0	2.5			
			0.00	0.00	
109+00	0	0.5			
			0.00	0.00	
109+50	0	0			
			0.00	0.00	
110+00	0	0			
			0.00	0.00	
110+50	0	0.1			
			0.00	0.00	
111+00	0	0			
			0.00	0.00	
111+50	0	0.00			
			0.00	0.00	
112+00	0	0.00			
			0.00	0.00	
112+50	0	0			
			0.00	0.00	
113+00	0	0			
			0.00	0.00	
113+50	0	0			
			0.00	0.00	
114+00	0	0			
			0.00	0.00	
114+50	0	0			
			0.00	0.00	
115+00	0	0			
			0.00	0.00	
115+50	0	0			
			0.00	0.00	
116+00	0	0			
			0.00	0.00	

R 2 Alignment

FP 3/6

116+50	0	0		
			0.00	0.00
117+00	0	0		
			0.00	0.00
117+50	0	0		
			0.00	0.00
117+75	0	0		
			0.00	0.00
118+00	0	0		
			0.00	0.00
118+50	0	0		
			0.00	0.00
119+00	0	0		
			0.00	0.00
119+28	0	0.1		
			0.00	0.00
119+34	0	0		
			0.00	0.00
119+50	0	0		
		Total	0.03	1.28

FP 4/6

Jane Addams Memorial Tollway (I-90, East) (STA. 3854+00 to STA. 3884+00)

Normal Elevation 646.12 ft
10-Year Elevation 650.60 ft
100-Year Elevation 652.70 ft

	Normal - 10 YR (SF)	10 YR -100 YR (SF)	Normal - 10 YR (AC-FT)	10 YR - 100 YR (AC-FT)
3854+00	0	0		
			0.00	0.00
3854+50	0	0		
			0.00	0.00
3855+00	0	0		
			0.00	0.00
3855+50	0	0		
			0.00	0.00
3856+00	0	0		
			0.00	0.00
3856+50	0	0		
			0.00	0.00
3857+00	0	0		
			0.00	0.00
3857+50	0	0		
			0.00	0.00
3858+00	0	0		
			0.00	0.00
3858+50	0	0		
			0.00	0.00
3859+00	0	0		
			0.00	0.00
3859+50	0	0		
			0.00	0.00
3860+00	0	0		
			0.00	0.00
3860+50	0	0		
			0.00	0.00
3861+00	0	0		
			0.00	0.00
3861+50	0	0.2		
			0.00	0.00
3862+00	0	0.4		
			0.00	0.00
3862+50	0	1.0		
			0.00	0.00
3863+00	0	2.2		
			0.00	0.00
3863+50	0	2.8		
			0.00	0.00
3864+00	0	5.1		
			0.00	0.01
3864+50	0	15.1		
			0.00	0.02
3865+00	0	14.4		
			0.00	0.02
3865+50	0	15.1		
			0.00	0.01
3866+00	0	4		
			0.00	0.01
3866+50	0	6.9		
			0.00	0.01
3867+00	0	16.20		
			0.00	0.02
3867+50	0	20.10		
			0.00	0.03
3868+00	0	32.4		
			0.00	0.04
3868+50	0	35.9		
			0.00	0.04
3869+00	0	37.3		
			0.00	0.04
3869+50	0	40.1		
			0.00	0.05
3870+00	1.8	48.4		
			0.00	0.06
3870+50	3.2	62.2		
			0.01	0.09
3871+00	7.6	88.1		
			0.01	0.11
3871+50	12.8	107.1		
			0.03	0.13
3872+00	31.3	124.1		
			0.04	0.11
3872+50	32.2	60.4		
			0.01	0.01

FP 5/6

3872+58	32.2	60.4			bridge opening
3873+00	0	0			no fill within bridge opening
3873+42	0	9.6			bridge opening
			0.00	0.00	
3873+50	0	9.6			
			0.00	0.01	
3874+00	0	11.4			
			0.00	0.01	
3874+50	0.9	11.3			
			0.01	0.02	
3875+00	8.2	18.4			
			0.01	0.02	
3875+50	10	20.5			
			0.01	0.03	
3876+00	10.6	23.5			
			0.02	0.03	
3876+50	17.9	29.9			
			0.02	0.04	
3877+00	16.5	32.3			
			0.02	0.04	
3877+50	18.3	35			
			0.02	0.04	
3878+00	16.7	34			
			0.02	0.04	
3878+50	21	38.4			
			0.03	0.05	
3879+00	23	50.9			
			0.02	0.07	
3879+50	19.9	78.1			
			0.02	0.09	
3880+00	11.1	75.9			
			0.02	0.09	
3880+50	17.4	87.4			
			0.02	0.09	
3881+00	11.9	75.2			
			0.01	0.09	
3881+50	9.9	76.2			
			0.01	0.07	
3882+00	6.7	41			
			0.01	0.05	
3882+50	9.4	51.8			
			0.01	0.06	
3883+00	4.1	45.2			
			0.01	0.07	
3883+50	9.5	80.5			
			0.01	0.05	
3884+00	0	0			
		Total	**0.37**	**1.89**	

FP 6/6

I-90 West (STA. 3826+00 TO STA. 3848+50)

Normal Elevation	650.74 ft
10-Year Elevation	656.50 ft
100-Year Elevation	658.20 ft

	Normal - 10 YR (SF)	10 YR -100 YR (SF)	Normal - 10 YR (AC-FT)	10 YR - 100 YR (AC-FT)
3826+00	0	0		
			0.00	0.00
3826+50	0	0		
			0.00	0.00
3827+00	0	0		
			0.00	0.00
3827+50	0	0		
			0.00	0.00
3828+00	0	0		
			0.00	0.00
3828+50	0	0.0		
			0.00	0.00
3829+00	0	0		
			0.00	0.00
3829+50	0	0		
			0.00	0.00
3830+00	0	0.0		
			0.00	0.00
3830+50	0	0		
			0.00	0.00
3831+00	0	0		
			0.00	0.00
3831+50	0	0		
			0.00	0.01
3832+00	0	20.6		
			0.00	0.01
3832+50	0	2.8		
			0.00	0.00
3833+00	0	0.2		
			0.00	0.01
3833+50	4.1	21.7		
			0.00	0.01
3834+00	0	0		
			0.00	0.00
3834+50	0	0		
			0.00	0.00
3835+00	0	0		
			0.00	0.00
3835+50	0.4	0		
			0.00	0.00
3836+00	3.1	1.1		
			0.01	0.00
3836+50	7.2	5.7		
			0.01	0.01
3837+00	8.3	10.9		
			0.03	0.04
3837+50	49.5	60.5		
			0.04	0.05
3838+00	18.3	32.8		
			0.02	0.04
3838+50	20.9	30.2		
			0.02	0.04
3839+00	22	32.50		
			0.03	0.04
3839+50	27.1	35.50		
			0.04	0.06
3840+00	45.1	64.1		
			0.10	0.14
3840+50	127.5	181.7		
			0.27	0.22
3841+00	336.1	203.7		
			0.26	0.20
3841+50	109.1	149.7		
			0.10	0.12
3842+00	64.9	54.4		
			0.07	0.06
3842+50	61.9	42.9		
			0.07	0.05
3843+00	67.3	38.8		
			0.08	0.05
3843+50	72	42		
			0.06	0.04
3844+00	37.2	34.6		
			0.02	0.02
3844+50	0	0		
		Total	**1.24**	**1.22**

FW 1/4

Elmhurst Road (STA. 105+00 TO STA. 119+50)

Normal Elevation	647.69 ft
10-Year Elevation	653.90 ft
100-Year Elevation	657.80 ft

	Normal - 10 YR (SF)	10 YR -100 YR (SF)	Normal - 10 YR (AC-FT)	10 YR - 100 YR (AC-FT)	
105+00	0	0			
			0.00	0.00	
105+50	0	0			
			0.00	0.00	
106+00	0	0			
			0.00	0.00	
106+50	0	0			
			0.00	0.00	
107+00	0	0			
			0.00	0.00	
107+50	0	0			
			0.00	0.00	
108+00	0	0			
			0.00	0.00	
108+50	0	0			
			0.00	0.00	
108+65	0	0			
			0.00	0.00	
109+00	0	0			
			0.00	0.00	
109+50	0	0			
			0.00	0.00	
110+00	0	0			
			0.00	0.00	
110+50	0	0			
			0.00	0.00	
111+00	0	0			
111+50	16.6	123.7			floodway impacts start at sta. 111+50
			0.00	0.02	
111+58	16.6	123.7			bridge opening
					no fill in bridge opening
111+92	8.3	87			bridge opening
			0.00	0.02	
112+00	8.3	87			
			0.01	0.09	floodway ends at sta. 112+12
112+12	8.3	87			
107+00	0	0			
			0.00	0.00	
107+50	0	0			
			0.00	0.00	
108+00	0	0			
			0.00	0.00	
108+86	0	0			
			0.00	0.00	
109+00	0	0			
			0.00	0.00	
109+50	0	0			
			0.00	0.00	
110+00	0	0			
			0.00	0.00	
110+50	0	0			
			0.00	0.00	
111+00	0	0			
			0.00	0.00	
111+50	0	0			
			0.00	0.00	
112+00	0	0			
			0.00	0.00	
112+50	0	0			
			0.00	0.00	
113+00	0	0			
			0.00	0.00	
113+50	0	0			
			0.00	0.00	
114+00	0	0			
			0.00	0.00	
114+50	0	0			
			0.00	0.00	
115+00	0	0			
			0.00	0.00	
115+50	0	0			
			0.00	0.00	
116+00	0	0			
			0.00	0.00	

R 2 Alignment

FW 2/4

116+50	0	0		
			0.00	0.00
117+00	0	0		
			0.00	0.00
117+50	0	0		
			0.00	0.00
117+75	0	0		
			0.00	0.00
118+00	0	0		
			0.00	0.00
118+50	0	0		
			0.00	0.00
119+00	0	0		
			0.00	0.00
119+28	0	0.1		
			0.00	0.00
119+34	0	0		
			0.00	0.00
119+50	0	0		
		Total	**0.01**	**0.13**

FW 3/4

Jane Addams Memorial Tollway (I-90, East) (STA. 3854+00 to STA. 3884+00)

Normal Elevation 646.12 ft
10-Year Elevation 650.60 ft
100-Year Elevation 652.70 ft

	Normal - 10 YR (SF)	10 YR -100 YR (SF)	Normal - 10 YR (AC-FT)	10 YR - 100 YR (AC-FT)
3854+00	0	0		
			0.00	0.00
3854+50	0	0		
			0.00	0.00
3855+00	0	0		
			0.00	0.00
3855+50	0	0		
			0.00	0.00
3856+00	0	0		
			0.00	0.00
3856+50	0	0		
			0.00	0.00
3857+00	0	0		
			0.00	0.00
3857+50	0	0		
			0.00	0.00
3858+00	0	0		
			0.00	0.00
3858+50	0	0		
			0.00	0.00
3859+00	0	0		
			0.00	0.00
3859+50	0	0		
			0.00	0.00
3860+00	0	0		
			0.00	0.00
3860+50	0	0		
			0.00	0.00
3861+00	0	0		
			0.00	0.00
3861+50	0	0		
			0.00	0.00
3862+00	0	0		
			0.00	0.00
3862+50	0	0		
			0.00	0.00
3863+00	0	0		
			0.00	0.00
3863+50	0	0		
			0.00	0.00
3864+00	0	0		
			0.00	0.00
3864+50	0	0		
			0.00	0.00
3865+00	0	0		
			0.00	0.00
3865+50	0	0		
			0.00	0.00
3866+00	0	0		
			0.00	0.00
3866+50	0	0		
			0.00	0.00
3867+00	0	0		
			0.00	0.00
3867+50	0	0		
			0.00	0.00
3868+00	0	0		
			0.00	0.00
3868+50	0	0		
			0.00	0.00
3869+00	0	0		
			0.00	0.00
3869+50	0	0		
			0.00	0.00
3870+00	0	0		
			0.00	0.00
3870+50	0	0		
			0.00	0.00
3871+00	0	0		
			0.00	0.00
3871+50	0	0		
			0.00	0.00
3872+00	0	0		
		Subtotal:	**0.00**	**0.00**

	Normal - 10YR (SF)	10 YR -100 YR (SF)	Normal - 10YR (AC-FT)	10 YR - 100 YR (AC-FT)
3872+00	0	0		
			0.00	0.00
3872+50	0	0		
			0.00	0.00
3873+00	0	0		
			0.00	0.00
3873+50	0	0		
			0.00	0.00
3874+00	0	3		
			0.00	0.00
3874+50	0	0		
		Subtotal:	**0.00**	**0.00**
		+	**0.00**	**0.00**
		TOTAL:	**0.00**	**0.00**

*Proposed bridge spans floodway

FW 4/4

HIGGINS RDY IL-72

ELMHURST RD

LANDMEIER RD

EX. OUTLET HG 1

MADISON ST

MCKINLEY ST

TYLER RD

MCKINLEY RD

MATCH LINE STA 80+00

NOTES:
1. INLET LOCATIONS ARE FOR ILLUSTRATION PURPOSE ONLY.
2. DSE SHALL CONSIDER THE INSTALLATION OF FURROW'S ON EMBANKMENTS WHICH ARE NOT BELOW A GUTTER OR RETAINING WALLS. FOR DETAILS SEE DD-2.
3. DSE SHALL CONSIDER THE INSTALLATION OF PREFABRICATED CONCRETE BMP DITCH CHECKS. FOR DETAILS SEE DD-3.

LEGEND

	EXISTING	PROPOSED
REFERENCE LINE/CENTERLINE AND STATIONING	1930+00	1830+00
RIGHT OF WAY LINE		
DRAINAGE DIVIDE (HYDROLOGIC ATLAS)		

	PROPOSED
TEMPORARY EASEMENT	
PERMANENT EASEMENT	
STORM SEWER REMOVAL	

	EXISTING	PROPOSED
HEADWALL		
CATCH BASIN		
INLET/SCUPPER		
MANHOLE		
INVERT	(XXX.XX)	XXX.XX
STORM SEWER		

	EXISTING	PROPOSED
OVERFLOW		
OUTLET		
SHEET FLOW		

	EXISTING	PROPOSED
BIOSWALE		
GRASS SWALE		
SWALE		
DITCH SUMMIT		
BMP FEATURE		

CALLOUT

(1) STORM SEWER 12" (5) STORM SEWER 30" (9) STORM SEWER 54" (13) CATCH BASIN
(2) STORM SEWER 15" (6) STORM SEWER 36" (10) STORM SEWER 60" (14) HEADWALL
(3) STORM SEWER 18" (7) STORM SEWER 42" (11) STORM SEWER 72" (15) MANHOLE W/ RESTRICTOR
(4) STORM SEWER 24" (8) STORM SEWER 48" (12) MANHOLE

SCALE IN FEET
0 50 100

FILE NAME = DIEOWB-PC-HY-sht-PR-Plan-001	USER NAME = eanderson	DESIGNED MA	REVISED -
CHRISTOPHER B. BURKE ENGINEERING, LTD 9575 W. Higgins Road, Suite 600 Rosemont, Illinois 60018 (847) 823-0500		DRAWN EB	REVISED -
	PLOT SCALE = 100'	CHECKED CW	REVISED -
	PLOT DATE = 11/7/2012	DATE -	REVISED -

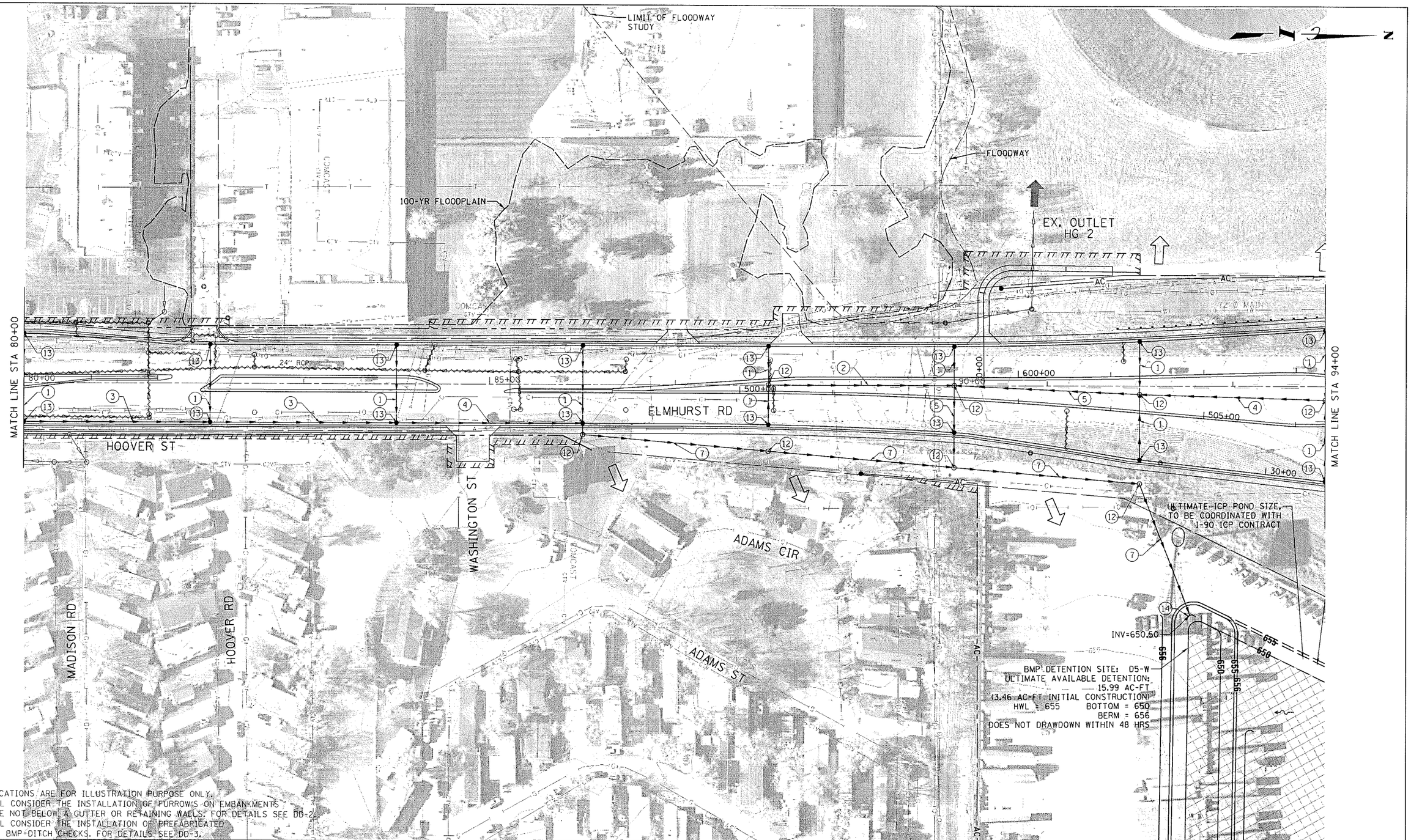
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

DRAINAGE PLANS
ELMHURST ROAD

SCALE: | SHEET NO. 1 OF 18 SHEETS | STA. 67+00 | TO STA. 80+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	224	94
DRAWING NO. DR-1		CONTRACT NO.		
PROJECT C	ILLINOIS	FED. AID PROJECT		

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NOTES:
1. INLET LOCATIONS ARE FOR ILLUSTRATION PURPOSE ONLY.
2. DSE SHALL CONSIDER THE INSTALLATION OF FURROWS ON EMBANKMENTS WHICH ARE NOT BELOW A GUTTER OR RETAINING WALLS. FOR DETAILS SEE DD-2.
3. DSE SHALL CONSIDER THE INSTALLATION OF PREFABRICATED CONCRETE BMP-DITCH CHECKS. FOR DETAILS SEE DD-3.

LEGEND

	EXISTING	PROPOSED
REFERENCE LINE/CENTERLINE AND STATIONING	1930+00	1830+00
RIGHT OF WAY LINE		
DRAINAGE DIVIDE (HYDROLOGIC ATLAS)		

	PROPOSED
TEMPORARY EASEMENT	
PERMANENT EASEMENT	
STORM SEWER REMOVAL	

	EXISTING	PROPOSED
HEADWALL		
CATCH BASIN		
INLET/SCUPPER		
MANHOLE		
INVERT	(XXX.XX)	XXX.XX
STORM SEWER		

	EXISTING	PROPOSED
OVERFLOW		
OUTLET		
SHEET FLOW		

	EXISTING	PROPOSED
BIOSWALE		
GRASS SWALE		
SWALE		
DITCH SUMMIT		
BMP FEATURE		

CALLOUT

(1) STORM SEWER 12"	(5) STORM SEWER 30"	(9) STORM SEWER 54"	(13) CATCH BASIN
(2) STORM SEWER 15"	(6) STORM SEWER 36"	(10) STORM SEWER 60"	(14) HEADWALL
(3) STORM SEWER 18"	(7) STORM SEWER 42"	(11) STORM SEWER 72"	(15) MANHOLE W/ RESTRICTOR
(4) STORM SEWER 24"	(8) STORM SEWER 48"	(12) MANHOLE	

FILE NAME = DIEOWB-PC-HY-sht-PR-Plan-002	USER NAME = eanderson	DESIGNED MA	REVISED -
CHRISTOPHER B. BURKE ENGINEERING, LTD. 9575 W. Higgins Road, Suite 600 Rosemont, Illinois 60018 (847) 823-0500		DRAWN EB	REVISED -
	PLOT SCALE = 100'	CHECKED CW	REVISED -
	PLOT DATE = 11/7/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

DRAINAGE PLANS
ELMHURST ROAD

SCALE: | SHEET NO. 2 OF 18 SHEETS | STA. 80+00 | TO STA. 94+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	224	95
DRAWING NO. DR-2		CONTRACT NO.		
PROJECT C	ILLINOIS FED. AID PROJECT			

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LEGEND

	EXISTING	PROPOSED
REFERENCE LINE/CENTERLINE AND STATIONING	1930+00	1830+00
RIGHT OF WAY LINE		
DRAINAGE DIVIDE (HYDROLOGIC ATLAS)		

	PROPOSED
TEMPORARY EASEMENT	
PERMANENT EASEMENT	
STORM SEWER REMOVAL	

	EXISTING	PROPOSED
HEADWALL		
CATCH BASIN		
INLET/SCUPPER		
MANHOLE		
INVERT	(XXX.XX)	XXX.XX
STORM SEWER		

	EXISTING	PROPOSED
OVERFLOW		
OUTLET		
SHEET FLOW		

	EXISTING	PROPOSED
BIOSWALE		
GRASS SWALE		
SWALE		
DITCH SUMMIT		
BMP FEATURE		

CALLOUT

(1) STORM SEWER 12"	(5) STORM SEWER 30"	(9) STORM SEWER 54"	(13) CATCH BASIN
(2) STORM SEWER 15"	(6) STORM SEWER 36"	(10) STORM SEWER 60"	(14) HEADWALL
(3) STORM SEWER 18"	(7) STORM SEWER 42"	(11) STORM SEWER 72"	(15) MANHOLE W/ RESTRICTOR
(4) STORM SEWER 24"	(8) STORM SEWER 48"	(12) MANHOLE	

NOTES:
1. INLET LOCATIONS ARE FOR ILLUSTRATION PURPOSE ONLY.
2. DSE SHALL CONSIDER THE INSTALLATION OF FURROW'S ON EMBANKMENTS WHICH ARE NOT BELOW A GUTTER OR RETAINING WALLS. FOR DETAILS SEE DD-2.
3. DSE SHALL CONSIDER THE INSTALLATION OF PREFABRICATED CONCRETE BMP DITCH CHECKS. FOR DETAILS SEE DD-3.

MATCH LINE STA 94+00

MATCH LINE STA 108+00

100-YR FLOODPLAIN 658.20

HIGGINS CREEK TRIB. A
COMP. STORAGE SITE: CSG-E

AVAILABLE STORAGE:
NORMAL - 10YR: 1.14 AC-FT
10-100YR: 1.01 AC-FT

INV=654.00

INV=653.75

HIGGINS CREEK

ELMHURST RD

RAMP Y2

RAMP Y1

RAMP Y3

RAMP X2

RAMP X1

RAMP Y4

JANE ADDAMS MEM TOLLWAY (I-90) EB

JANE ADDAMS MEM TOLLWAY (I-90) WB

ULTIMATE ICP POND SIZE, TO BE COORDINATED WITH I-90 ICP CONTRACT

100-YR FLOODPLAIN 652.70

INFILITRATION AREA 1A053

INFILITRATION AREA 1A054

WILLE RD

JAWA

24" RCP

CONC DRAIN

AC

SCALE IN FEET
0 50 100

FILE NAME = DIEOWB-PC-HY-sht-PR-Plan-003	USER NAME = eanderson	DESIGNED MA	REVISED -
CHRISTOPHER B. BURKE ENGINEERING, LTD 9575 W. Higgins Road, Suite 600 Rosemont, Illinois 60018 (847) 823-0500		DRAWN EB	REVISED -
	PLOT SCALE = 100'	CHECKED CW	REVISED -
	PLOT DATE = 11/7/2012	DATE -	REVISED -

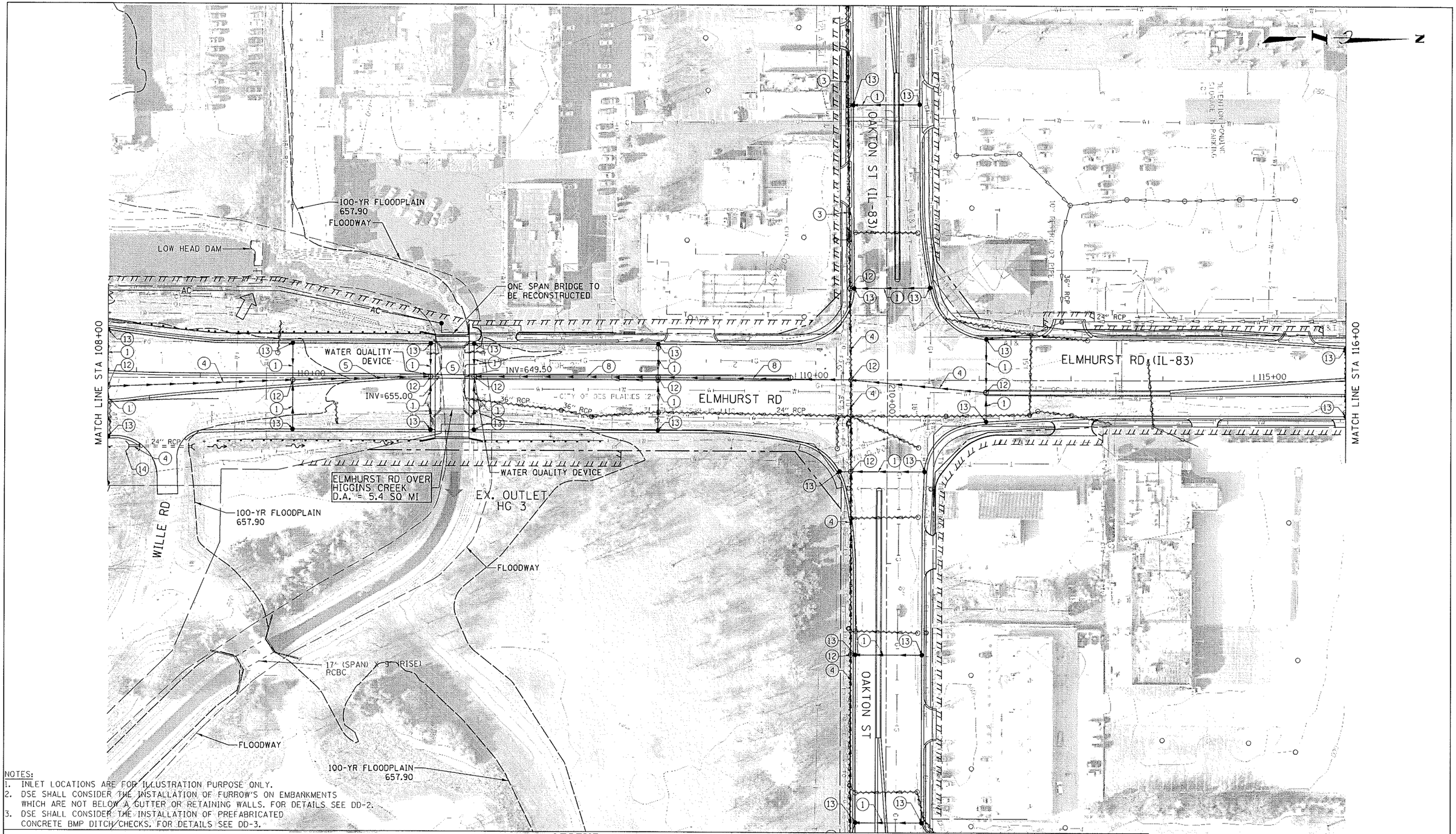
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

DRAINAGE PLANS
ELMHURST ROAD

SCALE: | SHEET NO. 3 OF 18 SHEETS | STA. 94+00 TO STA. 108+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	224	96
DRAWING NO. DR-3		CONTRACT NO.		
PROJECT C	ILLINOIS	FED. AID PROJECT		

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NOTES:
1. INLET LOCATIONS ARE FOR ILLUSTRATION PURPOSE ONLY.
2. DSE SHALL CONSIDER THE INSTALLATION OF FURROW'S ON EMBANKMENTS WHICH ARE NOT BELOW A GUTTER OR RETAINING WALLS. FOR DETAILS SEE DD-2.
3. DSE SHALL CONSIDER THE INSTALLATION OF PREFABRICATED CONCRETE BMP DITCH CHECKS. FOR DETAILS SEE DD-3.

LEGEND

	EXISTING	PROPOSED
REFERENCE LINE/CENTERLINE AND STATIONING	1930+00	1830+00
RIGHT OF WAY LINE		
DRAINAGE DIVIDE (HYDROLOGIC ATLAS)		

	PROPOSED
TEMPORARY EASEMENT	
PERMANENT EASEMENT	
STORM SEWER REMOVAL	

	EXISTING	PROPOSED
HEADWALL		
CATCH BASIN		
INLET/SCUPPER		
MANHOLE		
INVERT	(XXX.XX)	XXX.XX
STORM SEWER		

	EXISTING	PROPOSED
OVERFLOW		
OUTLET		
SHEET FLOW		

	EXISTING	PROPOSED
BIOSWALE		
GRASS SWALE		
SWALE		
DITCH SUMMIT		
BMP FEATURE		

CALLOUT

(1)	STORM SEWER 12"	(5)	STORM SEWER 30"	(9)	STORM SEWER 54"	(13)	CATCH BASIN
(2)	STORM SEWER 15"	(6)	STORM SEWER 36"	(10)	STORM SEWER 60"	(14)	HEADWALL
(3)	STORM SEWER 18"	(7)	STORM SEWER 42"	(11)	STORM SEWER 72"	(15)	MANHOLE W/ RESTRICTOR
(4)	STORM SEWER 24"	(8)	STORM SEWER 48"	(12)	MANHOLE		

FILE NAME = DIEOWB-PC-HY-sht-PR-Plan-004	USER NAME = eanderson	DESIGNED MA	REVISED -
CHRISTOPHER B. BURKE ENGINEERING, LTD 9575 W. Higgins Road, Suite 600 Rosemont, Illinois 60018 (847) 823-0500		DRAWN EB	REVISED -
	PLOT SCALE = 100'	CHECKED CW	REVISED -
	PLOT DATE = 11/7/2012	DATE -	REVISED -

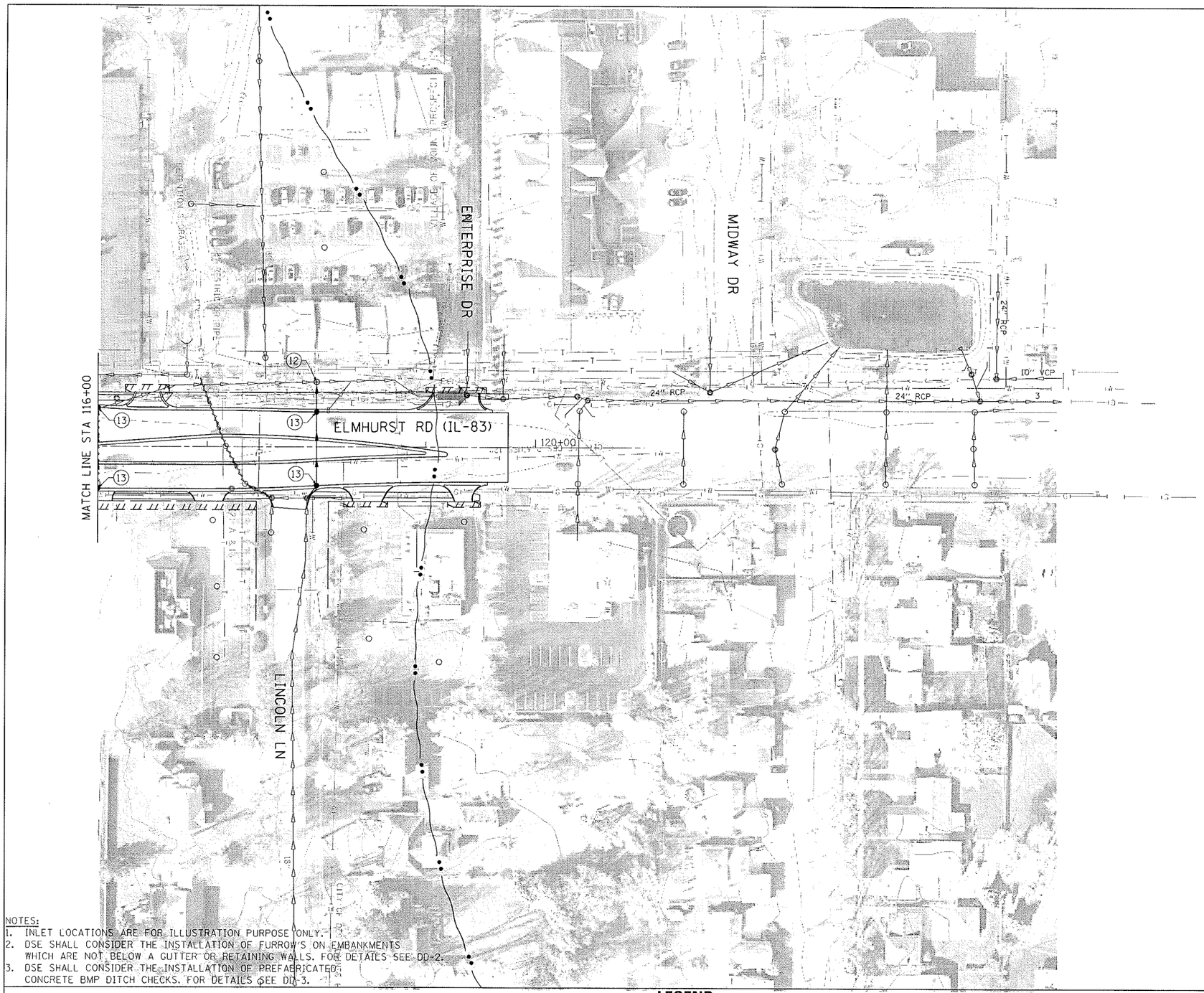
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

DRAINAGE PLANS
ELMHURST ROAD

SCALE: | SHEET NO. 4 OF 18 SHEETS | STA. 108+00 TO STA. 116+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	224	97
DRAWING NO. DR-4		CONTRACT NO.		
PROJECT C	ILLINOIS FED. AID PROJECT			

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NOTES:
1. INLET LOCATIONS ARE FOR ILLUSTRATION PURPOSE ONLY.
2. DSE SHALL CONSIDER THE INSTALLATION OF FURROW'S ON EMBANKMENTS WHICH ARE NOT BELOW A GUTTER OR RETAINING WALLS. FOR DETAILS SEE DD-2.
3. DSE SHALL CONSIDER THE INSTALLATION OF PREFABRICATED CONCRETE BMP DITCH CHECKS. FOR DETAILS SEE DD-3.

LEGEND

	EXISTING	PROPOSED
REFERENCE LINE/CENTERLINE AND STATIONING	1930+00	1830+00
RIGHT OF WAY LINE		
DRAINAGE DIVIDE (HYDROLOGIC ATLAS)		

	PROPOSED
TEMPORARY EASEMENT	
PERMANENT EASEMENT	
STORM SEWER REMOVAL	

	EXISTING	PROPOSED
HEADWALL		
CATCH BASIN		
INLET/SCUPPER		
MANHOLE		
INVERT	(XXX.XX)	XXX.XX
STORM SEWER		

	EXISTING	PROPOSED
OVERFLOW		
OUTLET		
SHEET FLOW		

	EXISTING	PROPOSED
BIOSWALE		
GRASS SWALE		
SWALE		
DITCH SUMMIT	<	>
BMP FEATURE		

CALLOUT

1. STORM SEWER 12"
2. STORM SEWER 15"
3. STORM SEWER 18"
4. STORM SEWER 24"
5. STORM SEWER 30"
6. STORM SEWER 36"
7. STORM SEWER 42"
8. STORM SEWER 48"
9. STORM SEWER 54"
10. STORM SEWER 60"
11. STORM SEWER 72"
12. MANHOLE
13. CATCH BASIN
14. HEADWALL
15. MANHOLE W/ RESTRICTOR

SCALE IN FEET
0 50 100

FILE NAME =	USER NAME = eenderson	DESIGNED MA	REVISED -
DIEOWB-PC-HY-sht-PR-Plan-005		DRAWN EB	REVISED -
CHRISTOPHER B. BURKE ENGINEERING, LTD 9575 W. Higgins Road, Suite 600 Rosemont, Illinois 60018 (847) 823-0500	PLOT SCALE = 100'	CHECKED CW	REVISED -
	PLOT DATE = 11/7/2012	DATE -	REVISED -

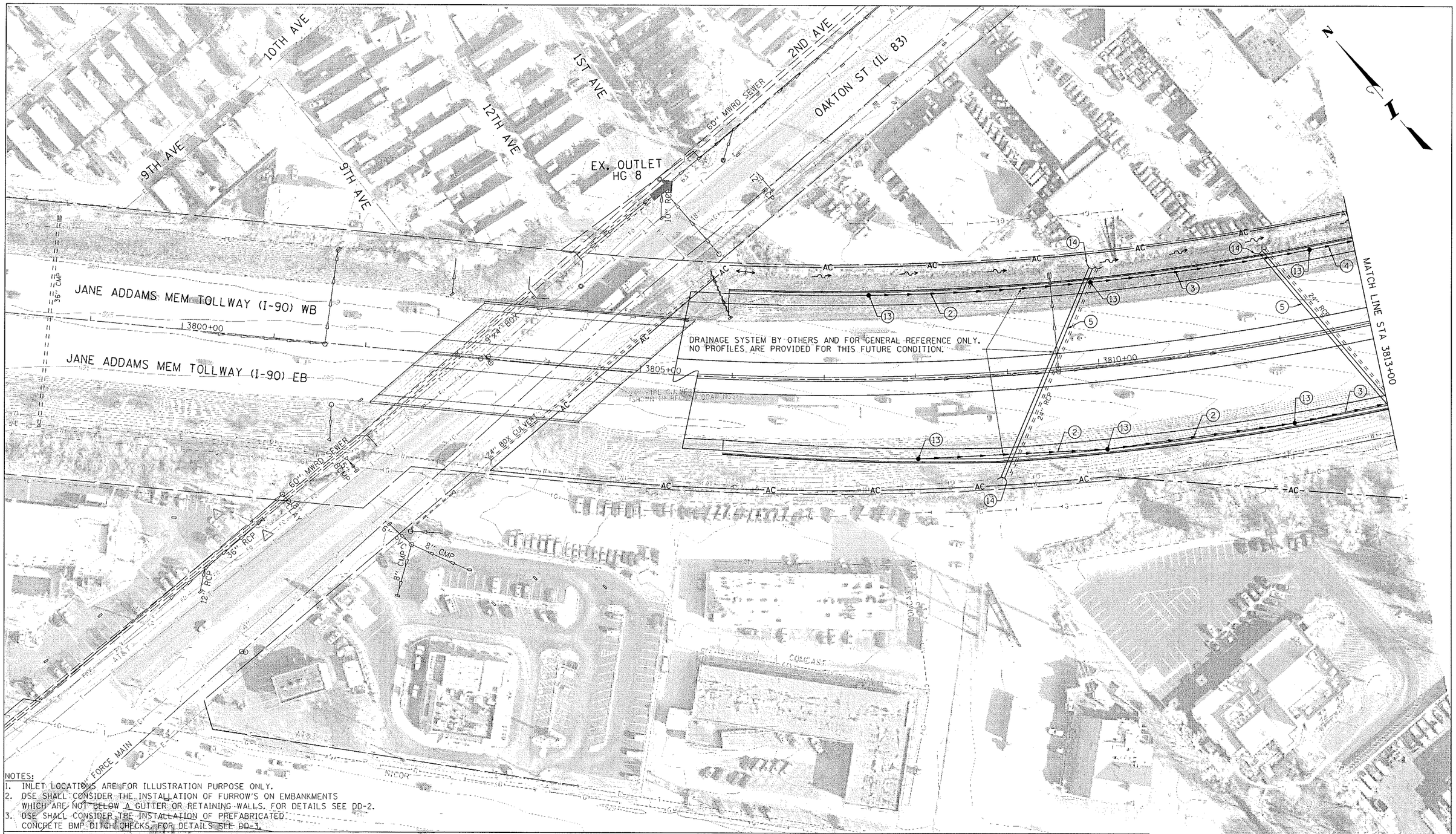
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

DRAINAGE PLANS
ELMHURST ROAD

SCALE: | SHEET NO. 5 OF 18 SHEETS | STA. 116+00 TO STA. 120+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	224	98
DRAWING NO. DR-5		CONTRACT NO.		
PROJECT C	ILLINOIS FED. AID PROJECT			

I:\36080 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\sheets\DIEOWB-PC-HY-sht-PR-Plan-005.dgn 12:04:57 PM



NOTES:
1. INLET LOCATIONS ARE FOR ILLUSTRATION PURPOSE ONLY.
2. DSE SHALL CONSIDER THE INSTALLATION OF FURROW'S ON EMBANKMENTS WHICH ARE NOT BELOW A GUTTER OR RETAINING WALLS. FOR DETAILS SEE DD-2.
3. DSE SHALL CONSIDER THE INSTALLATION OF PREFABRICATED CONCRETE BMP DITCH CHECKS. FOR DETAILS SEE DD-3.

LEGEND

	EXISTING	PROPOSED
REFERENCE LINE/CENTERLINE AND STATIONING	1930+00	1830+00
RIGHT OF WAY LINE		
DRAINAGE DIVIDE (HYDROLOGIC ATLAS)		

	PROPOSED
TEMPORARY EASEMENT	
PERMANENT EASEMENT	
STORM SEWER REMOVAL	

	EXISTING	PROPOSED
HEADWALL		
CATCH BASIN		
INLET/SCUPPER		
MANHOLE		
INVERT	(XXX.XX)	XXX.XX
STORM SEWER		

	EXISTING	PROPOSED
OVERFLOW		
OUTLET		
SHEET FLOW		

	EXISTING	PROPOSED
BIOSWALE		
GRASS SWALE		
SWALE		
DITCH SUMMIT < I >		
BMP FEATURE		

CALLOUT

(1)	STORM SEWER 12"	(5)	STORM SEWER 30"	(9)	STORM SEWER 54"	(13)	CATCH BASIN
(2)	STORM SEWER 15"	(6)	STORM SEWER 36"	(10)	STORM SEWER 60"	(14)	HEADWALL
(3)	STORM SEWER 18"	(7)	STORM SEWER 42"	(11)	STORM SEWER 72"	(15)	MANHOLE W/ RESTRICTOR
(4)	STORM SEWER 24"	(8)	STORM SEWER 48"	(12)	MANHOLE		

SCALE IN FEET
0 50 100

FILE NAME = DIEOWB-PC-HY-sht-PR-Plan-007	USER NAME = eanderson	DESIGNED MA	REVISED -
		DRAWN EB	REVISED -
	PLOT SCALE = 100'	CHECKED CW	REVISED -
	PLOT DATE = 11/7/2012	DATE -	REVISED -

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

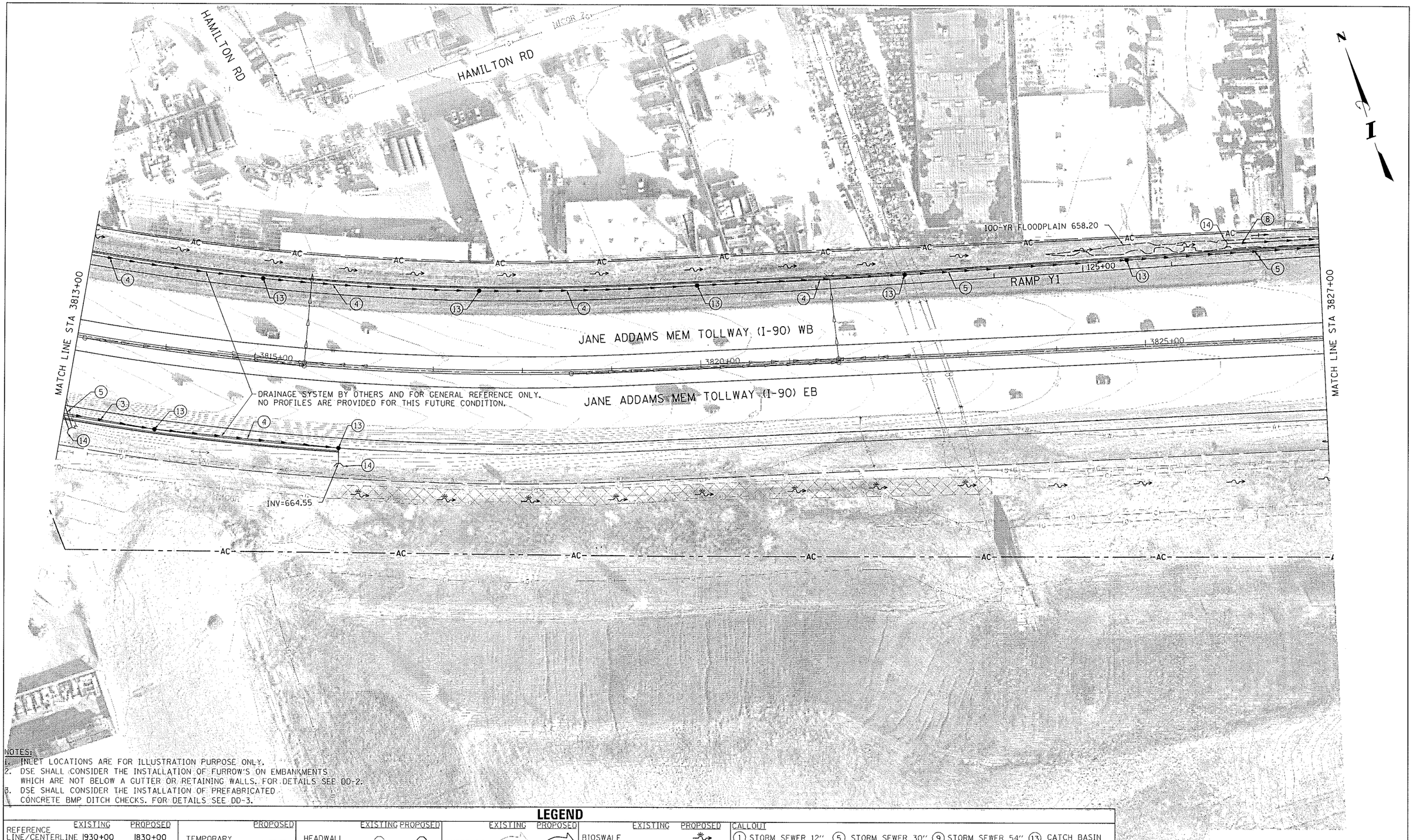
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

DRAINAGE PLANS
JANE ADDAMS MEM TOLLWAY (I-90)

SCALE: | SHEET NO. 6 OF 18 SHEETS | STA. 3805+00 TO STA. 3813+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	224	99
DRAWING NO. DR-6		CONTRACT NO.		
PROJECT C	ILLINOIS	FED. AID PROJECT		

Y:\36180 - Eglin O'Hare - West Bypass\TER_TWO\HY\CADD\sheets TCP Project C\sheets\DIEOWB-PC-HY-sht-PR-Plan-007.dgn 12:05:18 PM



NOTES:
1. INLET LOCATIONS ARE FOR ILLUSTRATION PURPOSE ONLY.
2. DSE SHALL CONSIDER THE INSTALLATION OF FURROW'S ON EMBANKMENTS WHICH ARE NOT BELOW A GUTTER OR RETAINING WALLS. FOR DETAILS SEE DD-2.
3. DSE SHALL CONSIDER THE INSTALLATION OF PREFABRICATED CONCRETE BMP DITCH CHECKS. FOR DETAILS SEE DD-3.

LEGEND

	EXISTING	PROPOSED
REFERENCE LINE/CENTERLINE AND STATIONING	1930+00	1830+00
RIGHT OF WAY LINE	——	——
DRAINAGE DIVIDE (HYDROLOGIC ATLAS)		

	PROPOSED
TEMPORARY EASEMENT	
PERMANENT EASEMENT	
STORM SEWER REMOVAL	

	EXISTING	PROPOSED
HEADWALL		
CATCH BASIN		
INLET/SCUPPER		
MANHOLE		
INVERT	(XXX.XX)	XXX.XX
STORM SEWER		

	EXISTING	PROPOSED
OVERFLOW		
OUTLET		
SHEET FLOW		

	EXISTING	PROPOSED
BIOSWALE		
GRASS SWALE		
SWALE		
DITCH SUMMIT		
BMP FEATURE		

CALLOUT

(1)	STORM SEWER 12"	(5)	STORM SEWER 30"	(9)	STORM SEWER 54"	(13)	CATCH BASIN
(2)	STORM SEWER 15"	(6)	STORM SEWER 36"	(10)	STORM SEWER 60"	(14)	HEADWALL
(3)	STORM SEWER 18"	(7)	STORM SEWER 42"	(11)	STORM SEWER 72"	(15)	MANHOLE W/ RESTRICTOR
(4)	STORM SEWER 24"	(8)	STORM SEWER 48"	(12)	MANHOLE		

SCALE IN FEET
0 50 100

FILE NAME = DIEOW8-PC-HY-sht-PR-Plan-008	USER NAME = eanderson	DESIGNED MA	REVISED -
CHRISTOPHER B. BURKE ENGINEERING, LTD. 9575 W. Higgins Road, Suite 606 Rosemont, Illinois 60018 (847)823-0500		DRAWN EB	REVISED -
	PLOT SCALE = 100'	CHECKED CW	REVISED -
	PLOT DATE = 11/7/2012	DATE -	REVISED -

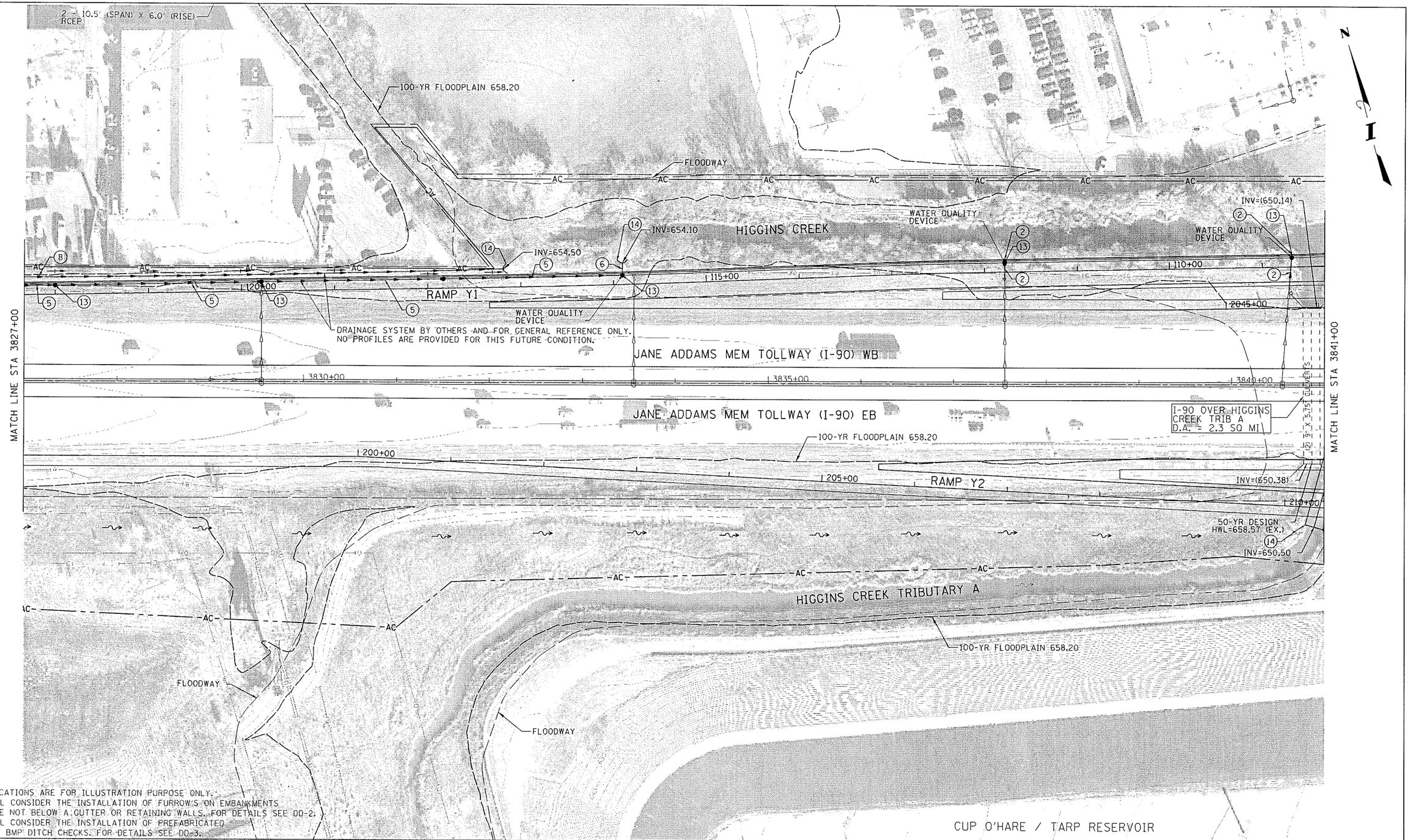
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

DRAINAGE PLAN
JANE ADDAMS MEM TOLLWAY (I-90)

SCALE: | SHEET NO. 7 OF 18 SHEETS | STA. 3813+00 TO STA. 3827+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	224	100
DRAWING NO. DR-7		CONTRACT NO.		
PROJECT C	ILLINOIS	FED. AID PROJECT		

Y:\36680 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TOP Project C\Sheets\DIEOW8-PC-HY-sht-PR-Plan-008.dgn 12:05:36 PM



NOTES:
1. INLET LOCATIONS ARE FOR ILLUSTRATION PURPOSE ONLY.
2. DSE SHALL CONSIDER THE INSTALLATION OF FURROWS ON EMBANKMENTS WHICH ARE NOT BELOW A GUTTER OR RETAINING WALLS. FOR DETAILS SEE DD-2.
3. DSE SHALL CONSIDER THE INSTALLATION OF PREFABRICATED CONCRETE BMP DITCH CHECKS. FOR DETAILS SEE DD-3.

LEGEND

	EXISTING	PROPOSED
REFERENCE LINE/CENTERLINE AND STATIONING	1930+00	1830+00
RIGHT OF WAY LINE		
DRAINAGE DIVIDE (HYDROLOGIC ATLAS)		
TEMPORARY EASEMENT		
PERMANENT EASEMENT		
STORM SEWER REMOVAL		
HEADWALL		
CATCH BASIN		
INLET/SCUPPER		
MANHOLE		
INVERT	(XXX.XX)	XXX.XX
STORM SEWER		
OVERFLOW		
OUTLET		
SHEET FLOW		
BIOSWALE		
GRASS SWALE		
SWALE		
DITCH SUMMIT		
BMP FEATURE		

CALLOUT
1. STORM SEWER 12"
2. STORM SEWER 15"
3. STORM SEWER 18"
4. STORM SEWER 24"
5. STORM SEWER 30"
6. STORM SEWER 36"
7. STORM SEWER 42"
8. STORM SEWER 48"
9. STORM SEWER 54"
10. STORM SEWER 60"
11. STORM SEWER 72"
12. MANHOLE
13. CATCH BASIN
14. HEADWALL
15. MANHOLE W/ RESTRICTOR

SCALE IN FEET
0 50 100

FILE NAME = DIEOWB-PC-HY-sht-PR-Plan-009	USER NAME = eanderson	DESIGNED MA	REVISED -
CHRISTOPHER B. BURKE (ENGINEERING, LTD 9575 W. Higgins Road, Suite 600 Rosemont, Illinois 60018 (847) 823-0999		DRAWN EB	REVISED -
	PLOT SCALE = 100'	CHECKED CW	REVISED -
	PLOT DATE = 11/7/2012	DATE -	REVISED -

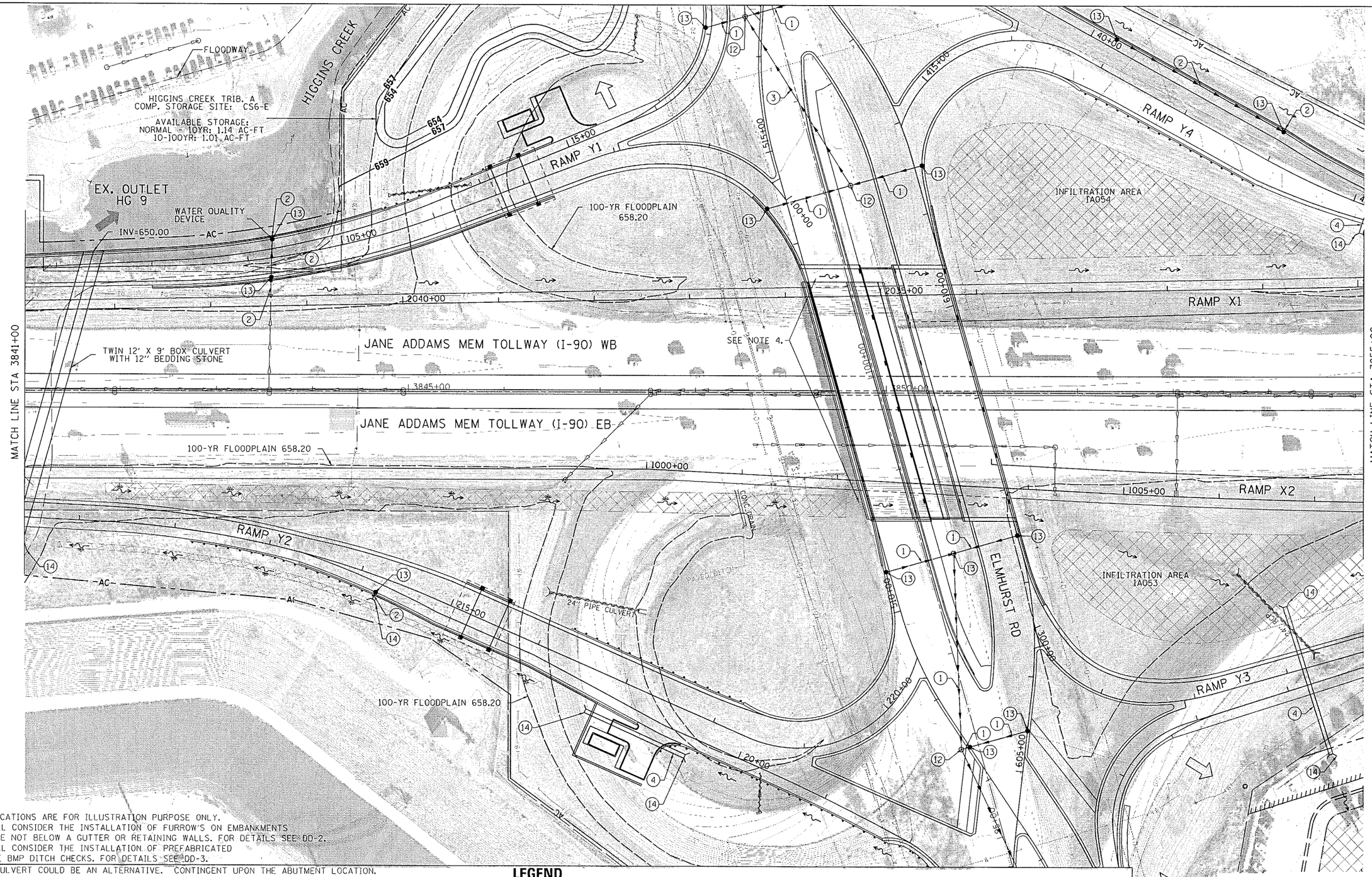
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

DRAINAGE PLANS
JANE ADDAMS MEM TOLLWAY (I-90)

SCALE: | SHEET NO. 8 OF 18 SHEETS | STA. 3827+00 TO STA. 3841+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	224	101
DRAWING NO. DR-8		CONTRACT NO.		
PROJECT C	ILLINOIS FED. AID PROJECT			

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HIGGINS CREEK TRIB. A
COMP. STORAGE SITE: CS6-E
AVAILABLE STORAGE:
NORMAL - 10YR: 1.14 AC-FT
10-100YR: 1.01 AC-FT
HIGGINS CREEK
FLOODWAY
EX. OUTLET
HG 9
WATER QUALITY
DEVICE
INV=650.00
RAMP Y1
100-YR FLOODPLAIN
658.20
INFILTRATION AREA
IA054
RAMP Y4
RAMP X1
JANE ADDAMS MEM TOLLWAY (I-90) WB
JANE ADDAMS MEM TOLLWAY (I-90) EB
TWIN 12' X 9' BOX CULVERT
WITH 12" BEDDING STONE
SEE NOTE 4.
RAMP X2
RAMP Y2
CONC. DRAIN
24" PIPE CULVERT
ELMHURST RD
INFILTRATION AREA
IA053
RAMP Y3
100-YR FLOODPLAIN 658.20
MATCH LINE STA 3841+00
MATCH LINE STA 3855+00
105+00
115+00
1200+00
1215+00
1400+00
1415+00
2040+00
2055+00
3845+00
3850+00
1000+00
1005+00
2015+00
2030+00
2045+00
2060+00
2075+00
2090+00
2105+00
2120+00
2135+00
2150+00
2165+00
2180+00
2195+00
2210+00
2225+00
2240+00
2255+00
2270+00
2285+00
2300+00
2315+00
2330+00
2345+00
2360+00
2375+00
2390+00
2405+00
2420+00
2435+00
2450+00
2465+00
2480+00
2495+00
2510+00
2525+00
2540+00
2555+00
2570+00
2585+00
2600+00

LEGEND

	EXISTING	PROPOSED
REFERENCE LINE/CENTERLINE AND STATIONING	1930+00	1830+00
RIGHT OF WAY LINE		
DRAINAGE DIVIDE (HYDROLOGIC ATLAS)		

	PROPOSED
TEMPORARY EASEMENT	
PERMANENT EASEMENT	
STORM SEWER REMOVAL	

	EXISTING	PROPOSED
HEADWALL		
CATCH BASIN		
INLET/SCUPPER		
MANHOLE		
INVERT	(XXX.XX)	XXX.XX
STORM SEWER		

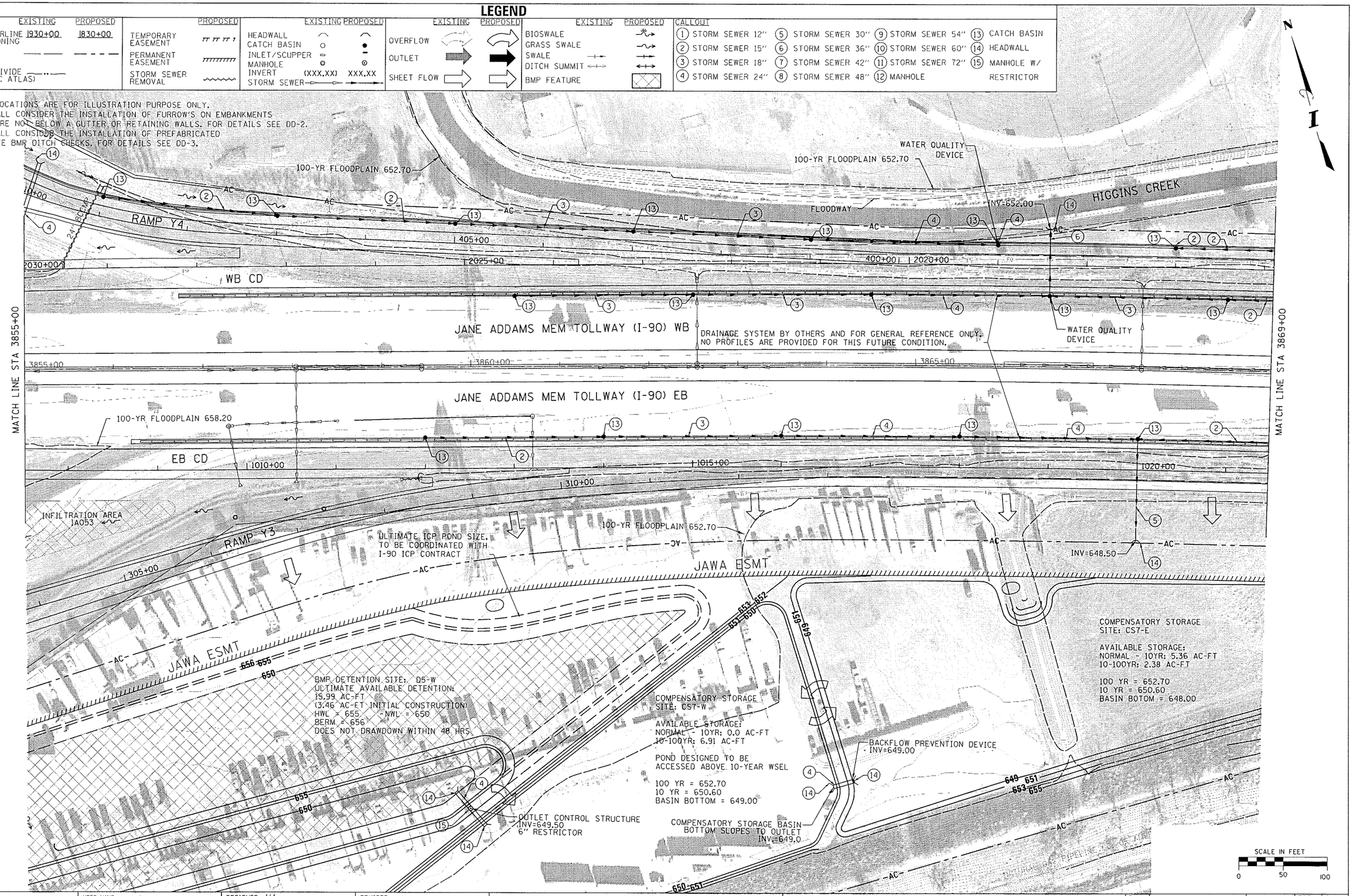
	EXISTING	PROPOSED
OVERFLOW		
OUTLET		
SHEET FLOW		

	EXISTING	PROPOSED
BIOSWALE		
GRASS SWALE		
SWALE		
DITCH SUMMIT		
BMP FEATURE		

CALLOUT

(1) STORM SEWER 12" (5) STORM SEWER 30" (9) STORM SEWER 54" (13) CATCH BASIN
(2) STORM SEWER 15" (6) STORM SEWER 36" (10) STORM SEWER 60" (14) HEADWALL
(3) STORM SEWER 18" (7) STORM SEWER 42" (11) STORM SEWER 72" (15) MANHOLE W/ RESTRICTOR
(4) STORM SEWER 24" (8) STORM SEWER 48" (12) MANHOLE

NOTES:
1. INLET LOCATIONS ARE FOR ILLUSTRATION PURPOSE ONLY.
2. DSE SHALL CONSIDER THE INSTALLATION OF FURROW'S ON EMBANKMENTS WHICH ARE NOT BELOW A GUTTER OR RETAINING WALLS. FOR DETAILS SEE DD-2.
3. DSE SHALL CONSIDER THE INSTALLATION OF PREFABRICATED CONCRETE BMP DITCH CHECKS. FOR DETAILS SEE DD-3.



FILE NAME = DIEOW8-PC-HY-sht-PR-Plan-011	USER NAME = eanderson	DESIGNED MA	REVISED -
CHRISTOPHER B. BURKE ENGINEERING, LTD 9575 W. Higgins Road, Suite 600 Rosemont, Illinois 60018 (847) 823-0500		DRAWN EB	REVISED -
	PLOT SCALE = 100'	CHECKED CW	REVISED -
	PLOT DATE = 11/7/2012	DATE -	REVISED -

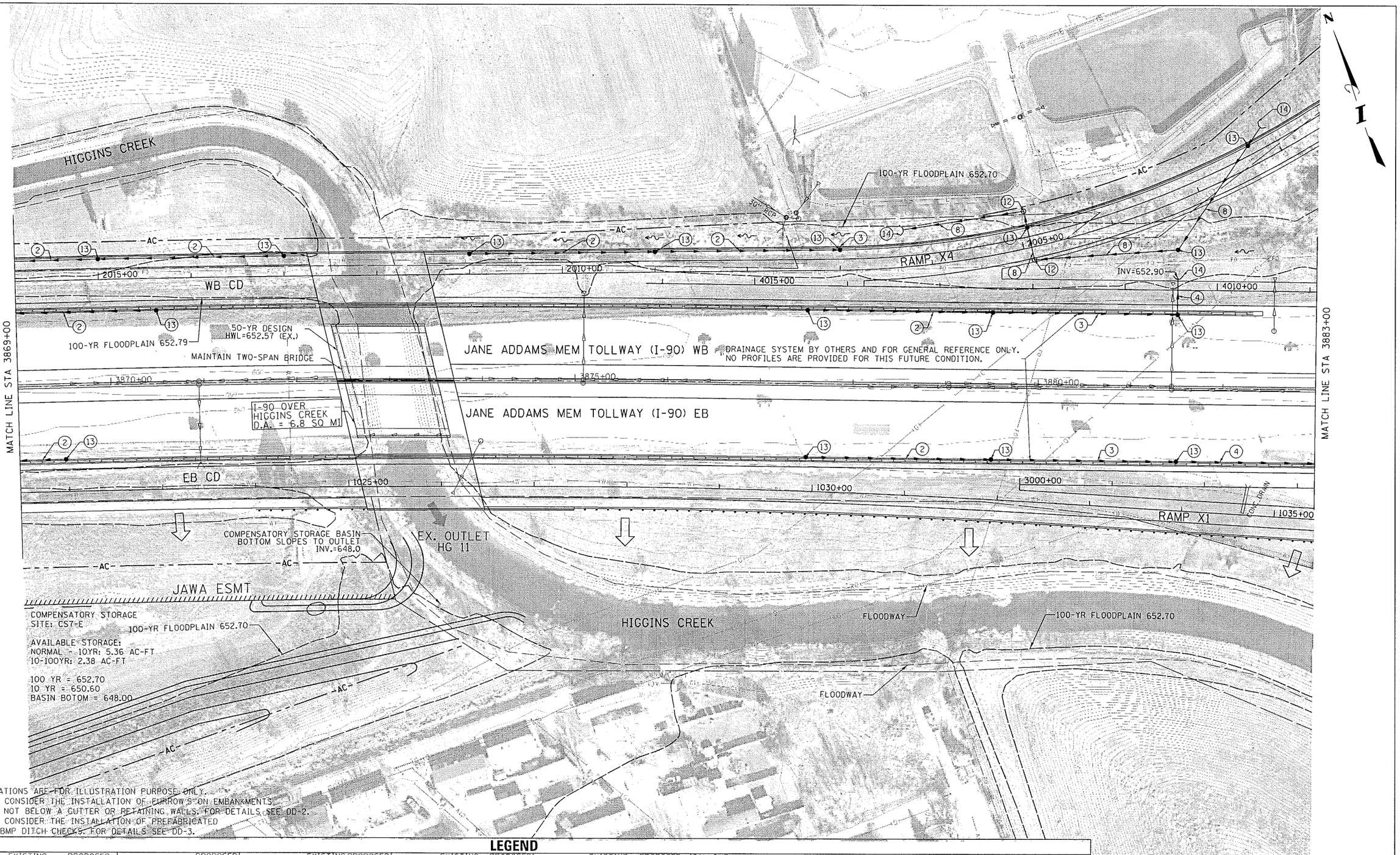
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

DRAINAGE PLANS
JANE ADDAMS MEM TOLLWAY (I-90)

SCALE: | SHEET NO. 10 OF 18 SHEETS | STA. 3855+00 TO STA. 3869+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	224	103
DRAWING NO. DR-10		CONTRACT NO.		
PROJECT C	ILLINOIS	FED. AID PROJECT		

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NOTES:
1. INLET LOCATIONS ARE FOR ILLUSTRATION PURPOSE ONLY.
2. DSE SHALL CONSIDER THE INSTALLATION OF CURB'S ON EMBANKMENTS WHICH ARE NOT BELOW A GUTTER OR RETAINING WALLS. FOR DETAILS SEE DD-2.
3. DSE SHALL CONSIDER THE INSTALLATION OF PREFABRICATED CONCRETE BMP DITCH CHECKS. FOR DETAILS SEE DD-3.

LEGEND

	EXISTING	PROPOSED
REFERENCE LINE/CENTERLINE AND STATIONING	1930+00	1830+00
RIGHT OF WAY LINE		
DRAINAGE DIVIDE (HYDROLOGIC ATLAS)		

	PROPOSED
TEMPORARY EASEMENT	
PERMANENT EASEMENT	
STORM SEWER REMOVAL	

	EXISTING	PROPOSED
HEADWALL		
CATCH BASIN		
INLET/SCUPPER		
MANHOLE		
INVERT	(XXX.XX)	XXX.XX
STORM SEWER		

	EXISTING	PROPOSED
OVERFLOW		
OUTLET		
SHEET FLOW		

	EXISTING	PROPOSED
BIOSWALE		
GRASS SWALE		
SWALE		
DITCH SUMMIT		
BMP FEATURE		

CALLOUT

(1)	STORM SEWER 12"	(5)	STORM SEWER 30"	(9)	STORM SEWER 54"	(13)	CATCH BASIN
(2)	STORM SEWER 15"	(6)	STORM SEWER 36"	(10)	STORM SEWER 60"	(14)	HEADWALL
(3)	STORM SEWER 18"	(7)	STORM SEWER 42"	(11)	STORM SEWER 72"	(15)	MANHOLE W/ RESTRICTOR
(4)	STORM SEWER 24"	(8)	STORM SEWER 48"	(12)	MANHOLE		

FILE NAME =	USER NAME = sanderson	DESIGNED MA	REVISED -
DIEOWB-PC-HY-sht-PR-Plan-012		DRAWN EB	REVISED -
CHRISTOPHER B. BURKE ENGINEERING, LTD 9575 W. Higgins Road, Suite 600 Rosemont, Illinois 60018 (847) 823-0500	PLOT SCALE = 100'	CHECKED CW	REVISED -
	PLOT DATE = 11/7/2012	DATE -	REVISED -

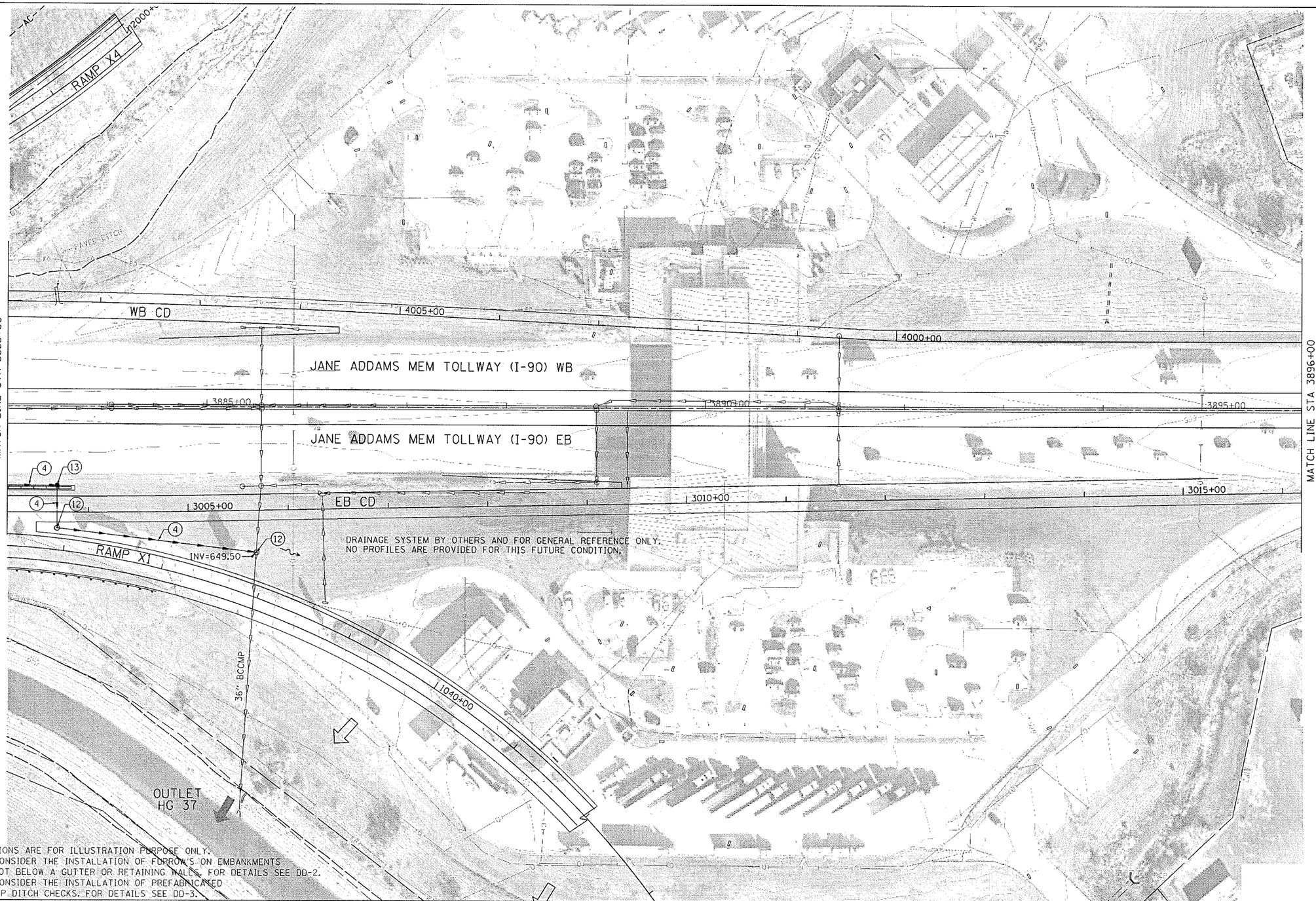
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

DRAINAGE PLANS
JANE ADDAMS MEM TOLLWAY (I-90)

SCALE: | SHEET NO. 11 OF 18 SHEETS | STA. 3869+00 TO STA. 3883+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	224	104
DRAWING NO. DR-11		CONTRACT NO.		
PROJECT C	ILLINOIS FED. AID PROJECT			

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NOTES:
1. INLET LOCATIONS ARE FOR ILLUSTRATION PURPOSE ONLY.
2. DSE SHALL CONSIDER THE INSTALLATION OF FURROWS ON EMBANKMENTS WHICH ARE NOT BELOW A GUTTER OR RETAINING WALLS. FOR DETAILS SEE DD-2.
3. DSE SHALL CONSIDER THE INSTALLATION OF PREFABRICATED CONCRETE BMP DITCH CHECKS. FOR DETAILS SEE DD-3.

LEGEND

	EXISTING	PROPOSED
REFERENCE LINE/CENTERLINE AND STATIONING	1930+00	1830+00
RIGHT OF WAY LINE		
DRAINAGE DIVIDE (HYDROLOGIC ATLAS)		

	PROPOSED
TEMPORARY EASEMENT	
PERMANENT EASEMENT	
STORM SEWER REMOVAL	

	EXISTING	PROPOSED
HEADWALL		
CATCH BASIN		
INLET/SCUPPER		
MANHOLE		
INVERT	(XXX.XX)	XXX.XX
STORM SEWER		

	EXISTING	PROPOSED
OVERFLOW		
OUTLET		
SHEET FLOW		

	EXISTING	PROPOSED
BIOSWALE		
GRASS SWALE		
SWALE		
DITCH SUMMIT		
BMP FEATURE		

CALLOUT

(1) STORM SEWER 12"	(5) STORM SEWER 30"	(9) STORM SEWER 54"	(13) CATCH BASIN
(2) STORM SEWER 15"	(6) STORM SEWER 36"	(10) STORM SEWER 60"	(14) HEADWALL
(3) STORM SEWER 18"	(7) STORM SEWER 42"	(11) STORM SEWER 72"	(15) MANHOLE W/ RESTRICTOR
(4) STORM SEWER 24"	(8) STORM SEWER 48"	(12) MANHOLE	

SCALE IN FEET
0 50 100

FILE NAME = DIEOW8-PC-HY-sht-PR-Plan-013

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

USER NAME = eanderson	DESIGNED MA	REVISED -
	DRAWN EB	REVISED -
PLOT SCALE = 100'	CHECKED CW	REVISED -
PLOT DATE = 11/7/2012	DATE -	REVISED -

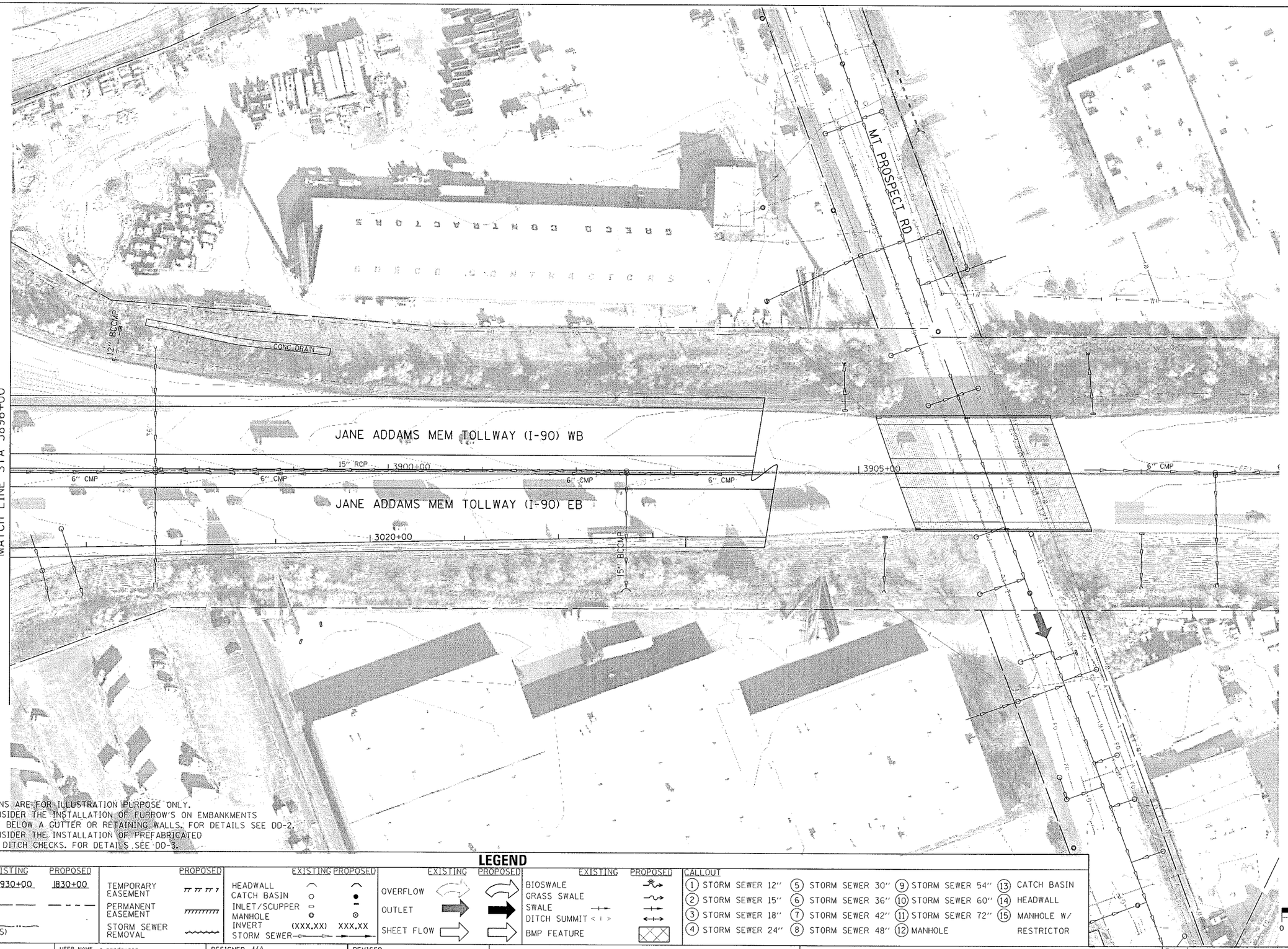
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

DRAINAGE PLANS
JANE ADDAMS MEM TOLLWAY (I-90)

SCALE: | SHEET NO. 12 OF 18 SHEETS | STA. 3883+00 TO STA. 3896+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	224	105
DRAWING NO. DR-12		CONTRACT NO.		
PROJECT C	ILLINOIS FED. AID PROJECT			

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NOTES:
1. INLET LOCATIONS ARE FOR ILLUSTRATION PURPOSE ONLY.
2. DSE SHALL CONSIDER THE INSTALLATION OF FURROW'S ON EMBANKMENTS WHICH ARE NOT BELOW A GUTTER OR RETAINING WALLS. FOR DETAILS SEE DD-2.
3. DSE SHALL CONSIDER THE INSTALLATION OF PREFABRICATED CONCRETE BMP DITCH CHECKS. FOR DETAILS SEE DD-3.

LEGEND

	EXISTING	PROPOSED
REFERENCE LINE/CENTERLINE AND STATIONING	1930+00	1830+00
RIGHT OF WAY LINE		
DRAINAGE DIVIDE (HYDROLOGIC ATLAS)		

	PROPOSED
TEMPORARY EASEMENT	
PERMANENT EASEMENT	
STORM SEWER REMOVAL	

	EXISTING	PROPOSED
HEADWALL		
CATCH BASIN		
INLET/SCUPPER		
MANHOLE		
INVERT	(XXX.XX)	XXX.XX
STORM SEWER		

	EXISTING	PROPOSED
OVERFLOW		
OUTLET		
SHEET FLOW		

	EXISTING	PROPOSED
BIOSWALE		
GRASS SWALE		
SWALE		
DITCH SUMMIT < I >		
BMP FEATURE		

CALLOUT

1. STORM SEWER 12"
2. STORM SEWER 15"
3. STORM SEWER 18"
4. STORM SEWER 24"
5. STORM SEWER 30"
6. STORM SEWER 36"
7. STORM SEWER 42"
8. STORM SEWER 48"
9. STORM SEWER 54"
10. STORM SEWER 60"
11. STORM SEWER 72"
12. MANHOLE
13. CATCH BASIN
14. HEADWALL
15. MANHOLE W/ RESTRICTOR

FILE NAME = DIEOWB-PC-HY-sht-PR-Plan-013a	USER NAME = eanderson	DESIGNED MA	REVISED -
CHRISTOPHER B. BURKE ENGINEERING, LTD 9575 W. Higgins Road, Suite 600 Rosemont, Illinois 60018 (847) 823-0500		DRAWN EB	REVISED -
	PLOT SCALE = 100'	CHECKED CW	REVISED -
	PLOT DATE = 11/7/2012	DATE -	REVISED -

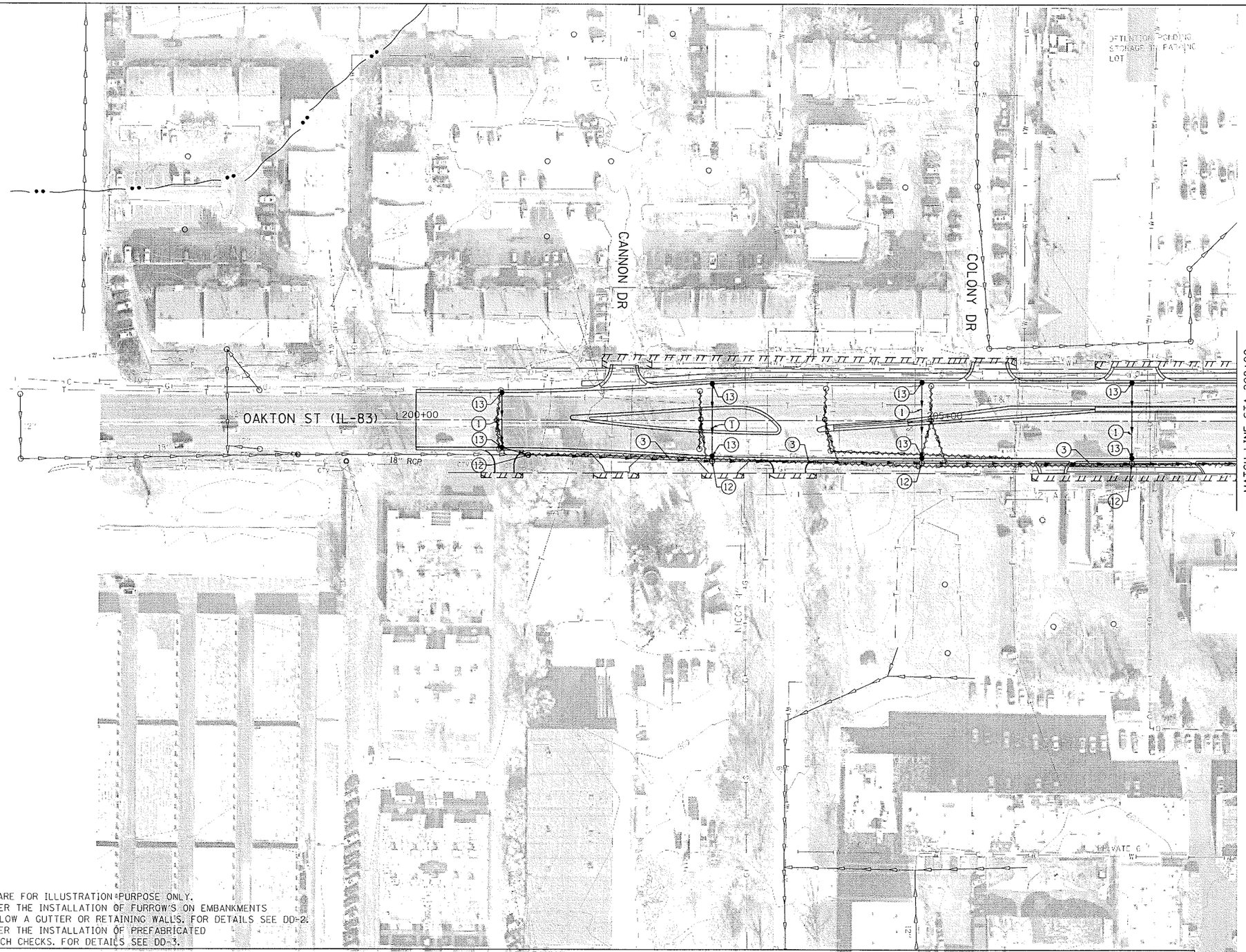
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

DRAINAGE PLANS
JANE ADDAMS MEM TOLLWAY (I-90)

SCALE: | SHEET NO. 13 OF 18 SHEETS | STA. 3896+00 TO STA. 3905+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	224	106
DRAWING NO. DR-13		CONTRACT NO.		
PROJECT C	ILLINOIS FED. AID PROJECT			

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NOTES:
1. INLET LOCATIONS ARE FOR ILLUSTRATION PURPOSE ONLY.
2. DSE SHALL CONSIDER THE INSTALLATION OF FURROW'S ON EMBANKMENTS WHICH ARE NOT BELOW A GUTTER OR RETAINING WALLS. FOR DETAILS SEE DD-2.
3. DSE SHALL CONSIDER THE INSTALLATION OF PREFABRICATED CONCRETE BMP DITCH CHECKS. FOR DETAILS SEE DD-3.

LEGEND

	EXISTING	PROPOSED
REFERENCE LINE/CENTERLINE AND STATIONING	1930+00	1830+00
RIGHT OF WAY LINE		
DRAINAGE DIVIDE (HYDROLOGIC ATLAS)		

	PROPOSED
TEMPORARY EASEMENT	
PERMANENT EASEMENT	
STORM SEWER REMOVAL	

	EXISTING	PROPOSED
HEADWALL		
CATCH BASIN	○	●
INLET/SCUPPER	▫	▬
MANHOLE	◘	⊙
INVERT	(XXX.XX)	XXX.XX
STORM SEWER		

	EXISTING	PROPOSED
OVERFLOW		
OUTLET		
SHEET FLOW		

	EXISTING	PROPOSED
BIOSWALE		
GRASS SWALE		
SWALE		
DITCH SUMMIT	< 1 >	
BMP FEATURE		

CALLOUT

(1) STORM SEWER 12"	(5) STORM SEWER 30"	(9) STORM SEWER 54"	(13) CATCH BASIN
(2) STORM SEWER 15"	(6) STORM SEWER 36"	(10) STORM SEWER 60"	(14) HEADWALL
(3) STORM SEWER 18"	(7) STORM SEWER 42"	(11) STORM SEWER 72"	(15) MANHOLE W/ RESTRICTOR
(4) STORM SEWER 24"	(8) STORM SEWER 48"	(12) MANHOLE	

SCALE IN FEET
0 50 100

FILE NAME = OIEOWB-PC-HY-sht-PR-Plan-014	USER NAME = eanderson	DESIGNED MA	REVISED -
CHRISTOPHER B. BURKE ENGINEERING, LTD 9575 W. Higgins Road, Suite 600 Rosemont, Illinois 60018 (847) 823-0500		DRAWN EB	REVISED -
	PLOT SCALE = 100'	CHECKED CW	REVISED -
	PLOT DATE = 11/7/2012	DATE -	REVISED -

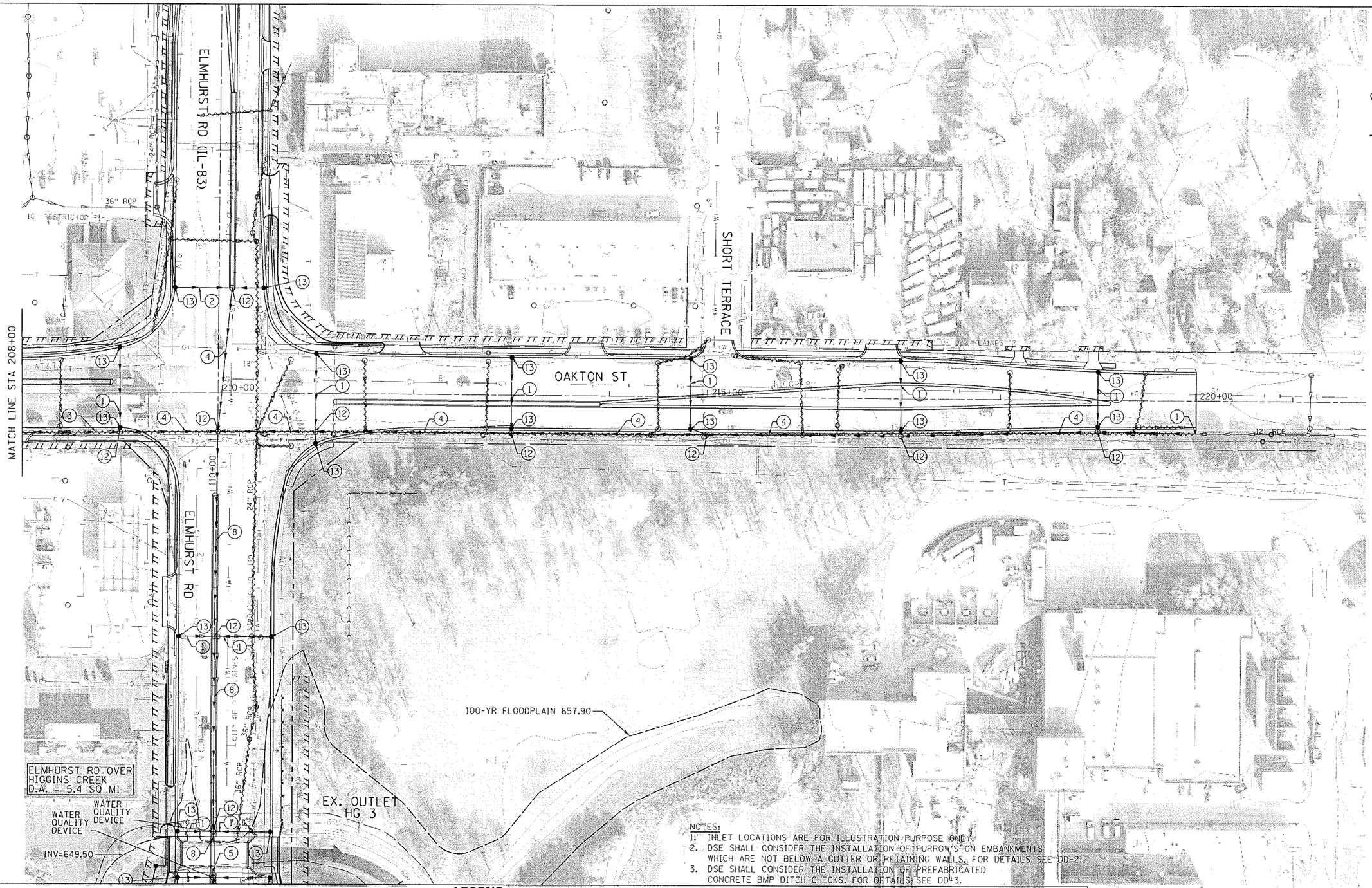
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

DRAINAGE PLANS
OAKTON STREET

SCALE: | SHEET NO. 14 OF 18 SHEETS | STA. 200+00 TO STA. 208+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	224	107
DRAWING NO. DR-14		CONTRACT NO.		
PROJECT C	ILLINOIS	FED. AID PROJECT		

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LEGEND

	EXISTING	PROPOSED
REFERENCE LINE/CENTERLINE AND STATIONING	1930+00	1830+00
RIGHT OF WAY LINE		
DRAINAGE DIVIDE (HYDROLOGIC ATLAS)		
TEMPORARY EASEMENT		
PERMANENT EASEMENT		
STORM SEWER REMOVAL		
HEADWALL		
CATCH BASIN		
INLET/SCUPPER		
MANHOLE		
INVERT (XXX.XX)		XXX.XX
STORM SEWER		
OVERFLOW		
OUTLET		
SHEET FLOW		
BIOSWALE		
GRASS SWALE		
SWALE		
DITCH SUMMIT		
BMP FEATURE		

CALLOUT

(1) STORM SEWER 12"	(5) STORM SEWER 30"	(9) STORM SEWER 54"	(13) CATCH BASIN
(2) STORM SEWER 15"	(6) STORM SEWER 36"	(10) STORM SEWER 60"	(14) HEADWALL
(3) STORM SEWER 18"	(7) STORM SEWER 42"	(11) STORM SEWER 72"	(15) MANHOLE W/ RESTRICTOR
(4) STORM SEWER 24"	(8) STORM SEWER 48"	(12) MANHOLE	

SCALE IN FEET
0 50 100

FILE NAME = DIEOWB-PC-HY-sht-PR-Plan-015	USER NAME = eanderson	DESIGNED MA	REVISED -
		DRAWN EB	REVISED -
	PLOT SCALE = 100'	CHECKED CW	REVISED -
	PLOT DATE = 11/7/2012	DATE -	REVISED -

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

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

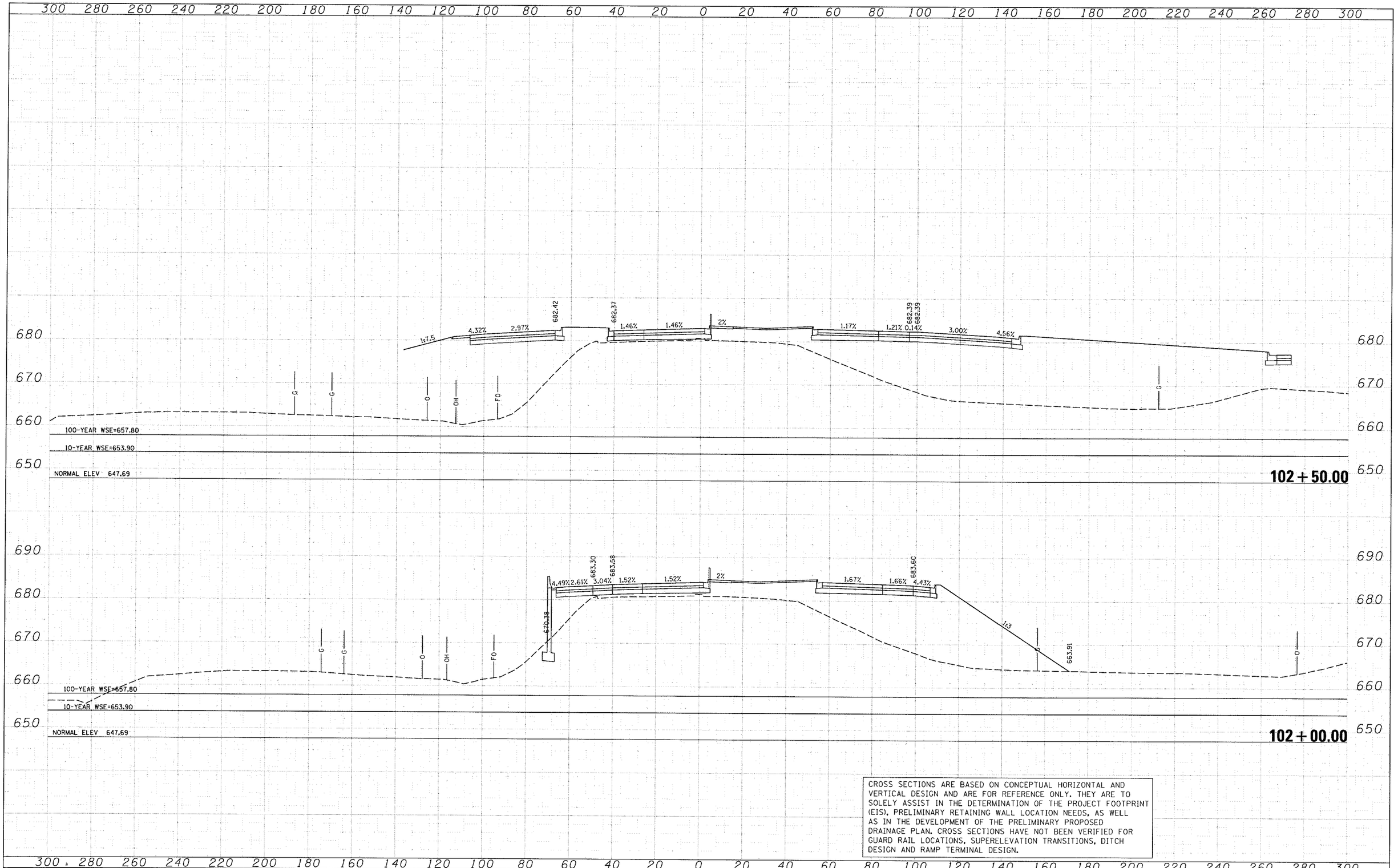
DRAINAGE PLANS
OAKTON STREET

SCALE: | SHEET NO. 15 OF 18 SHEETS | STA. 208+00 TO STA. 221+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	224	108
DRAWING NO. DR-15		CONTRACT NO.		
PROJECT C	ILLINOIS	FED. AID PROJECT		

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FINAL SURVEY	SURVEYED	BY	DATE
NOTE BOOK	PLOTTED		
NO.	TEMPLATE		
	AREAS		
	AREAS CHECKED		



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

ORIGINAL SURVEY	SURVEYED	BY	DATE
NOTE BOOK	PLOTTED		
NO.	TEMPLATE		
	AREAS		
	AREAS CHECKED		

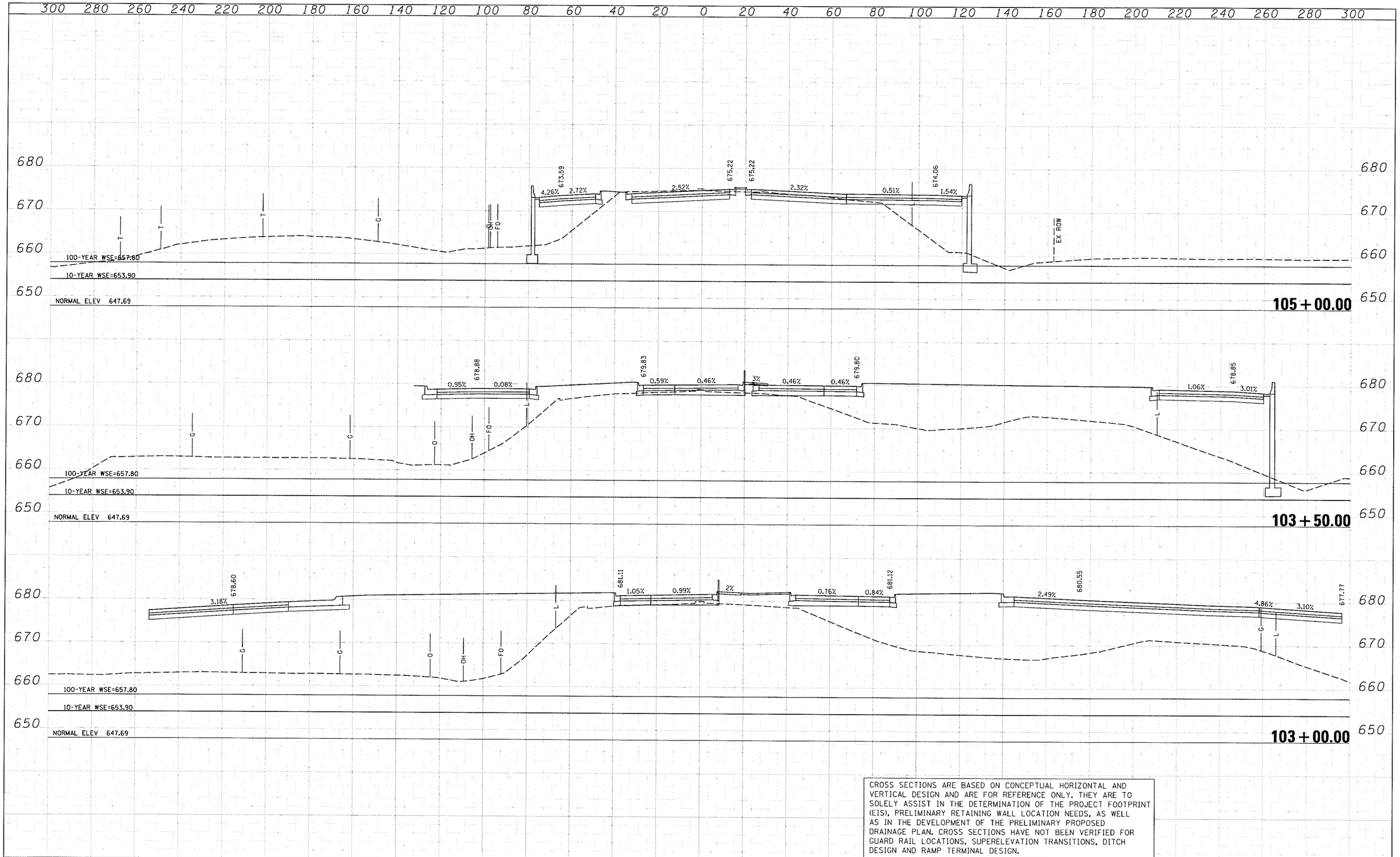
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	PLOT SCALE = 40'	DRAWN - CH2MHILL.	REVISED -
CH2MHILL.	PLOT DATE = 10/29/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
ELMHURST ROAD

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 102+00.00 | TO STA. 102+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO.		CONTRACT NO.		
PROJECT B1	ILLINOIS FED. AID PROJECT			



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

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	PLOT SCALE = 40'	DRAWN - CH2MHILL.	REVISED -
CH2MHILL.	PLOT DATE = 10/29/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

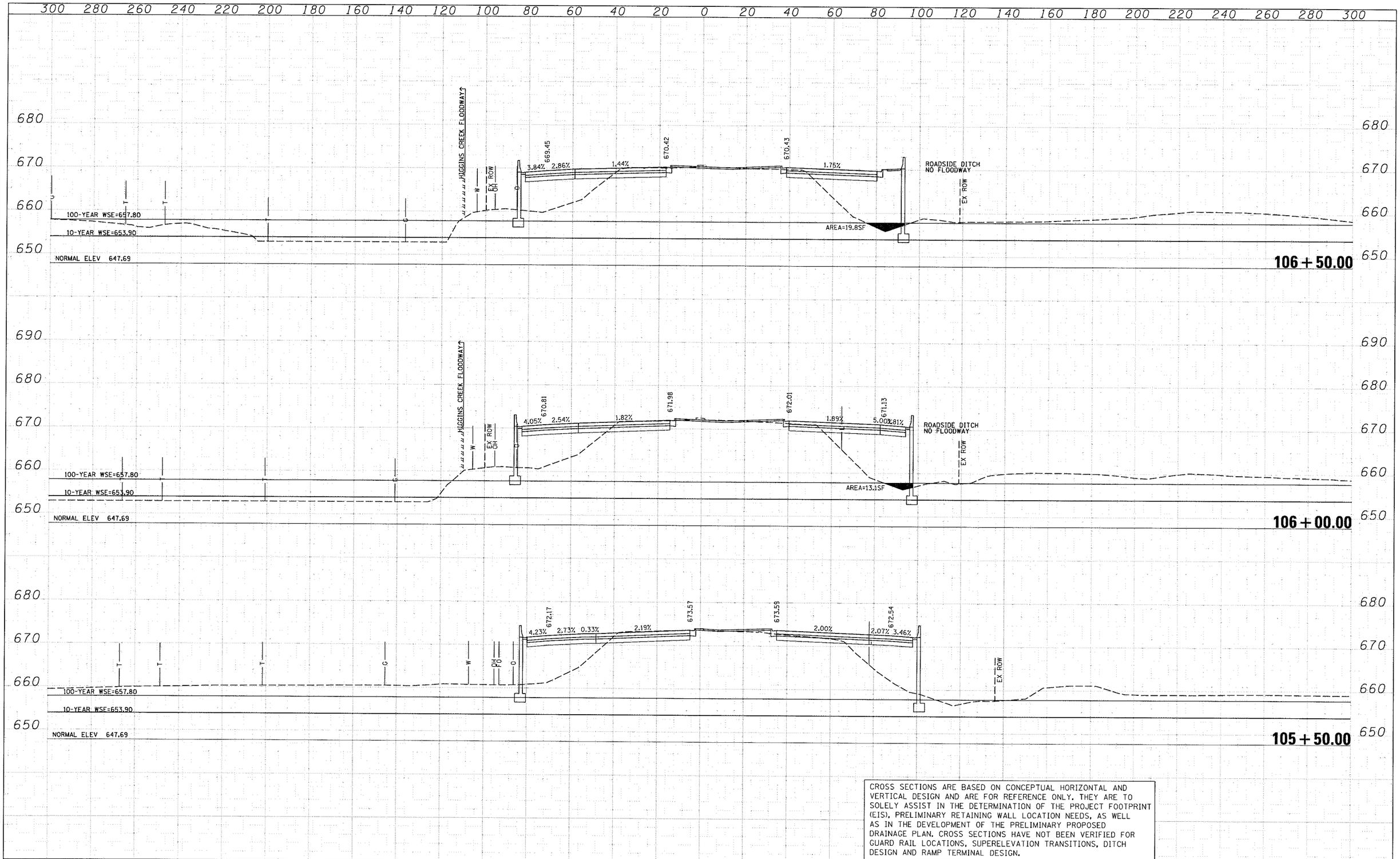
PROPOSED CROSS SECTIONS
ELMHURST ROAD

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 103+00.00 TO STA. 105+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO.		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		

ORIGINAL SURVEY	BY	DATE
NOTE BOOK		
NO.		
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

FINAL SURVEY	BY	DATE
NOTE BOOK		
NO.		
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TJCP Project C\Drainage Calculations\Comp Storage\...sht-xs650.CBBEL.dgn

USER NAME = eanderson | PLOT SCALE = 40' | PLOT DATE = 10/29/2012

DESIGNED - CH2MHILL. | DRAWN - CH2MHILL. | CHECKED - CH2MHILL. | DATE -

REVISED - | REVISED - | REVISED - | REVISED -

CH2MHILL.

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2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
ELMHURST ROAD

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 105+50.00 TO STA. 106+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO.		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

680 670 660 650

G T W OH O

HUGGINS CREEK FLOODWAY

100-YEAR WSE=657.80

10-YEAR WSE=653.90

NORMAL ELEV 647.69

2% 2.34% 1.84% 665.74 665.68 1.78% 2.28% 2%

ROADSIDE DITCH
NO FLOODWAY

1:3

655.42

AREA=83.6SF

108+00.00

680 670 660 650

G T W 6R ROW O

HUGGINS CREEK FLOODWAY

100-YEAR WSE=657.80

10-YEAR WSE=653.90

NORMAL ELEV 647.69

2% 2.27% 1.77% 667.30 667.27 1.75% 2.25% 2%

ROADSIDE DITCH
NO FLOODWAY

1:3

656.32

EX ROW

EX ROW

AREA=66.7SF

107+50.00

680 670 660 650

G T W EX ROW O

HUGGINS CREEK FLOODWAY

100-YEAR WSE=657.80

10-YEAR WSE=653.90

NORMAL ELEV 647.69

2% 2.23% 1.42% 668.86 668.85 1.75% 1.89% 2%

ROADSIDE DITCH
NO FLOODWAY

EX ROW

AREA=29.7SF

107+00.00

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

FINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

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		DRAWN - CH2MHILL.	REVISED -
	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
CH2MHILL.	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

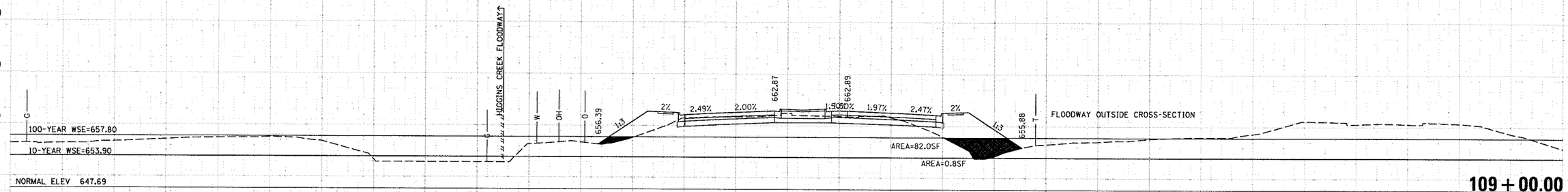
PROPOSED CROSS SECTIONS
ELMHURST ROAD

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 107+00.00 TO STA. 108+00.00

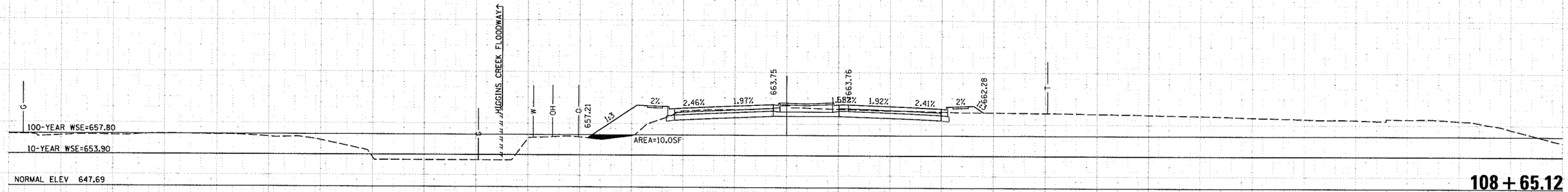
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO.		CONTRACT NO.		
PROJECT B1	ILLINOIS	FED. AID PROJECT		

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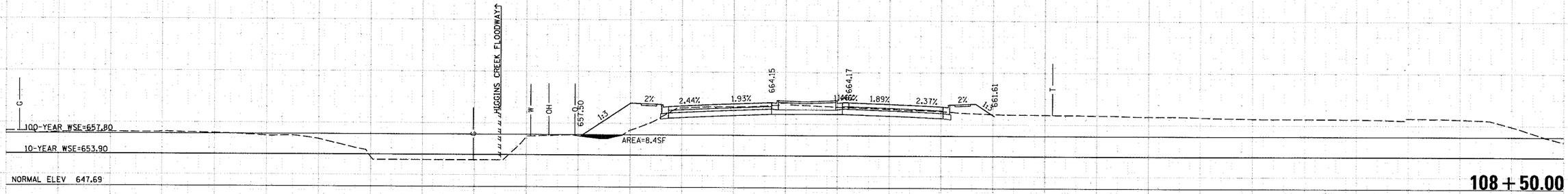
680
670
660
650



109 + 00.00



108 + 65.12



108 + 50.00

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Stores\ELMH0050.CBBEL.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
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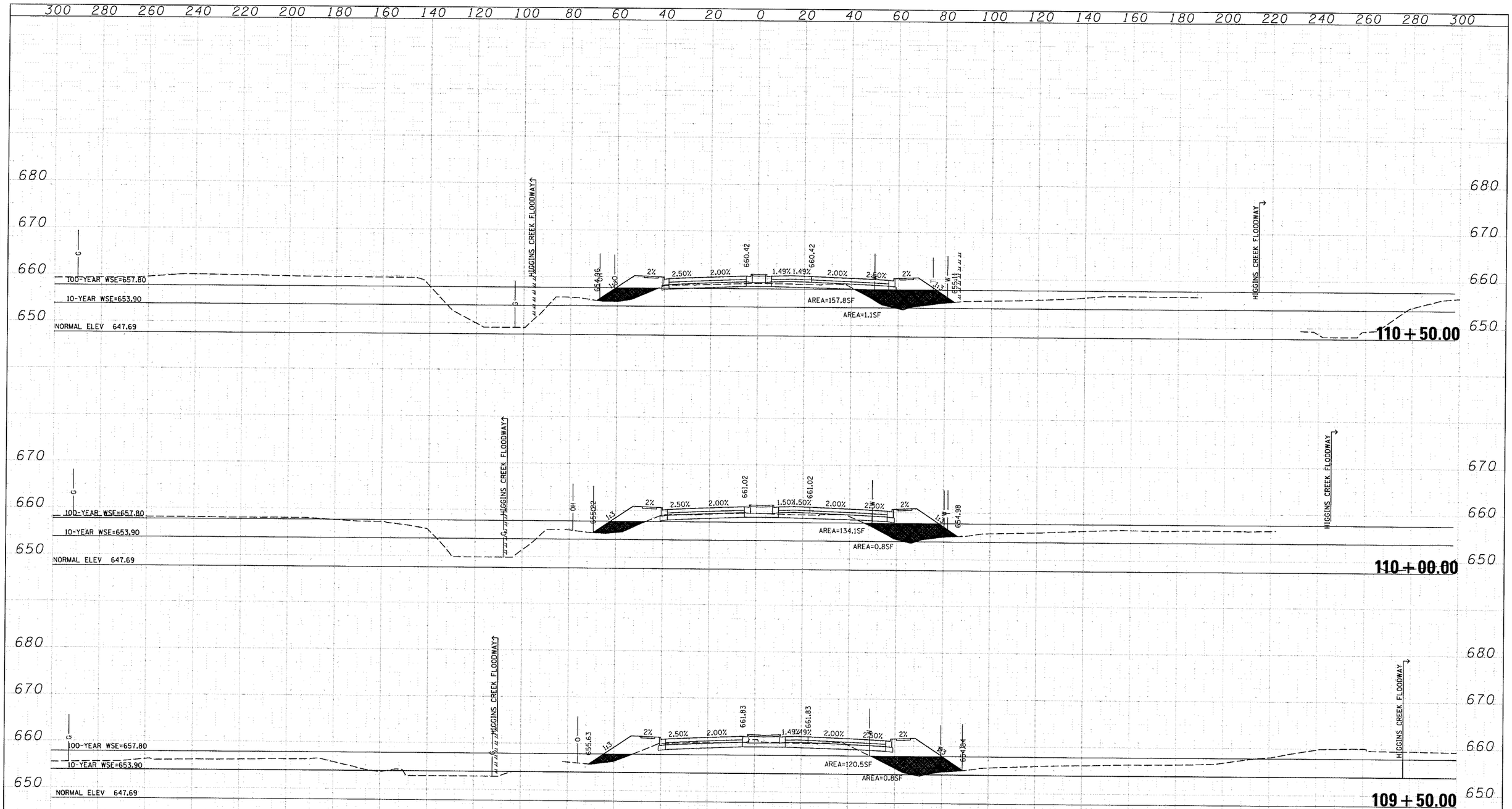
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
ELMHURST ROAD

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 108+50.00 TO STA. 109+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO.		CONTRACT NO.		
PROJECT B1	ILLINOIS FED. AID PROJECT			

FINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	



ORIGINAL SURVEY?	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

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CH2MHILL.	PLOT SCALE = 40'	DRAWN - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

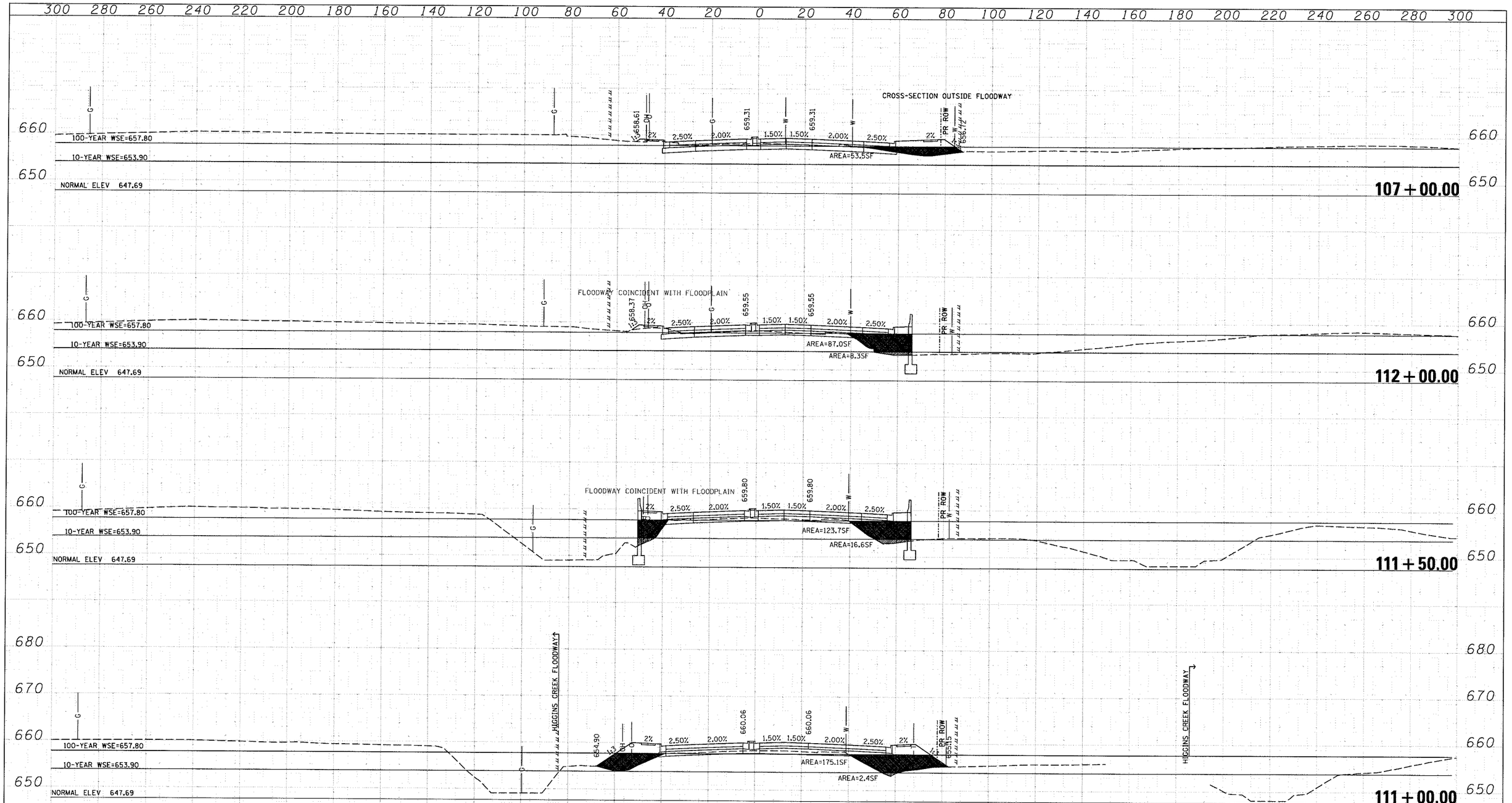
PROPOSED CROSS SECTIONS
ELMHURST ROAD

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 109+50.00 TO STA. 110+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM

DRAWING NO. | CONTRACT NO.

PROJECT B1 | ILLINOIS | FED. AID PROJECT



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY	DATE	BY
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	

ORIGINAL SURVEY	DATE	BY
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	

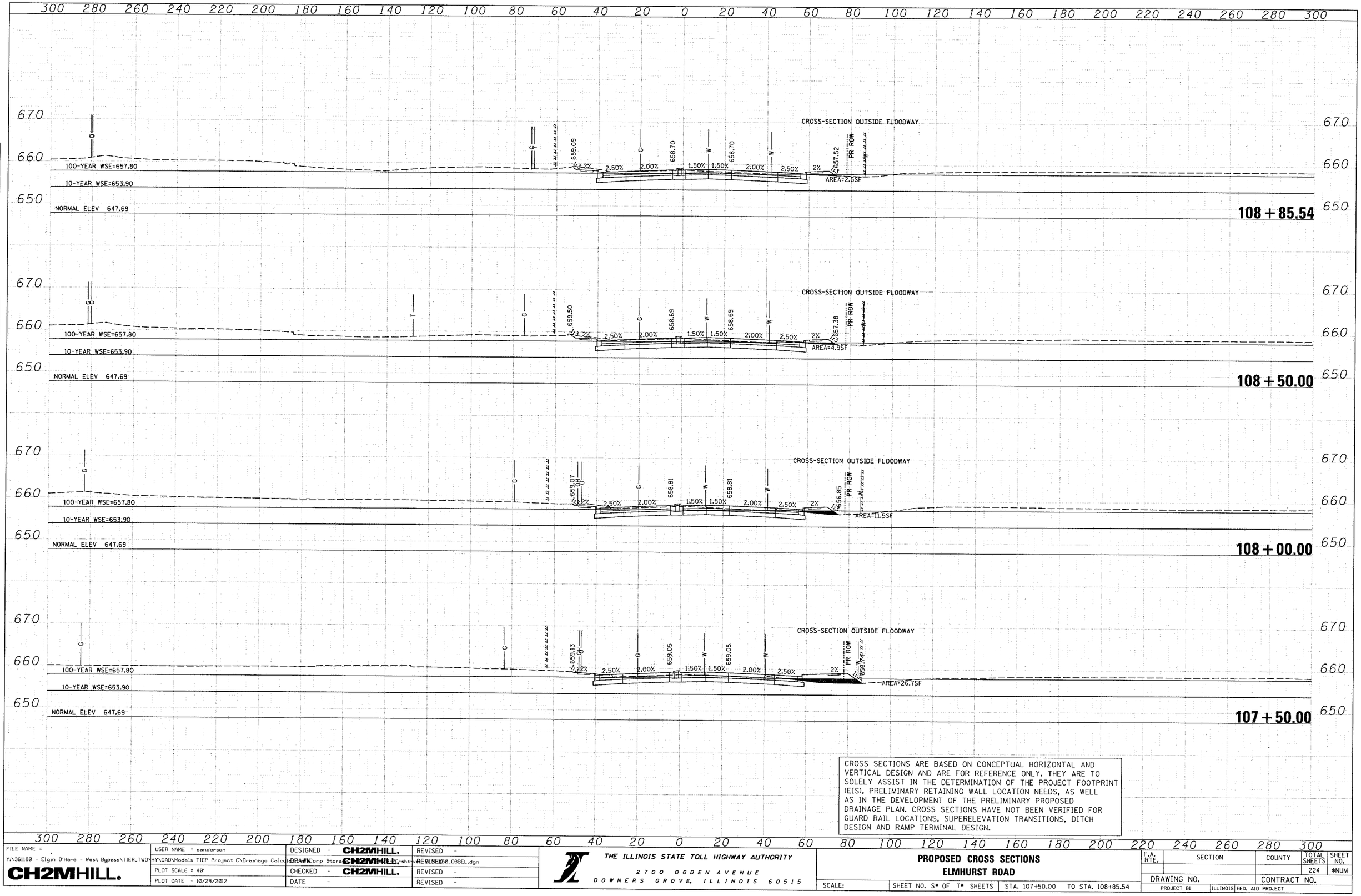
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		DRAWN - CH2MHILL	REVISED -
CH2MHILL	PLOT SCALE = 40'	CHECKED - CH2MHILL	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
ELMHURST ROAD

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 111+00.00 TO STA. 107+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO.		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		



FINAL SURVEY	NOTE BOOK	NO.	ORIGINAL SURVEY	NOTE BOOK	NO.
SURVEYED			SURVEYED		
PLOTTED			PLOTTED		
TEMPLATE			TEMPLATE		
AREAS			AREAS		
AREAS CHECKED			AREAS CHECKED		
BY			BY		
DATE			DATE		

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

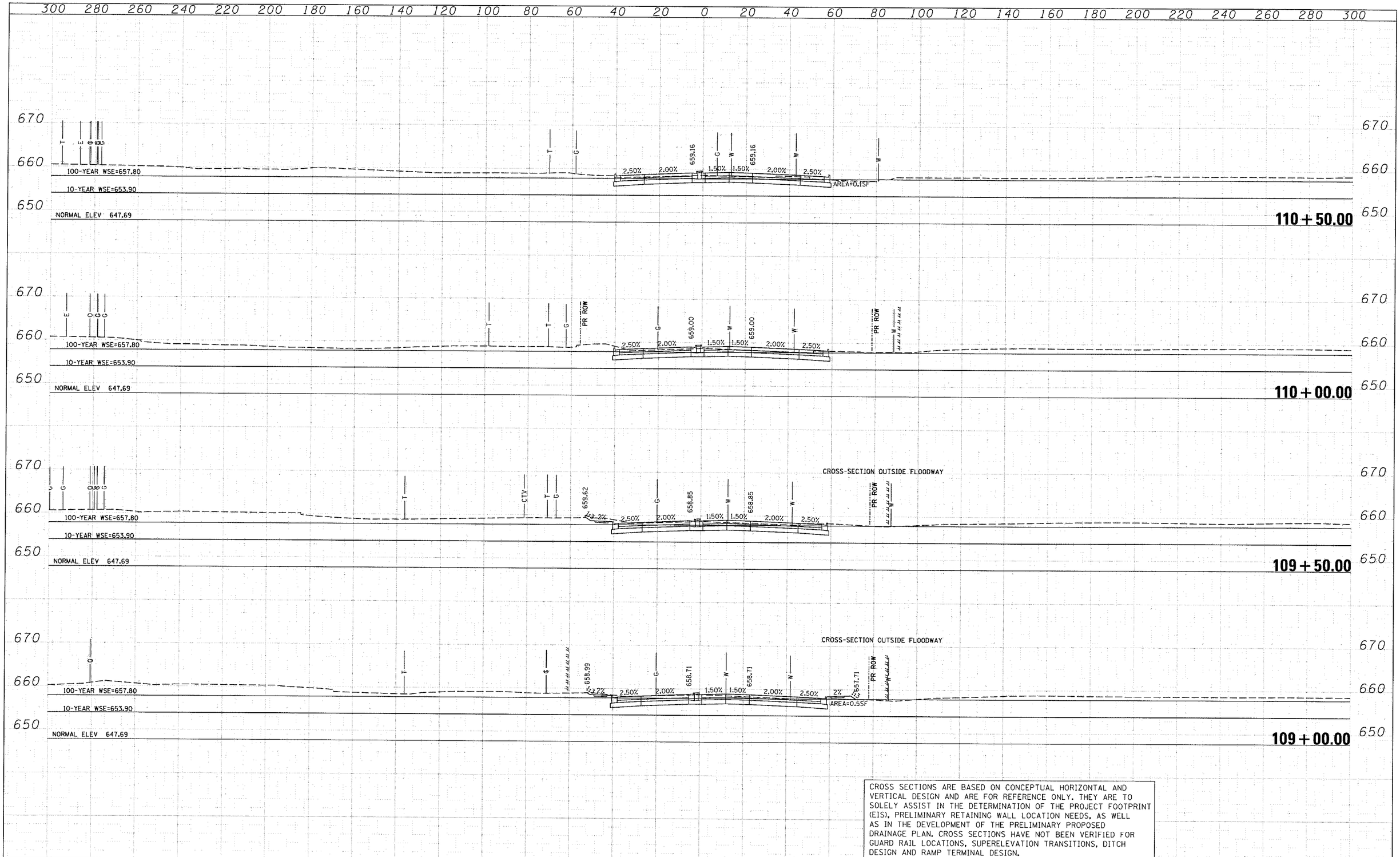
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CH2MHILL.	PLOT SCALE = 40'	DRAWN - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
ELMHURST ROAD

SCALE: | SHEET NO. S= OF T= SHEETS | STA. 107+50.00 TO STA. 108+85.54

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM
DRAWING NO.		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FILE NAME =	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Sht-Sht-Rev\8ECB2.CBBEL.dgn		DRAWN - CH2MHILL.	REVISED -
CH2MHILL.	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/24/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
ELMHURST ROAD

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 109+00.00 TO STA. 110+50.00

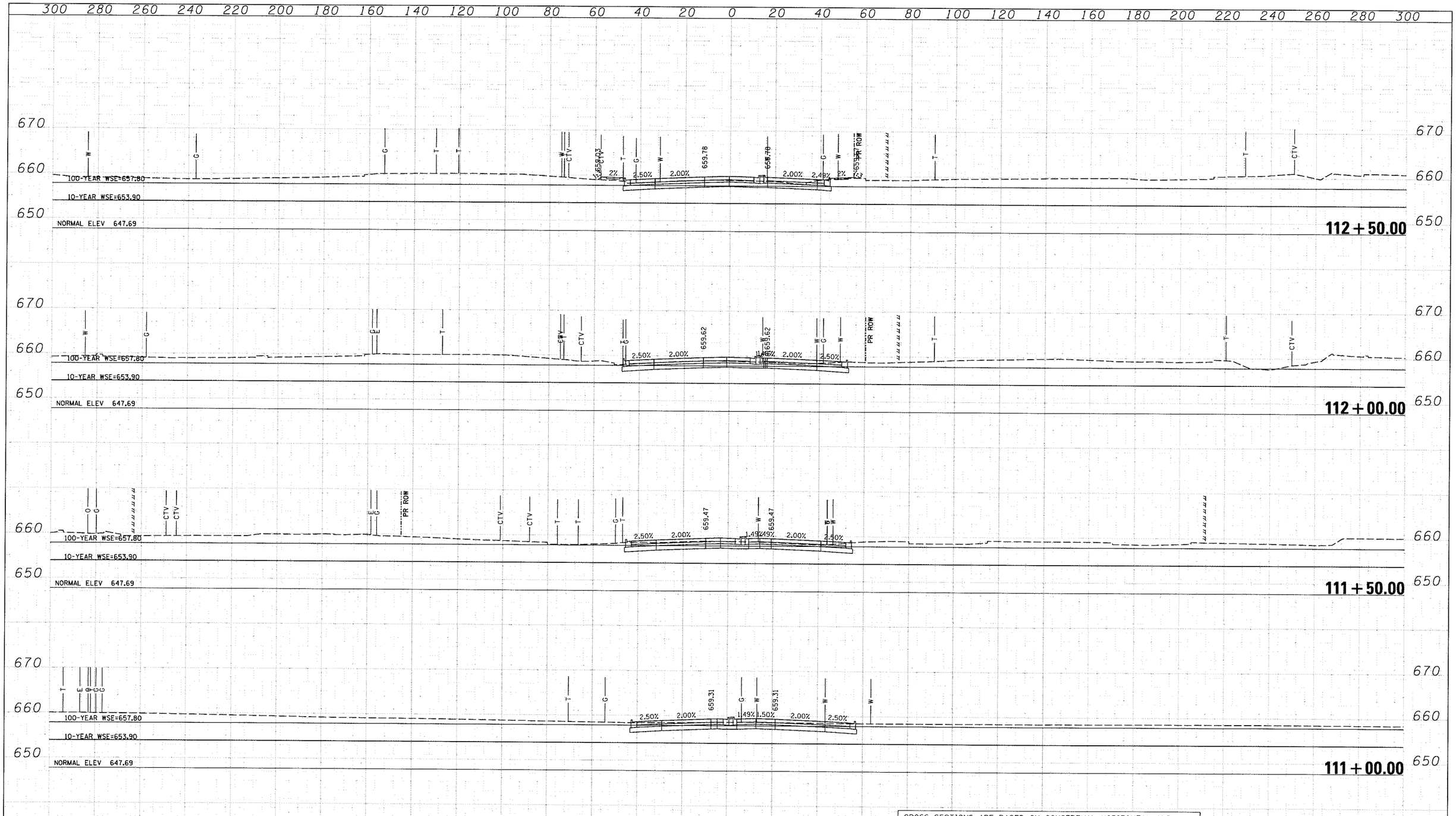
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM

DRAWING NO. | CONTRACT NO.

PROJECT BI | ILLINOIS | FED. AID PROJECT

FINAL SURVEY — NOTE BOOK — NO. — DATE — BY — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED

ORIGINAL SURVEY — NOTE BOOK — NO. — DATE — BY — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED



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FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Plan_Sht_XSECTIONS.CBBEL.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
CH2MHILL.	PLOT SCALE = 40'	DRAWN - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
ELMHURST ROAD

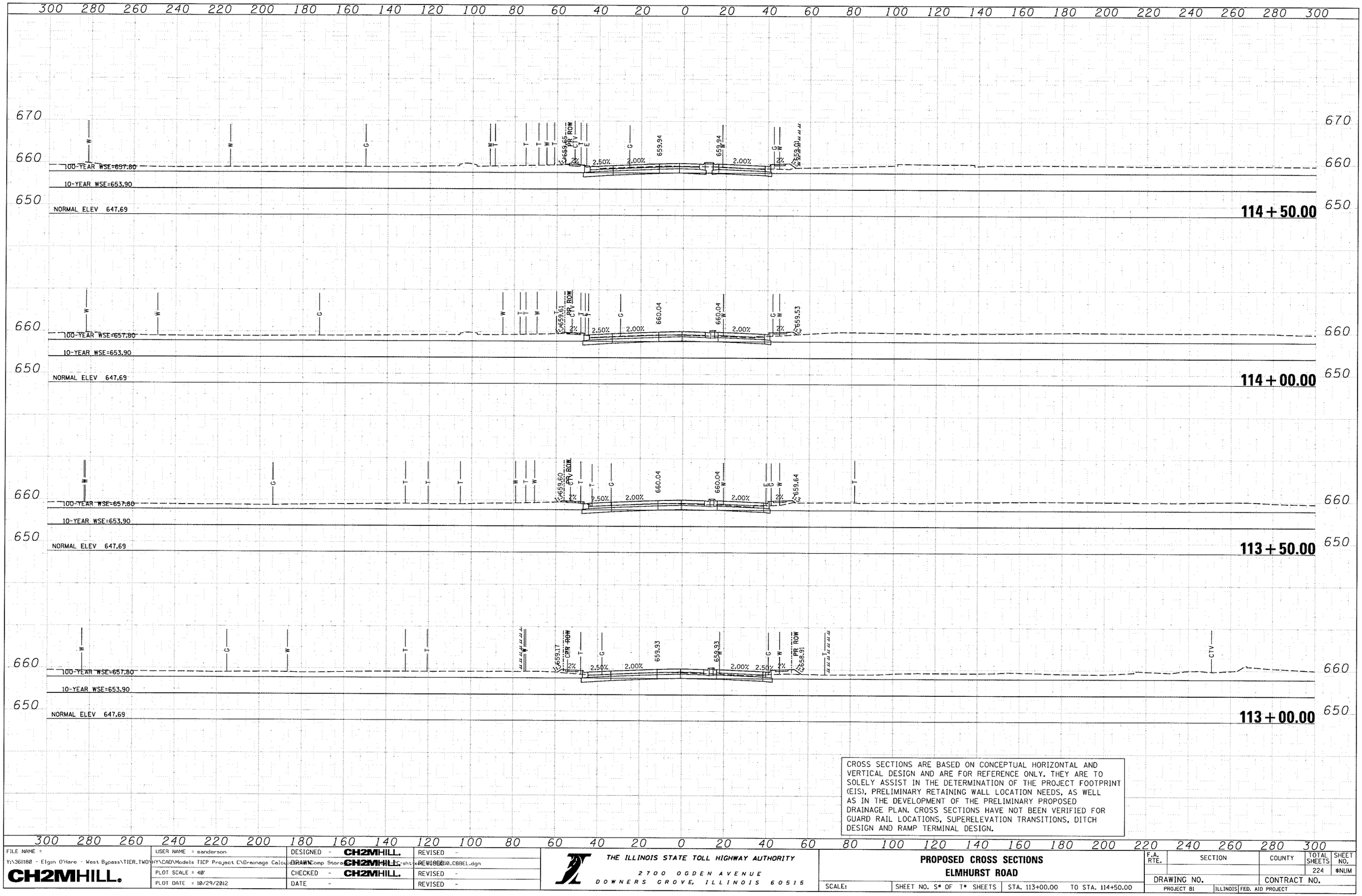
SCALE: | SHEET NO. S# OF T# SHEETS | STA. 111+00.00 TO STA. 112+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM

DRAWING NO. | CONTRACT NO.
PROJECT BI | ILLINOIS | FED. AID PROJECT

ORIGINAL SURVEY — NOTE BOOK — NO. — BY — DATE
SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED

FINAL SURVEY — NOTE BOOK — NO. — BY — DATE
SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY / ORIGINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\xsht_XS_180000.CBBEL.dgn

USER NAME = eanderson | PLOT SCALE = 40' | PLOT DATE = 10/29/2012

DESIGNED - CH2MHILL. | DRAWN - CH2MHILL. | CHECKED - CH2MHILL. | DATE -

REVISED - | REVISED - | REVISED - | REVISED -

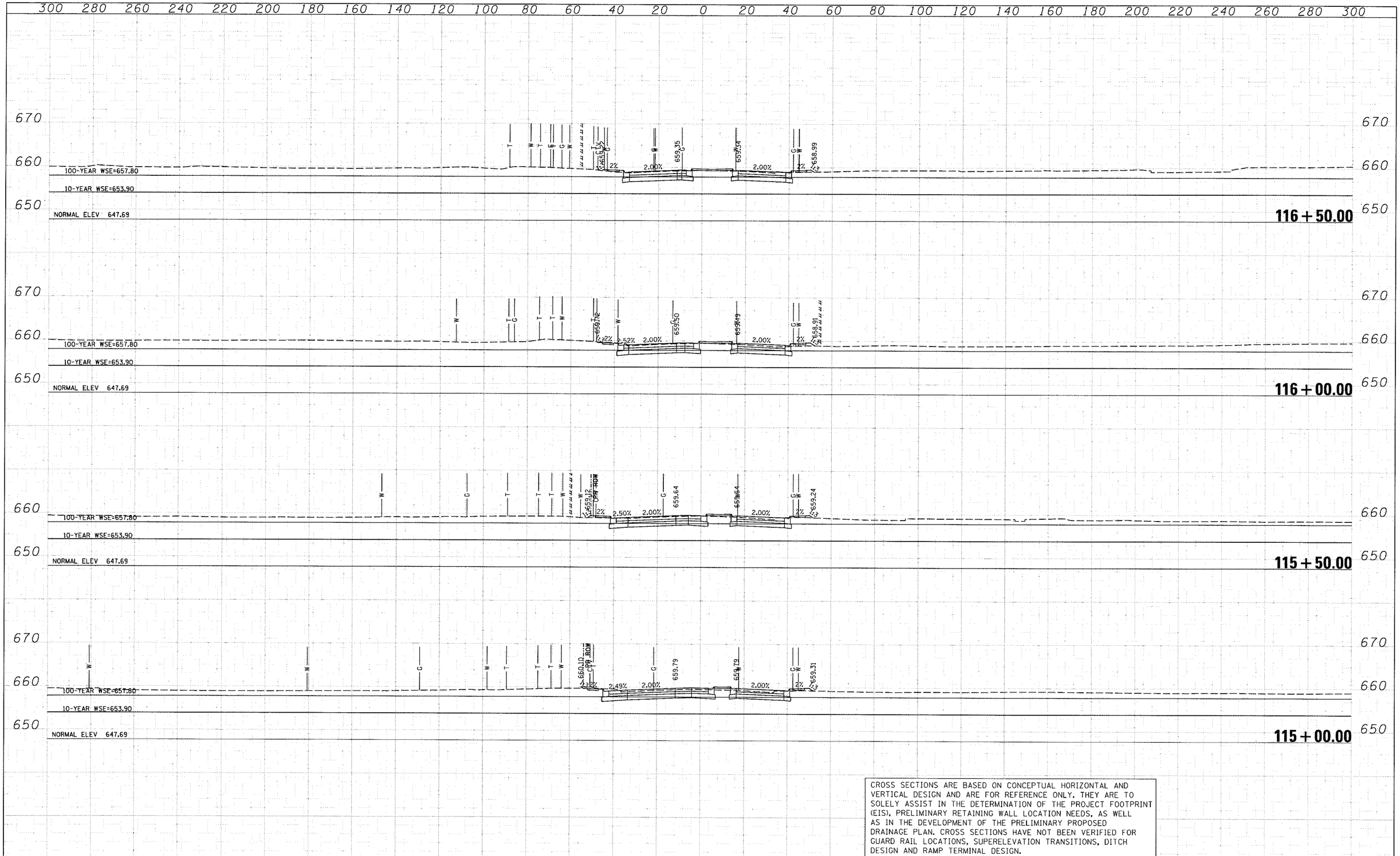
CH2MHILL.

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
ELMHURST ROAD

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 113+00.00 TO STA. 114+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO.		CONTRACT NO.		
PROJECT B1	ILLINOIS	FED. AID PROJECT		



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY	DATE	BY
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	

ORIGINAL SURVEY	DATE	BY
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\...sht-x-REVISED50.CBBEL.dgn

USER NAME = eanderson | PLOT SCALE = 40' | PLOT DATE = 10/29/2012

DESIGNED - CH2MHILL. | DRAWN - CH2MHILL. | CHECKED - CH2MHILL. | DATE -

REVISED - | REVISED - | REVISED - | REVISED -

CH2MHILL.

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

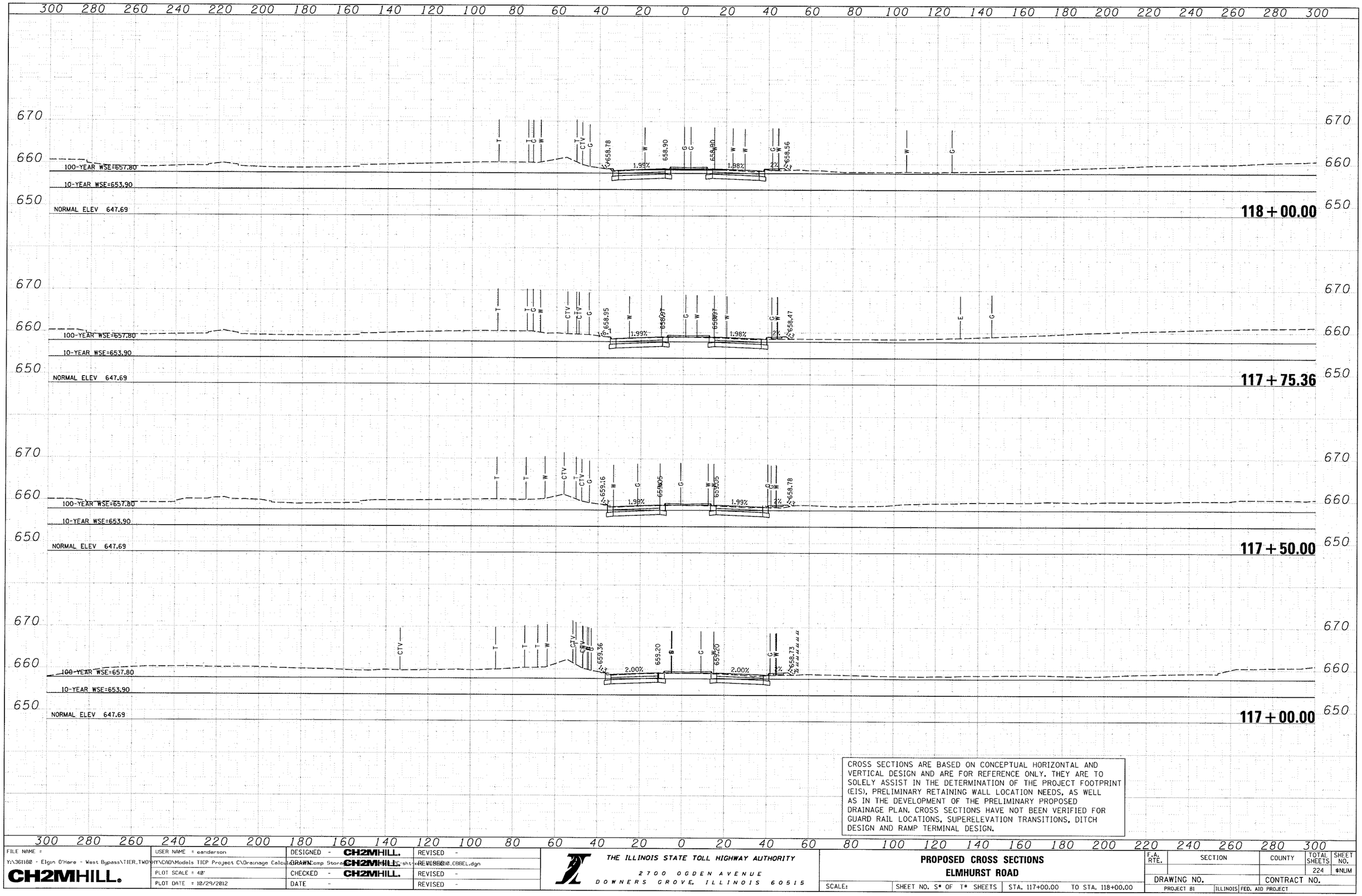
PROPOSED CROSS SECTIONS
ELMHURST ROAD

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 115+00.00 TO STA. 116+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM

DRAWING NO. | CONTRACT NO.

PROJECT BI | ILLINOIS | FED. AID PROJECT



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Right\xRIGHT_CBBEL.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
CH2MHILL.	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

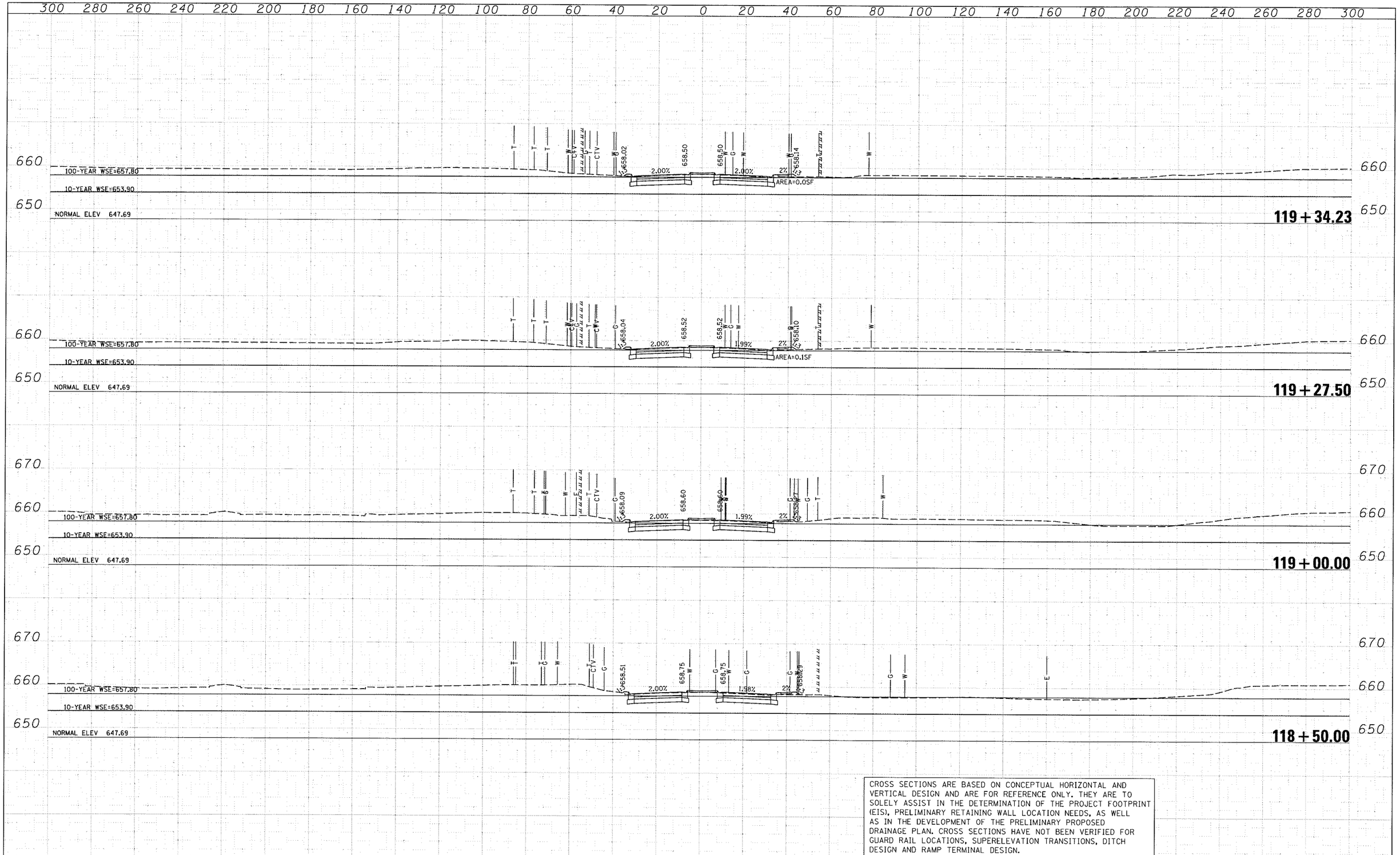
PROPOSED CROSS SECTIONS
ELMHURST ROAD

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 117+00.00 TO STA. 118+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	*NUM
DRAWING NO.		CONTRACT NO.		
PROJECT B1	ILLINOIS	FED. AID PROJECT		

FINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE



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FINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	

ORIGINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Sht-xsec050_CBBEL.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
CH2MHILL.	PLOT SCALE = 40'	DRAWN - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
ELMHURST ROAD

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 118+50.00 TO STA. 119+34.23

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM
DRAWING NO.		CONTRACT NO.		
PROJECT B1	ILLINOIS	FED. AID PROJECT		

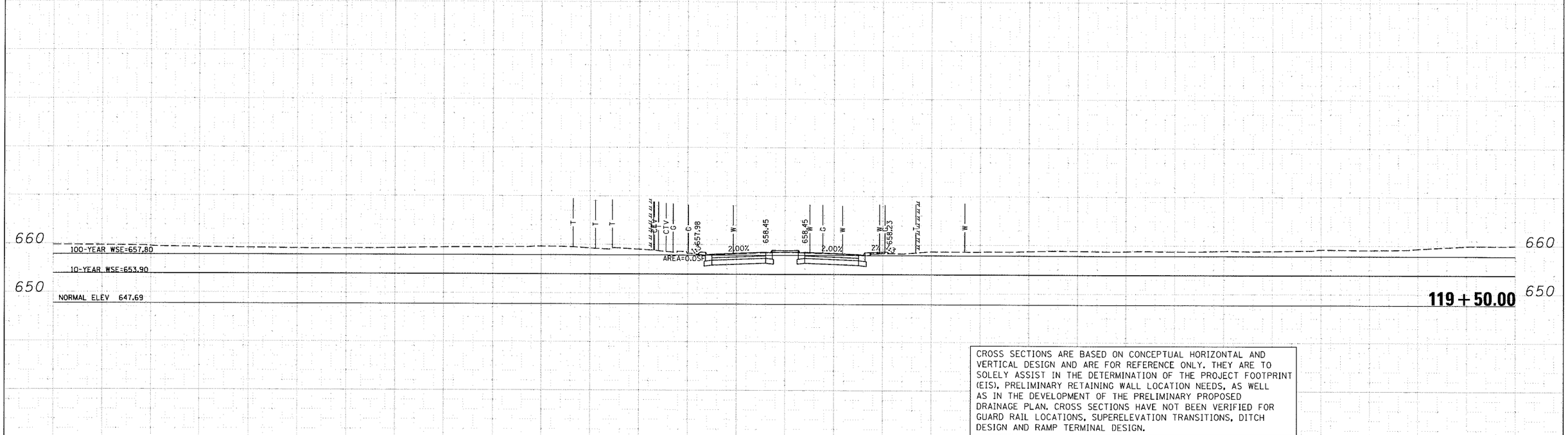
FINAL SURVEY	SURVEYED	
	PLOTTED	
NOTE BOOK	TEMPLATE	
	AREAS	
NO.	AREAS CHECKED	

BY	DATE

ORIGINAL SURVEY	SURVEYED	
	PLOTTED	
NOTE BOOK	TEMPLATE	
	AREAS	
NO.	AREAS CHECKED	

BY	DATE

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300



119 + 50.00

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\...sht-xELMH050.CBBEL.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
		DRAWN - CH2MHILL.	REVISED -
CH2MHILL.	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

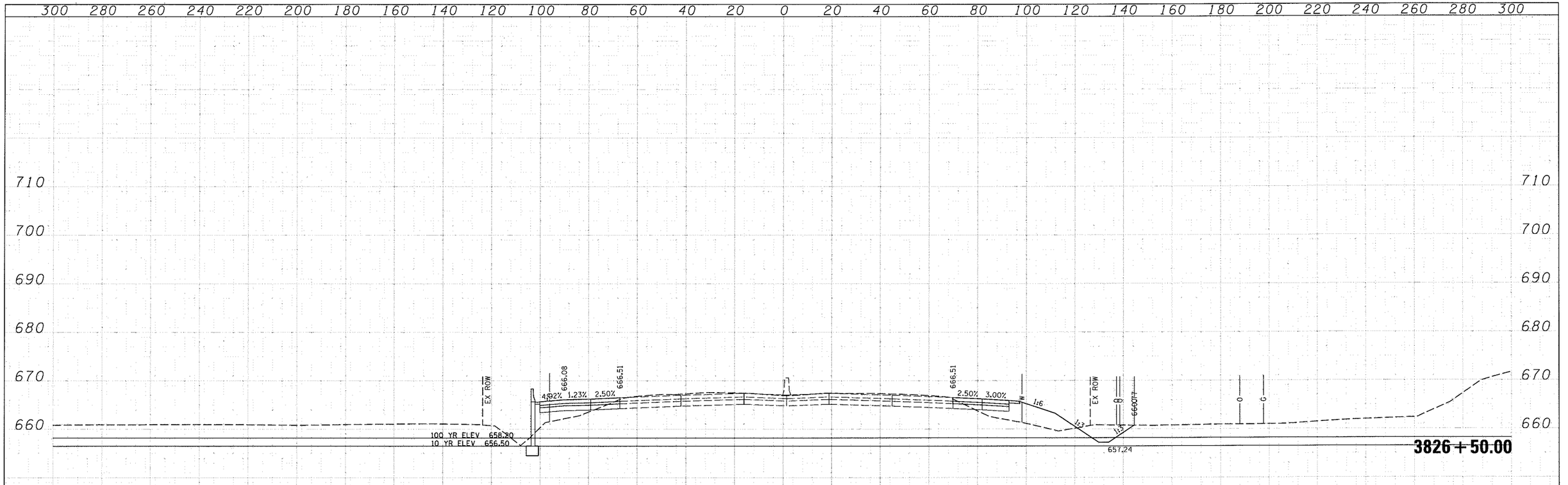
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
ELMHURST ROAD

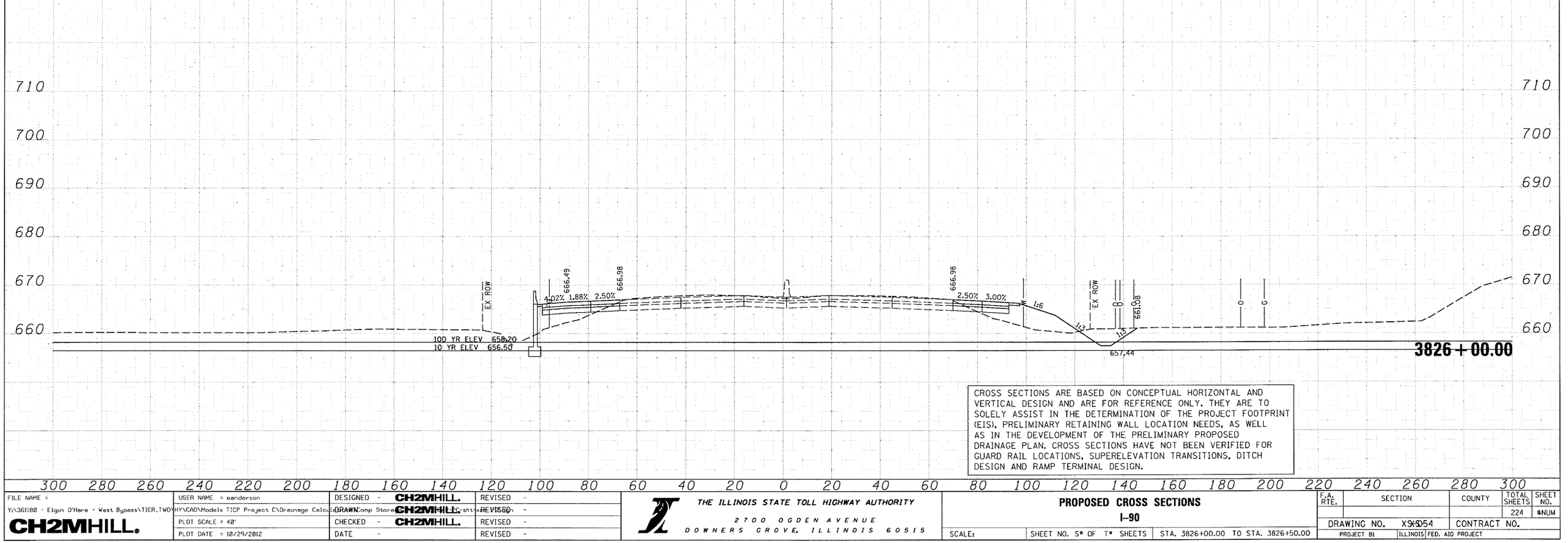
SCALE: | SHEET NO. S* OF T* SHEETS | STA. 119+50.00 | TO STA. 119+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM
DRAWING NO.			CONTRACT NO.	
PROJECT BI	ILLINOIS	FED. AID PROJECT		

FINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	



ORIGINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	



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FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Comp Storage Section.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
	PLOT SCALE = 40'	DRAWN - CH2MHILL.	REVISED -
CH2MHILL.	PLOT DATE = 10/29/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

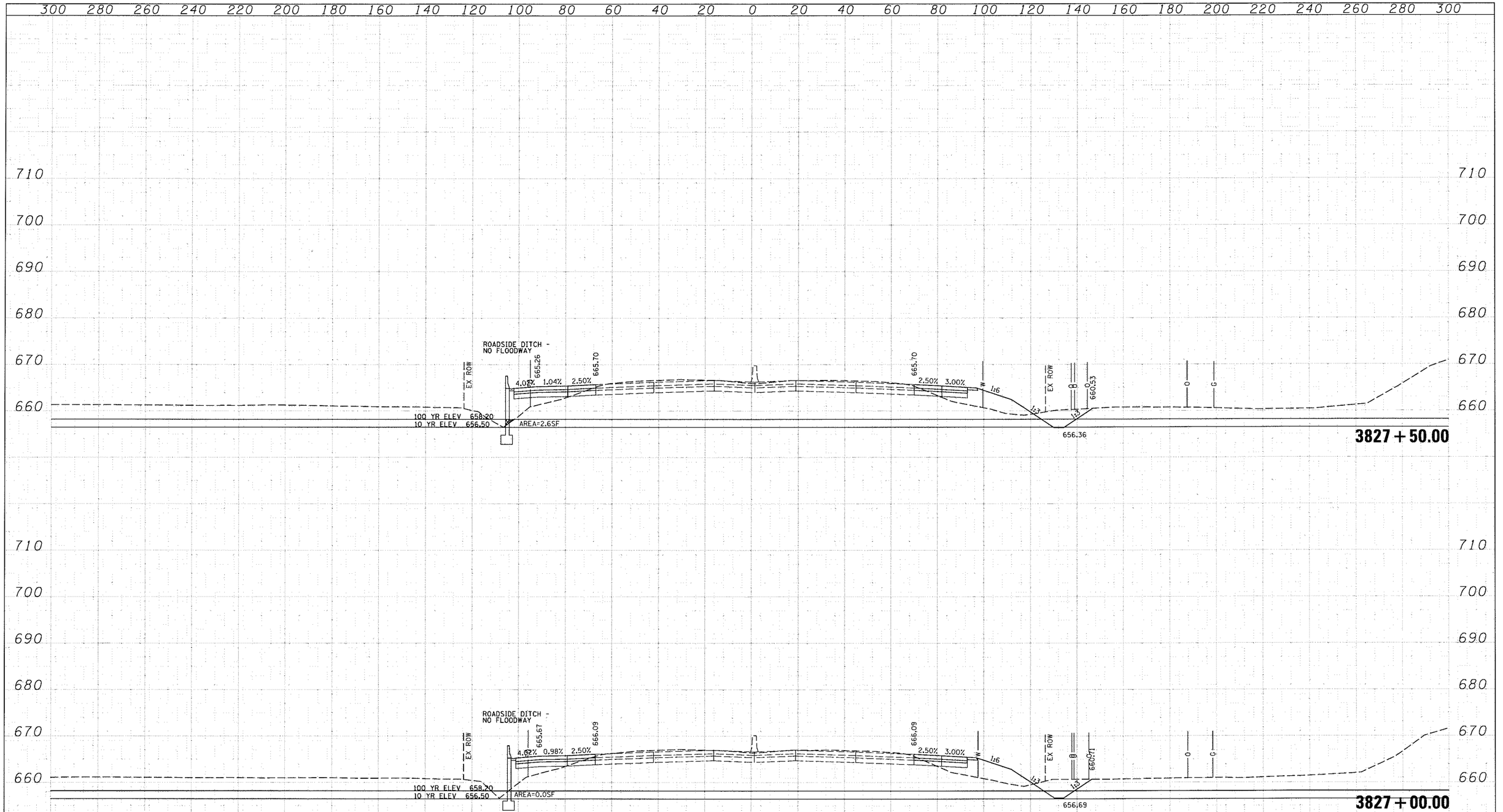
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3826+00.00 TO STA. 3826+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM
DRAWING NO. XS4054		CONTRACT NO.		
PROJECT BI	ILLINOIS FED. AID PROJECT			

FINAL SURVEY	NOTE BOOK	NO.	BY	DATE
SURVEYED				
PLOTTED				
TEMPLATE				
AREAS				
AREAS CHECKED				



ORIGINAL SURVEY	NOTE BOOK	NO.	BY	DATE
SURVEYED				
PLOTTED				
TEMPLATE				
AREAS				
AREAS CHECKED				

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FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calc...Comp Stora...sht.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
CH2MHILL.	PLOT SCALE = 40'	DRAWN - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

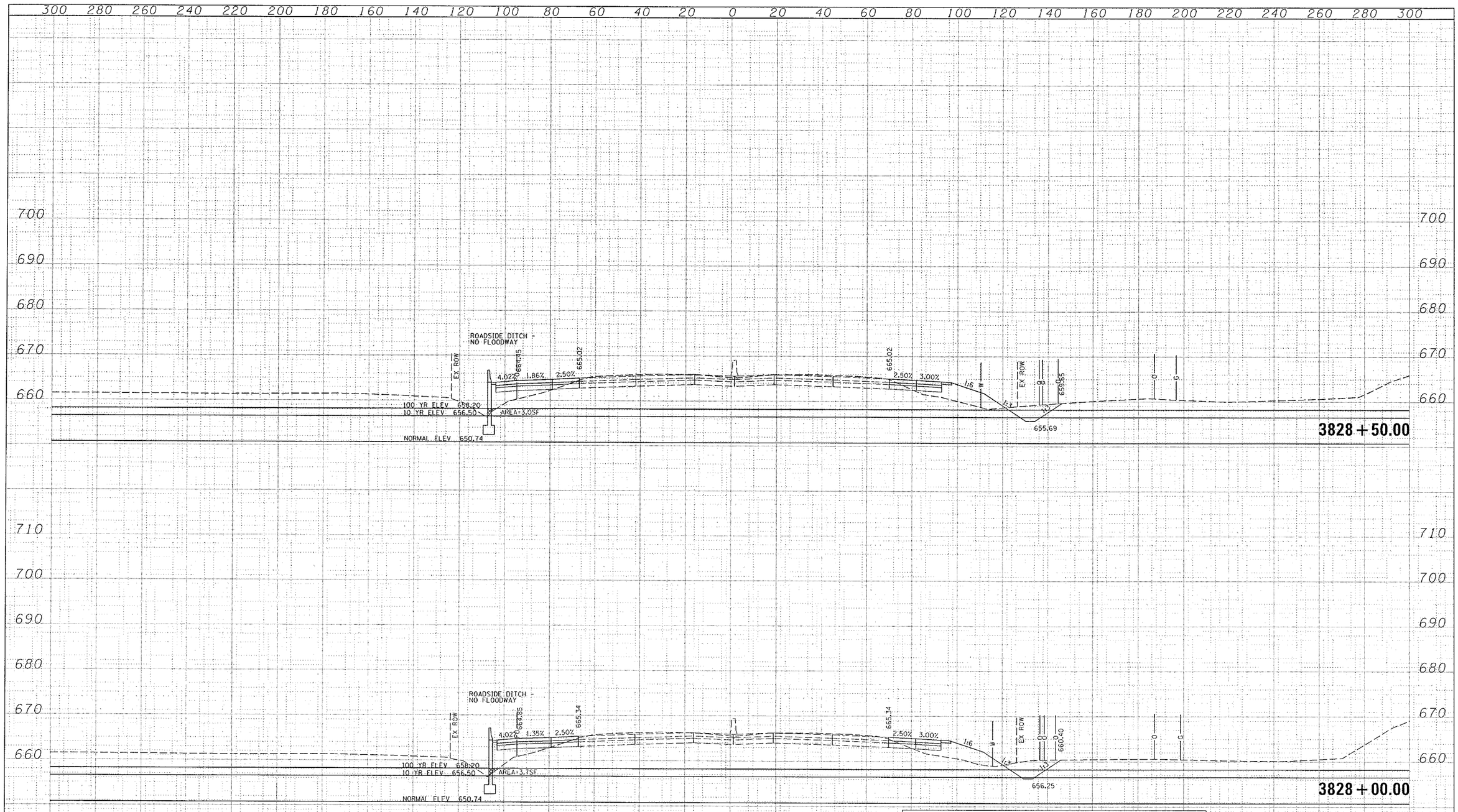
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3827+00.00 TO STA. 3827+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM
DRAWING NO. XSX5055		CONTRACT NO.		
PROJECT B1	ILLINOIS FED. AID PROJECT			

FINAL SURVEY	NO.	NOTE BOOK	BY	DATE
SURVEYED				
PLOTTED				
TEMPLATE				
AREAS				
AREAS CHECKED				



ORIGINAL SURVEY	NO.	NOTE BOOK	BY	DATE
SURVEYED				
PLOTTED				
TEMPLATE				
AREAS				
AREAS CHECKED				

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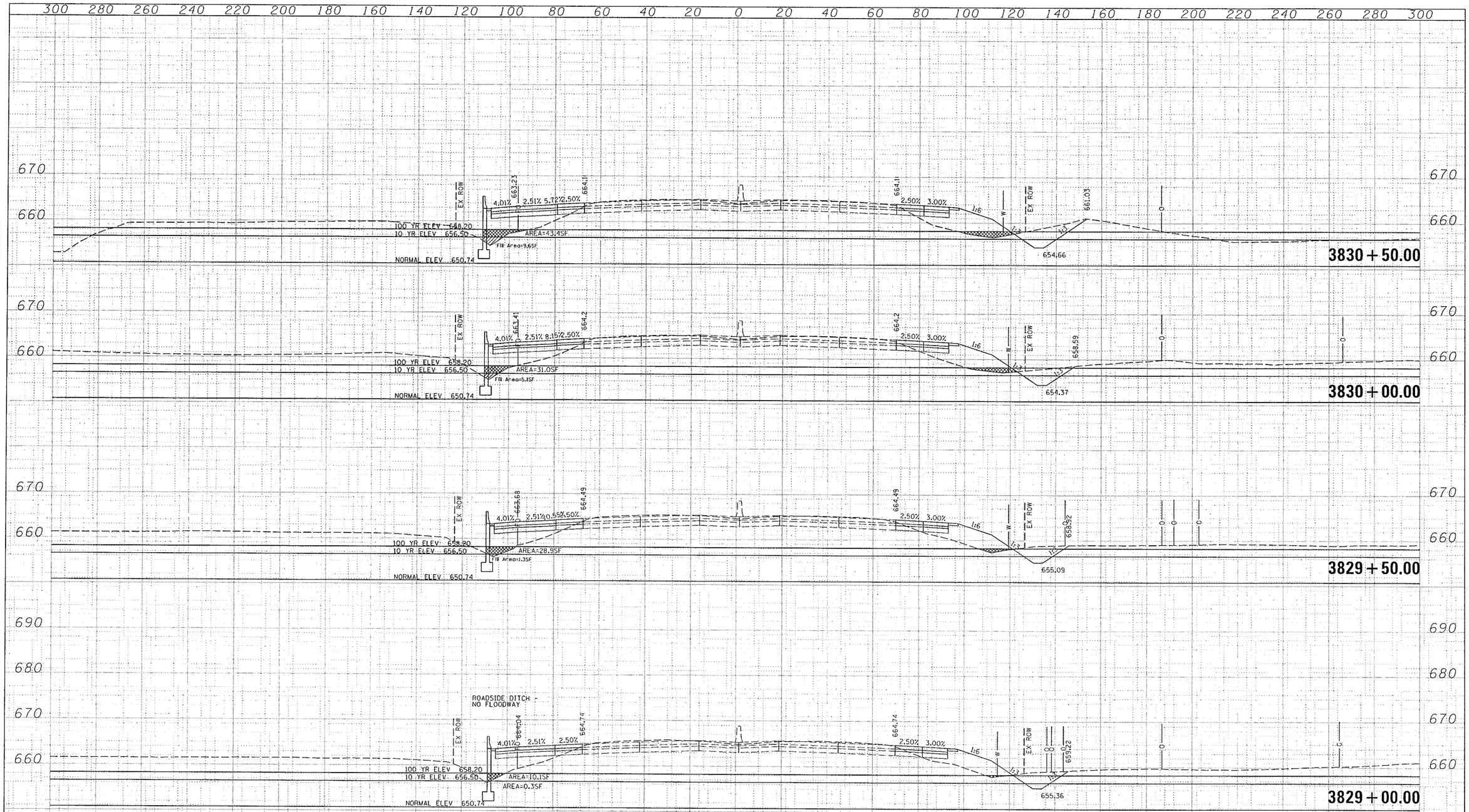
FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage_sht_rev.dgn	USER NAME = anderson	DESIGNED - CH2MHILL	REVISED -
		DRAWN - CH2MHILL	REVISED -
	PLOT SCALE = 40'	CHECKED - CH2MHILL	REVISED -
CH2MHILL	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3828+00.00 TO STA. 3828+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM
DRAWING NO. XS-056		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		



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NO.	NOTE BOOK	AREAS CHECKED	TEMPLATE	PLOTTED	SURVEYED	BY	DATE
					FINAL SURVEY		

NO.	NOTE BOOK	AREAS CHECKED	TEMPLATE	PLOTTED	SURVEYED	BY	DATE
					ORIGINAL SURVEY		

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Comp_sht_cse_I-90.dgn

USER NAME = anderson | PLOT SCALE = 40' | PLOT DATE = 10/29/2012

DESIGNED - CH2MHILL. | DRAWN - CH2MHILL. | CHECKED - CH2MHILL. | DATE -

REVISED - | REVISED - | REVISED -

CH2MHILL

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

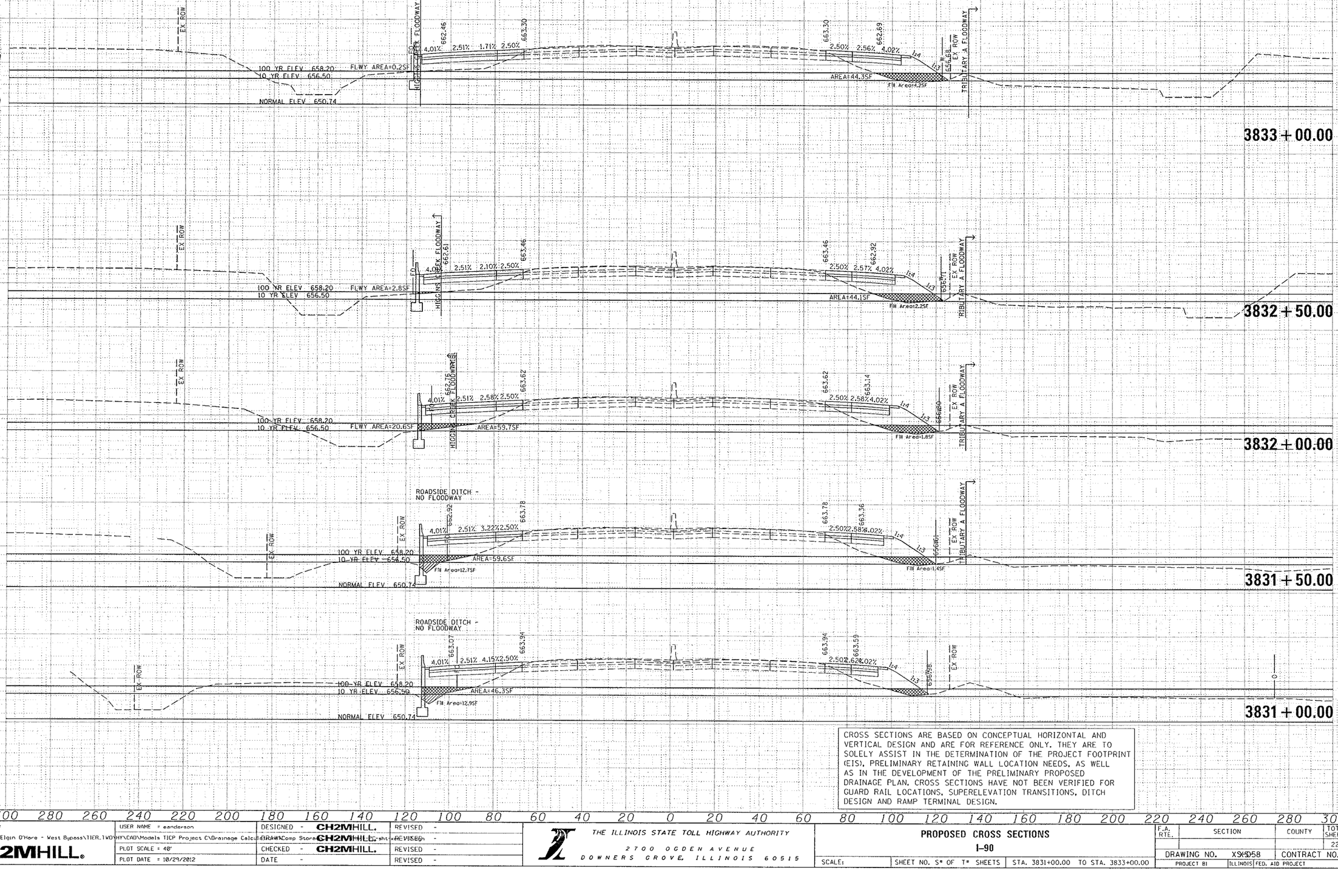
SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3829+00.00 TO STA. 3830+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM

DRAWING NO. XS-057 | CONTRACT NO.

PROJECT BI | ILLINOIS | FED. AID PROJECT

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300



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NO.	BY	DATE
FINAL SURVEY NOTE BOOK	SURVEYED PLOTTED TEMPLATE AREAS AREAS CHECKED	

NO.	BY	DATE
ORIGINAL SURVEY NOTE BOOK	SURVEYED PLOTTED TEMPLATE AREAS AREAS CHECKED	

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\I-90_shts_revised.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
CH2MHILL®	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

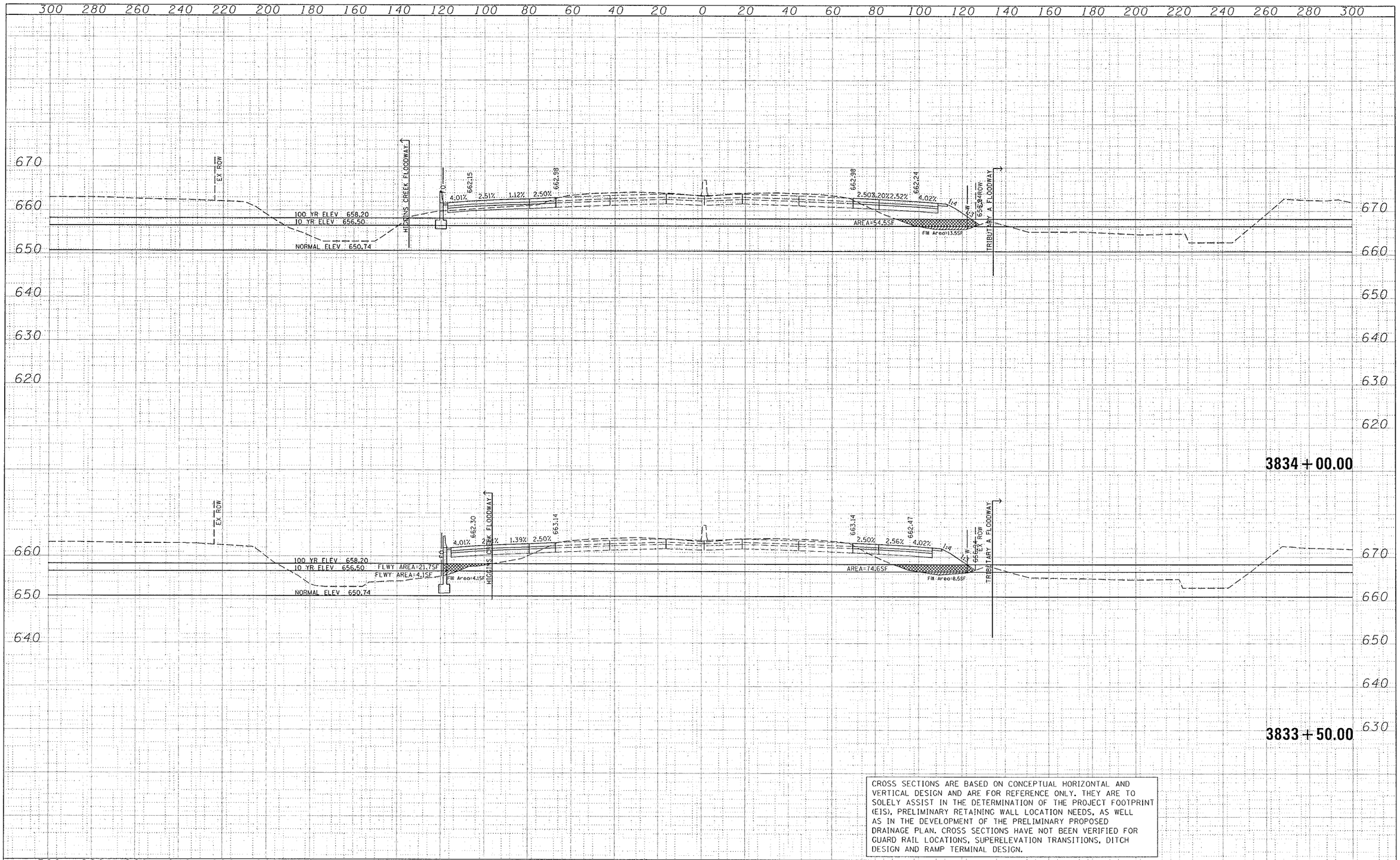
PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3831+00.00 TO STA. 3833+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO. XS-058		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		

FINAL SURVEY	BY	DATE
NOTE BOOK		
NO.		

SURVEYED
PLOTTED
DRAWN
AREAS
AREAS CHECKED



ORIGINAL SURVEY	BY	DATE
NOTE BOOK		
NO.		

SURVEYED
PLOTTED
DRAWN
AREAS
AREAS CHECKED

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage_sht-xsections.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
	PLOT SCALE = 40'	DRAWN - CH2MHILL.	REVISED -
CH2MHILL.	PLOT DATE = 10/29/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3833+50.00 TO STA. 3834+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM
DRAWING NO. XS-059		CONTRACT NO.		
PROJECT BI	ILLINOIS FED. AID PROJECT			

FINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
FIELD BOOK		
NOTE BOOK		
AREAS		
NO.	AREAS CHECKED	

ORIGINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
FIELD BOOK		
NOTE BOOK		
AREAS		
NO.	AREAS CHECKED	

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

670 660 650 640 630 620 610 600 590

EX ROW

HIGGINS CREEK FLOODWAY

100 YR ELEV 658.20
10 YR ELEV 656.50
NORMAL ELEV 650.74

FO

661.99

4.01% 2.51% 0.92% 2.50%

662.82

662.82

2.50% 2.76% 2.52%

662.02

4.02%

1:4

EX ROW

656.8

TRIBUTARY A FLOODWAY

AREA=55.2SF

Fill Area=12.7SF

3834+50.00

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CADD\Models TICP Project CXD\Drainage Calculations\Comp Storage\[Fig-sht-REVISED.dgn]

USER NAME = eanderson

PLOT SCALE = 40'

PLOT DATE = 10/29/2012

DESIGNED - CH2MHILL

DRAWN - CH2MHILL

CHECKED - CH2MHILL

DATE -

REVISED -

REVISED -

REVISED -

CH2MHILL

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE:

SHEET NO. S* OF T* SHEETS

STA. 3834+50.00 TO STA. 3834+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM

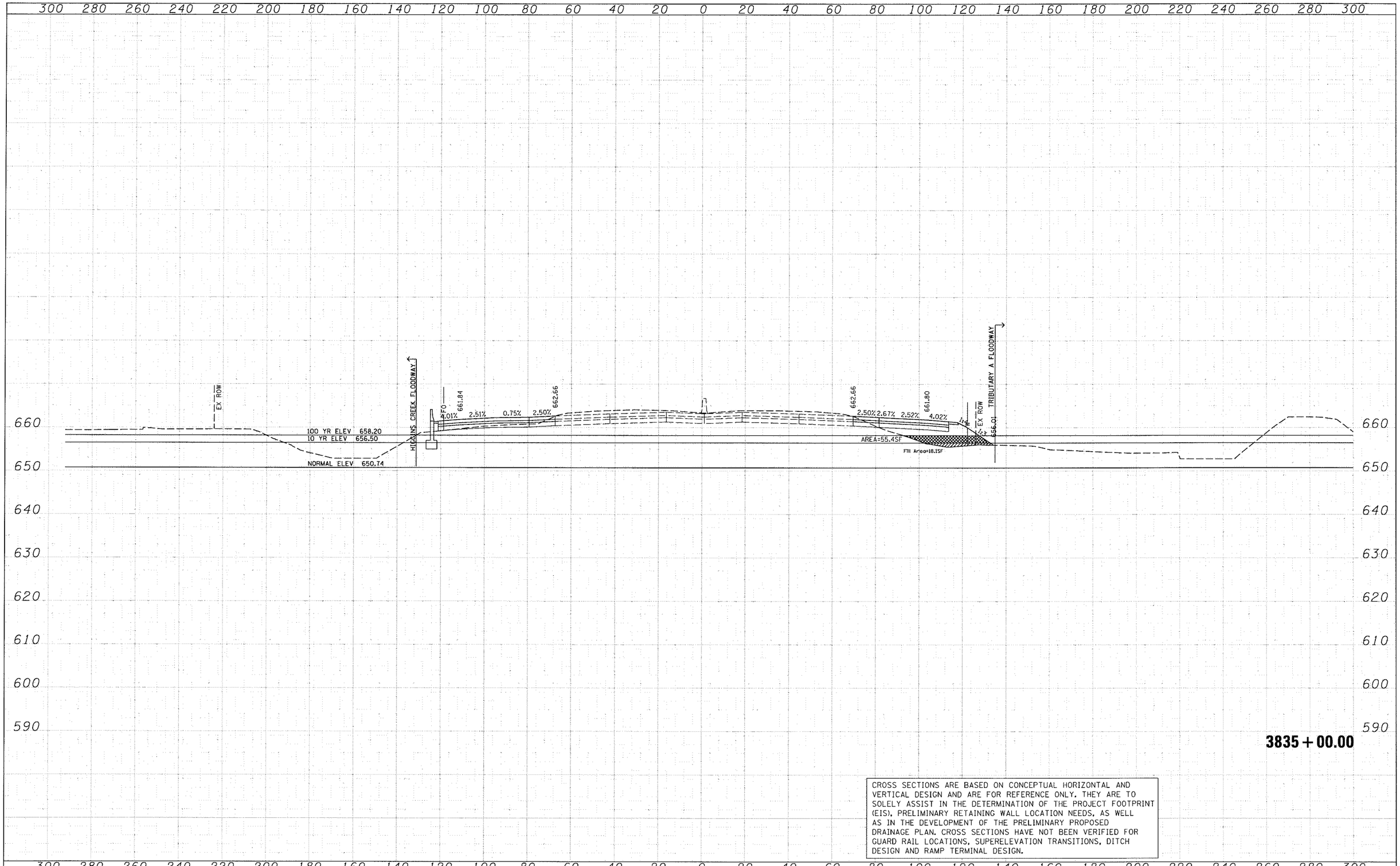
DRAWING NO. XS-D60

CONTRACT NO.

PROJECT B1 | ILLINOIS | FED. AID PROJECT

FINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	

ORIGINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Comp Storage_Sheet.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
		DRAWN - CH2MHILL.	REVISED -
CH2MHILL.	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

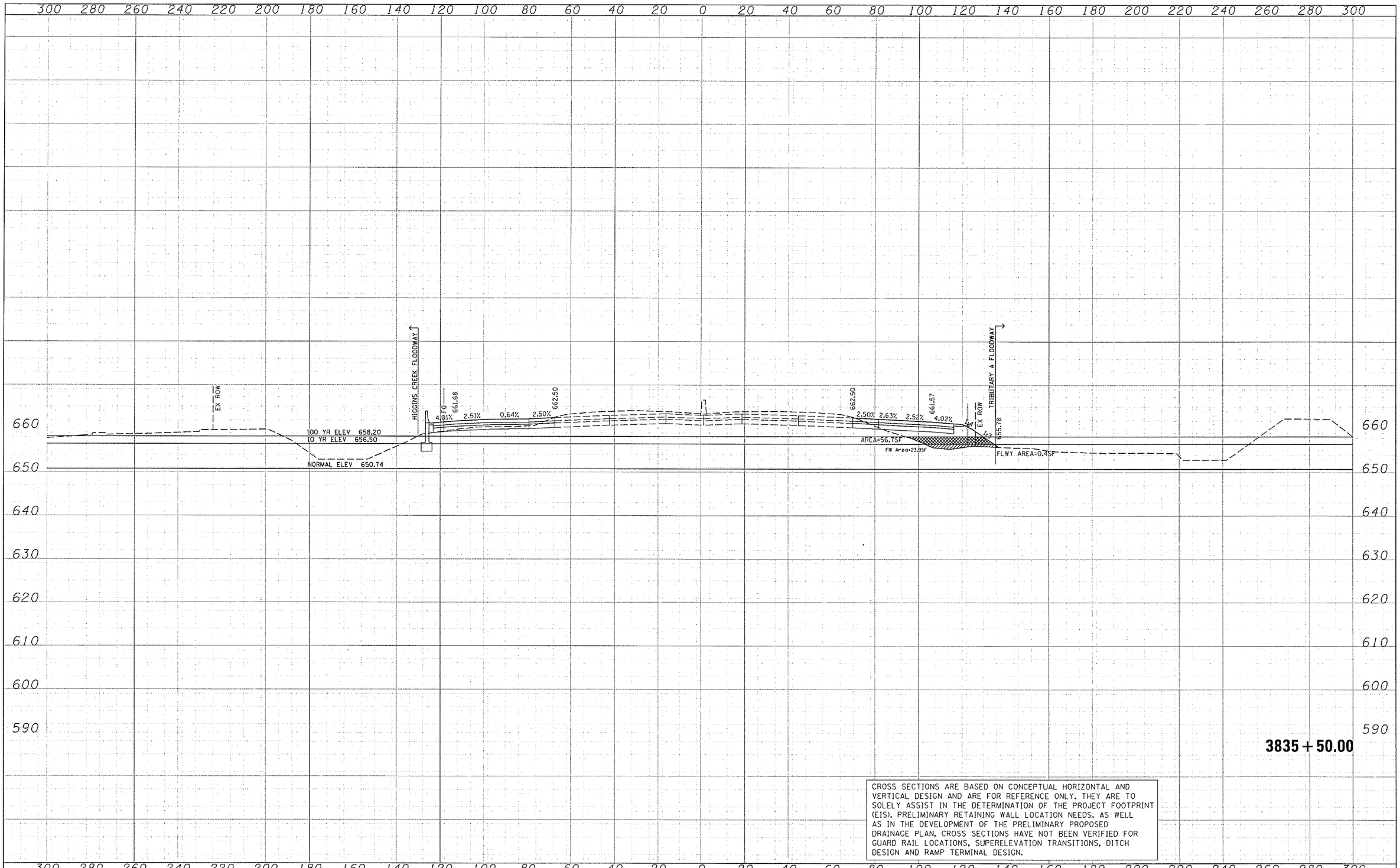
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3835+00.00 TO STA. 3835+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO. XS-5061		CONTRACT NO.		
PROJECT B1	ILLINOIS FED. AID PROJECT			

FINAL SURVEY	NOTE BOOK	NO.	SURVEYED	PLOTTED	TEMPLATE	AREAS	AREAS CHECKED	BY	DATE



ORIGINAL SURVEY	NOTE BOOK	NO.	SURVEYED	PLOTED	TEMPLATE	AREAS	AREAS CHECKED	BY	DATE

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\[illc-sht-xs.dgn]	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
CH2MHILL®		DRAWN - CH2MHILL.	REVISED -
	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

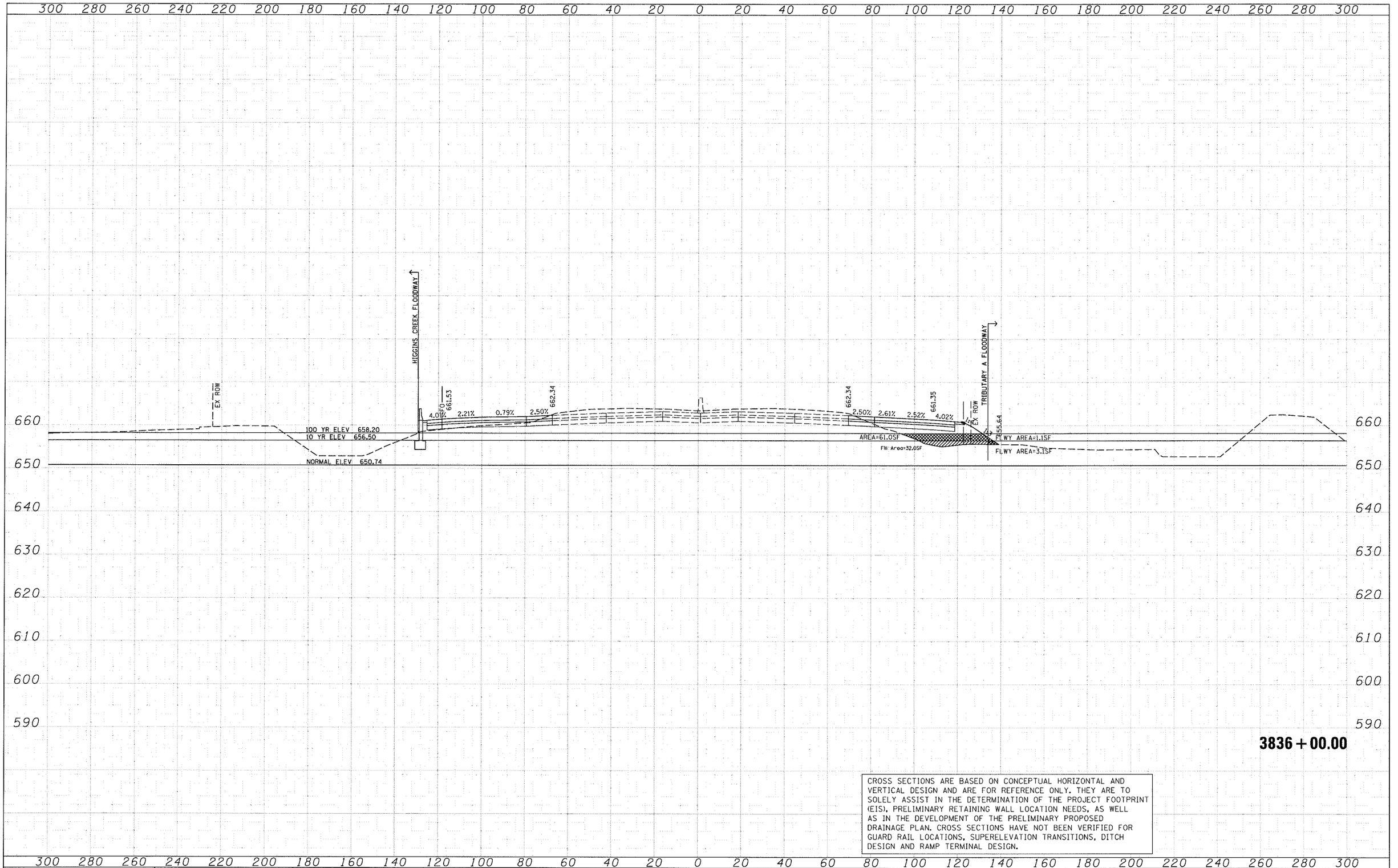
SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3835+50.00 TO STA. 3835+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM

DRAWING NO. XS#D62 | CONTRACT NO.

PROJECT 81 | ILLINOIS | FED. AID PROJECT

FINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	



ORIGINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FILE NAME = Y:\361180 - Elgin O'Here - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\[illegible]	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
		DRAWN - CH2MHILL.	REVISED -
CH2MHILL.	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

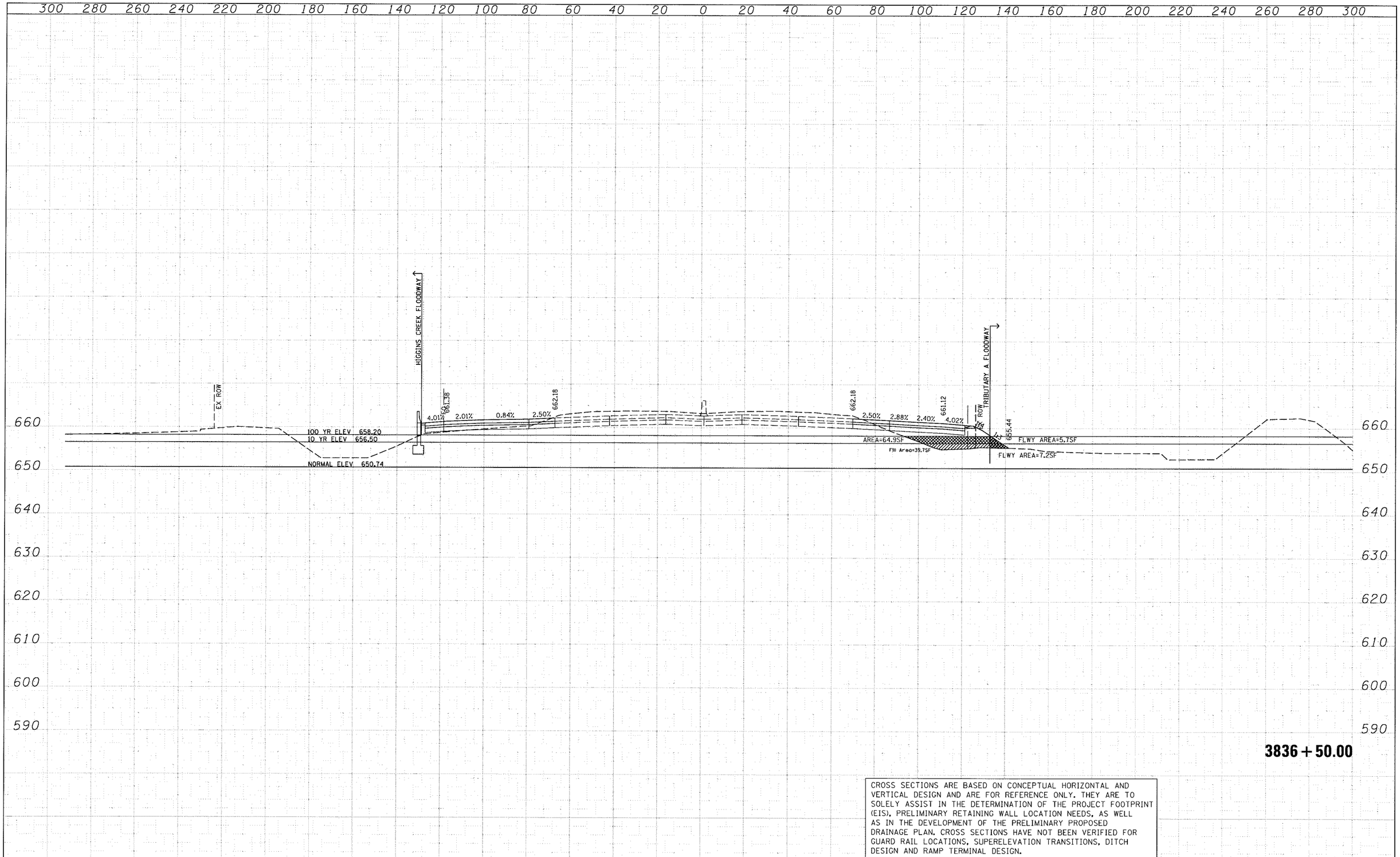
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3836+00.00 TO STA. 3836+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM
DRAWING NO. XS-063		CONTRACT NO.		
PROJECT B1	ILLINOIS	FED. AID PROJECT		

FINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	



ORIGINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\...sht-xsection	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
		DRAWN - CH2MHILL.	REVISED -
	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

CH2MHILL.

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

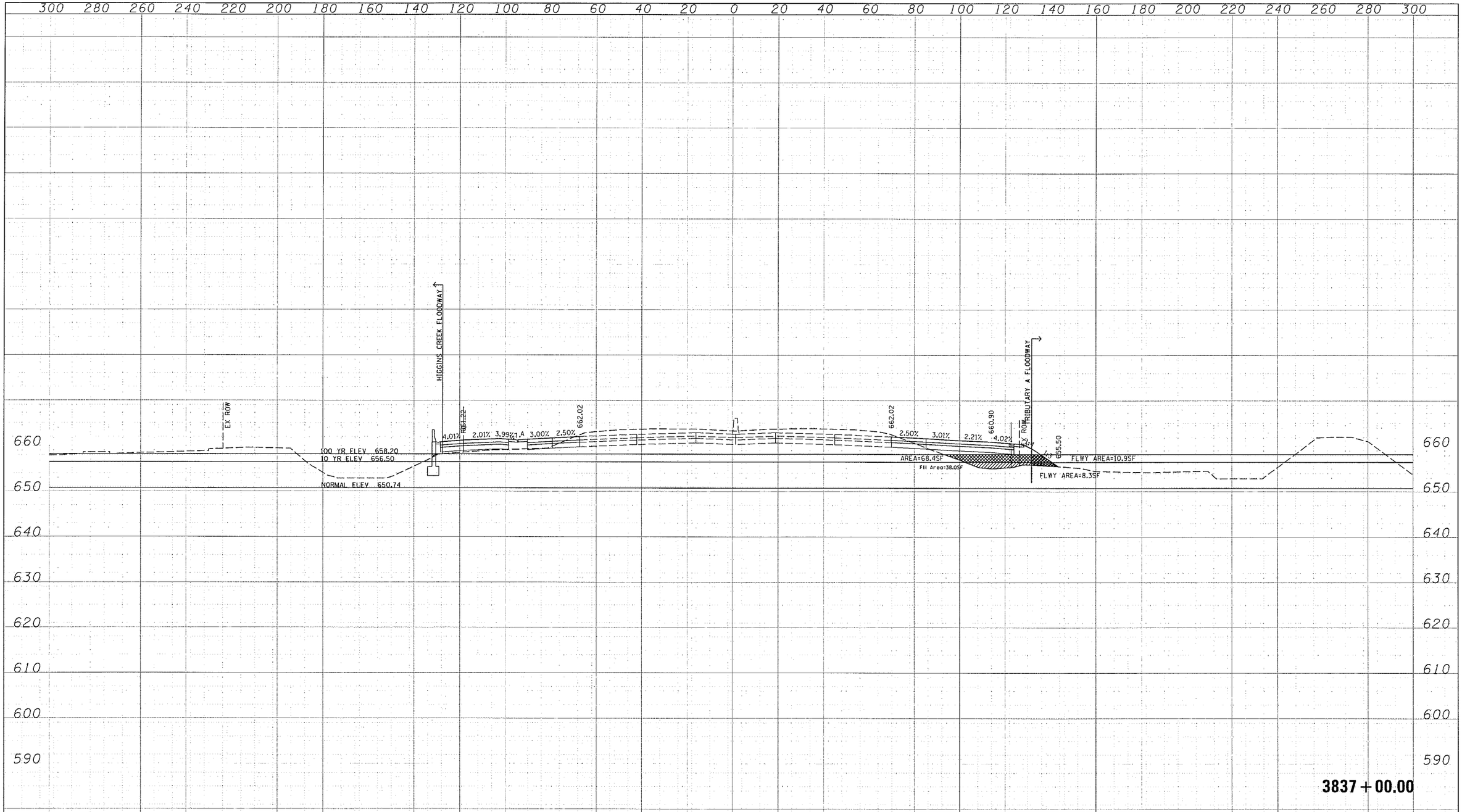
PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3836+50.00 TO STA. 3836+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO. XS#D64		CONTRACT NO.		
PROJECT BI	ILLINOIS FED. AID PROJECT			

FINAL SURVEY	NOTE BOOK	NO.
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

BY	DATE



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

ORIGINAL SURVEY	NOTE BOOK	NO.
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

BY	DATE

FILE NAME = Y:\361100 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
CH2MHILL.		DRAWN - CH2MHILL.	REVISED -
	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

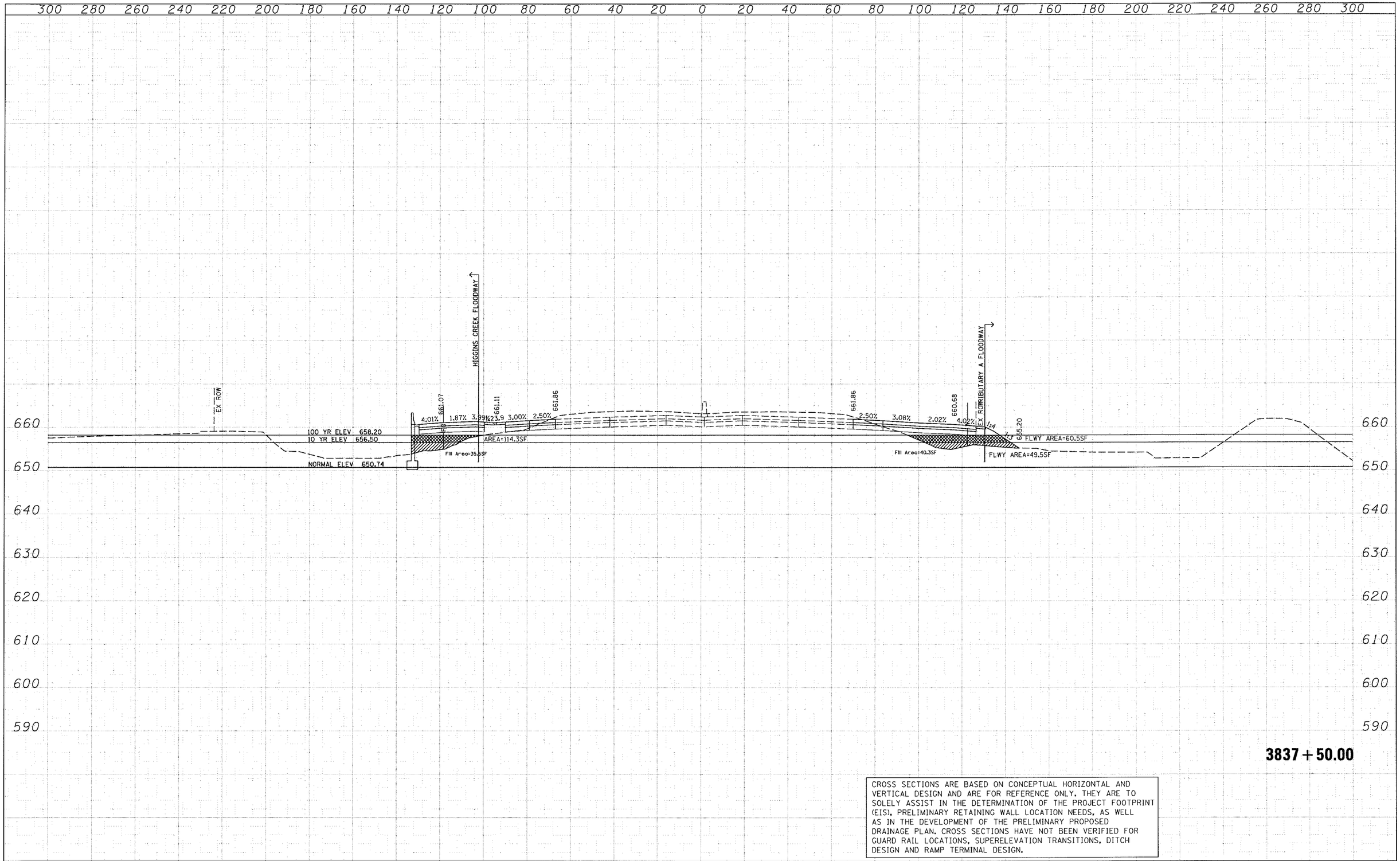
SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3837+00.00 TO STA. 3837+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM

DRAWING NO. XS-065 | CONTRACT NO.

PROJECT BI | ILLINOIS | FED. AID PROJECT

FINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	



ORIGINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\...sht-xsec.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
		DRAWN - CH2MHILL.	REVISED -
CH2MHILL.	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 12/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3837+50.00 TO STA. 3837+50.00

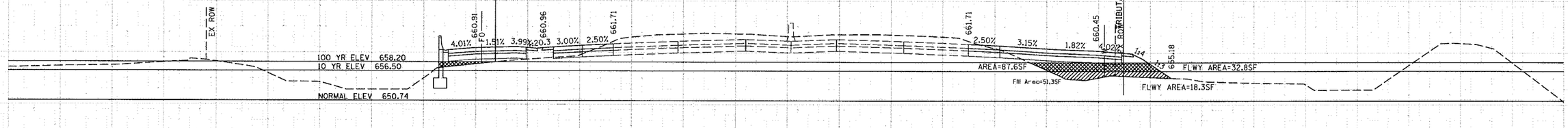
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO. XS#D66		CONTRACT NO.		
PROJECT 81	ILLINOIS FED. AID PROJECT			

FINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	

ORIGINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

660
650
640
630
620
610
600
590



3838+00.00

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\[redacted]	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
		DRAWN - CH2MHILL.	REVISED -
CH2MHILL.	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

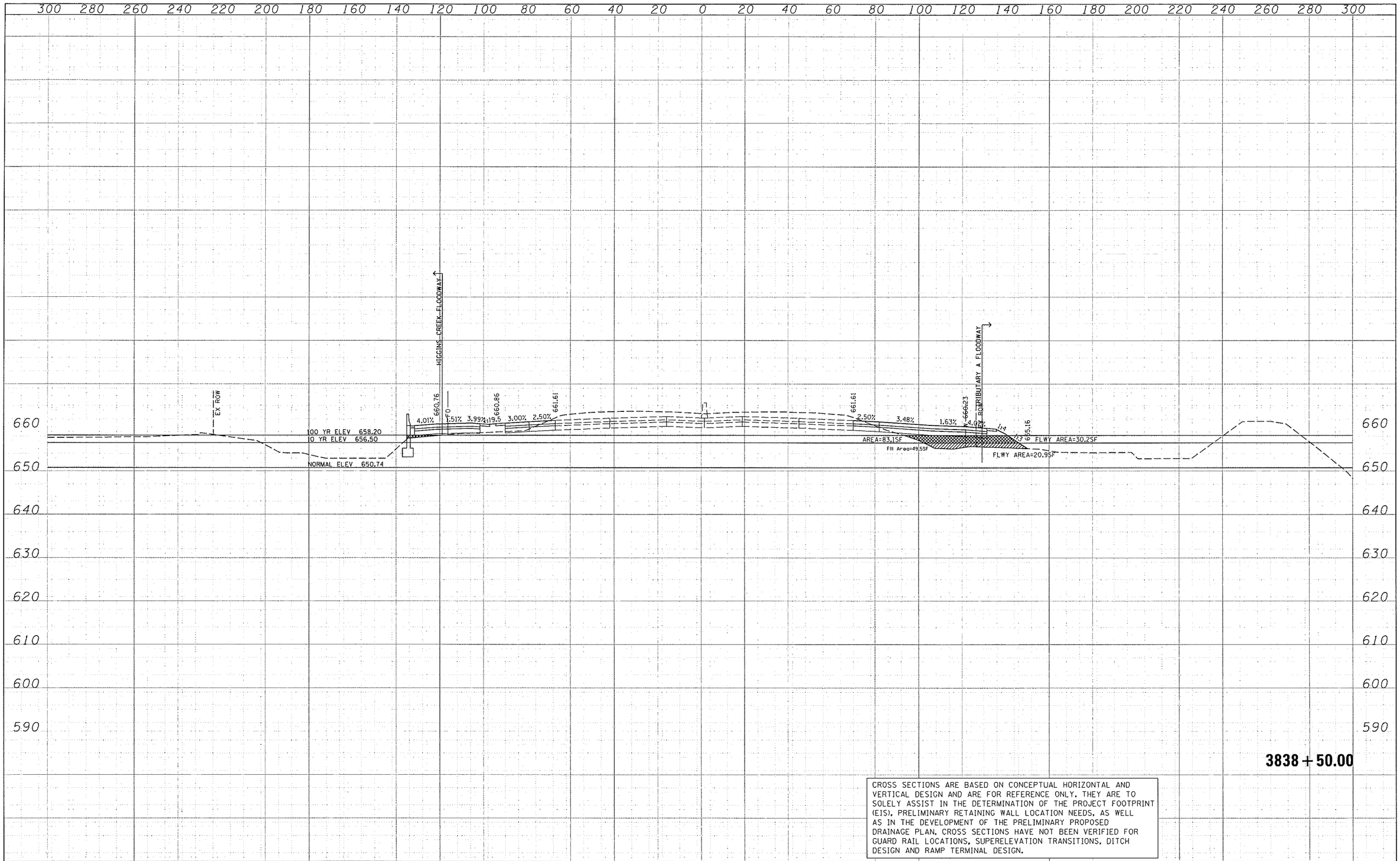
PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3838+00.00 TO STA. 3838+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM
DRAWING NO. XS-D67		CONTRACT NO.		
PROJECT B1	ILLINOIS FED. AID PROJECT			

FINAL SURVEY	NOTE BOOK	NO.
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

BY	DATE



ORIGINAL SURVEY	NOTE BOOK	NO.
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

BY	DATE

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Comp_Storage_Sht_XS.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
		DRAWN - CH2MHILL.	REVISED -
	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
CH2MHILL.	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3838+50.00 TO STA. 3838+50.00

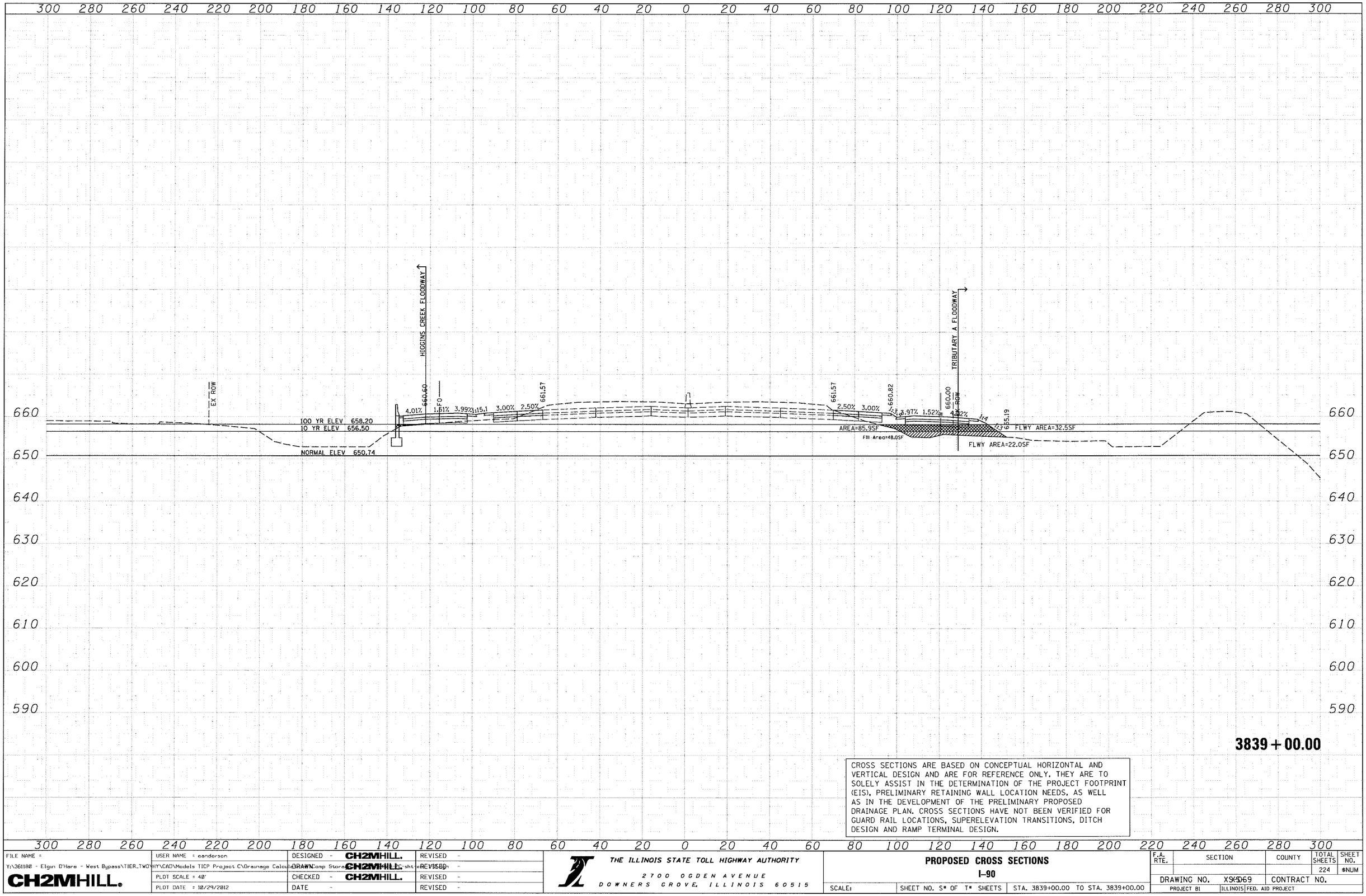
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM

DRAWING NO. XS-3838 | CONTRACT NO.

PROJECT B1 | ILLINOIS | FED. AID PROJECT

FINAL SURVEY	NOTE BOOK	NO.
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

BY	DATE



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

ORIGINAL SURVEY	NOTE BOOK	NO.
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

BY	DATE

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\TIC_xsht_xsec.dgn

USER NAME = eanderson | PLOT SCALE = 40' | PLOT DATE = 10/29/2012

DESIGNED - CH2MHILL. | DRAWN - CH2MHILL. | CHECKED - CH2MHILL. | DATE -

REVISED - | REVISED - | REVISED - | REVISED -

CH2MHILL.

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

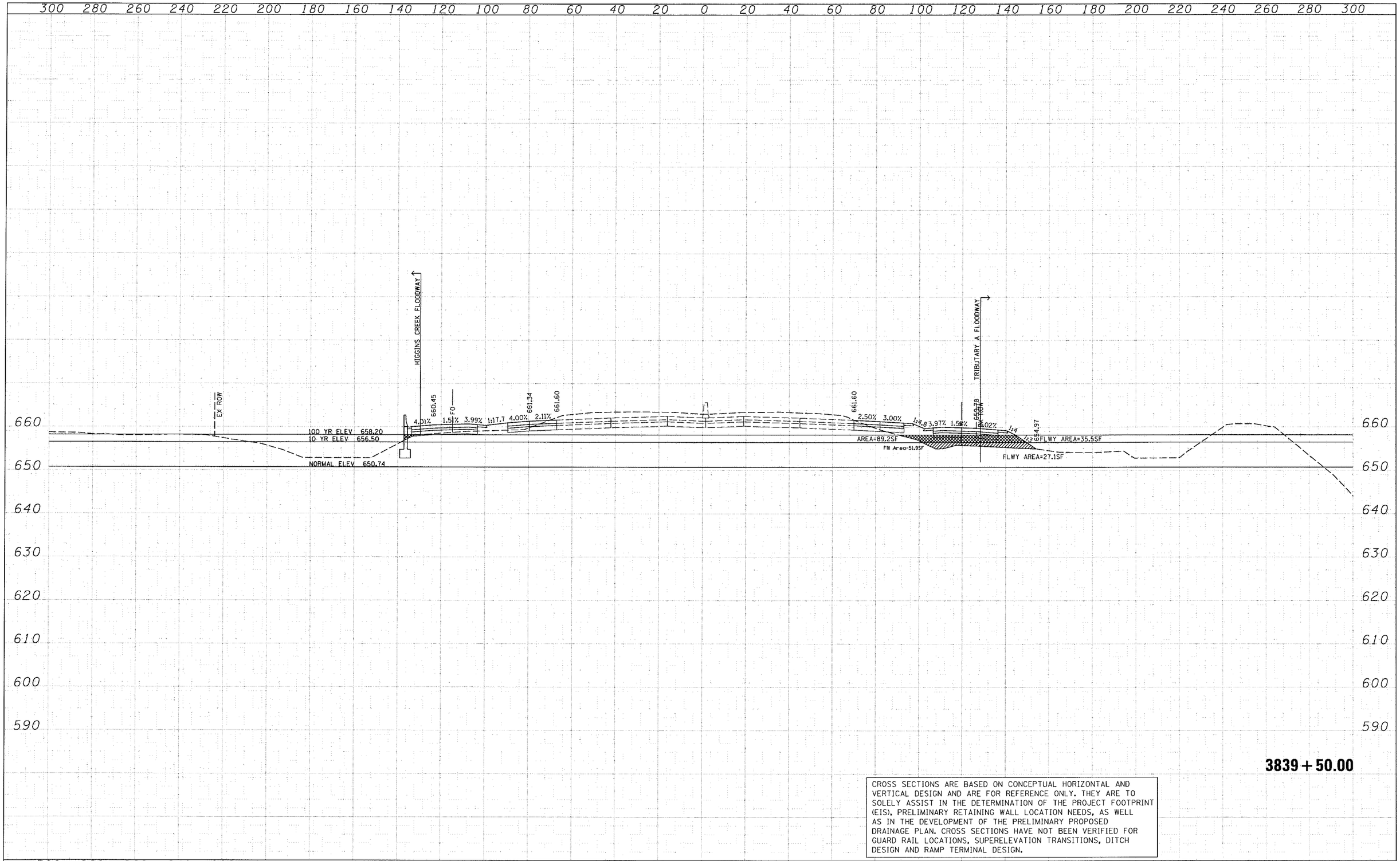
SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3839+00.00 TO STA. 3839+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM

DRAWING NO. XS-5.069 | CONTRACT NO.

PROJECT 81 | ILLINOIS | FED. AID PROJECT

FINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	



ORIGINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	

3839+50.00

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Comp Storage Sheet.xlsx	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
		DRAWN - CH2MHILL.	REVISED -
	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
CH2MHILL.	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

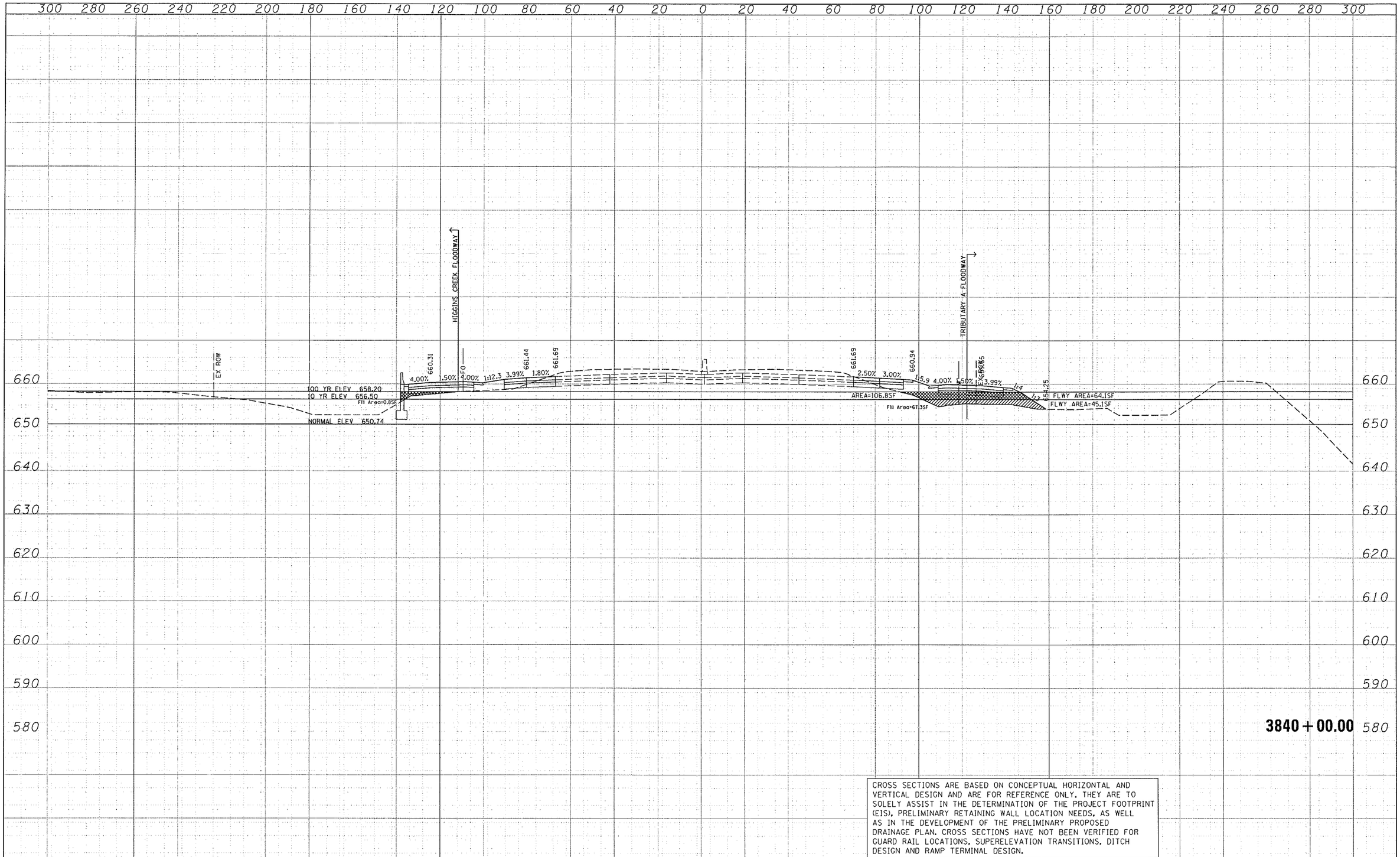
SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3839+50.00 TO STA. 3839+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM

DRAWING NO. XS-50-70 | CONTRACT NO.

PROJECT BI | ILLINOIS | FED. AID PROJECT

FINAL SURVEY	DATE
NOTE BOOK	BY
NO.	SURVEYED
	PLOTTED
	TEMPLATE
	AREAS
	AREAS CHECKED



ORIGINAL SURVEY	DATE
NOTE BOOK	BY
NO.	SURVEYED
	PLOTTED
	TEMPLATE
	AREAS
	AREAS CHECKED

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FILE NAME = Y:\361100 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Comp_Storage_sht_xsections	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
CH2MHILL.	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

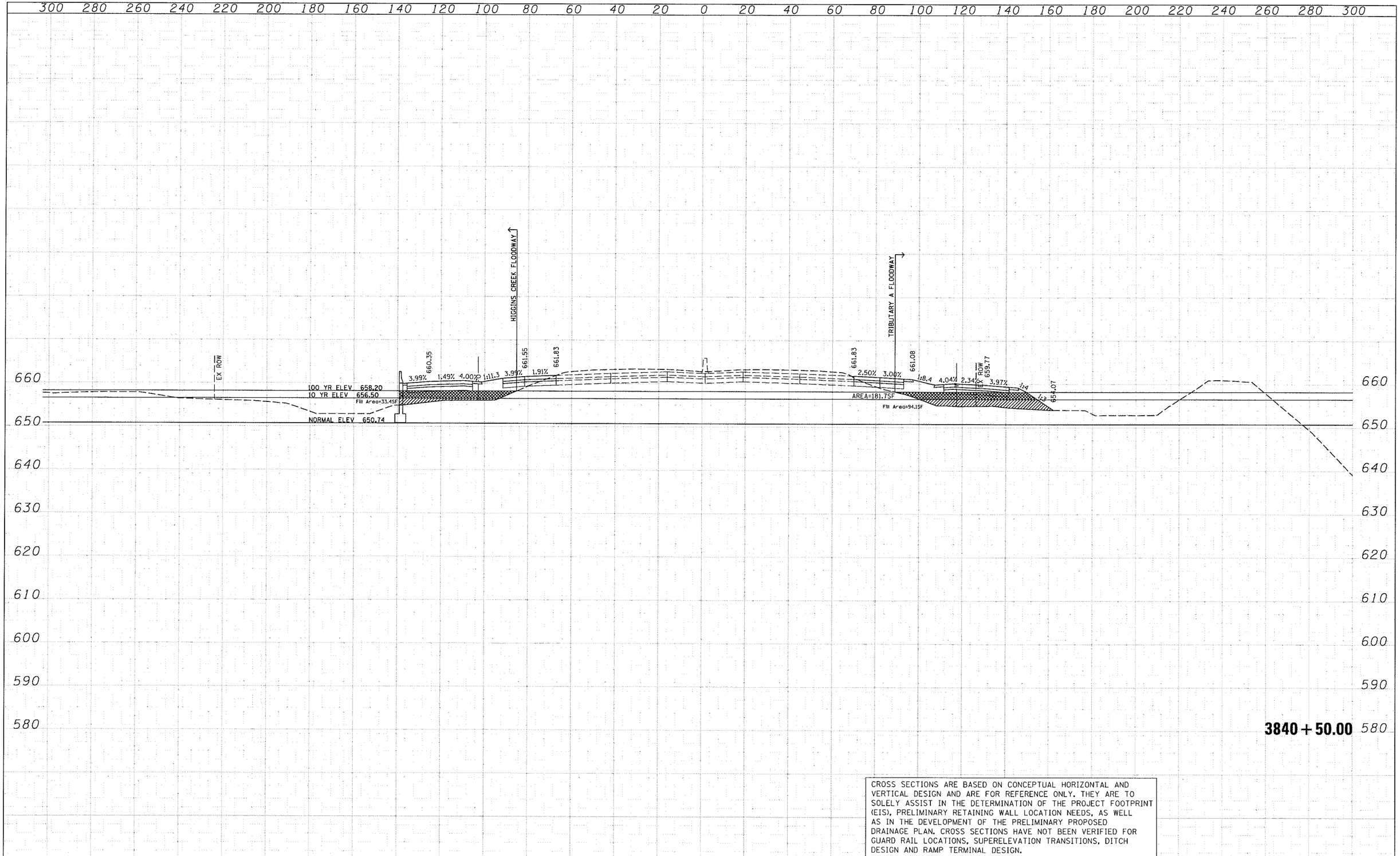
SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3840+00.00 TO STA. 3840+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM

DRAWING NO. XS-50-71 | CONTRACT NO.

PROJECT BI | ILLINOIS | FED. AID PROJECT

FINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	



ORIGINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	

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CH2MHILL.	PLOT SCALE = 40'	DRAWN - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

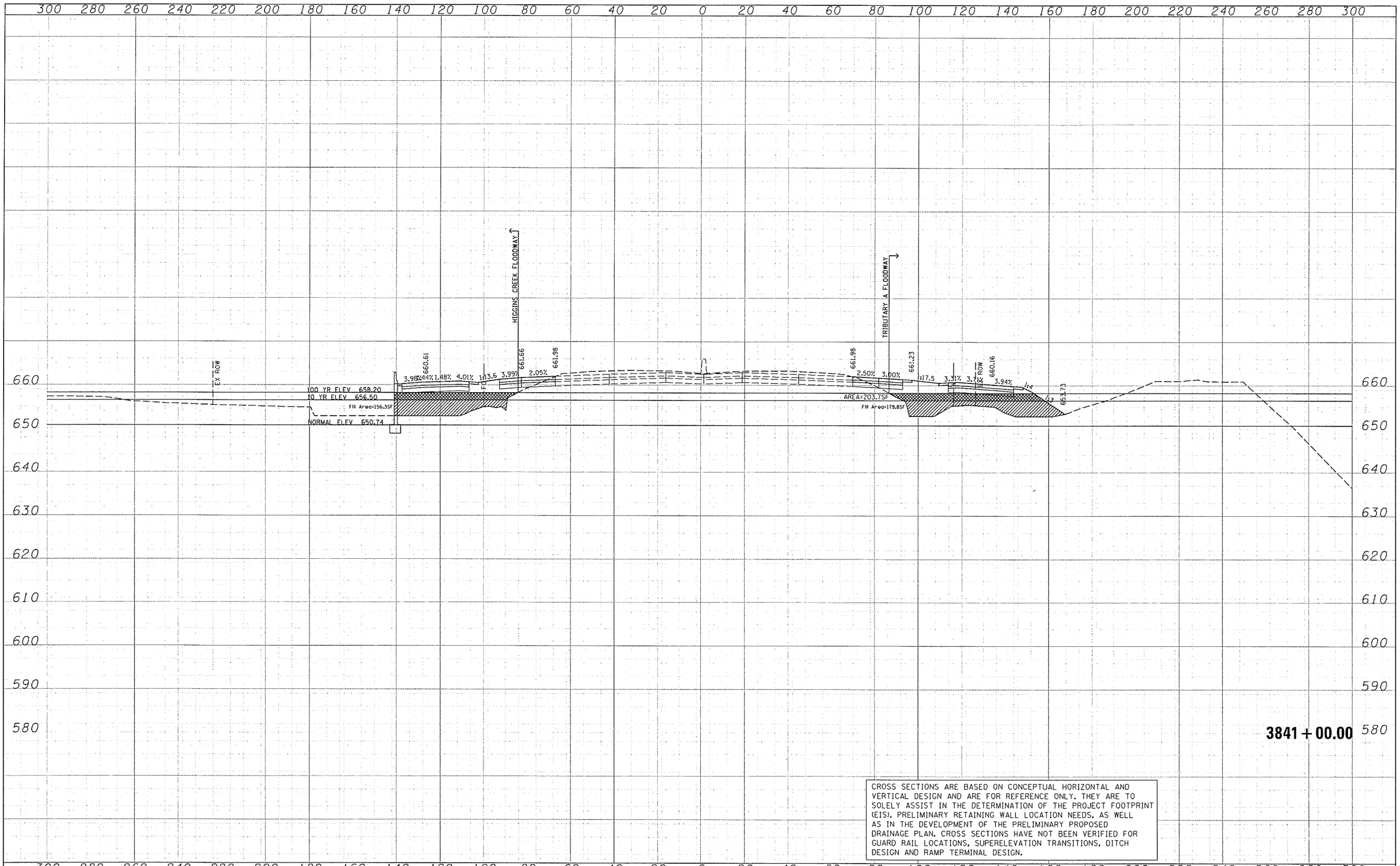
SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3840+50.00 TO STA. 3840+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO. XS-3072			CONTRACT NO.	
PROJECT B1	ILLINOIS	FED. AID PROJECT		

FINAL SURVEY	
NOTE BOOK	
NO.	

SURVEYED	
PLOTTED	
TEMPLATE	
AREAS	
AREAS CHECKED	

BY	DATE



ORIGINAL SURVEY	
NOTE BOOK	
NO.	

SURVEYED	
PLOTTED	
TEMPLATE	
AREAS	
AREAS CHECKED	

BY	DATE

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

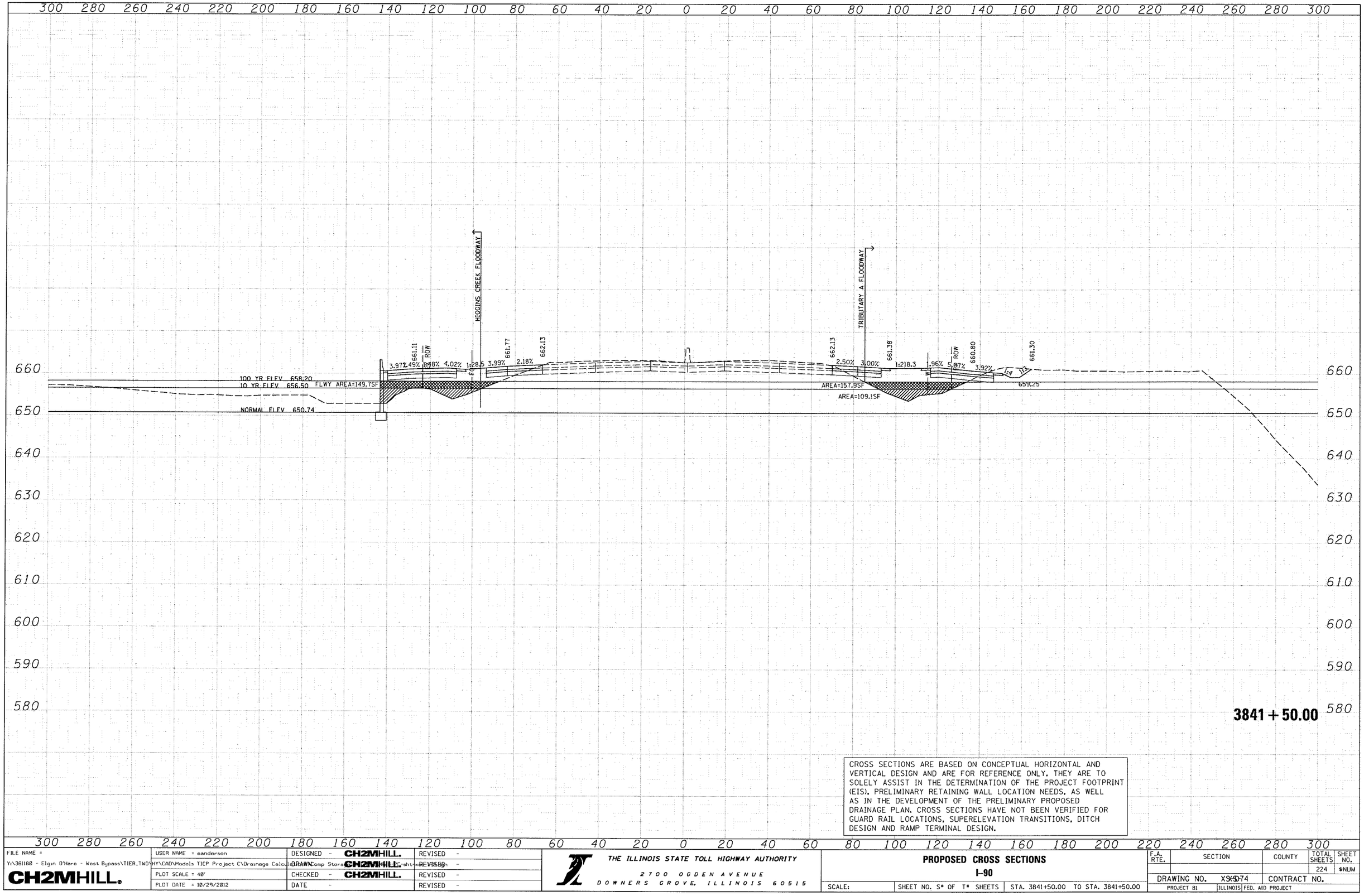
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		DRAWN - CH2MHILL.	REVISED -
	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
CH2MHILL.	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3841+00.00 TO STA. 3841+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO. XS-5D-73		CONTRACT NO.		
PROJECT BI	ILLINOIS FED. AID PROJECT			



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY	NOTE BOOK	NO.	BY	DATE
SURVEYED				
PLOTTED				
TEMPLATE				
AREAS				
AREAS CHECKED				

ORIGINAL SURVEY	NOTE BOOK	NO.	BY	DATE
SURVEYED				
PLOTTED				
TEMPLATE				
AREAS				
AREAS CHECKED				

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USER NAME = eanderson

PLOT SCALE = 40'

PLOT DATE = 10/29/2012

DESIGNED - CH2MHILL. REVISED -

DRAWN - CH2MHILL. REVISED -

CHECKED - CH2MHILL. REVISED -

DATE - REVISED -

CH2MHILL.

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

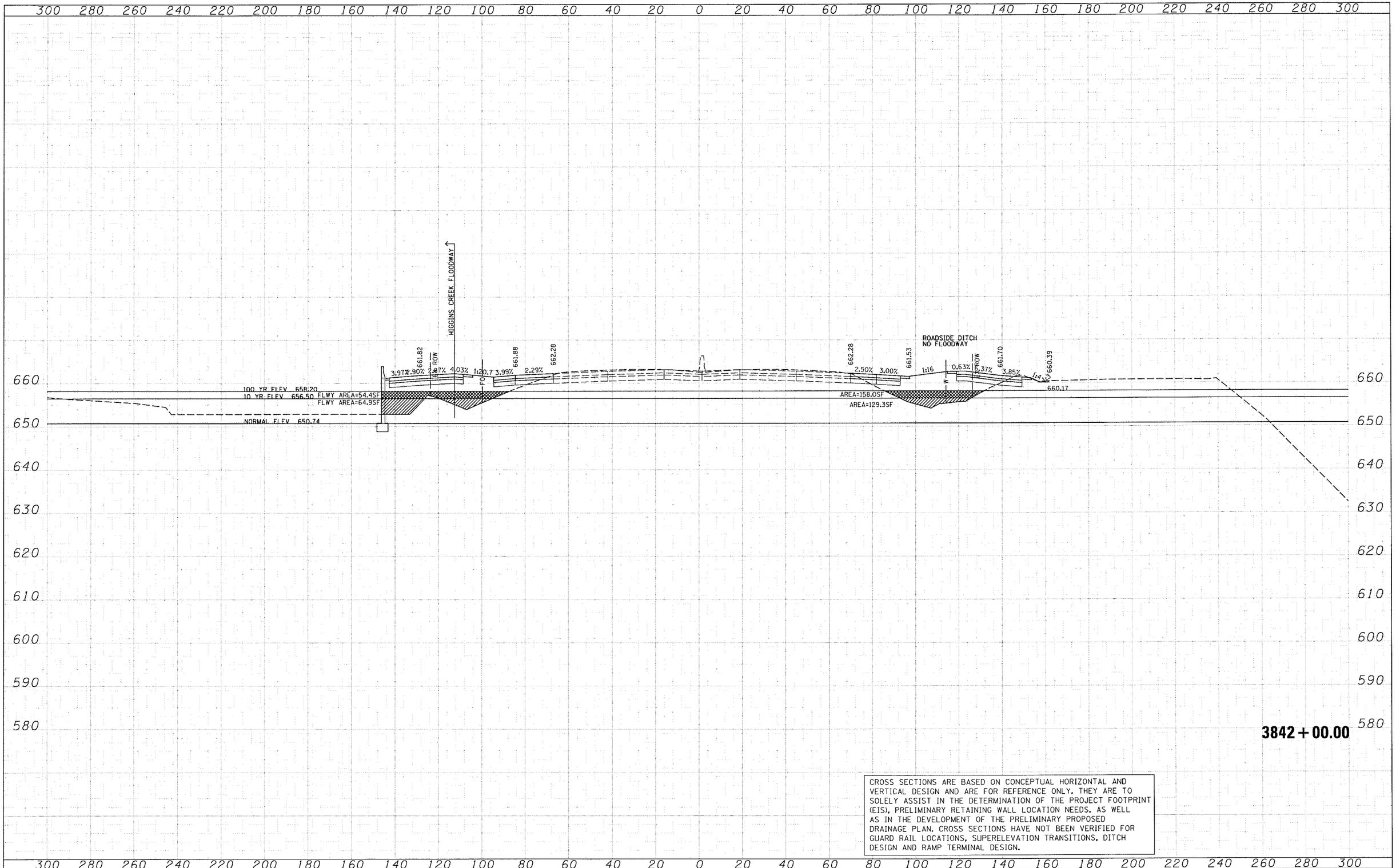
SCALE:

SHEET NO. S* OF T* SHEETS

STA. 3841+50.00 TO STA. 3841+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO. XS-D-74		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		

FINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	



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ORIGINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	

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	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
CH2MHILL.	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

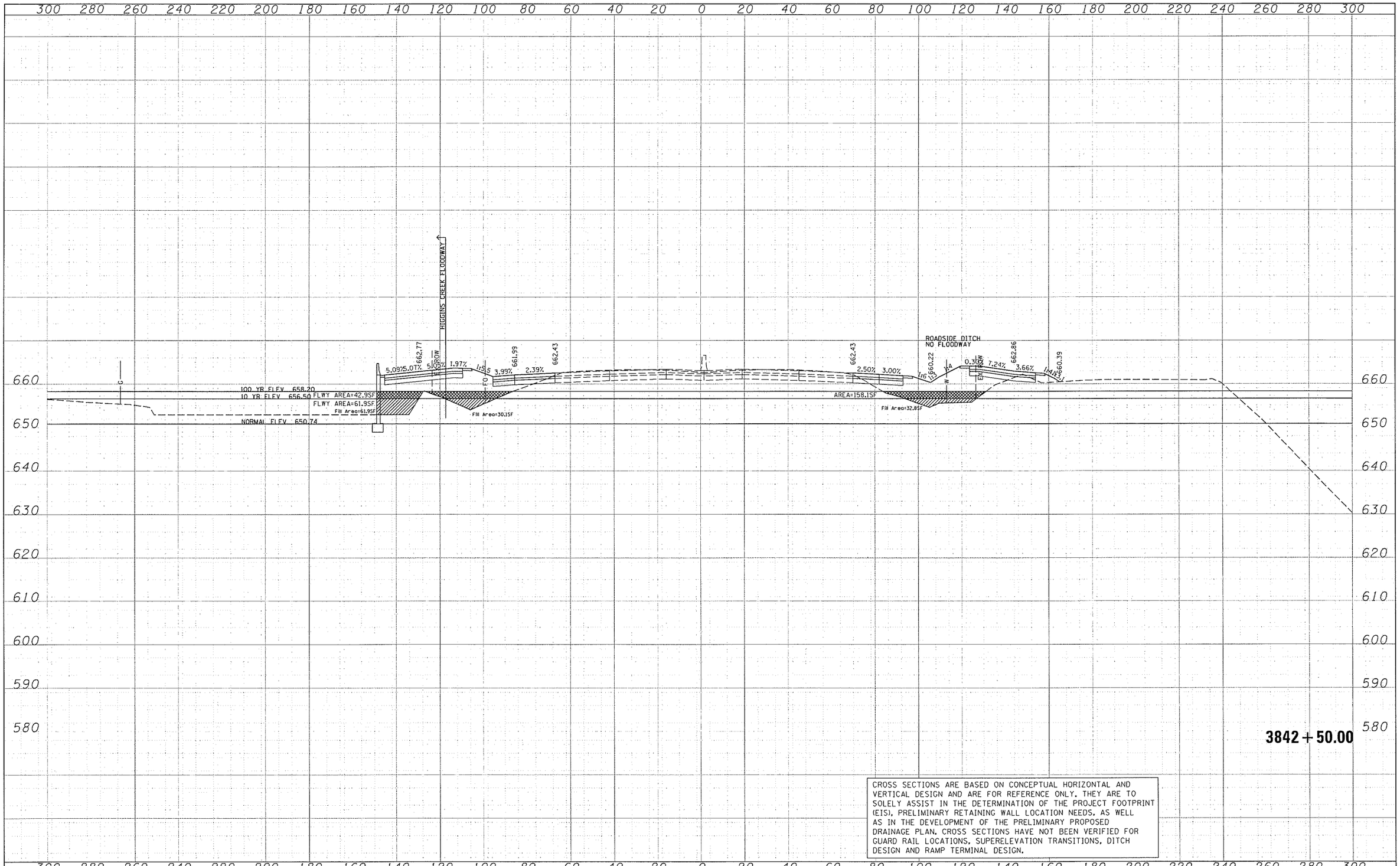
PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3842+00.00 TO STA. 3842+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM
DRAWING NO. XS-075		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		

FINAL SURVEY	NOTE BOOK	NO.
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

BY	DATE



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ORIGINAL SURVEY	NOTE BOOK	NO.
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

BY	DATE

FILE NAME = Y:\361100 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Comp_Storage_sht_xsects.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
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	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
CH2MHILL.	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3842+50.00 TO STA. 3842+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM
DRAWING NO. XS-50-76		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		

FINAL SURVEY	BY	DATE
NOTE BOOK		
NO.		

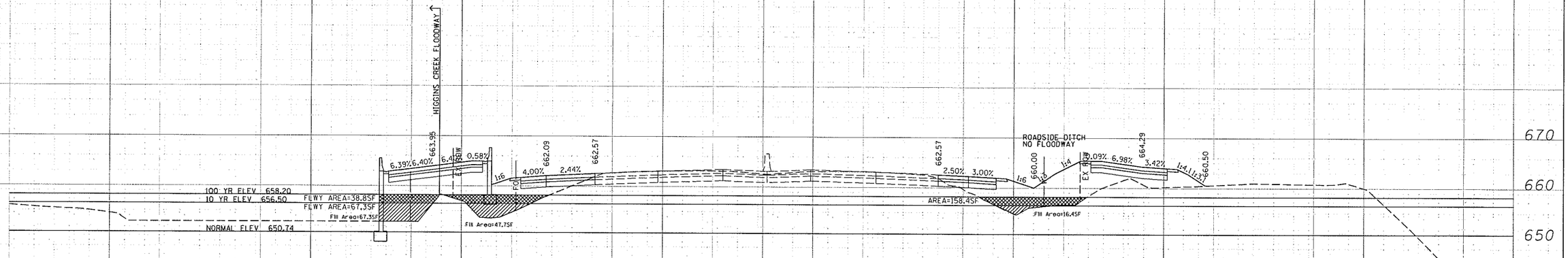
SURVEYED
PLOTTED
TEMPLATE
AREAS CHECKED

ORIGINAL SURVEY	BY	DATE
NOTE BOOK		
NO.		

SURVEYED
PLOTTED
TEMPLATE
AREAS CHECKED

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

670
660
650
640
630
620
610
600
590
580



3843+00.00

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300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Comp Storage.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
		DRAWN - CH2MHILL.	REVISED -
	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

CH2MHILL®

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

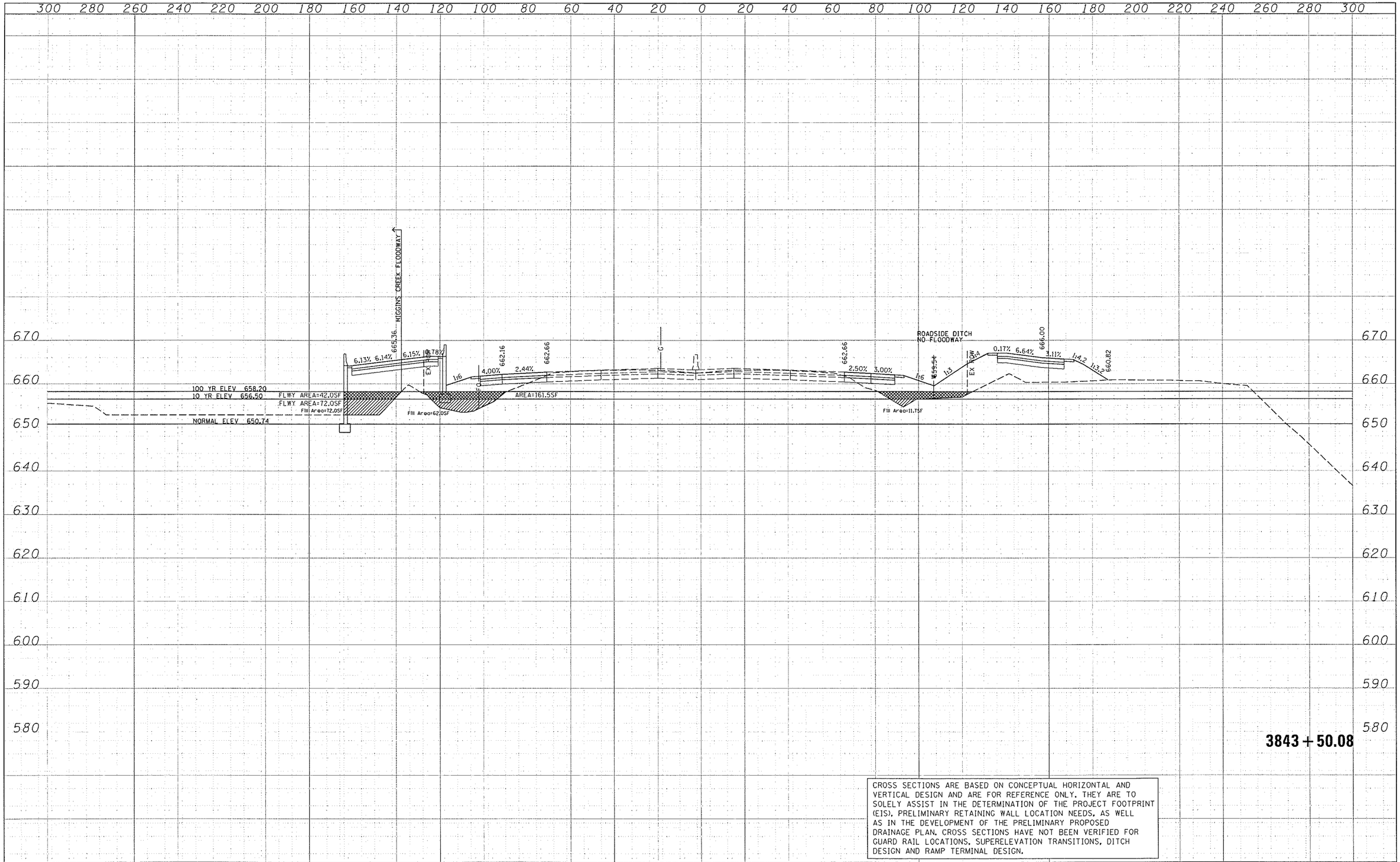
PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3843+00.00 TO STA. 3843+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO. XS-5077		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		

FINAL SURVEY	NOTE BOOK	NO.
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

BY	DATE



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ORIGINAL SURVEY	NOTE BOOK	NO.
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

BY	DATE

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Comp_Storage_sht_xs_I90.dgn

CH2MHILL.

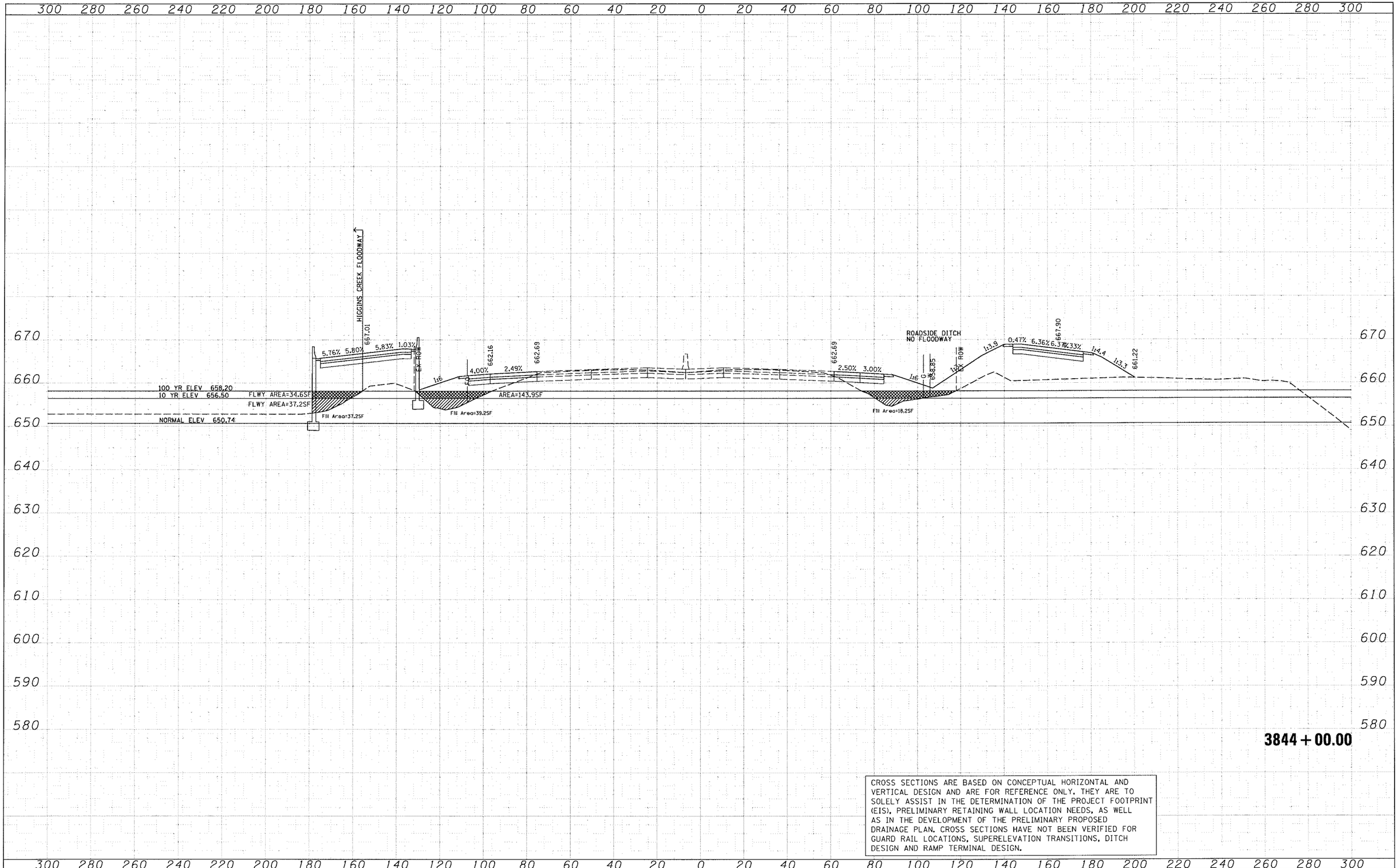
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PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3843+50.08 TO STA. 3843+50.08

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM
DRAWING NO. XS-50.78		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	

ORIGINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\[illegible].shtx

USER NAME = eanderson

PLOT SCALE = 40'

PLOT DATE = 10/29/2012

DESIGNED -	CH2MHILL.	REVISED -
DRAWN -	CH2MHILL.	REVISED -
CHECKED -	CH2MHILL.	REVISED -
DATE -		REVISED -

CH2MHILL.

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

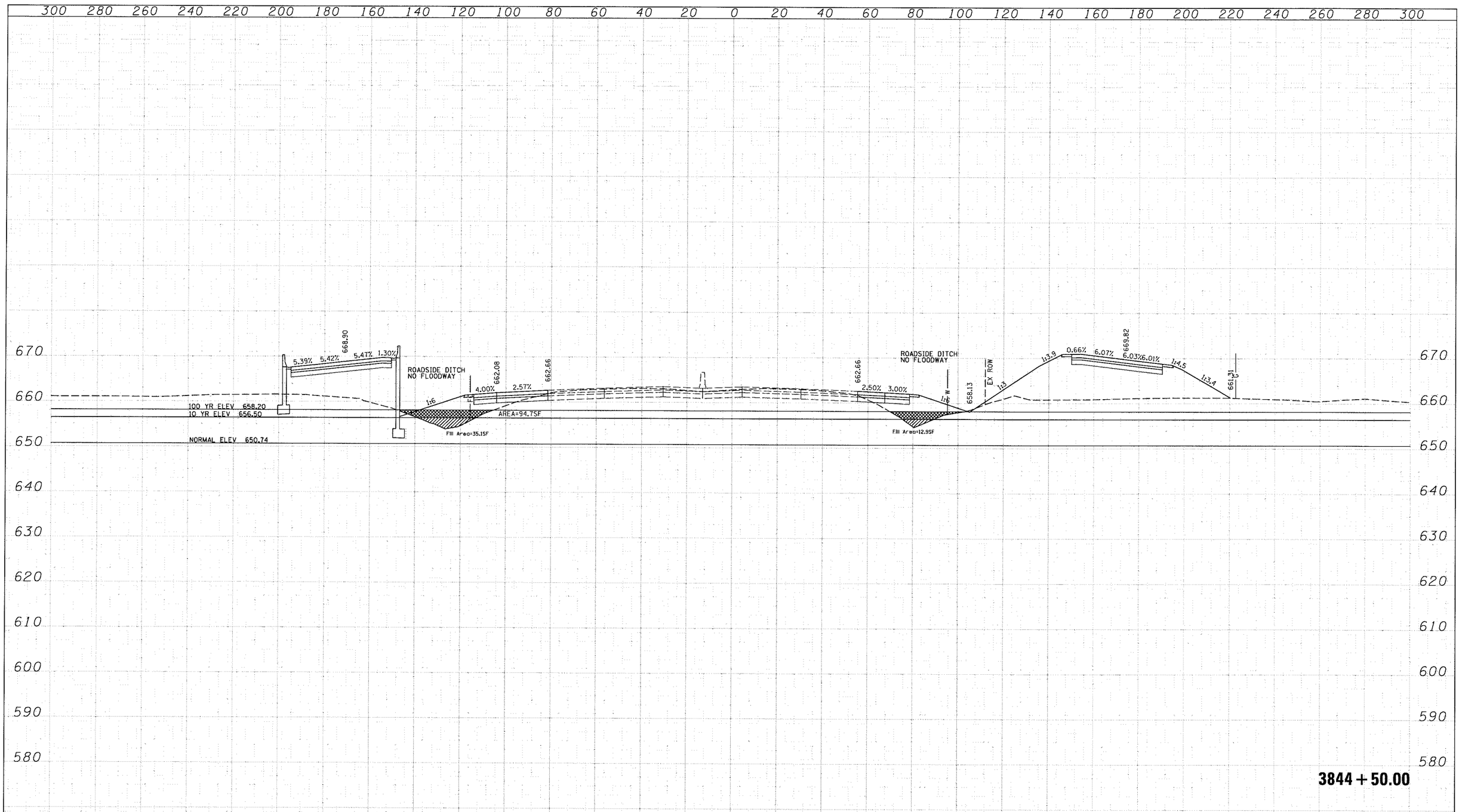
SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3844+00.00 TO STA. 3844+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM

DRAWING NO. XS-D-79 | CONTRACT NO.

PROJECT BI | ILLINOIS | FED. AID PROJECT

FINAL SURVEY	NOTE BOOK	NO.	BY	DATE
SURVEYED				
PLOTTED				
TEMPLATE				
AREAS				
AREAS CHECKED				



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ORIGINAL SURVEY	NOTE BOOK	NO.	BY	DATE
SURVEYED				
PLOTTED				
TEMPLATE				
AREAS				
AREAS CHECKED				

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	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

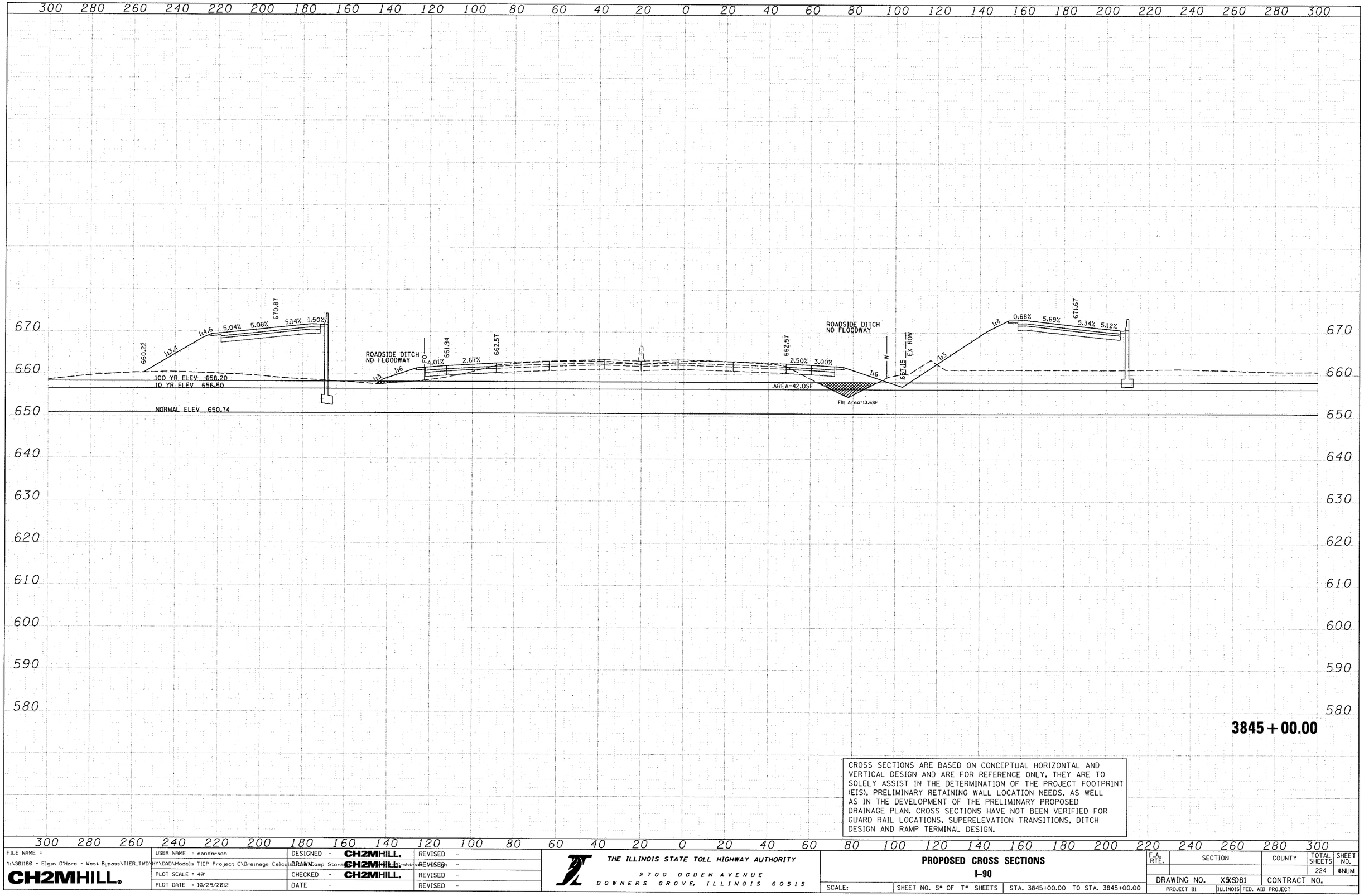
PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3844+50.00 TO STA. 3844+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO. XS-080		CONTRACT NO.		
PROJECT B1	ILLINOIS	FED. AID PROJECT		

FINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	

ORIGINAL SURVEY	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	TEMPLATE	
	AREAS	
	AREAS CHECKED	



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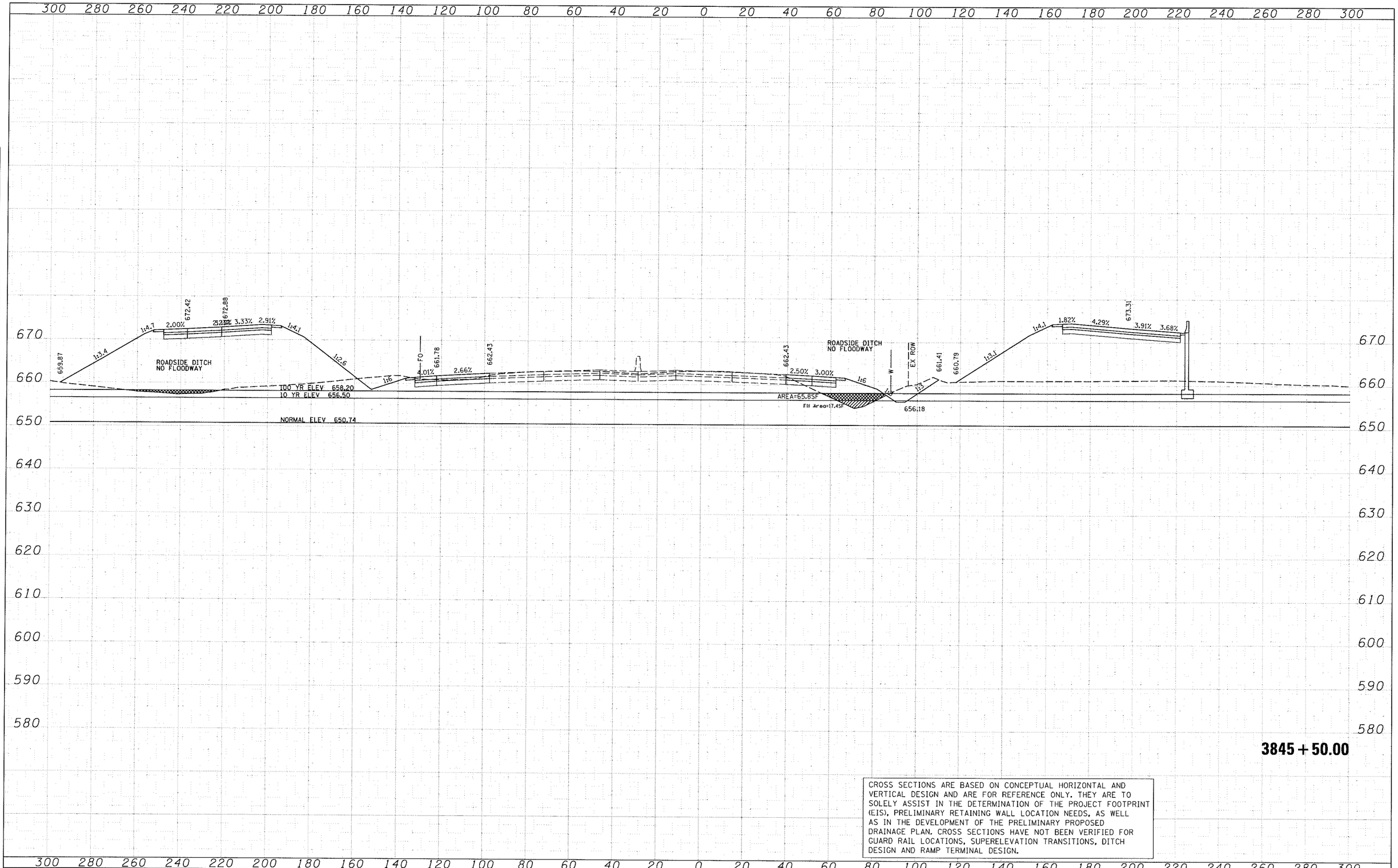
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CH2MHILL.		DRAWN - CH2MHILL.	REVISED -
	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3845+00.00 TO STA. 3845+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO. XXXXXX81		CONTRACT NO.		
PROJECT BI	ILLINOIS FED. AID PROJECT			



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

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USER NAME = eanderson

PLOT SCALE = 40'

PLOT DATE = 10/29/2012

DESIGNED - CH2MHILL. REVISED -

DRAWN - CH2MHILL. REVISED -

CHECKED - CH2MHILL. REVISED -

DATE - REVISED -

CH2MHILL.

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

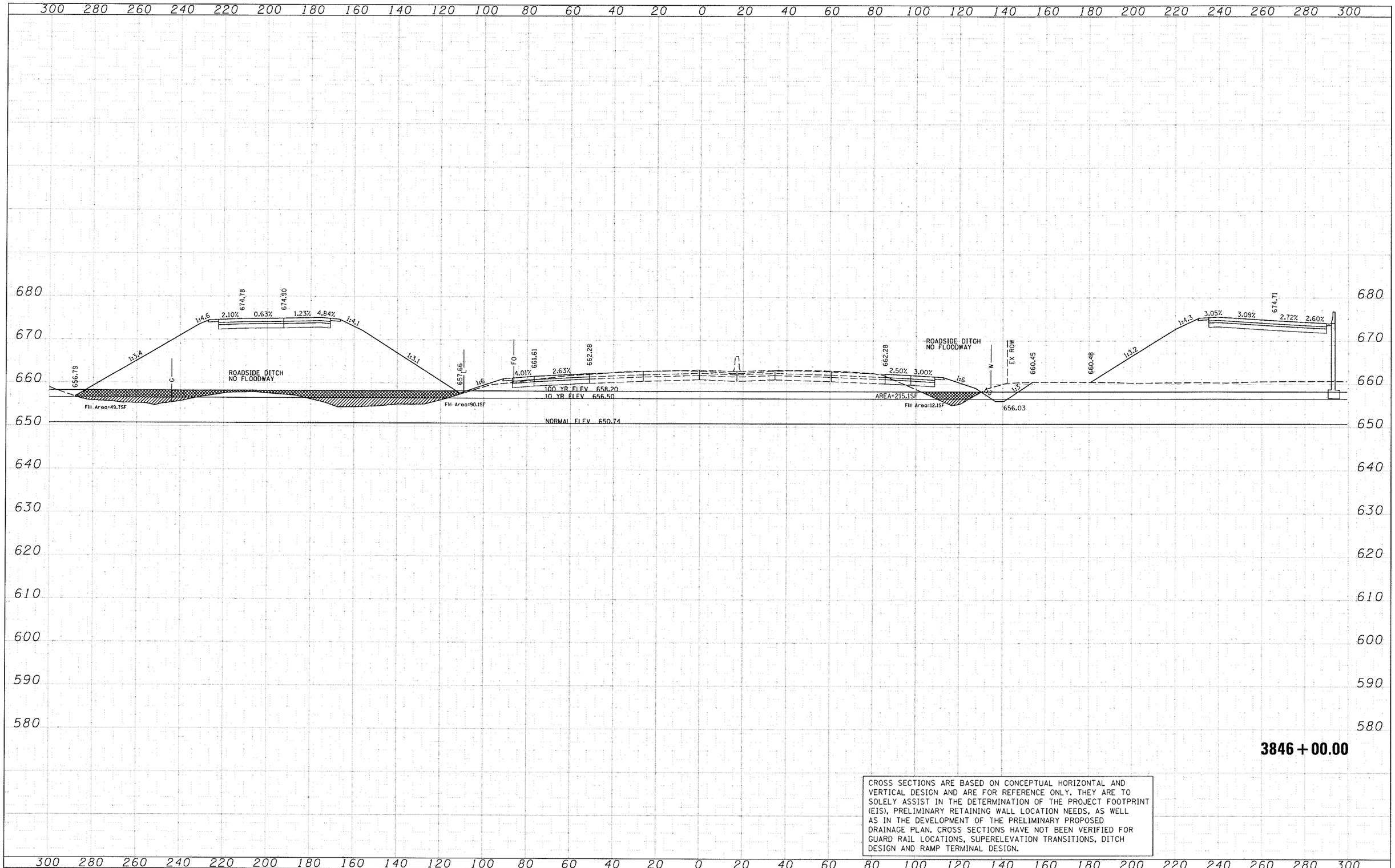
PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3845+50.00 TO STA. 3845+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM

DRAWING NO. XS-082 | CONTRACT NO.

PROJECT BI | ILLINOIS FED. AID PROJECT



3846 + 00.00

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY	DATE	BY
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	

ORIGINAL SURVEY	DATE	BY
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREA	
	AREAS CHECKED	

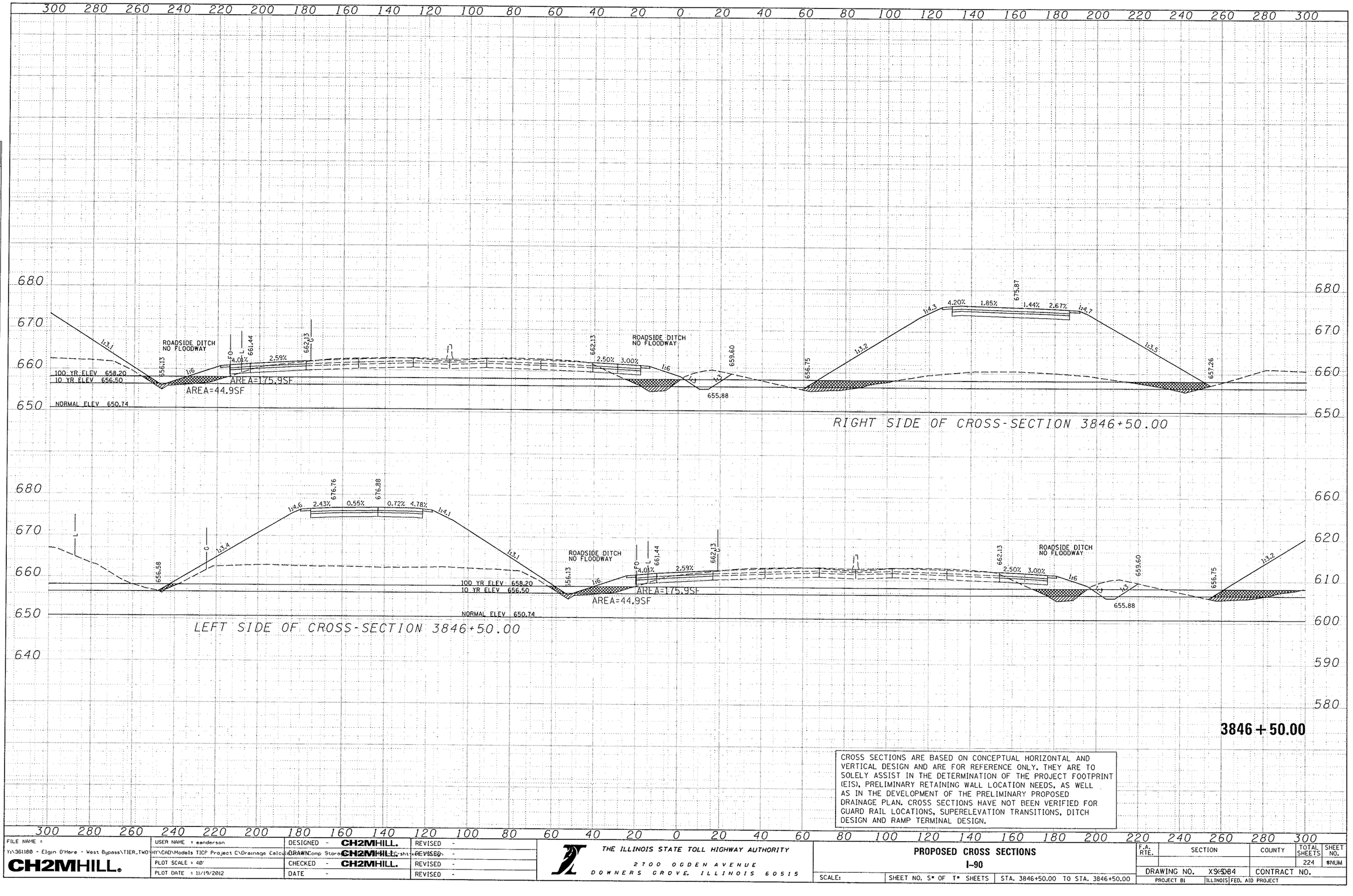
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CH2MHILL.	PLOT SCALE = 40'	DRAWN - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3846+00.00 TO STA. 3846+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO. XS-083		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

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USER NAME = eanderson

PLOT SCALE = 40'

PLOT DATE = 11/19/2012

DESIGNED - CH2MHILL.

DRAWN - CH2MHILL.

CHECKED - CH2MHILL.

DATE -

REVISED -

REVISED -

REVISED -

REVISED -

CH2MHILL.

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

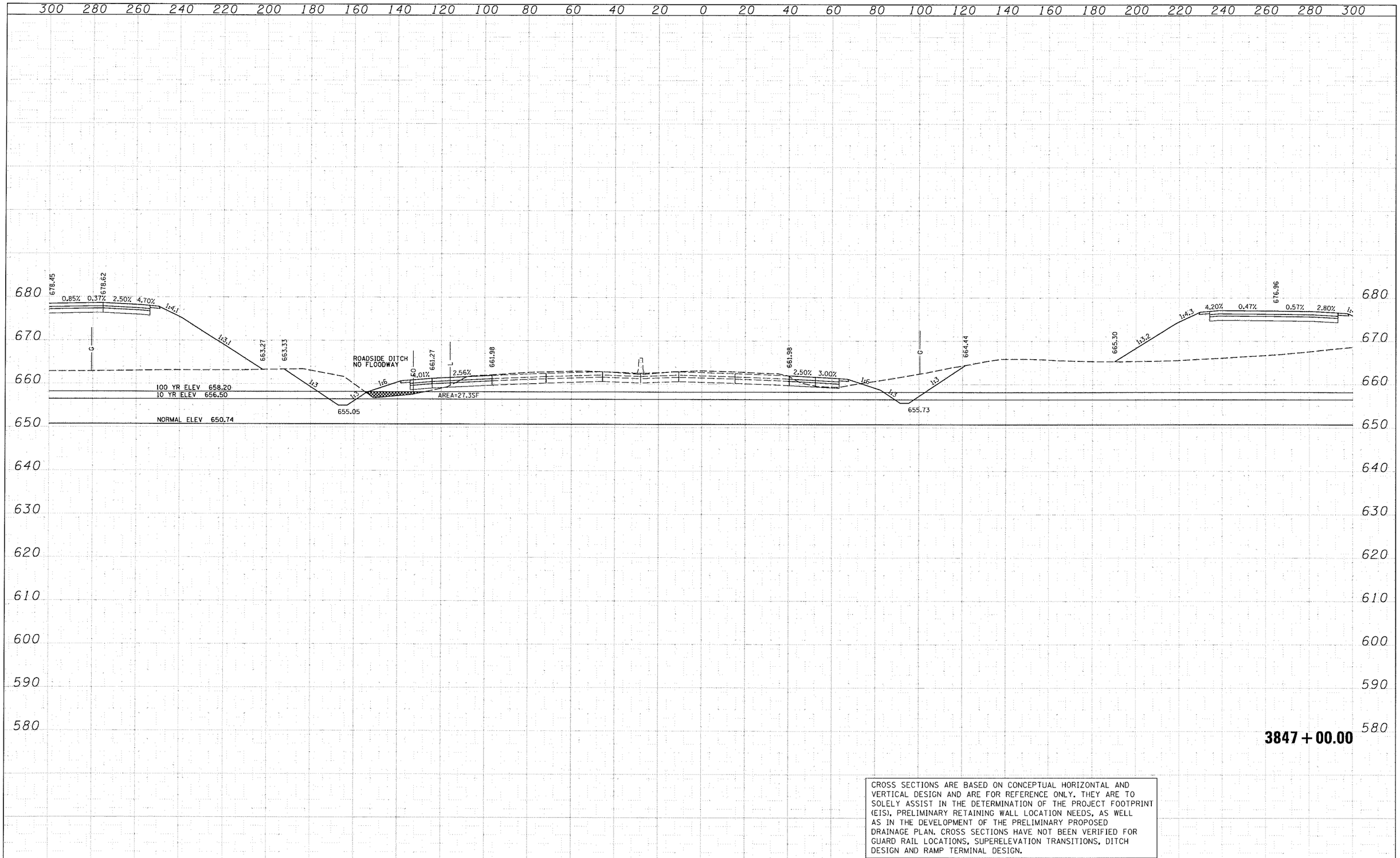
PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. 5* OF T* SHEETS | STA. 3846+50.00 TO STA. 3846+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	*NUM

DRAWING NO. XS-3846 | CONTRACT NO.

PROJECT BI | ILLINOIS | FED. AID PROJECT



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

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USER NAME = eanderson
PLOT SCALE = 40'
PLOT DATE = 10/29/2012

DESIGNED - CH2MHILL.
DRAWN - CH2MHILL.
CHECKED - CH2MHILL.
DATE -

REVISED -
REVISED -
REVISED -
REVISED -

CH2MHILL.

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

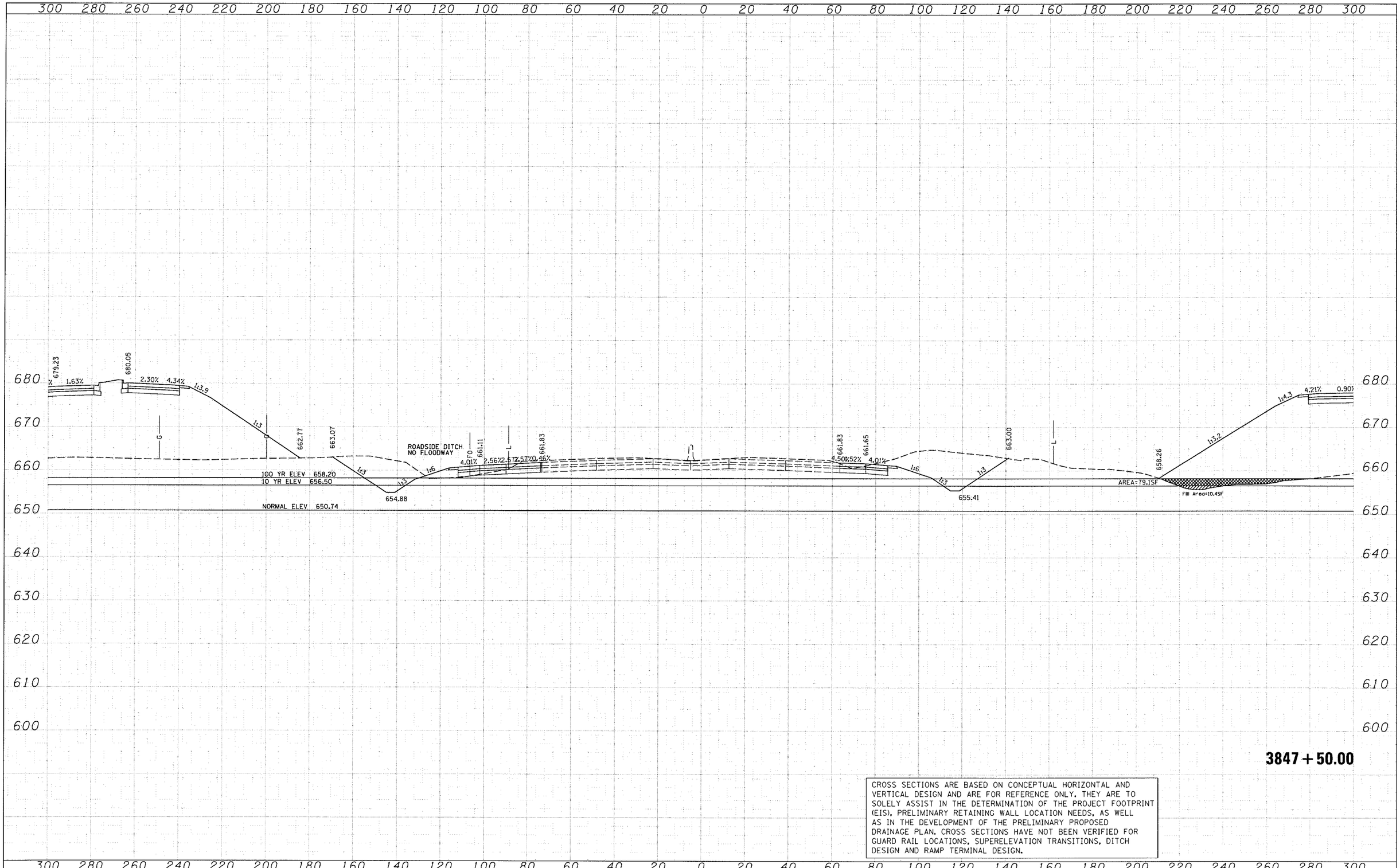
SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3847+00.00 TO STA. 3847+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM

DRAWING NO. XS-3085 | CONTRACT NO.
PROJECT BI | ILLINOIS | FED. AID PROJECT

FINAL SURVEY	NOTE BOOK	NO.
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

BY	DATE



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

ORIGINAL SURVEY	NOTE BOOK	NO.
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

BY	DATE

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Comp_Storage_Sht_xsections.dgn

CH2MHILL.

USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
	DRAWN - CH2MHILL.	REVISED -
PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3847+50.00 TO STA. 3847+50.00

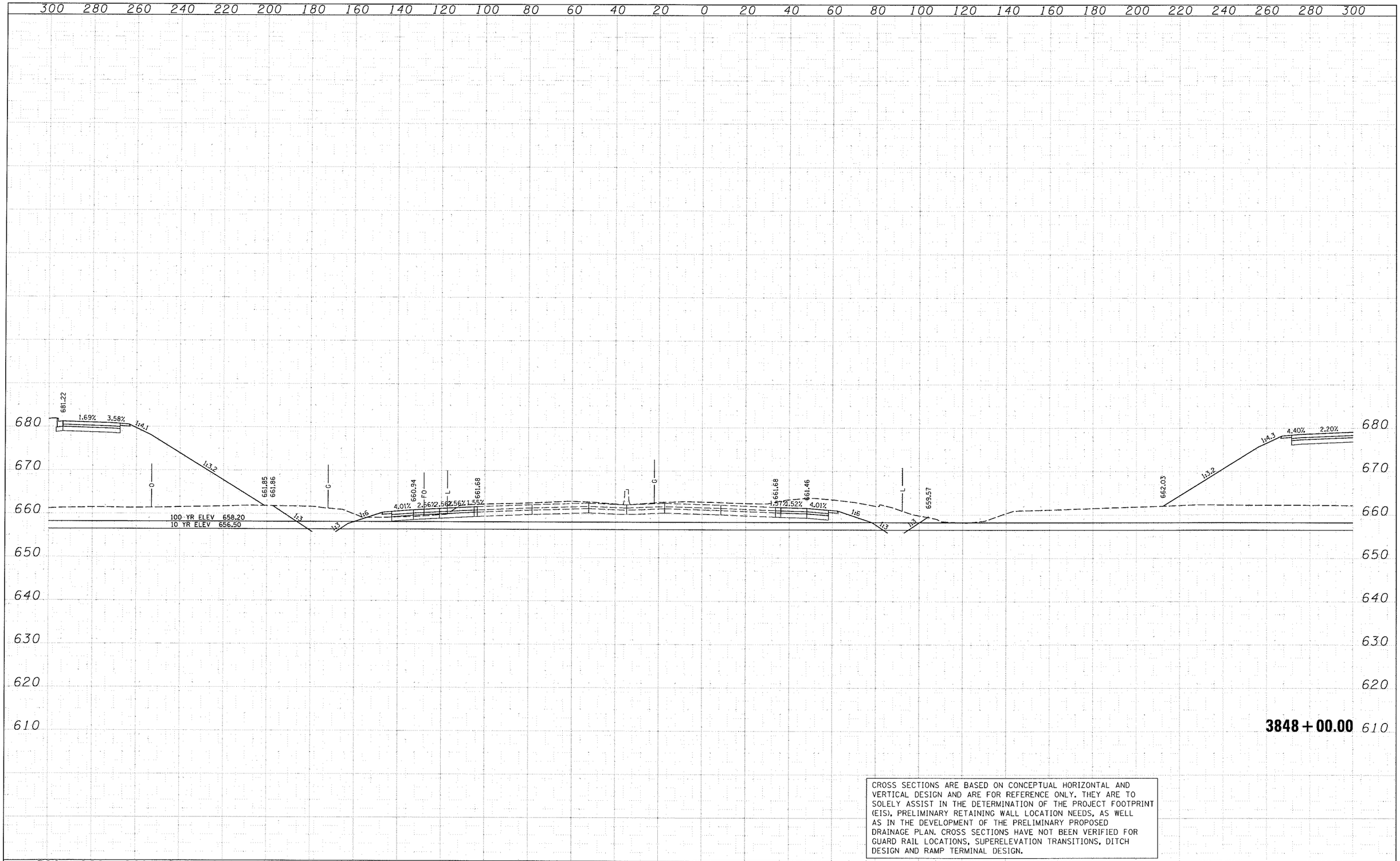
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM

DRAWING NO. XS-3086 | CONTRACT NO.

PROJECT B1 | ILLINOIS | FED. AID PROJECT

FINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	

ORIGINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

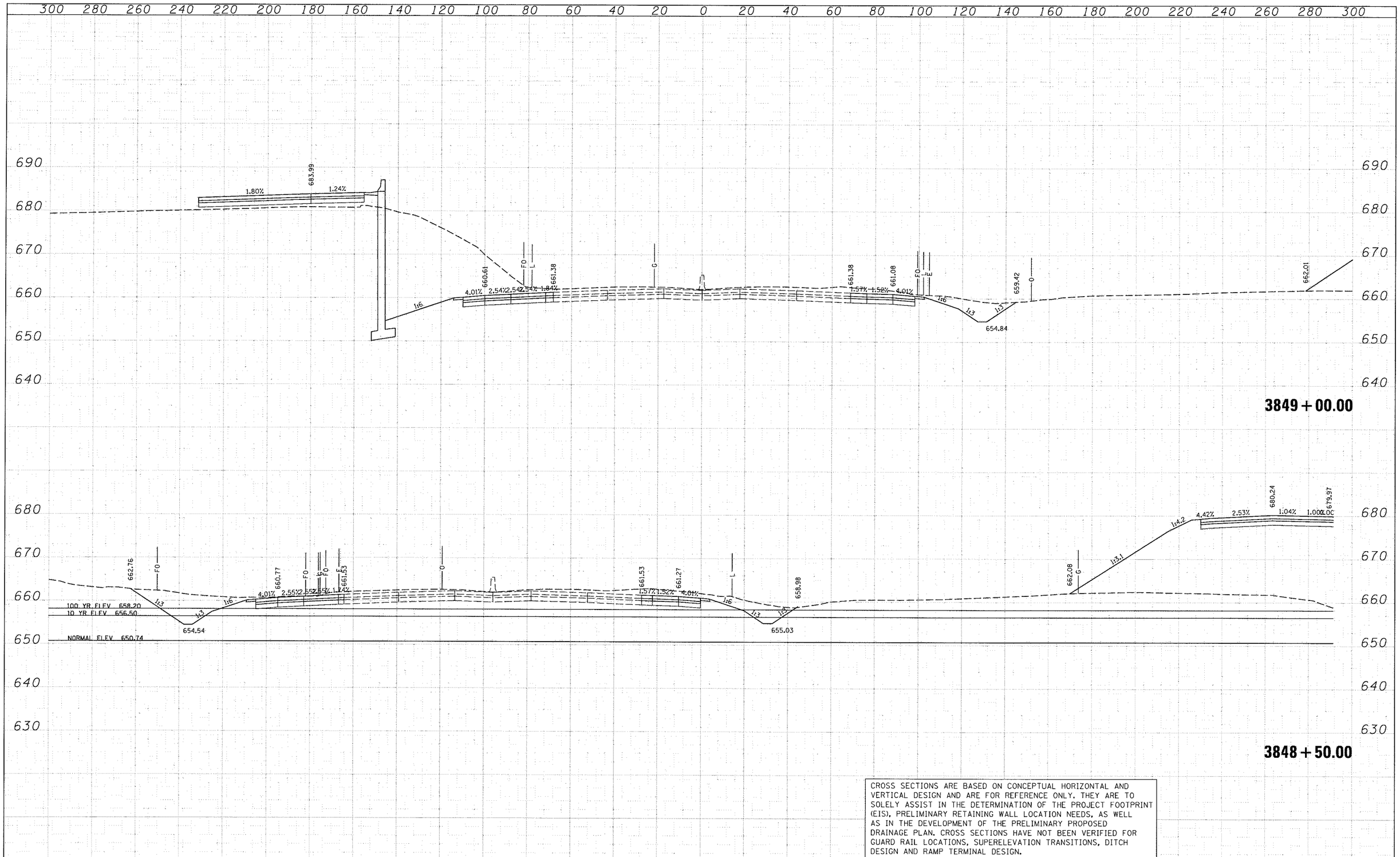
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		DRAWN - CH2MHILL.	REVISED -
CH2MHILL.	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3848+00.00 TO STA. 3848+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	SNUM
DRAWING NO. XS-087		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY — NOTE BOOK NO. — SURVEYED BY — PLOTTED DATE — TEMPLATE — AREAS — AREAS CHECKED

ORIGINAL SURVEY — NOTE BOOK NO. — SURVEYED BY — PLOTTED DATE — TEMPLATE — AREAS — AREAS CHECKED

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\...sht-xsec.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
CH2MHILL.	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

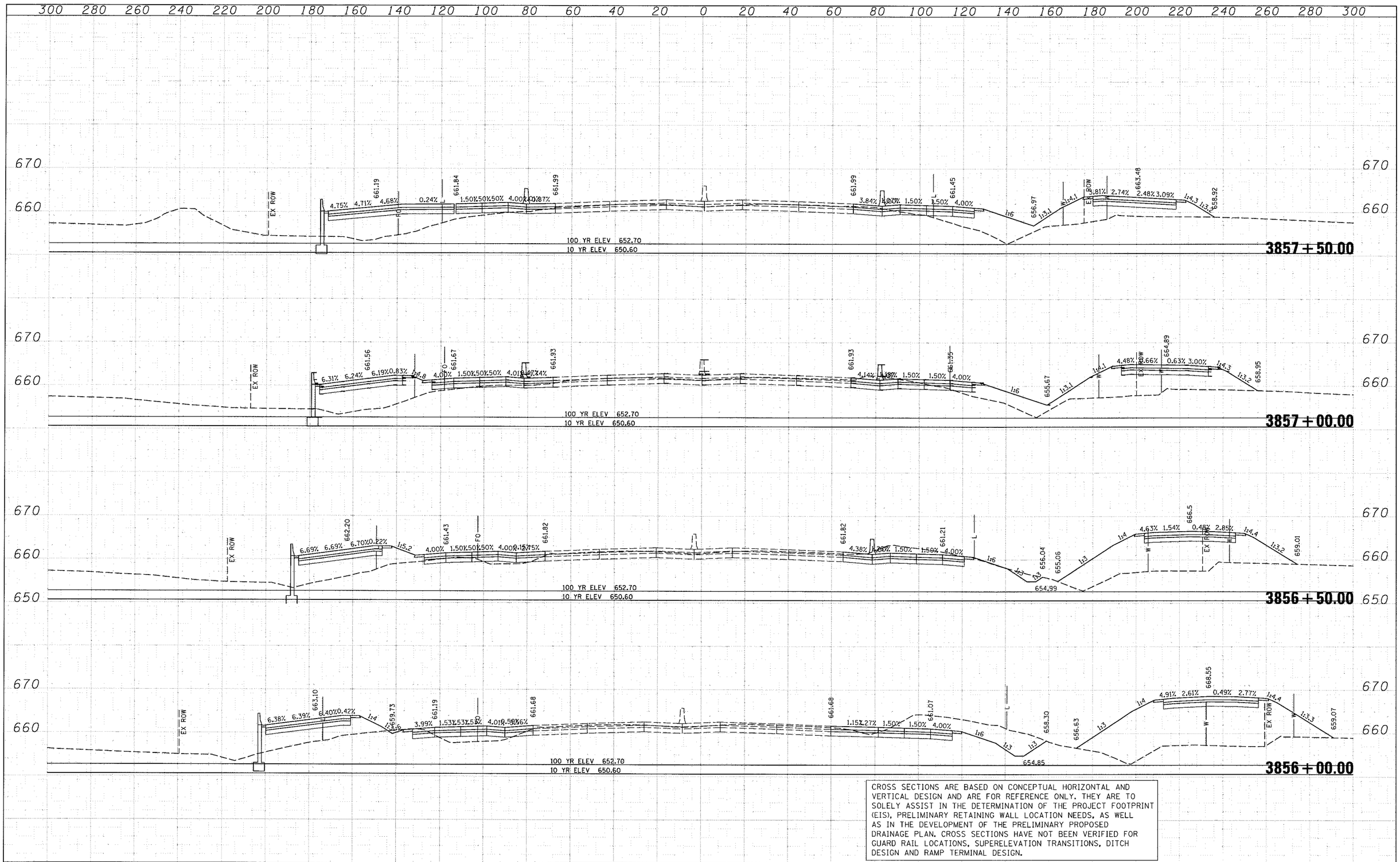
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3848+50.00 TO STA. 3849+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM

DRAWING NO. XSXSD88 — CONTRACT NO.
PROJECT B1 — ILLINOIS — FED. AID PROJECT



FINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE AREAS — AREAS CHECKED — BY — DATE

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

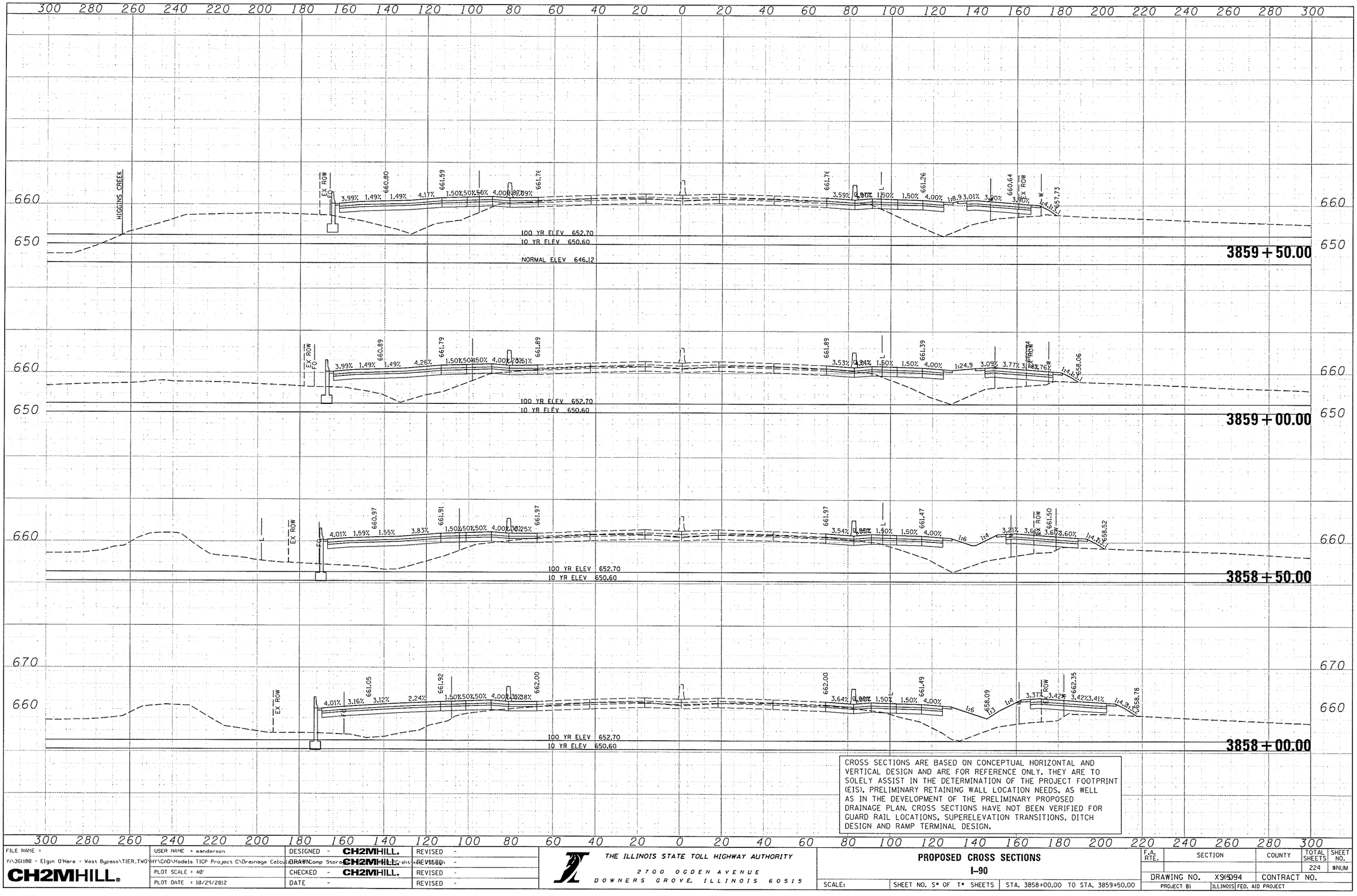
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CH2MHILL.	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3856+00.00 TO STA. 3857+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO. XS-093		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\TICP_Comp_Storage_sht_xs_I90.dgn

USER NAME = eanderson | PLOT SCALE = 40' | PLOT DATE = 10/29/2012

DESIGNED - CH2MHILL. | CHECKED - CH2MHILL. | DATE -

REVISED - | REVISED - | REVISED - | REVISED -

CH2MHILL.

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

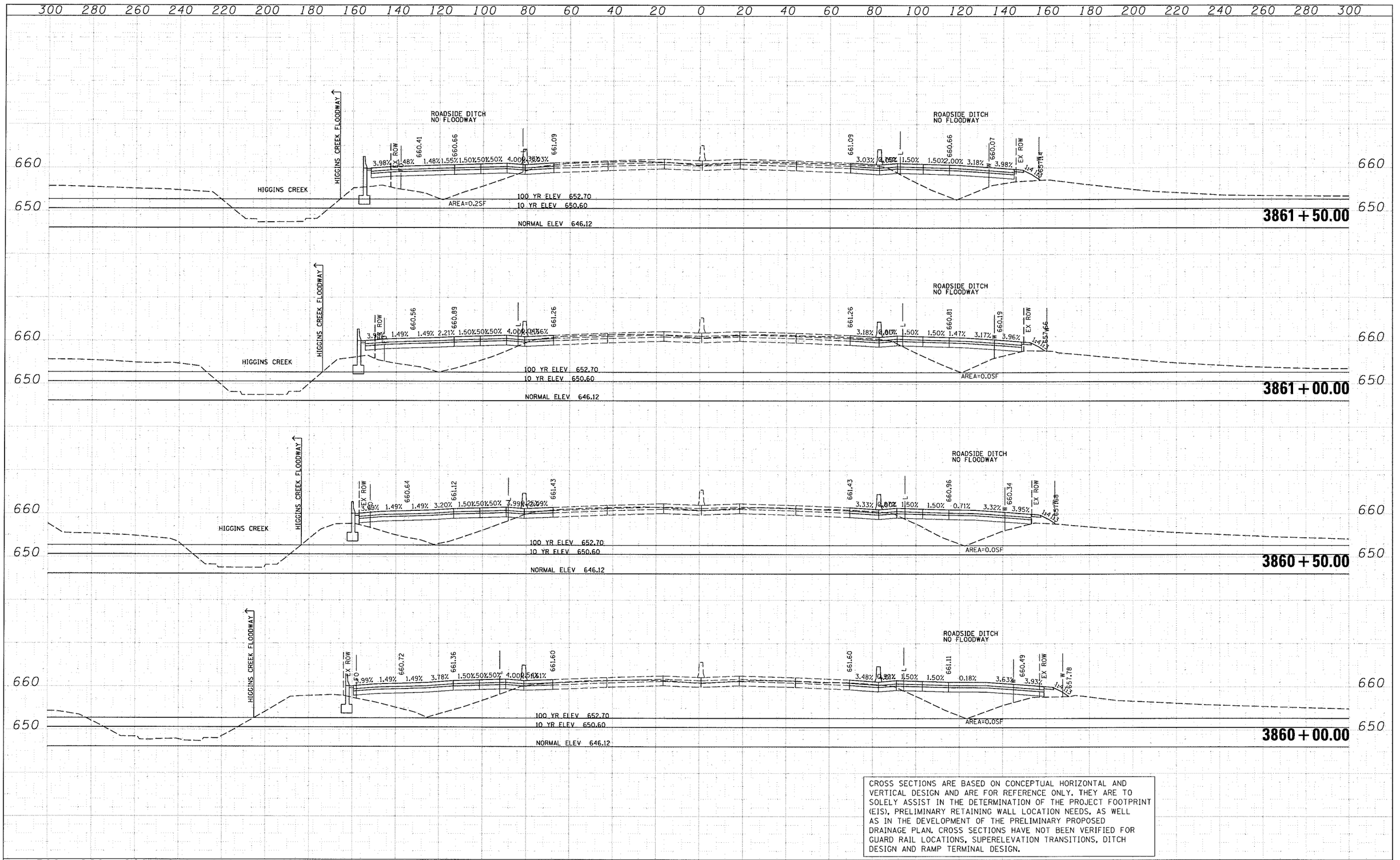
PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S" OF T" SHEETS | STA. 3858+00.00 TO STA. 3859+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM

DRAWING NO. XS-5D94 | CONTRACT NO.

PROJECT BI | ILLINOIS FED. AID PROJECT



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

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CH2MHILL.	PLOT SCALE = 40'	DRAWN - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3860+00.00 TO STA. 3861+50.00

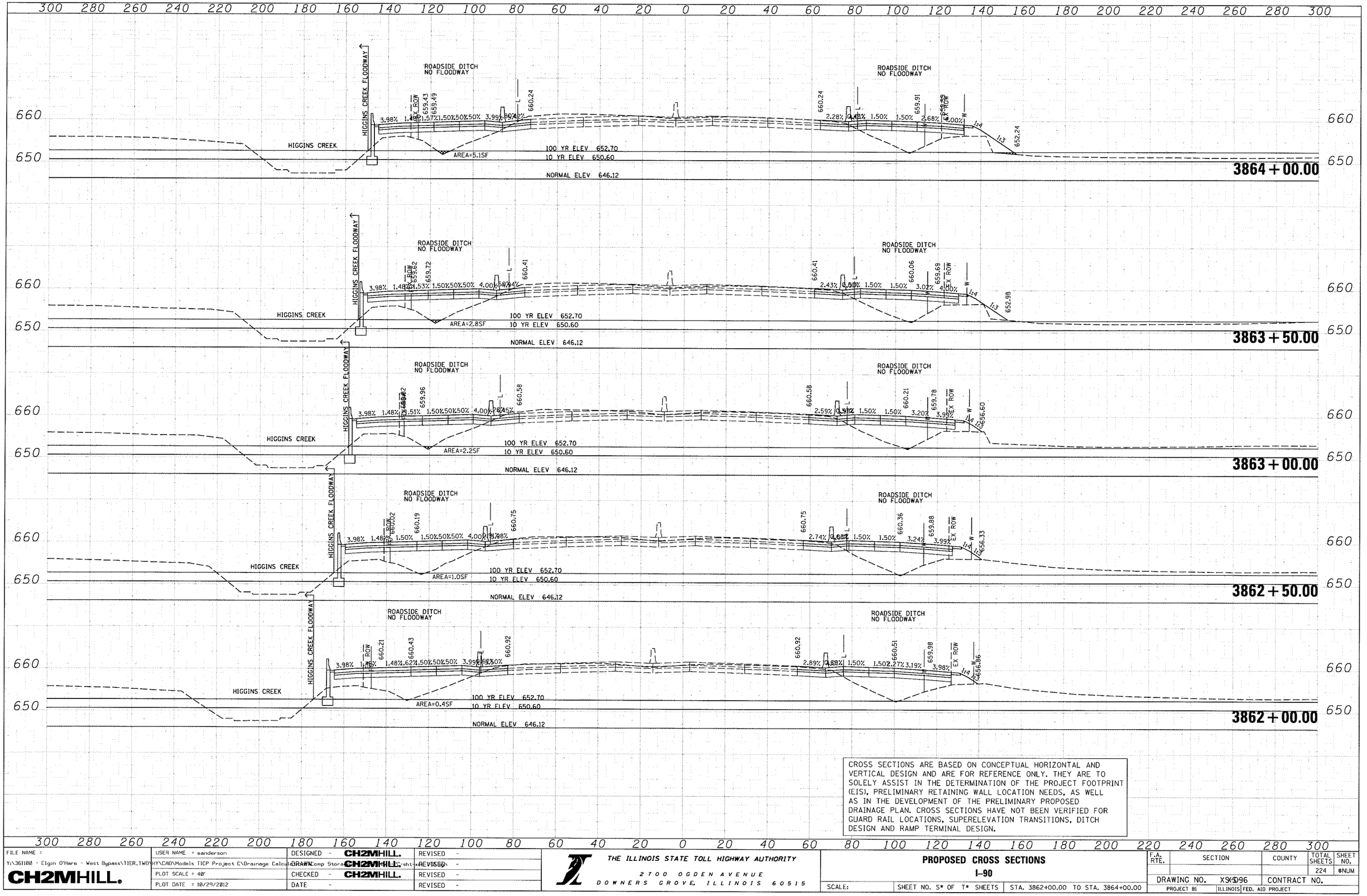
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM

DRAWING NO. XS0095 | CONTRACT NO.

PROJECT B1 | ILLINOIS | FED. AID PROJECT

ORIGINAL SURVEY	NOTE BOOK	NO.
SURVEYED	BY	DATE
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

FINAL SURVEY	NOTE BOOK	NO.
SURVEYED	BY	DATE
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Cross-sht-xsection	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
CH2MHILL.	PLOT SCALE = 40'	DRAWN - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3862+00.00 TO STA. 3864+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM

DRAWING NO. XS-096 | CONTRACT NO.

PROJECT B1 | ILLINOIS | FED. AID PROJECT

FINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\...sht_xsections.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
CH2MHILL.	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

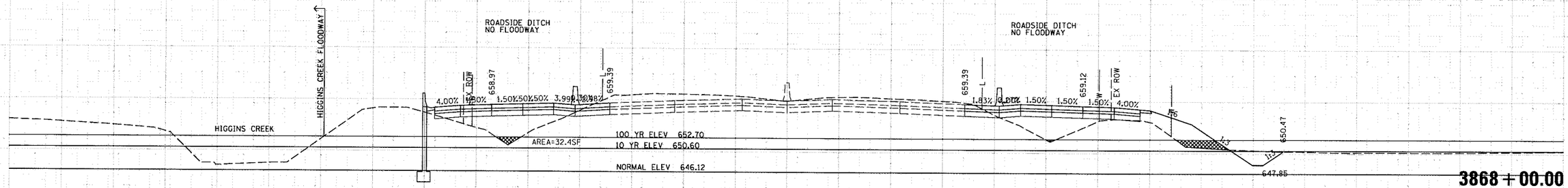
PROPOSED CROSS SECTIONS
I-90

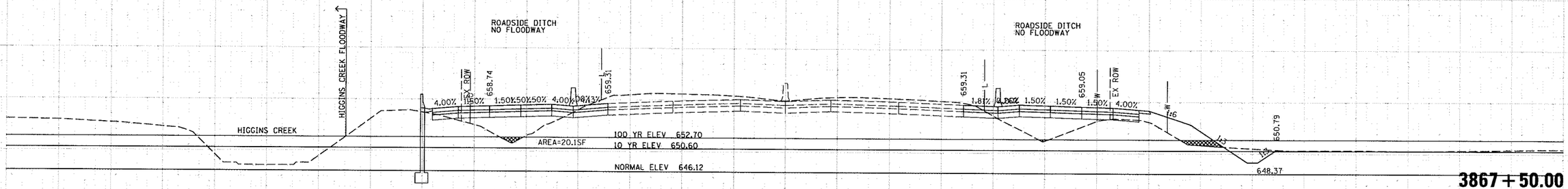
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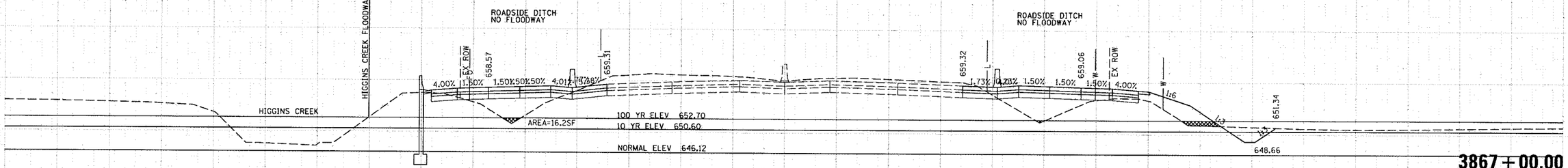
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM

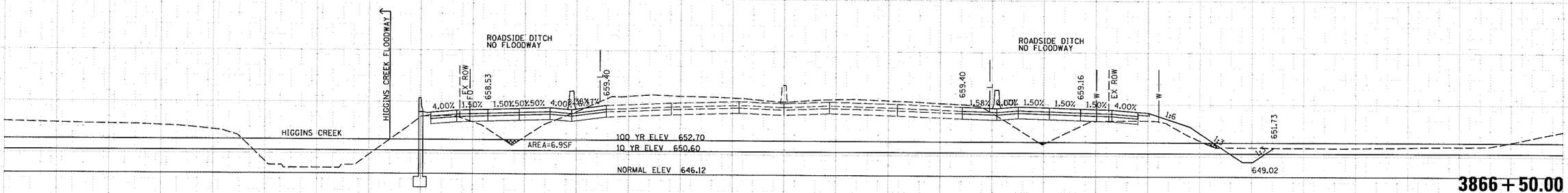
DRAWING NO. XSXD97 — CONTRACT NO.
PROJECT BI — ILLINOIS FED. AID PROJECT

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300









CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

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	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

CH2MHILL.

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

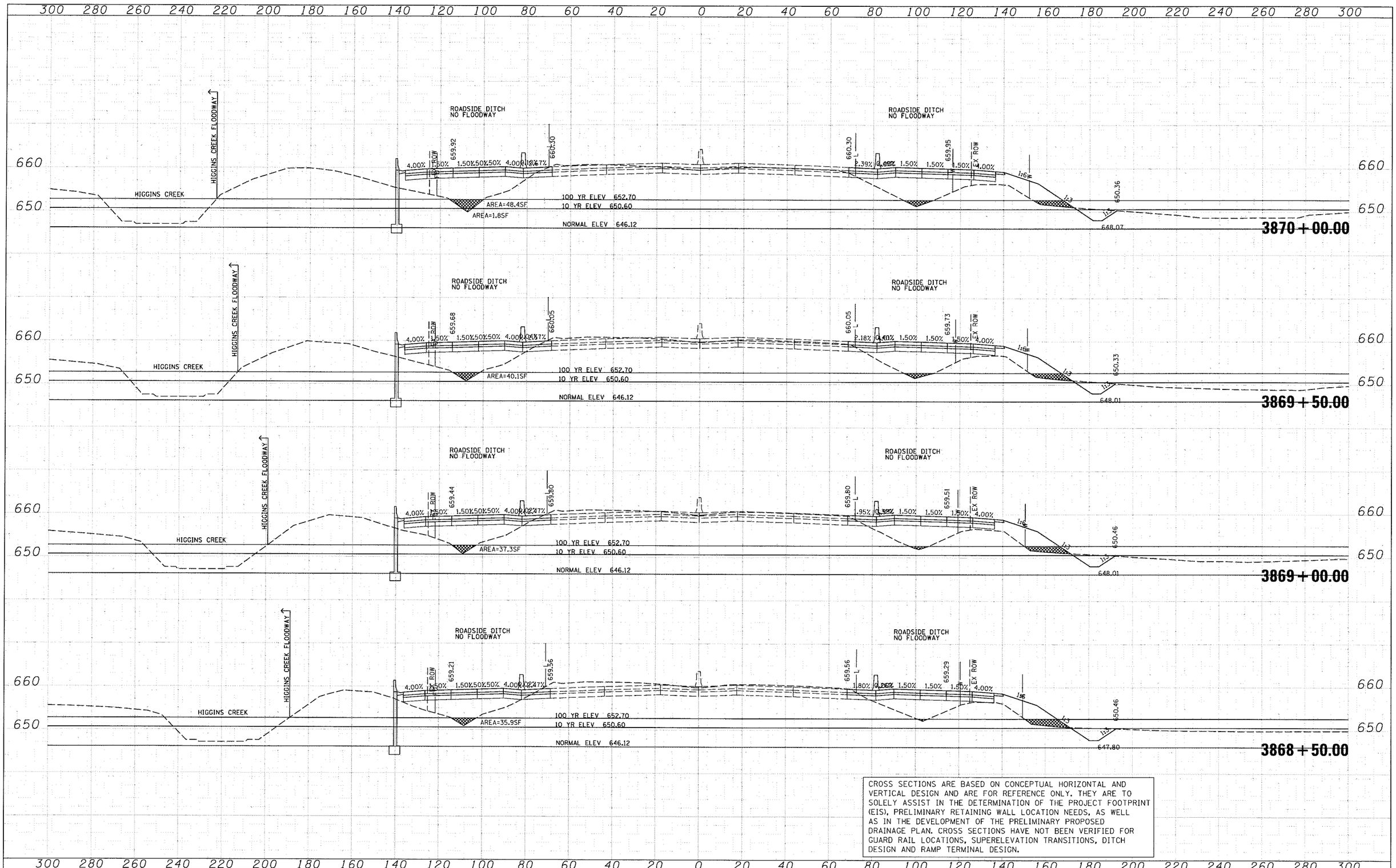
PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3866+50.00 TO STA. 3868+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM
DRAWING NO. XS-098		CONTRACT NO.		
PROJECT B1	ILLINOIS FED. AID PROJECT			

FINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY / ORIGINAL SURVEY	NOTE BOOK	NO.	BY	DATE
SURVEYED				
PLOTTED				
TEMPLATE				
AREAS				
AREAS CHECKED				

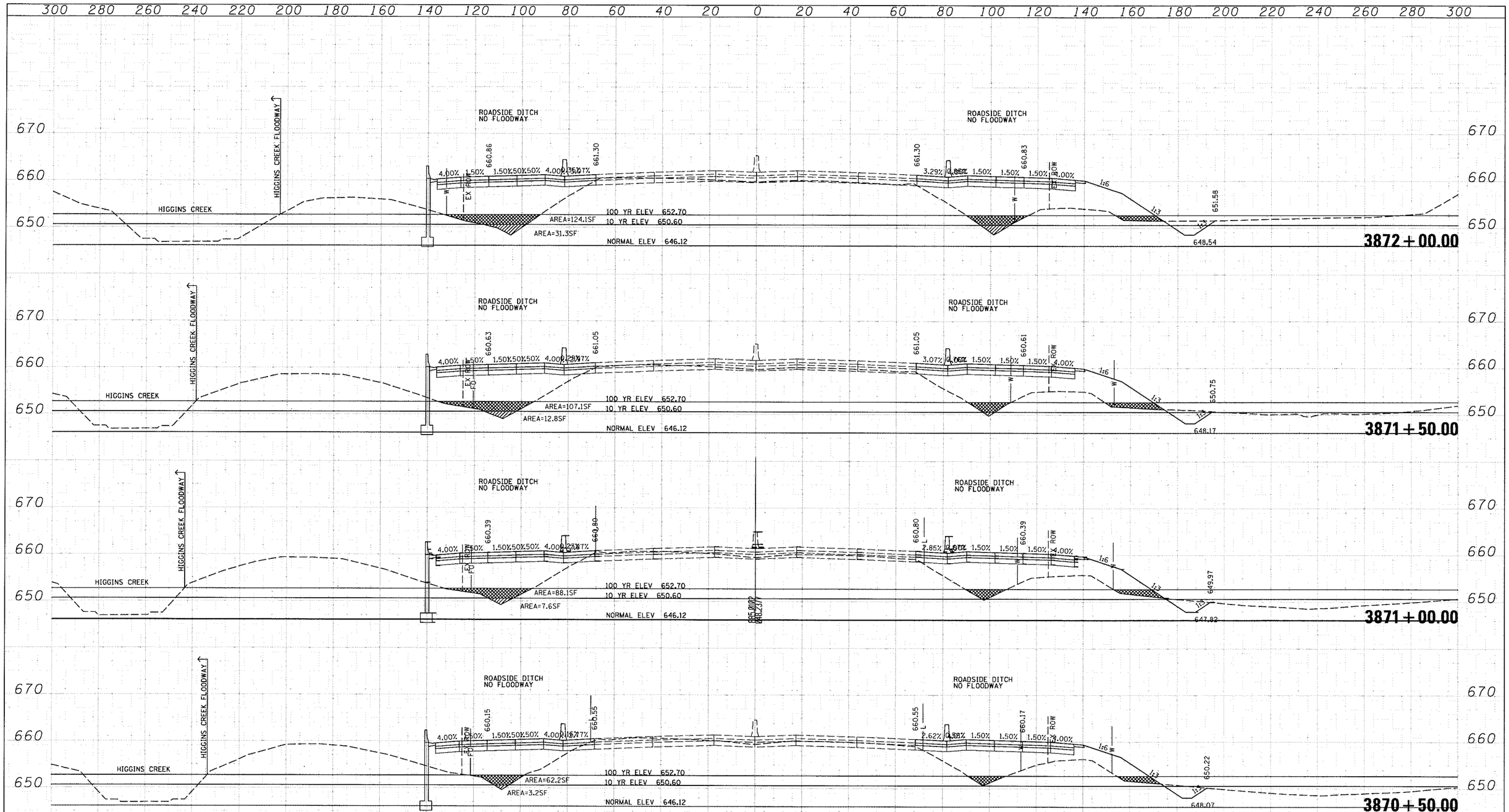
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	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
CH2MHILL.	PLOT DATE = 10/29/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3868+50.00 TO STA. 3870+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM
DRAWING NO. XS0099		CONTRACT NO.		
PROJECT B1	ILLINOIS	FED. AID PROJECT		



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY / ORIGINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

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USER NAME = eanderson
PLOT SCALE = 40'
PLOT DATE = 10/29/2012
DESIGNED - CH2MHILL.
DRAWN - CH2MHILL.
CHECKED - CH2MHILL.
DATE -
REVISED -
REVISED -
REVISED -
REVISED -

CH2MHILL.

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

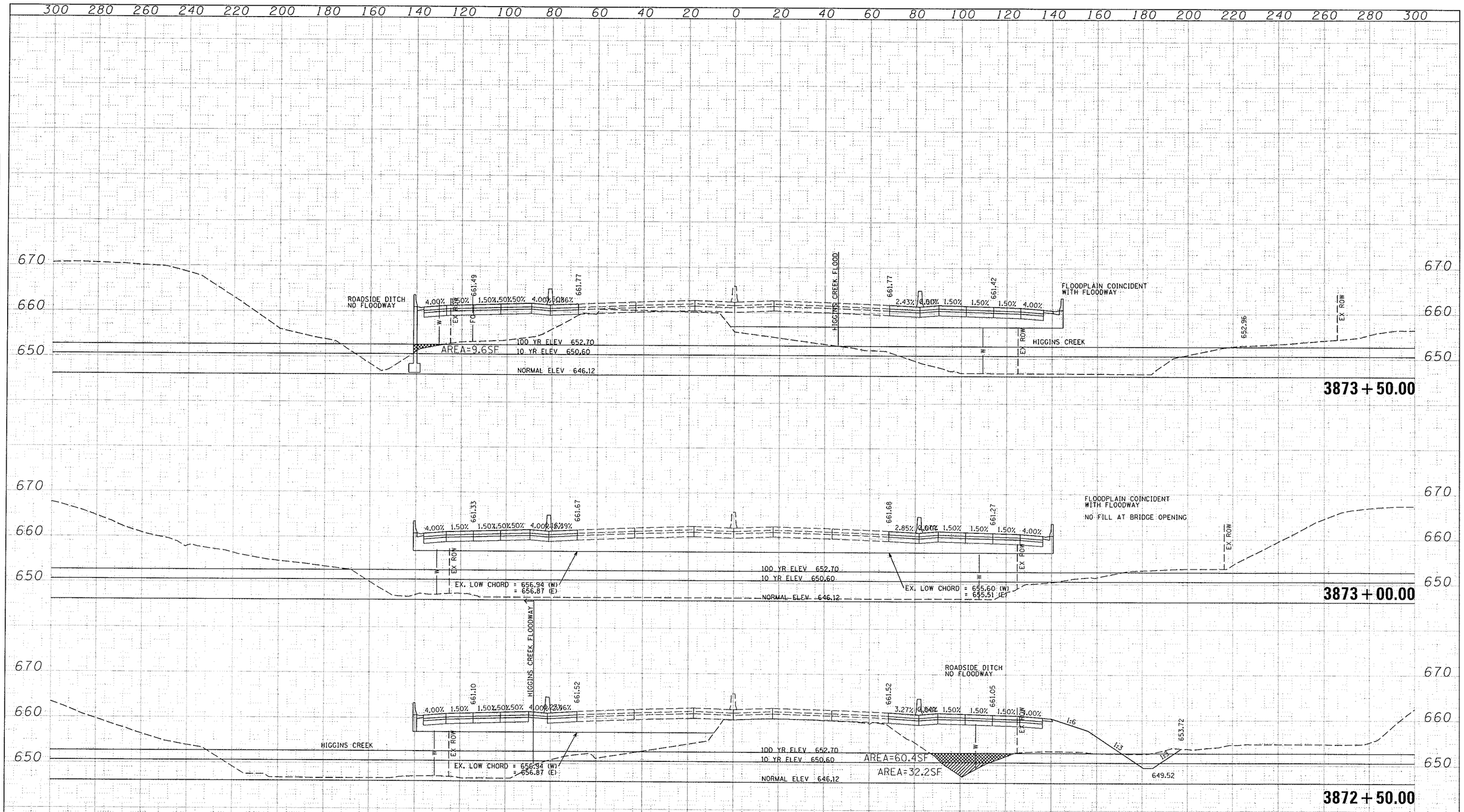
PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3870+50.00 TO STA. 3872+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM

DRAWING NO. XS-100 | CONTRACT NO.
PROJECT BI | ILLINOIS | FED. AID PROJECT

FINAL SURVEY	SURVEYED	DATE
	PLOTTED	BY
	TEMPLATE	
NOTE BOOK	AREAS	
NO.	AREAS CHECKED	



ORIGINAL SURVEY	SURVEYED	DATE
	PLOTTED	BY
	TEMPLATE	
NOTE BOOK	AREAS	
NO.	AREAS CHECKED	

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

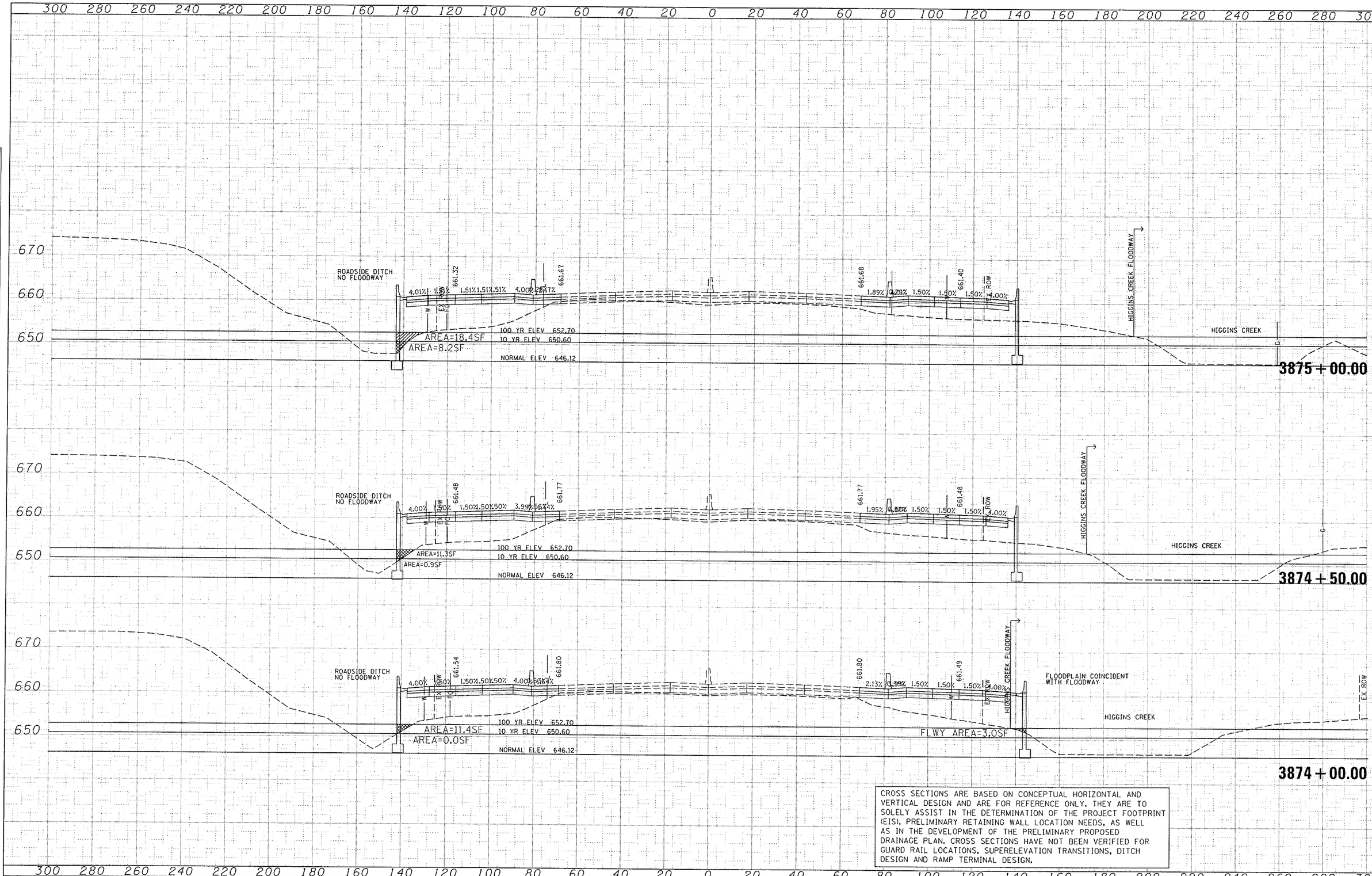
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	PLOT DATE = 11/7/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3872+50.00 TO STA. 3873+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO. X5-5101		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	

ORIGINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Comp_Storage_sht_xsections.dgn

USER NAME = eanderson

PLOT SCALE = 40'

PLOT DATE = 11/7/2012

DESIGNED - CH2MHILL.

DRAWN - CH2MHILL.

CHECKED - CH2MHILL.

DATE -

REVISED -

REVISED -

REVISED -

REVISED -

CH2MHILL.

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE:

SHEET NO. S* OF T* SHEETS

STA. 3874+00.00 TO STA. 3875+00.00

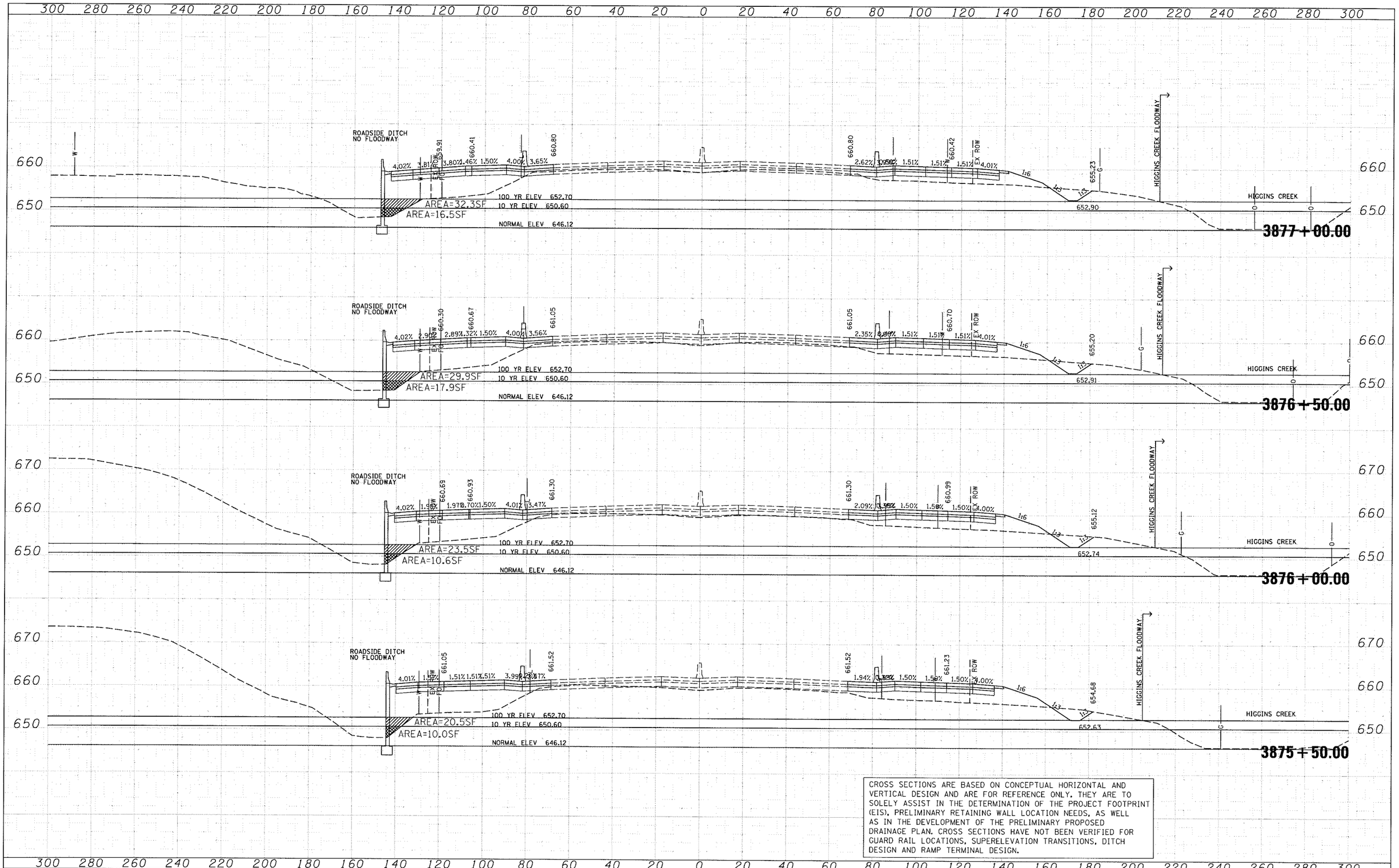
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM

DRAWING NO. XS-I90-02

CONTRACT NO.

PROJECT BI

ILLINOIS FED. AID PROJECT



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

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	PLOT SCALE = 40'	DRAWN - CH2MHILL.	REVISED -
CH2MHILL.	PLOT DATE = 10/29/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3875+50.00 TO STA. 3877+00.00

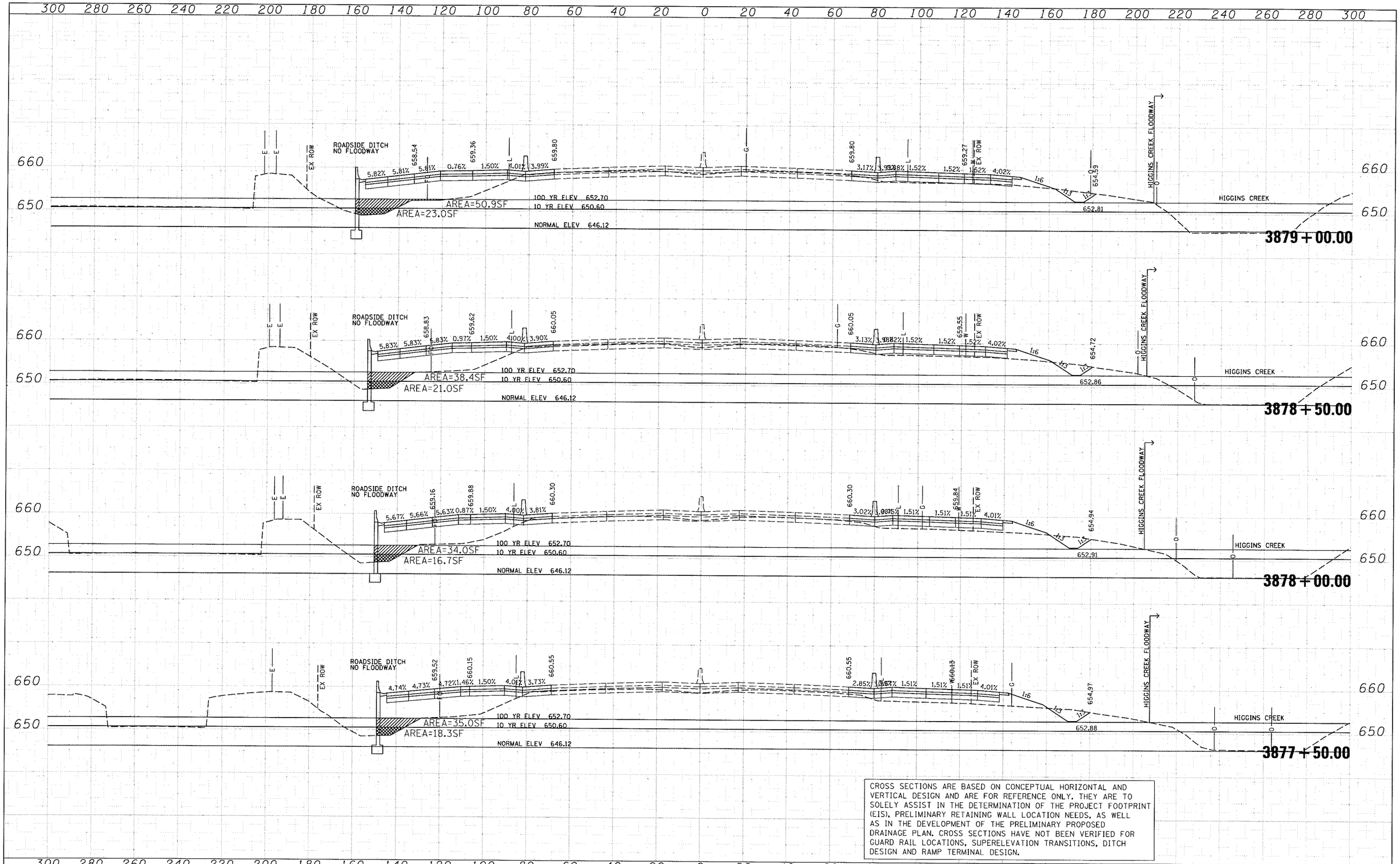
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM

DRAWING NO. XS-903 | CONTRACT NO.

PROJECT B1 | ILLINOIS | FED. AID PROJECT

	DATE
BY	
SURVEYED	
PLOTTED	
TEMPLATE	
AREAS	
AREAS CHECKED	
FINAL SURVEY	
NOTE BOOK	
NO.	

	DATE
BY	
SURVEYED	
PLOTTED	
TEMPLATE	
AREAS	
AREAS CHECKED	
ORIGINAL SURVEY	
NOTE BOOK	
NO.	



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FINAL SURVEY	NOTE BOOK	NO.	SURVEYED	PLOTTED	TEMPLATE	AREAS	AREAS CHECKED	BY	DATE
ORIGINAL SURVEY	NOTE BOOK	NO.	SURVEYED	PLOTTED	TEMPLATE	AREAS	AREAS CHECKED	BY	DATE

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USER NAME = eanderson | PLOT SCALE = 40' | PLOT DATE = 10/29/2012

DESIGNED - CH2MHILL. | DRAWN - CH2MHILL. | CHECKED - CH2MHILL. | DATE -

REVISED - | REVISED - | REVISED - | REVISED -

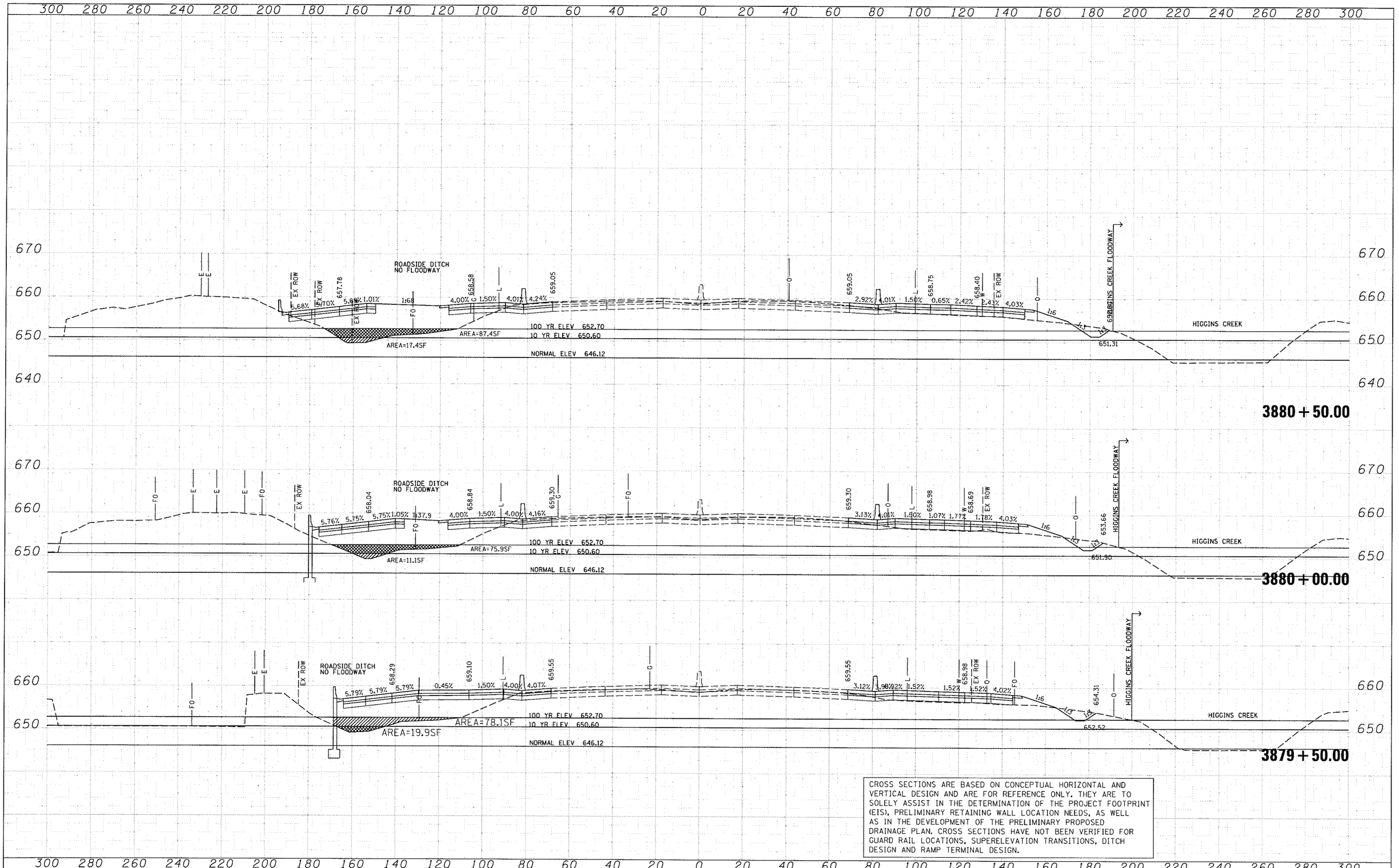
CH2MHILL.

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3877+50.00 TO STA. 3879+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	SNUM
DRAWING NO. XS-904		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	

ORIGINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	

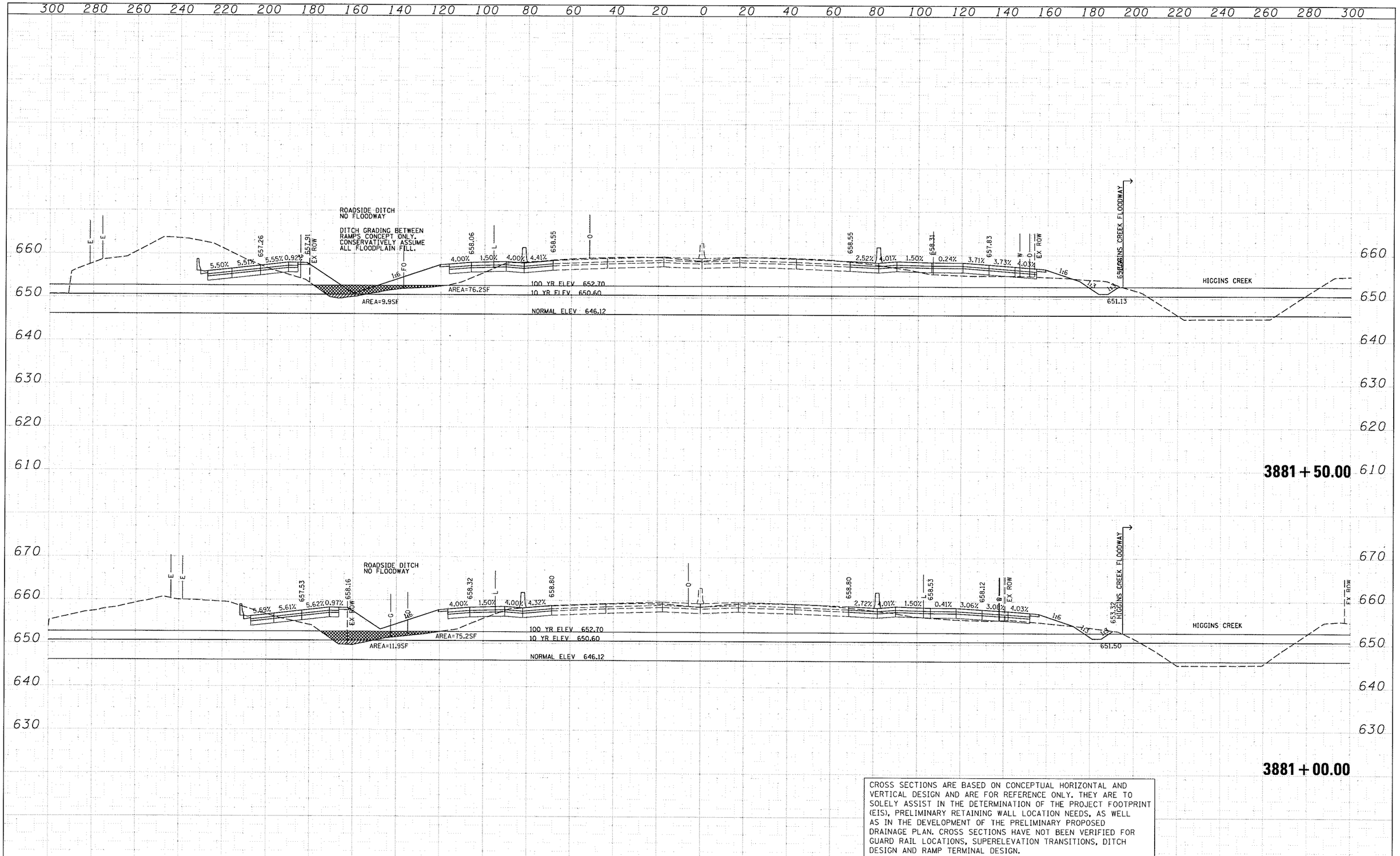
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	PLOT SCALE = 40'	DRAWN - CH2MHILL.	REVISED -
CH2MHILL.	PLOT DATE = 10/29/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3879+50.00 TO STA. 3880+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	SNUM
DRAWING NO. XS-905		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

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CH2MHILL.	PLOT SCALE = 40'	DRAWN - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3881+00.00 TO STA. 3881+50.00

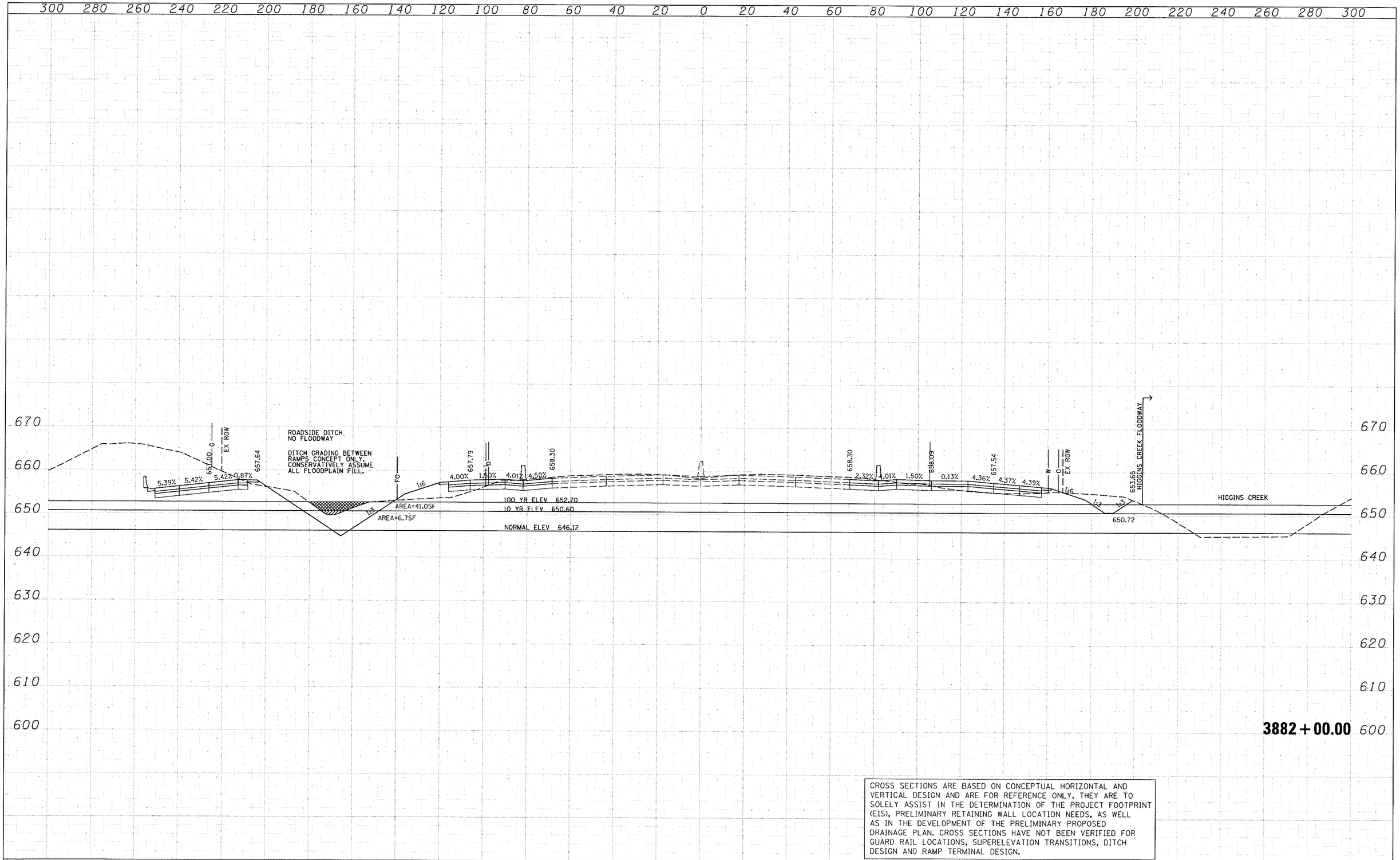
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO. XX-XX-06		CONTRACT NO.		
PROJECT BI	ILLINOIS	FED. AID PROJECT		

ORIGINAL SURVEY	NOTE BOOK	NO.
SURVEYED	BY	DATE
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

FINAL SURVEY	NOTE BOOK	NO.
SURVEYED	BY	DATE
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		

FINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	

ORIGINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	



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CH2MHILL.	PLOT SCALE = 40'	DRAWN - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	CHECKED - CH2MHILL.	REVISED -
		DATE -	REVISED -

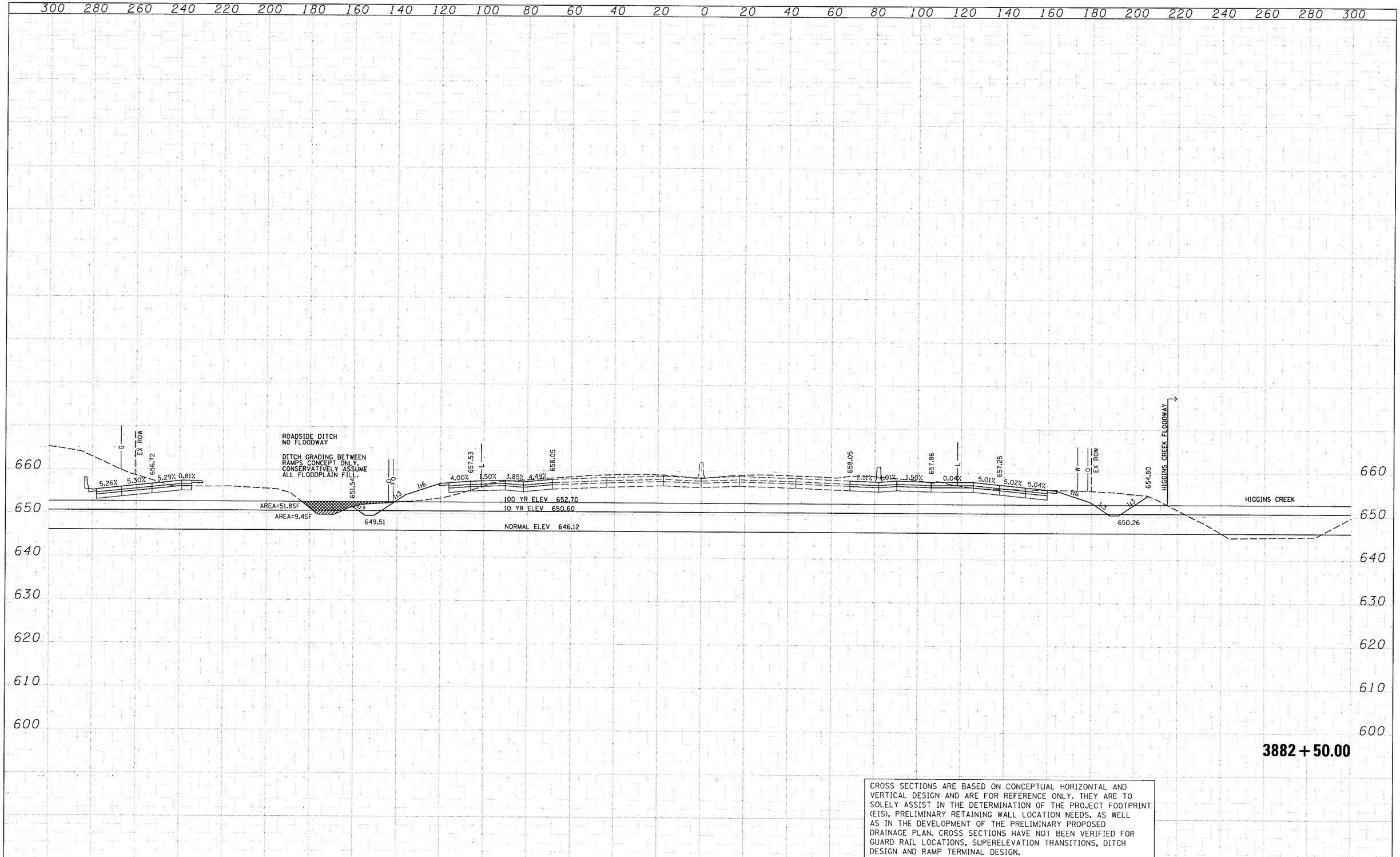
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3882+00.00 TO STA. 3882+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	*NUM
DRAWING NO. XS-107		CONTRACT NO.		
PROJECT B1	ILLINOIS FED. AID PROJECT			

FINAL SURVEY	SURVEYED	BY	
	PLOTTED		
NOTE BOOK	TEMPLATE		
	AREAS		
NO.	AREAS CHECKED		DATE



ORIGINAL SURVEY	SURVEYED	BY	
	PLOTTED		
NOTE BOOK	TEMPLATE		
	AREAS		
NO.	AREAS CHECKED		DATE

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Sht_Xsht.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
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CH2MHILL.	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

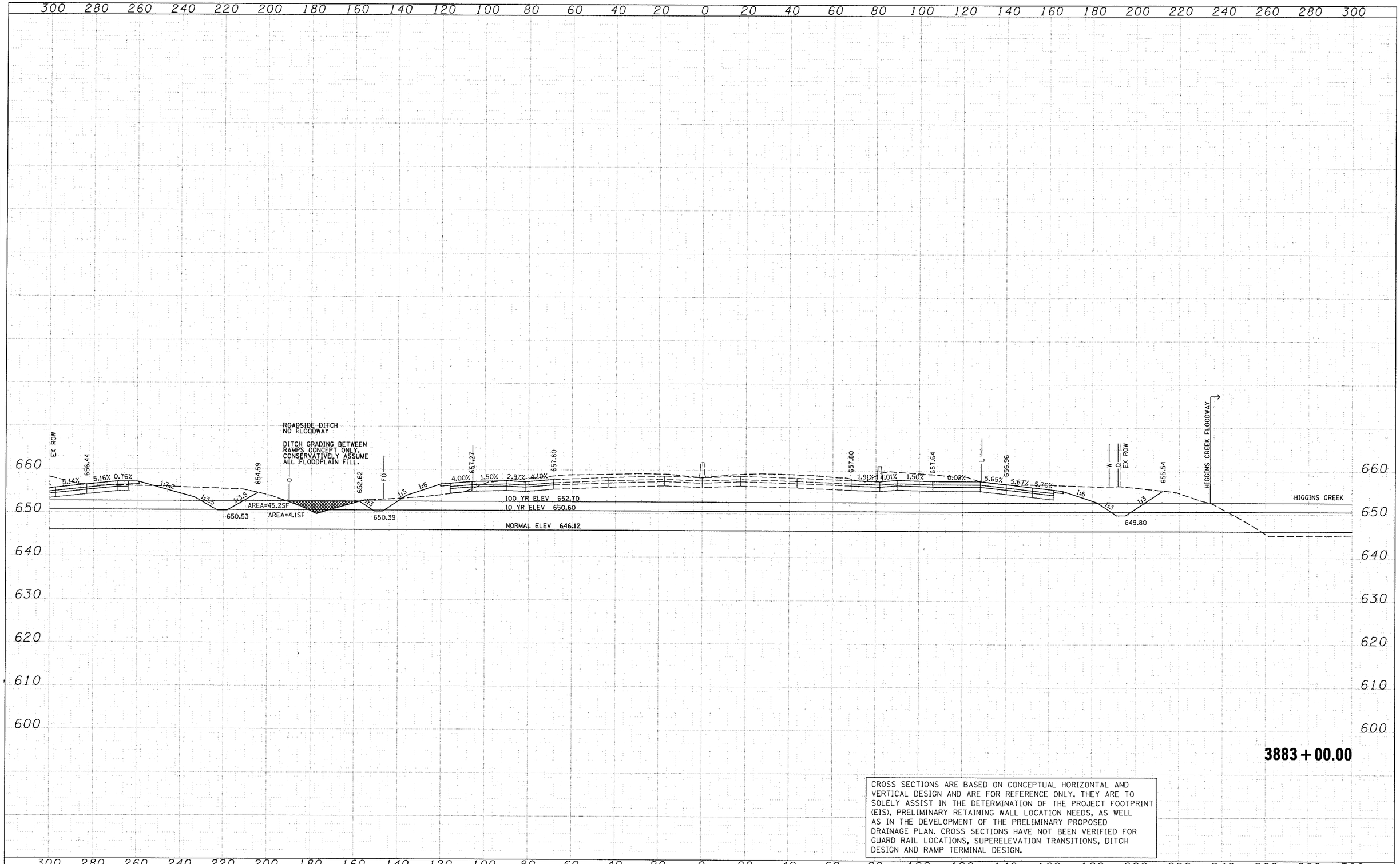
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3882+50.00 TO STA. 3882+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO. XS-108		CONTRACT NO.		
PROJECT BI	ILLINOIS FED. AID PROJECT			

FINAL SURVEY	SURVEYED	BY	DATE
	PLOTTED		
NOTE BOOK	TEMPLATE		
	AREAS		
NO.	AREAS CHECKED		



3883+00.00

CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

ORIGINAL SURVEY	SURVEYED	BY	DATE
	PLOTTED		
NOTE BOOK	TEMPLATE		
	AREAS		
NO.	AREAS CHECKED		

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\HY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\[illegible].sht-xsects.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
		DRAWN - CH2MHILL.	REVISED -
	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

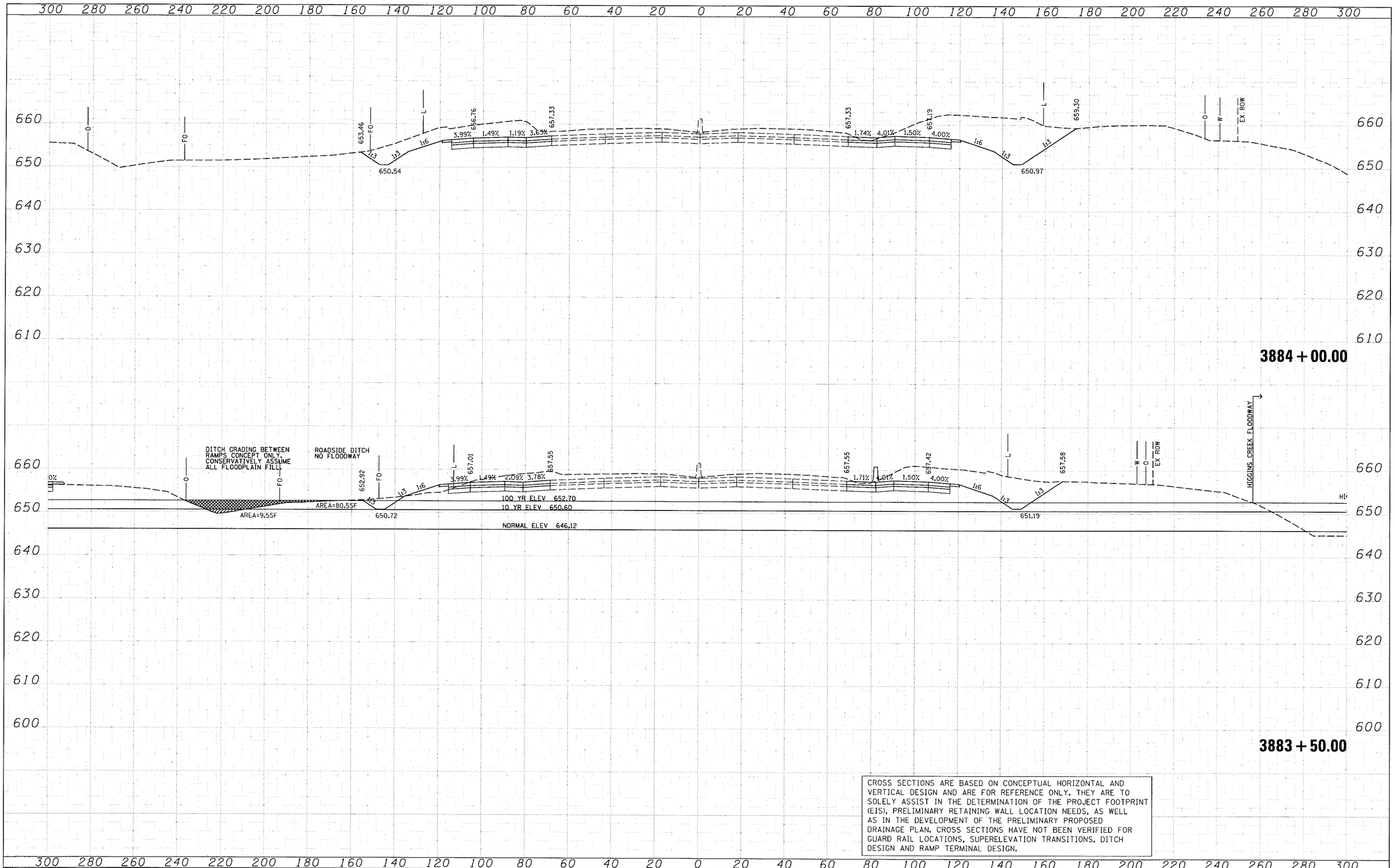
CH2MHILL.

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S# OF T# SHEETS | STA. 3883+00.00 TO STA. 3883+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	#NUM
DRAWING NO. XS-09		CONTRACT NO.		
PROJECT 81	ILLINOIS	FED. AID PROJECT		



CROSS SECTIONS ARE BASED ON CONCEPTUAL HORIZONTAL AND VERTICAL DESIGN AND ARE FOR REFERENCE ONLY. THEY ARE TO SOLELY ASSIST IN THE DETERMINATION OF THE PROJECT FOOTPRINT (EIS), PRELIMINARY RETAINING WALL LOCATION NEEDS, AS WELL AS IN THE DEVELOPMENT OF THE PRELIMINARY PROPOSED DRAINAGE PLAN. CROSS SECTIONS HAVE NOT BEEN VERIFIED FOR GUARD RAIL LOCATIONS, SUPERELEVATION TRANSITIONS, DITCH DESIGN AND RAMP TERMINAL DESIGN.

FINAL SURVEY — NOTE BOOK — NO. — BY — DATE
SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED

ORIGINAL SURVEY — NOTE BOOK — NO. — BY — DATE
SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED

FILE NAME = Y:\361180 - Elgin O'Hare - West Bypass\TIER_TWO\MY\CAD\Models TICP Project C\Drainage Calculations\Comp Storage\Comp Storage_Sheet.dgn	USER NAME = eanderson	DESIGNED - CH2MHILL.	REVISED -
		DRAWN - CH2MHILL.	REVISED -
	PLOT SCALE = 40'	CHECKED - CH2MHILL.	REVISED -
	PLOT DATE = 10/29/2012	DATE -	REVISED -

CH2MHILL.

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

PROPOSED CROSS SECTIONS
I-90

SCALE: | SHEET NO. S* OF T* SHEETS | STA. 3883+50.00 TO STA. 3884+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			224	$NUM

DRAWING NO. X$SH0 — CONTRACT NO.
PROJECT BI — ILLINOIS — FED. AID PROJECT

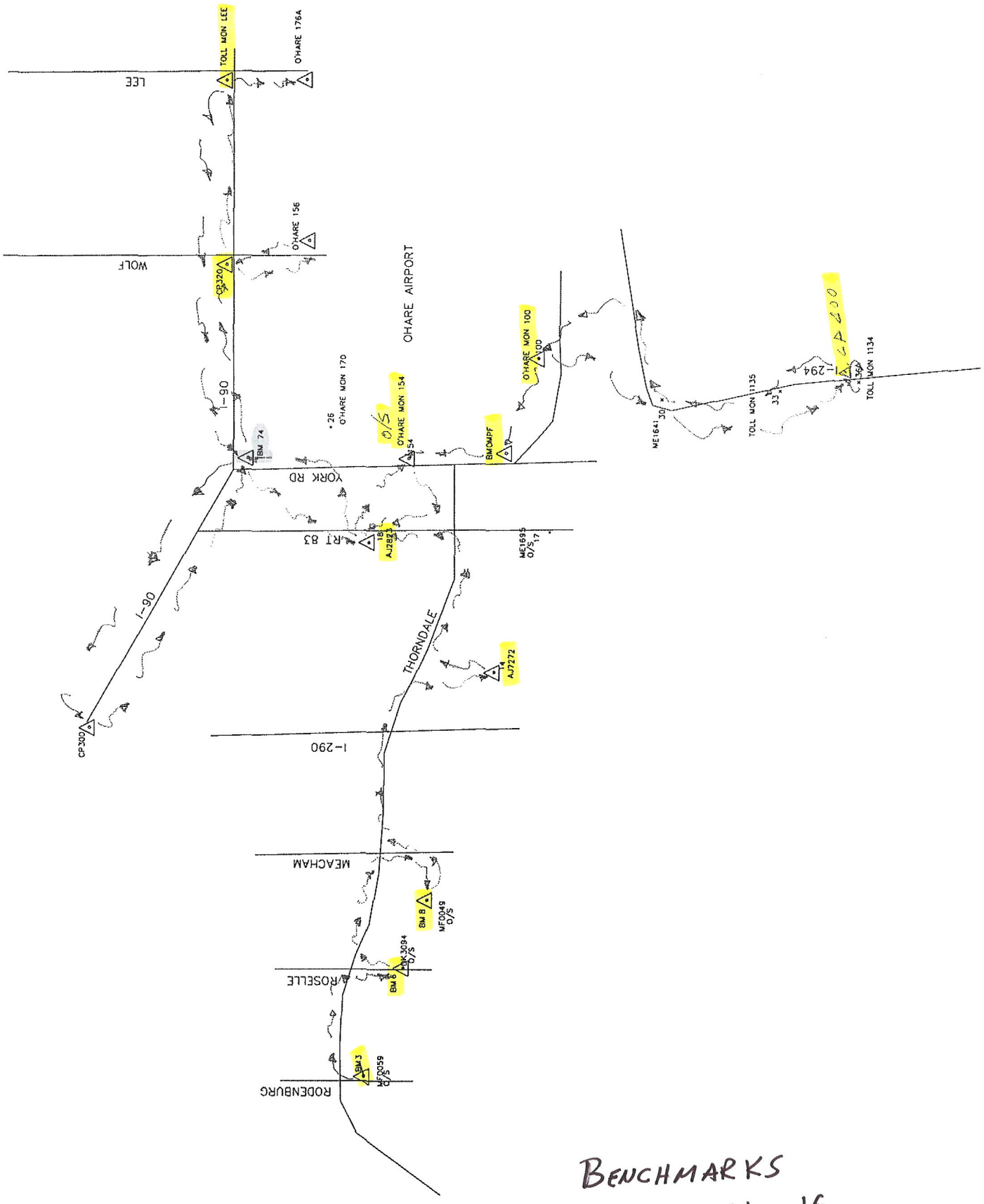
TAB 13

SECTION 13

SURVEY NOTES
VERTCON DATUM CONVERSION
FLOOD INSURANCE STUDY DATUM INFORMATION
HISTORIC WILLOW CREEK GAGE INFORMATION

DB STERLIN SURVEY NOTES

BENCHMARKS
FINAL LEVEL NETWORK ADJUSTMENT



BENCHMARKS
Final-Level-Ad.pdf

Network adjustment for O'Hare Bypass Project final
STAR*NET-PLUS Version 6.0.25
Copyright 1988-2002 Starplus Software, Inc.
Licensed for Use by D B Sterlin Consultants, Inc.
Run Date: Wed Nov 18 2009 15:15:47

Summary of Files Used and Option Settings

Project Folder and Data Files

Project Name ELGINO'HARE
Project Folder J:\O'HARE BYPASS
Data File List Level Run Elgin O'Hare Expy E2.dat
Level Run Thorndale Ave AJ7272-AJ2823.dat
Level Run Thorndale Ave OF154.dat
Level Run BM55-BM74.dat
Level Run I90.dat
Level Run Elgin O'Hare Expy E.dat
Level Run I-294.dat
Level Run OFF154-MON100.dat

Project Option Settings

STAR*NET Run Mode : Adjust with Error Propagation
Type of Adjustment : Lev
Project Units : FeetUS
Input/Output Coordinate Order : North-East
Create Coordinate File : Yes

Instrument Standard Error Settings

Project Default Instrument
Differential Levels : 0.008000 FeetUS / Turn

Summary of Unadjusted Input Observations

Number of Entered Stations (FeetUS) = 11

Fixed Stations	Elev	Description
BM3	797.8900	MF 0059 ALT
BM6	768.5400	DK3094 ALT
BM8	757.7100	MF 0049 ALT
AJ7272	697.0500	NGS MONUMENT
AJ2823	673.1500	NGS MONUMENT
OSOH154	663.4200	OFFSET O'Hare MON154
TOLL_M	666.0900	Toll Monument on Lee Street (Off. O'Hare Mon 176A)
CP320	676.8390	CP320 (Off. O'Hare Mon 156)
OM100	654.0780	O'HARE MONUMENT 100
CP400	672.5800	Transferred from Toll Mon.-St.Charles
BMOMPF	670.0840	Phase one OMP Level Run

Number of Differential Level Observations (FeetUS) = 126

From	To	Elev Diff	StdErr	Length
BM8	TBMB	-19.1200	0.0226	8(T)
TBMB	TBMC	-3.4100	0.0160	4(T)
TBMC	TBMD	-16.3000	0.0212	7(T)
TBMD	TBME	1.3100	0.0196	6(T)
TBME	TBMF	-1.5800	0.0179	5(T)
TBMF	CP114	2.0100	0.0080	1(T)

CP114	CP115	22.7200	0.0139	3(T)
CP115	CP116	-7.7000	0.0139	3(T)
CP116	CP117	3.9100	0.0080	1(T)
CP117	CP118	-15.3110	0.0113	2(T)
CP118	CP119	1.4000	0.0139	3(T)
CP119	CP120	-0.0300	0.0139	3(T)
CP120	CP121	-27.9100	0.0139	3(T)
CP121	CP122	-1.3750	0.0139	3(T)
CP122	CP123	-1.9550	0.0113	2(T)
CP123	TBMJ	-3.7390	0.0113	2(T)
TBMJ	TBMI	-0.4100	0.0179	5(T)
TBMI	TBMH	8.1300	0.0139	3(T)
TBMH	TBMG	-17.1700	0.0179	5(T)
TBMG	AJ7272	15.9700	0.0179	5(T)
AJ7272	TBMG	-15.9700	0.0179	5(T)
TBMG	TBMH	17.1700	0.0179	5(T)
TBMH	TBMI	-8.1300	0.0139	3(T)
TBMI	TBMJ	0.4100	0.0179	5(T)
TBMJ	CP124	-4.7600	0.0113	2(T)
CP124	CP125	0.2100	0.0179	5(T)
CP125	CP126	29.4300	0.0212	7(T)
CP126	CP127	2.7400	0.0160	4(T)
CP127	CP128	-17.4400	0.0179	5(T)
CP128	TBMO	2.4700	0.0113	2(T)
TBMO	TBMN	-5.7700	0.0080	1(T)
TBMN	TBMM	-17.6700	0.0212	7(T)
TBMM	TBML	-4.0200	0.0179	5(T)
TBML	TBMK	-0.9000	0.0160	4(T)
TBMK	AJ2823	-1.6700	0.0113	2(T)
AJ2823	TBMK	1.6700	0.0113	2(T)
TBMK	TBML	0.9000	0.0160	4(T)
TBML	TBMM	4.0200	0.0179	5(T)
TBMM	CP131	-3.7400	0.0139	3(T)
CP131	CP132	-2.6750	0.0113	2(T)
CP132	CP133	-4.1850	0.0080	1(T)
CP133	CP134	-3.7150	0.0139	3(T)
CP134	OSOH154	-1.9600	0.0212	7(T)
OSOH154	BM55	9.6950	0.0160	4(T)
BM55	AJ2823	-0.0500	0.0253	10(T)
BM55	TBM69	-0.3600	0.0179	5(T)
TBM69	TBM70	-2.6750	0.0080	1(T)
TBM70	TBM71	-4.9250	0.0080	1(T)
TBM71	TBM72	-5.6050	0.0080	1(T)
TBM72	TBM74	3.4750	0.0113	2(T)
TBM74	TBM70	7.0900	0.0160	4(T)
TBM70	TBM78	2.0900	0.0113	2(T)
TBM78	BM55	0.9750	0.0179	5(T)
TBM74	CP305	48.8300	0.0537	45(T)
CP305	CP304	9.6600	0.0139	3(T)
CP304	CP303	-4.4500	0.0160	4(T)
CP303	CP302	-4.9700	0.0160	4(T)
CP302	CP301	-7.7900	0.0179	5(T)
CP301	CP300	-0.4800	0.0113	2(T)
CP300	CP301	0.4850	0.0080	1(T)
CP301	CP302	7.7770	0.0113	2(T)
CP302	CP303	4.9540	0.0113	2(T)
CP303	CP304	4.4510	0.0113	2(T)
CP304	CP305	-9.6270	0.0139	3(T)
CP305	CP306	-14.0690	0.0113	2(T)
CP306	CP307	-1.5060	0.0113	2(T)
CP307	CP308	-2.7740	0.0113	2(T)
CP308	CP309	-2.4830	0.0113	2(T)
CP309	CP310	4.4320	0.0113	2(T)

CP310	CP311	-0.3830	0.0139	3(T)
CP311	CP312	-16.6050	0.0113	2(T)
CP312	CP313	-15.0840	0.0113	2(T)
CP313	CP314	-0.7150	0.0113	2(T)
CP314	CP315	-2.4280	0.0113	2(T)
CP315	TBM74	2.7770	0.0139	3(T)
TBM74	CP315	-2.7770	0.0139	3(T)
CP315	CP316	-1.3910	0.0113	2(T)
CP316	CP317	2.8360	0.0113	2(T)
CP317	CP318	17.6630	0.0139	3(T)
CP318	CP319	3.1140	0.0113	2(T)
CP319	CP320	-5.6070	0.0113	2(T)
CP320	TOLL_M	-10.7290	0.0212	7(T)
TOLL_M	TBM74	-3.0770	0.0367	21(T)
BM3	CP104	33.2620	0.0196	6(T)
CP104	CP105	-11.9670	0.0139	3(T)
CP105	CP106	3.6150	0.0139	3(T)
CP106	CP107	-3.7210	0.0160	4(T)
CP107	CP108	8.0350	0.0080	1(T)
CP108	CP109	-29.3180	0.0139	3(T)
CP109	CP110	-30.4650	0.0139	3(T)
CP110	BM6	1.2000	0.0277	12(T)
BM6	TBMA	22.5600	0.0240	9(T)
TBMA	CP110	-23.7600	0.0139	3(T)
CP110	CP111	-13.4200	0.0179	5(T)
CP111	CP112	-9.9500	0.0160	4(T)
CP112	CP113	-22.5000	0.0179	5(T)
CP113	CP114	-0.9300	0.0179	5(T)
CP114	TBMF	-2.0100	0.0080	1(T)
TBMF	TBMD	0.2700	0.0265	11(T)
TBMD	TBMB	19.7100	0.0265	11(T)
TBMB	BM8	19.1200	0.0226	8(T)
CP400	CP401	21.4600	0.0139	3(T)
CP401	CP402	0.9300	0.0139	3(T)
CP402	CP403	-1.6950	0.0139	3(T)
CP403	CP404	-4.0000	0.0113	2(T)
CP404	CP405	-23.0950	0.0139	3(T)
CP405	CP406	-3.1950	0.0139	3(T)
CP406	CP407	-3.2600	0.0139	3(T)
CP407	CP408	8.2700	0.0139	3(T)
CP408	BMAA	20.4750	0.0113	2(T)
BMAA	CP410	7.5500	0.0160	4(T)
CP410	CP411	-23.9650	0.0160	4(T)
CP411	CP412	-20.2950	0.0139	3(T)
CP412	CP413	5.5900	0.0139	3(T)
CP413	CP414	13.3400	0.0113	2(T)
CP414	BMBB	-23.7300	0.0139	3(T)
BMBB	BMAA	41.5000	0.0349	19(T)
BMAA	BMNORTH	4.5000	0.0310	15(T)
BMNORTH	CP400	-20.4450	0.0253	10(T)
OM100	TP21	-6.5710	0.0367	21(T)
TP21	TP31	3.1190	0.0253	10(T)
TP31	BMBB	-3.5840	0.0113	2(T)
BMBB	OM100	7.0520	0.0460	33(T)
OM100	BMF	15.9970	0.0320	16(T)
BMOMPF	CP134	-4.7260	0.0253	10(T)
CP134	OSOH154	-1.8970	0.0226	8(T)

Adjustment Statistical Summary

Number of Stations = 101

Network adjustment for O'Hare Bypass Project final
Number of Observations = 126
Number of Unknowns = 90
Number of Redundant Obs = 36

Observation	Count	Sum Squares of StdRes	Error Factor
Level Data	126	32.224	0.946
Total	126	32.224	0.946

The Chi-Square Test at 5.00% Level Passed
Lower/Upper Bounds (0.770/1.230)

Adjusted Elevations and Error Propagation (FeetUS)

Station	Elev	StdDev	95%	Description
BM3	797.8900	0.000000	0.000000	MF 0059 ALT
BM6	768.5400	0.000000	0.000000	DK3094 ALT
BM8	757.7100	0.000000	0.000000	MF 0049 ALT
AJ7272	697.0500	0.000000	0.000000	NGS MONUMENT
AJ2823	673.1500	0.000000	0.000000	NGS MONUMENT
TBMB	738.5775	0.014863	0.029131	
TBMC	735.1612	0.019659	0.038532	
TBMD	718.8502	0.020249	0.039688	
TBME	720.1508	0.023335	0.045736	
TBMF	718.5630	0.021598	0.042330	
CP114	720.5714	0.021564	0.042265	
CP115	743.2862	0.023592	0.046240	
CP116	735.5810	0.024910	0.048822	
CP117	739.4892	0.025212	0.049415	
CP118	724.1748	0.025626	0.050227	
CP119	725.5696	0.025792	0.050552	
CP120	725.5344	0.025418	0.049819	
CP121	697.6192	0.024480	0.047979	
CP122	696.2389	0.022907	0.044897	
CP123	694.2805	0.021440	0.042021	
TBMJ	690.5380	0.019552	0.038322	
TBMI	690.1258	0.017747	0.034784	
TBMH	698.2544	0.016131	0.031616	
TBMG	681.0822	0.012044	0.023605	
CP104	831.1556	0.017369	0.034042	
CP105	819.1904	0.019768	0.038744	
CP106	822.8072	0.020945	0.041051	
CP107	819.0886	0.020941	0.041044	
CP108	827.1242	0.020666	0.040504	
CP109	797.8080	0.019111	0.037457	
CP110	767.3448	0.016193	0.031737	
CP111	753.9318	0.021130	0.041414	
CP112	743.9874	0.022947	0.044975	
CP113	721.4944	0.023292	0.045652	
CP124	685.7763	0.021514	0.042166	
CP126	715.4061	0.026478	0.051895	
CP128	700.6985	0.024578	0.048171	
CP125	685.9821	0.024762	0.048533	
CP127	718.1428	0.026213	0.051377	
TBMO	703.1668	0.023461	0.045982	
TBMN	697.3960	0.022786	0.044660	
TBMM	679.7200	0.014803	0.029013	
TBML	675.7091	0.012348	0.024201	
TBMK	674.8164	0.007721	0.015132	
MF0039	685.9900	0.000000	0.000000	NGS MONUMENT
OSOH154	663.4200	0.000000	0.000000	OFFSET O'Hare MON154

CP131	675.9666	0.016252	0.031854	
CP132	673.2827	0.015984	0.031328	
CP133	669.0932	0.015478	0.030336	
CP134	665.3648	0.012059	0.023635	
BM55	673.1371	0.012248	0.024006	
TBM69	672.7634	0.015997	0.031353	
TBM70	670.0857	0.015509	0.030398	
TBM71	665.1559	0.016464	0.032268	
TBM72	659.5462	0.016839	0.033003	
TBM74	663.0117	0.015953	0.031267	
TBM78	672.1718	0.016507	0.032353	
TOLL_M	666.0900	0.000000	0.000000	Toll Monument on Lee
Street (Off. O'Hare Mon 176A)				
CP320	676.8390	0.000000	0.000000	CP320 (Off. O'Hare Mon
156)				
CP305	711.8462	0.034208	0.067046	
CP304	721.4897	0.035583	0.069742	
CP303	717.0390	0.036763	0.072054	
CP302	712.0797	0.037906	0.074294	
CP301	704.2989	0.039093	0.076621	
CP300	703.8156	0.039635	0.077683	
CP306	697.7774	0.033490	0.065639	
CP307	696.2715	0.032640	0.063974	
CP308	693.4977	0.031648	0.062029	
CP309	691.0149	0.030499	0.059778	
CP310	695.4471	0.029176	0.057184	
CP311	695.0644	0.026805	0.052537	
CP312	678.4596	0.024910	0.048823	
CP313	663.3758	0.022692	0.044476	
CP314	662.6610	0.020044	0.039285	
CP315	660.2332	0.016762	0.032853	
CP316	658.8406	0.017112	0.033538	
CP317	661.6749	0.016634	0.032602	
CP318	679.3354	0.014144	0.027722	
CP319	682.4477	0.010678	0.020928	
TBMA	791.1036	0.017073	0.033463	
OM100	654.0780	0.000000	0.000000	O'HARE MONUMENT 100
CP400	672.5800	0.000000	0.000000	Transferred from Toll
Mon.-St.Charles				
CP401	694.0449	0.013294	0.026056	
CP402	694.9798	0.017971	0.035223	
CP403	693.2898	0.020944	0.041050	
CP404	689.2930	0.022335	0.043775	
CP405	666.2029	0.023742	0.046533	
CP406	663.0129	0.024454	0.047928	
CP407	659.7578	0.024531	0.048080	
CP408	668.0327	0.023980	0.047000	
BMAA	688.5110	0.023243	0.045556	
CP410	696.0642	0.026068	0.051093	
CP411	672.1024	0.027416	0.053735	
CP412	651.8098	0.027597	0.054090	
CP413	657.4022	0.027089	0.053093	
CP414	670.7438	0.026349	0.051642	
BMBB	647.0162	0.024565	0.048146	
BMNORTH	693.0194	0.021690	0.042511	
TP21	647.4906	0.027076	0.053067	
TP31	650.6018	0.025549	0.050075	
BMOMPF	670.0840	0.000000	0.000000	Phase one OMP Level Run
BMF	670.0750	0.032000	0.062719	

Adjusted Observations and Residuals

Network adjustment for O'Hare Bypass Project final
Adjusted Differential Level Observations (FeetUS)

From	To	Elev Diff	Residual	StdErr	StdRes
BM8	TBMB	-19.1325	-0.0125	0.0226	0.6
TBMB	TBMC	-3.4163	-0.0063	0.0160	0.4
TBMC	TBMD	-16.3110	-0.0110	0.0212	0.5
TBMD	TBME	1.3006	-0.0094	0.0196	0.5
TBME	TBMF	-1.5878	-0.0078	0.0179	0.4
TBMF	CP114	2.0084	-0.0016	0.0080	0.2
CP114	CP115	22.7148	-0.0052	0.0139	0.4
CP115	CP116	-7.7052	-0.0052	0.0139	0.4
CP116	CP117	3.9083	-0.0017	0.0080	0.2
CP117	CP118	-15.3145	-0.0035	0.0113	0.3
CP118	CP119	1.3948	-0.0052	0.0139	0.4
CP119	CP120	-0.0352	-0.0052	0.0139	0.4
CP120	CP121	-27.9152	-0.0052	0.0139	0.4
CP121	CP122	-1.3802	-0.0052	0.0139	0.4
CP122	CP123	-1.9585	-0.0035	0.0113	0.3
CP123	TBMJ	-3.7425	-0.0035	0.0113	0.3
TBMJ	TBMI	-0.4122	-0.0022	0.0179	0.1
TBMI	TBMH	8.1287	-0.0013	0.0139	0.1
TBMH	TBMG	-17.1722	-0.0022	0.0179	0.1
TBMG	AJ7272	15.9678	-0.0022	0.0179	0.1
AJ7272	TBMG	-15.9678	0.0022	0.0179	0.1
TBMG	TBMH	17.1722	0.0022	0.0179	0.1
TBMH	TBMI	-8.1287	0.0013	0.0139	0.1
TBMI	TBMJ	0.4122	0.0022	0.0179	0.1
TBMJ	CP124	-4.7617	-0.0017	0.0113	0.1
CP124	CP125	0.2058	-0.0042	0.0179	0.2
CP125	CP126	29.4241	-0.0059	0.0212	0.3
CP126	CP127	2.7366	-0.0034	0.0160	0.2
CP127	CP128	-17.4442	-0.0042	0.0179	0.2
CP128	TBMO	2.4683	-0.0017	0.0113	0.1
TBMO	TBMN	-5.7708	-0.0008	0.0080	0.1
TBMN	TBMM	-17.6759	-0.0059	0.0212	0.3
TBMM	TBML	-4.0109	0.0091	0.0179	0.5
TBML	TBMK	-0.8927	0.0073	0.0160	0.5
TBMK	AJ2823	-1.6664	0.0036	0.0113	0.3
AJ2823	TBMK	1.6664	-0.0036	0.0113	0.3
TBMK	TBML	0.8927	-0.0073	0.0160	0.5
TBML	TBMM	4.0109	-0.0091	0.0179	0.5
TBMM	CP131	-3.7534	-0.0134	0.0139	1.0
CP131	CP132	-2.6839	-0.0089	0.0113	0.8
CP132	CP133	-4.1895	-0.0045	0.0080	0.6
CP133	CP134	-3.7284	-0.0134	0.0139	1.0
CP134	OSOH154	-1.9448	0.0152	0.0212	0.7
OSOH154	BM55	9.7171	0.0221	0.0160	1.4
BM55	AJ2823	0.0129	0.0629	0.0253	2.5
BM55	TBM69	-0.3736	-0.0136	0.0179	0.8
TBM69	TBM70	-2.6777	-0.0027	0.0080	0.3
TBM70	TBM71	-4.9298	-0.0048	0.0080	0.6
TBM71	TBM72	-5.6098	-0.0048	0.0080	0.6
TBM72	TBM74	3.4655	-0.0095	0.0113	0.8
TBM74	TBM70	7.0741	-0.0159	0.0160	1.0
TBM70	TBM78	2.0861	-0.0039	0.0113	0.3
TBM78	BM55	0.9653	-0.0097	0.0179	0.5
TBM74	CP305	48.8345	0.0045	0.0537	0.1
CP305	CP304	9.6435	-0.0165	0.0139	1.2
CP304	CP303	-4.4507	-0.0007	0.0160	0.0
CP303	CP302	-4.9593	0.0107	0.0160	0.7
CP302	CP301	-7.7807	0.0093	0.0179	0.5
CP301	CP300	-0.4833	-0.0033	0.0113	0.3
CP300	CP301	0.4833	-0.0017	0.0080	0.2

CP301	CP302	7.7807	0.0037	0.0113	0.3
CP302	CP303	4.9593	0.0053	0.0113	0.5
CP303	CP304	4.4507	-0.0003	0.0113	0.0
CP304	CP305	-9.6435	-0.0165	0.0139	1.2
CP305	CP306	-14.0688	0.0002	0.0113	0.0
CP306	CP307	-1.5058	0.0002	0.0113	0.0
CP307	CP308	-2.7738	0.0002	0.0113	0.0
CP308	CP309	-2.4828	0.0002	0.0113	0.0
CP309	CP310	4.4322	0.0002	0.0113	0.0
CP310	CP311	-0.3827	0.0003	0.0139	0.0
CP311	CP312	-16.6048	0.0002	0.0113	0.0
CP312	CP313	-15.0838	0.0002	0.0113	0.0
CP313	CP314	-0.7148	0.0002	0.0113	0.0
CP314	CP315	-2.4278	0.0002	0.0113	0.0
CP315	TBM74	2.7784	0.0014	0.0139	0.1
TBM74	CP315	-2.7784	-0.0014	0.0139	0.1
CP315	CP316	-1.3927	-0.0017	0.0113	0.1
CP316	CP317	2.8343	-0.0017	0.0113	0.1
CP317	CP318	17.6605	-0.0025	0.0139	0.2
CP318	CP319	3.1123	-0.0017	0.0113	0.1
CP319	CP320	-5.6087	-0.0017	0.0113	0.1
CP320	TOLL_M	-10.7490	-0.0200	0.0212	0.9
TOLL_M	TBM74	-3.0783	-0.0013	0.0367	0.0
BM3	CP104	33.2656	0.0036	0.0196	0.2
CP104	CP105	-11.9652	0.0018	0.0139	0.1
CP105	CP106	3.6168	0.0018	0.0139	0.1
CP106	CP107	-3.7186	0.0024	0.0160	0.1
CP107	CP108	8.0356	0.0006	0.0080	0.1
CP108	CP109	-29.3162	0.0018	0.0139	0.1
CP109	CP110	-30.4632	0.0018	0.0139	0.1
CP110	BM6	1.1952	-0.0048	0.0277	0.2
BM6	TBMA	22.5636	0.0036	0.0240	0.1
TBMA	CP110	-23.7588	0.0012	0.0139	0.1
CP110	CP111	-13.4130	0.0070	0.0179	0.4
CP111	CP112	-9.9444	0.0056	0.0160	0.3
CP112	CP113	-22.4930	0.0070	0.0179	0.4
CP113	CP114	-0.9230	0.0070	0.0179	0.4
CP114	TBMF	-2.0084	0.0016	0.0080	0.2
TBMF	TBMD	0.2872	0.0172	0.0265	0.6
TBMD	TBMB	19.7272	0.0172	0.0265	0.6
TBMB	BM8	19.1325	0.0125	0.0226	0.6
CP400	CP401	21.4649	0.0049	0.0139	0.4
CP401	CP402	0.9349	0.0049	0.0139	0.4
CP402	CP403	-1.6901	0.0049	0.0139	0.4
CP403	CP404	-3.9967	0.0033	0.0113	0.3
CP404	CP405	-23.0901	0.0049	0.0139	0.4
CP405	CP406	-3.1901	0.0049	0.0139	0.4
CP406	CP407	-3.2551	0.0049	0.0139	0.4
CP407	CP408	8.2749	0.0049	0.0139	0.4
CP408	BMAA	20.4783	0.0033	0.0113	0.3
BMAA	CP410	7.5532	0.0032	0.0160	0.2
CP410	CP411	-23.9618	0.0032	0.0160	0.2
CP411	CP412	-20.2926	0.0024	0.0139	0.2
CP412	CP413	5.5924	0.0024	0.0139	0.2
CP413	CP414	13.3416	0.0016	0.0113	0.1
CP414	BMBB	-23.7276	0.0024	0.0139	0.2
BMBB	BMAA	41.4948	-0.0052	0.0349	0.2
BMAA	BMNORTH	4.5084	0.0084	0.0310	0.3
BMNORTH	CP400	-20.4394	0.0056	0.0253	0.2
OM100	TP21	-6.5874	-0.0164	0.0367	0.4
TP21	TP31	3.1112	-0.0078	0.0253	0.3
TP31	BMBB	-3.5856	-0.0016	0.0113	0.1
BMBB	OM100	7.0618	0.0098	0.0460	0.2

Network adjustment for O'Hare Bypass Project final

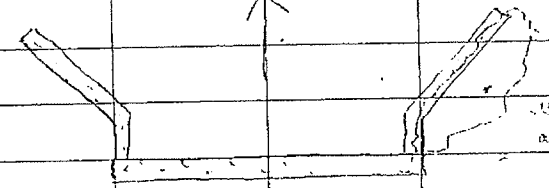
OM100	BMF	15.9970	-0.0000	0.0320	0.0
BMOMPF	CP134	-4.7192	0.0068	0.0253	0.3
CP134	OSOH154	-1.9448	-0.0478	0.0226	2.1

Elapsed Time = 00:00:01

DB STERLIN SURVEY NOTES

I-90 BRIDGE HIGGINS CREEK
I-90 CULVERT HIGGINS CREEK TRIBUTARY A

DOWNSTREAM FACE



5 GUARD RAIL

I 90 ~~WEST BOUND~~

X. SECTION 500' UPSTREAM

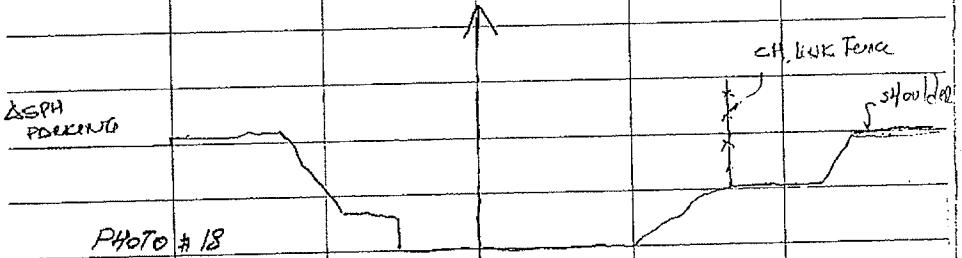


PHOTO # 18

X. SECTION 5000' UPSTREAM

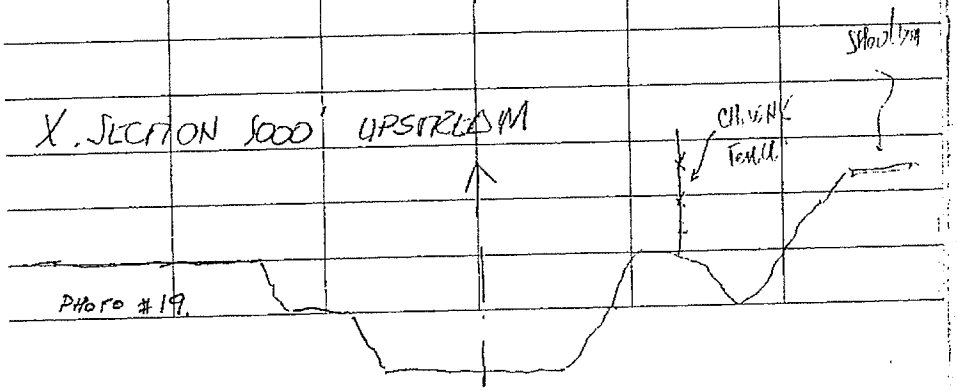
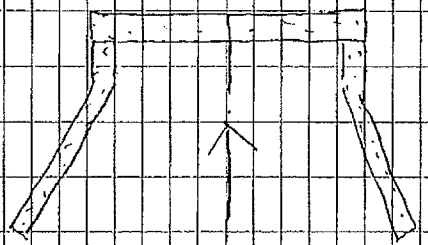


PHOTO # 19.

AP. TV. CLOUDY - 55°F

UPSTREAM FACE

I-90 EAST BOUND



MOUNT FROM P. PARK DISTRICT

CHESTER P MAJEWSKI

METRO PARK.

DARRYL KIMBROUGH

847-632-9320

File NAME: HIGGING111109 - GPS -

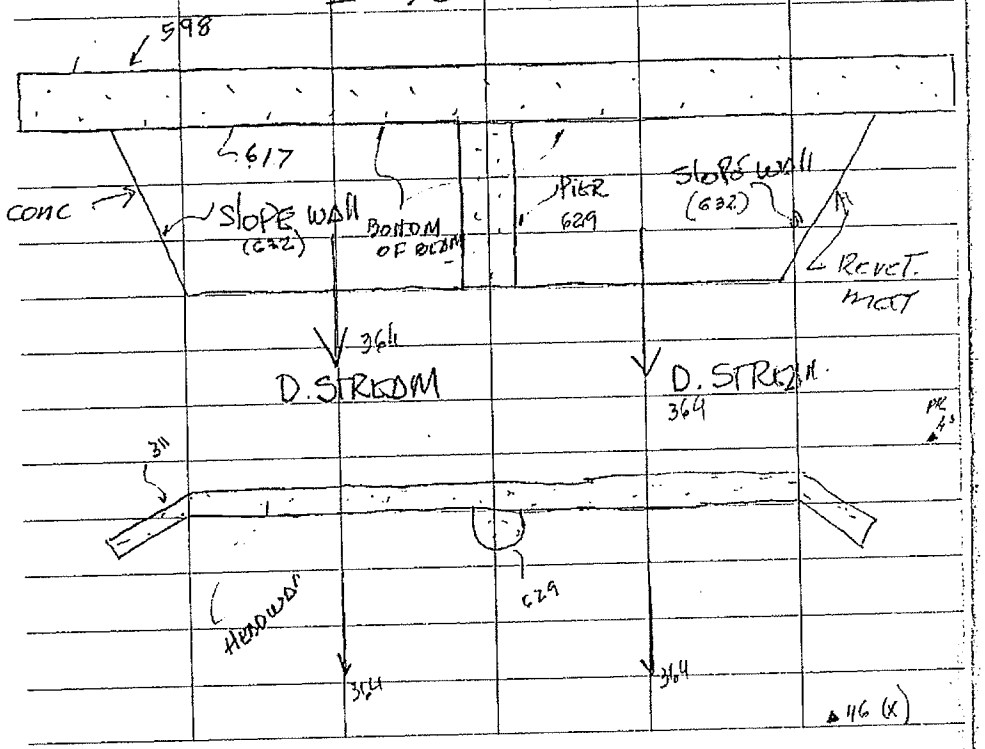
1950650.305
CHECK # EM 214-6 1090964.188
658.543 (658.00) Δ=+0.543

Autopoint # 1500 → 1529
1562 → 1697

I-90 D.STREAM - TRAILER PARK - (D/S FACE)

Photo # 4

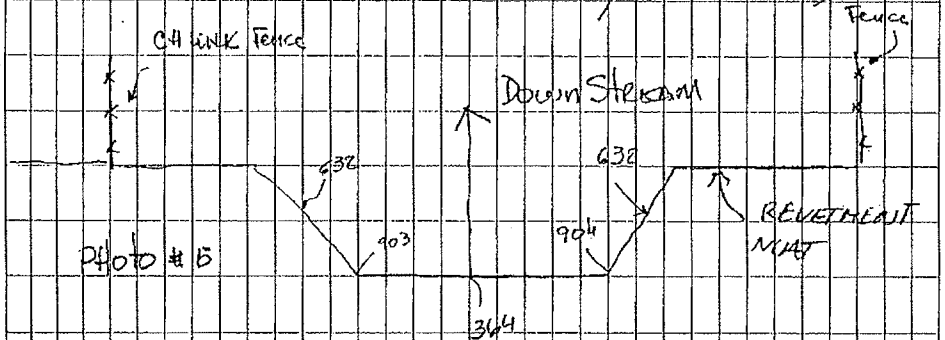
I-90 - EAST BOUND



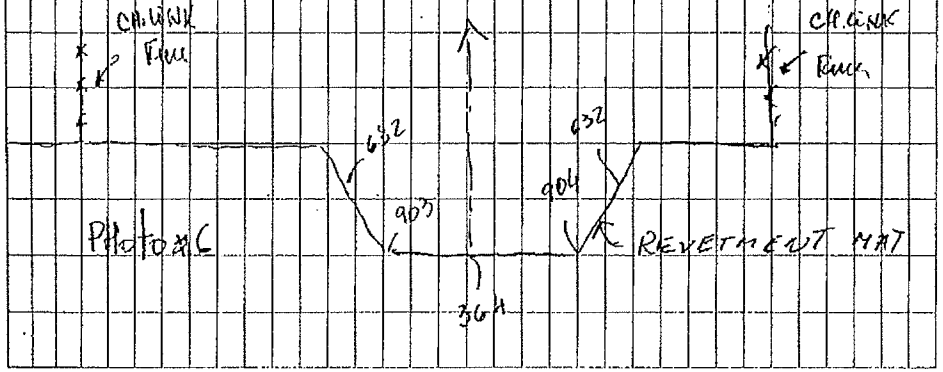
AP-TV-46°F

		1948727.540
CP # 45		1093331.211
PT. NAIL		659.132
CP # 46		1948702.451
(X) CROSS		1093278.726
		693.326

X. SECTION 100' DOWNSTREAM - (SELy OF I-90 EAST B)



X. SECTION 500' D/STREAM



AP_TV - SUNNY - 46°F

File Name: HIGGINGS111109-DC-

Stn # 46 ⇒ # Ints = 5.07 Δ Max = +0.036

B/S # 45 ⇒ # B/S = 5.00 Δ Aver = -0.059

Autopoint # 1529 ⇒ 1561

X. SECTION 1000' D/STREAM. - I-90 EAST Bound (S)

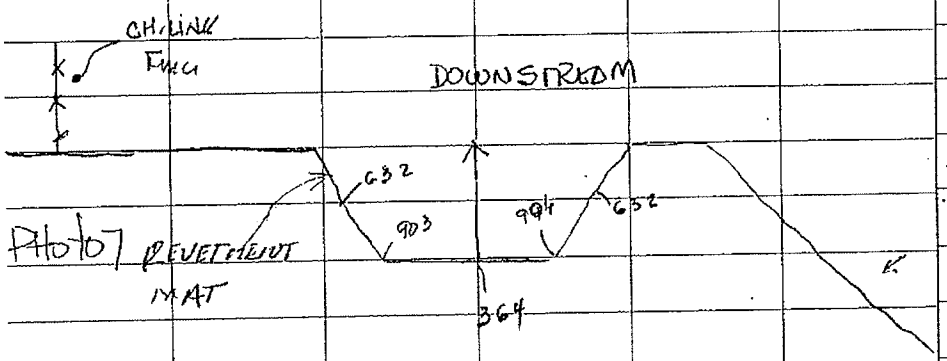
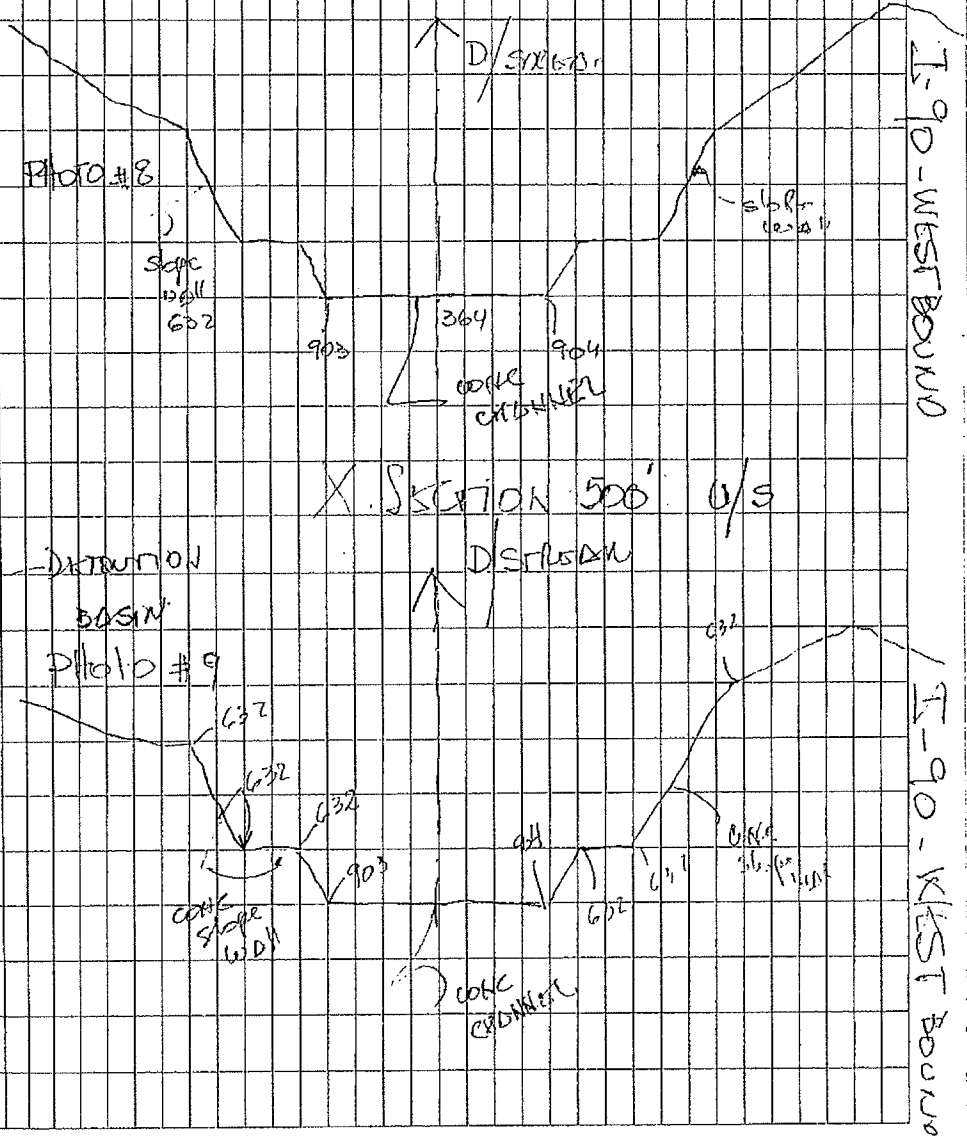


Photo 7 PAVEMENT MAT

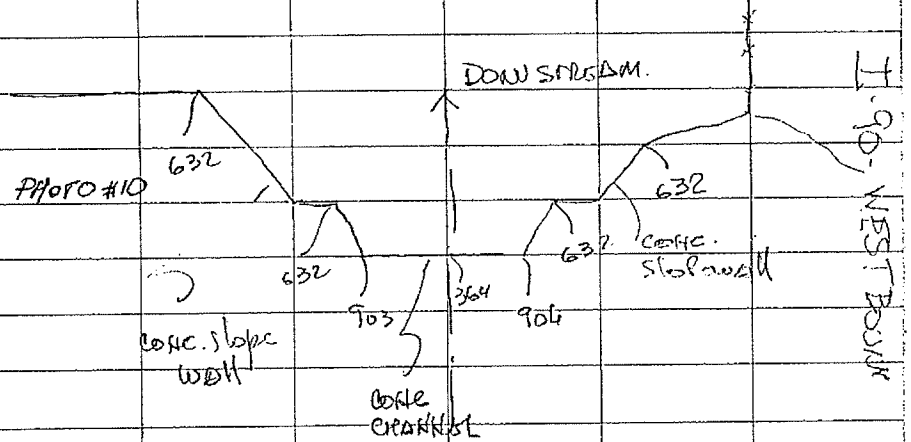
X. SECTIONS NW FROM I-90 WEST Bound

X. SECTION 100' UPSTREAM



AP-IV. SUNNY 55°F

X. SECTION UPSTREAM 1000'



CP# 49
1949114.741
1093209.896
WP 647.274

CP# 48
1949043.258
1093254.535
WP 647.213

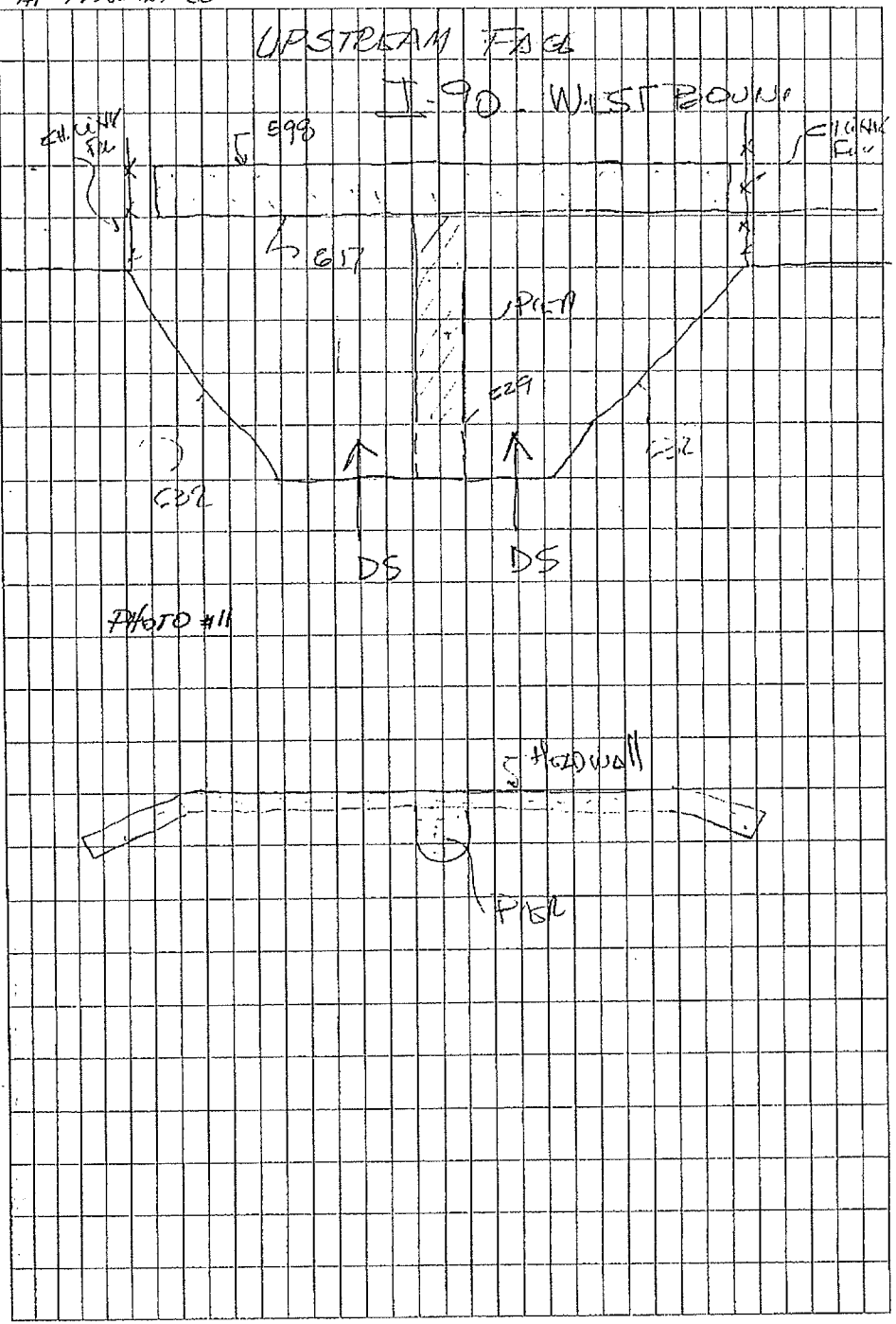
Sta # 48 ⇒ H.INST = 5.19 ΔHor = -0.055

Sta # 49 ⇒ H.Sta = 5.00 ΔVer = -0.051

Autopoint # 1698 → 1705

UPSTREAM FACE

I-90 WEST BOUND



File Name: HIGGINS111209-GPS

Autopoint 1706 → 1726

AP-TV-SUNNY-46°F

File Name: HIGGINGS11-09-1.2 -

SM # 50 ⇒ # INST: 4.66 ΔHor: -0.003

B/S # 47 ⇒ # B/S = 500 ΔVer: +0.061

Autopoint # 1727 → 1737

SM # 51 ⇒ # INST = 4.94 ΔHor = -0.028

B/S # 52 ⇒ # B/S = 5.00 ΔVer: +0.024

Autopoint # 1738 → 1745

SM # 53 ⇒ # INST = 4.87 ΔHor = +0.007

B/S # 52 ⇒ # B/S = 5.00 ΔVer = -0.025

Autopoint # 1746 → 1749

SM # 54 ⇒ # INST = 5.25 ΔHor = -0.029

B/S # 53 ⇒ # B/S = 5.00 ΔVer = -0.009

Autopoint # 1750 → 1759

AP-TV - 50°F -

CP # 50: 1949854.742
WP: 1090189.958
PK: 654.651

CP # 51: 1949940.646
PK-NP: 1090182.141
657.636

2 Cell - Conc. Culvert

⇒ Downstream Face

Photo # 17

624

Bot. TV

CP # 51: 1949987.999
1089762.867
659.970

CP # 52: 1950172.546
1089747.229
PK: 658.886

CP # 53: 1950129.054
WP: 1089395.384
662.882

FILE NAME: HIGGINGS 111309

Autopoint # 1760 → 1906

X. SECTION 2250 U/S

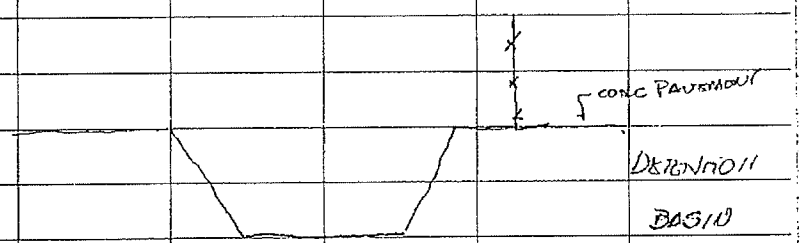


PHOTO # 20

X. SECTION 1800' U/S

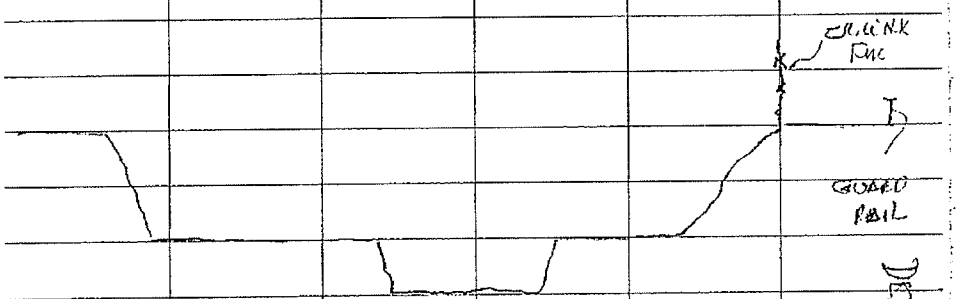


PHOTO # 21

AP-TV - CLOUDY - 50°F

X. SECTION # 1930 U/S

PHOTO # 23

X. SECTION # 1400 U/S

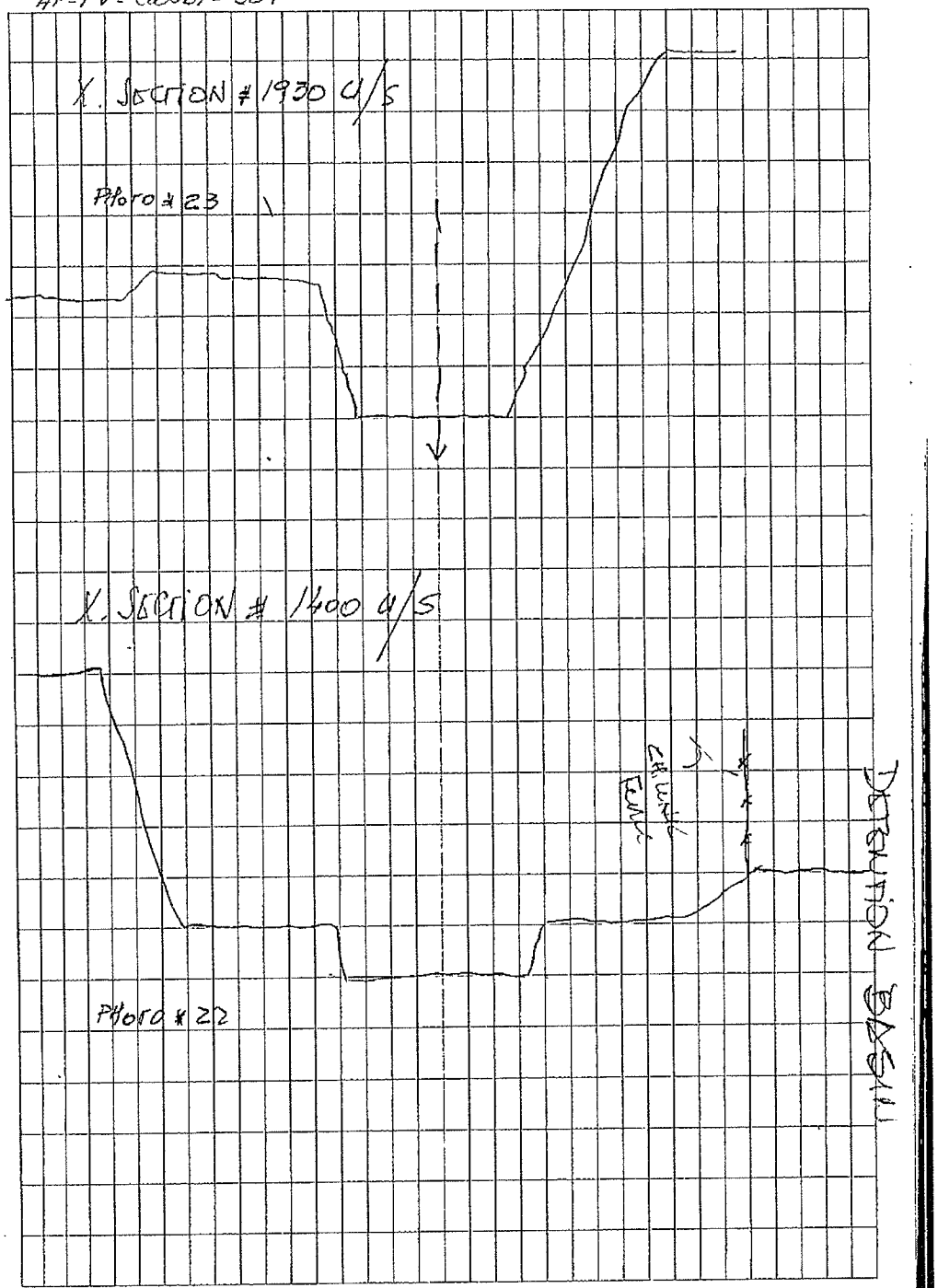


PHOTO # 22

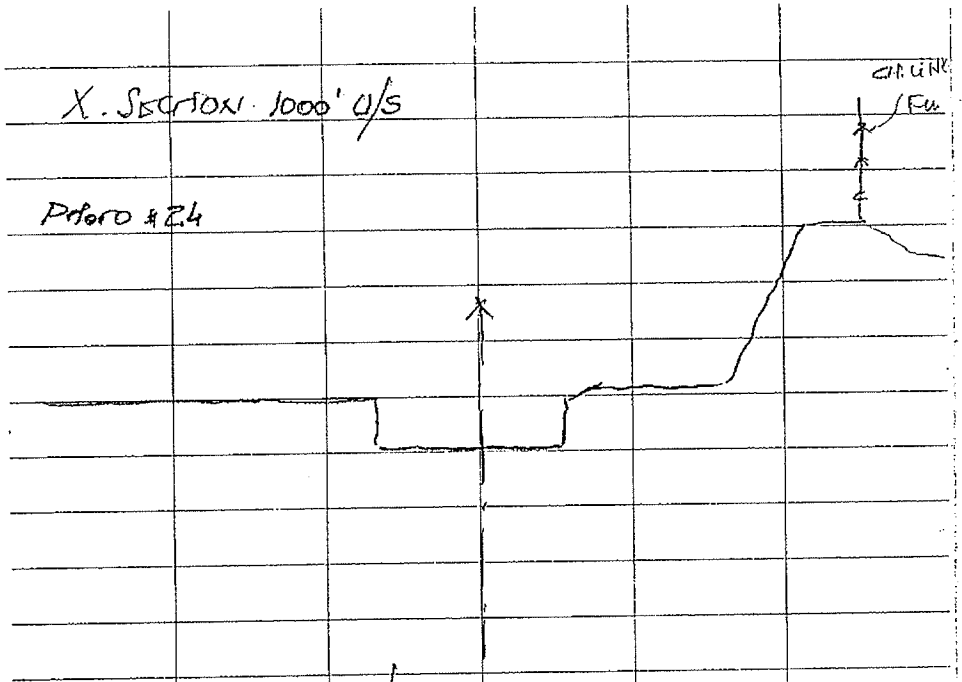
11-13-07

50

AP-TY- CLOUDY - 50°F

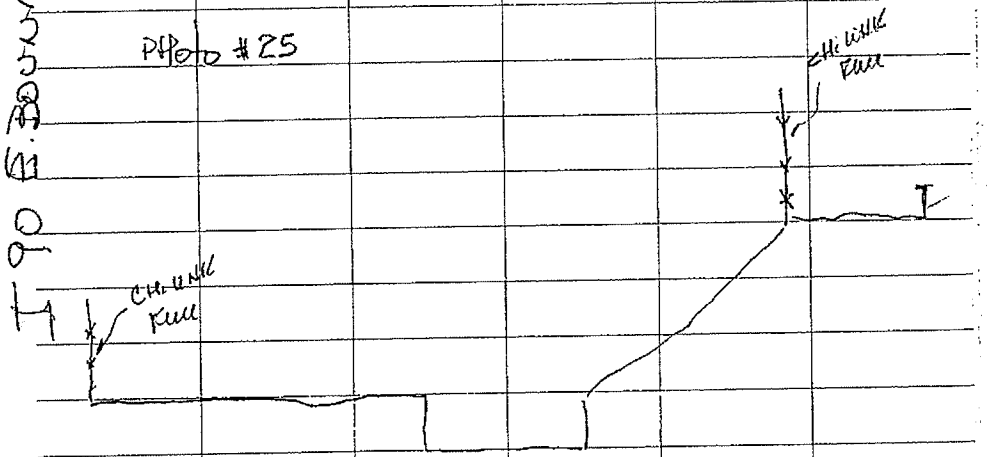
X. SECTION 1000' U/S

Photo #24



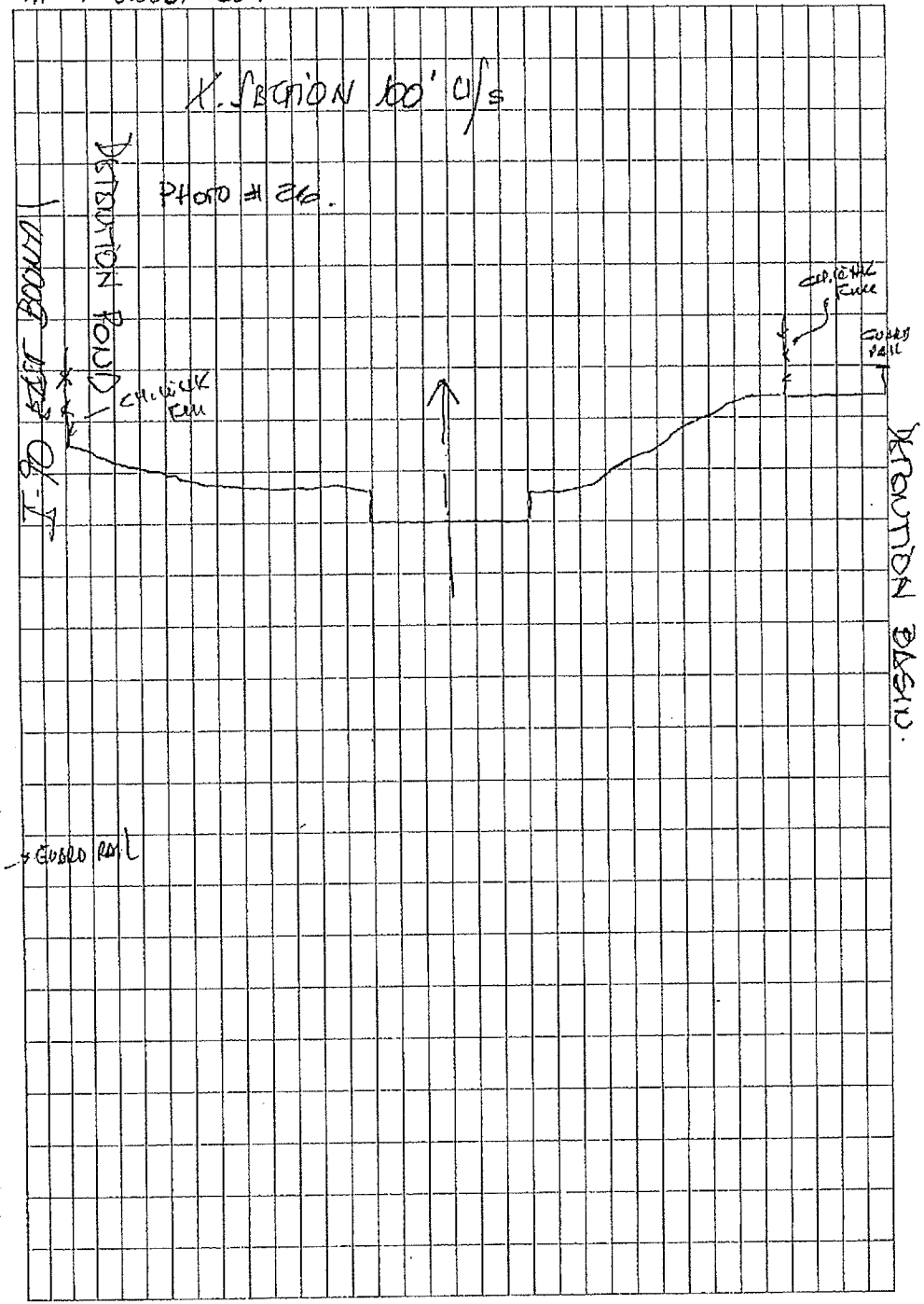
X. SECTION 500 U/S

Photo #25



X. SECTION 100' U/S

Photo #26.



FILE NAME: HIGGINGS 111309-DC—

SA # 56 ⇒ # SNST = 5.08 ΔHRZ = +0.08

B/S # 55 ⇒ # B/S = 5.00 ΔVRT = +0.10

Autopoint # 1907 → 1917

CP # 56 { 1949458.428 / 1090058.680
PK { 660.919

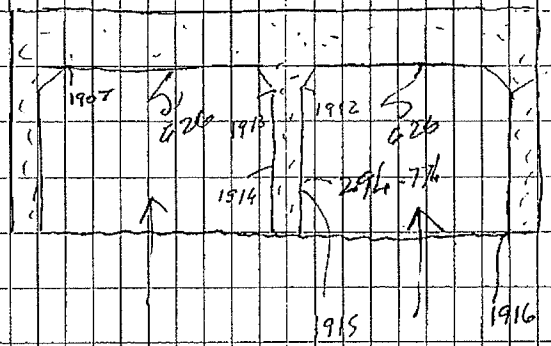
CP # 55 { 1949474.151 / 1089917.527
PK { 660.917

11-13-07

2

9P-TY - CLOUDY - 50°F

I-90 - EAST BOUND



DB STERLIN SURVEY NOTES

ELMHURST ROAD

O'hare - Elgin - Higgings Creek - 11-06-09-09 - Field Notes - .doc

11-06-09 8

HIGGINS CREEK - ~~PRELIMINARY~~

LEVEL RUN

AP - TV, SUNNY - 38°F

	+	HI	-	ELEV	
RM 214-8	4.413	670.963		666.550	
TP #37			5.873	665.07	(T/C)
	5.858	670.928			
RM 214-7			1.479	669.469	666.610
	1.444	670.913			
TP # 37			5.822	665.091	(T/C)
	5.807	670.898			
RM 214-8			4.349	666.549	(666.550)

Δ = + 2.859

(-0.001) OK

	+	HI	-	ELEV	
RM 214-7	7.019	676.488		669.469	
TP # 38			2.558	673.930	(T/C)
	4.587	678.517			
TP # 39			5.036	673.481	(T/C)
	5.895	679.376			
TP # 40			3.516	675.86	(T/C) MCDONALD
	3.286	679.146			
TP # 41			6.878	672.268	(T/C) NORTHEAST
	7.732	675.00			
TP # 42			9.332	665.668	(T/C) EAST
	2.701	668.369			
TP # 43			5.904	662.465	(T/C) EAST
	4.438	666.903			
RM 214-5			2.878	664.025	(666.189)

- WEST ROAD UNDER BRIDGE I-90

ROUND

ROUND

Δ (+ 2.135)

Elmhurst Road

HIGGINGS CREEK - ~~TRAVERSE~~

File Name: HIGGINS10909 (GPS)

Autopoint # 1000 → 1006

1062 → 1084

1177 → 1193

AP-TV- 110001-61°F

CP# 44	1950640.475	
PK NAIL	1090911.323	
	657.795	
CP# 37 (X)	1950623.558	
	1090970.183	
	658.415	
RM 216-G	1950650.274	
	1090964.197	
SQUARE CUT	658.542	(658.00) Δ = +0.542
CP# 45 (X)	1950643.761	
	1091150.047	
	649.488	
CP# 51 (BRASS PLUG)	1950624.549	
	1091030.663	
	658.546	

HIGGINGS CREEK - TRIBUTARY -

FILE NAME: HIGGINS1C0909-.SC-

SM # 44 → HINST = 4.89 ΔHER = +0.029

B/S # 37 → H B/S = 5.00 ΔVER = -0.012

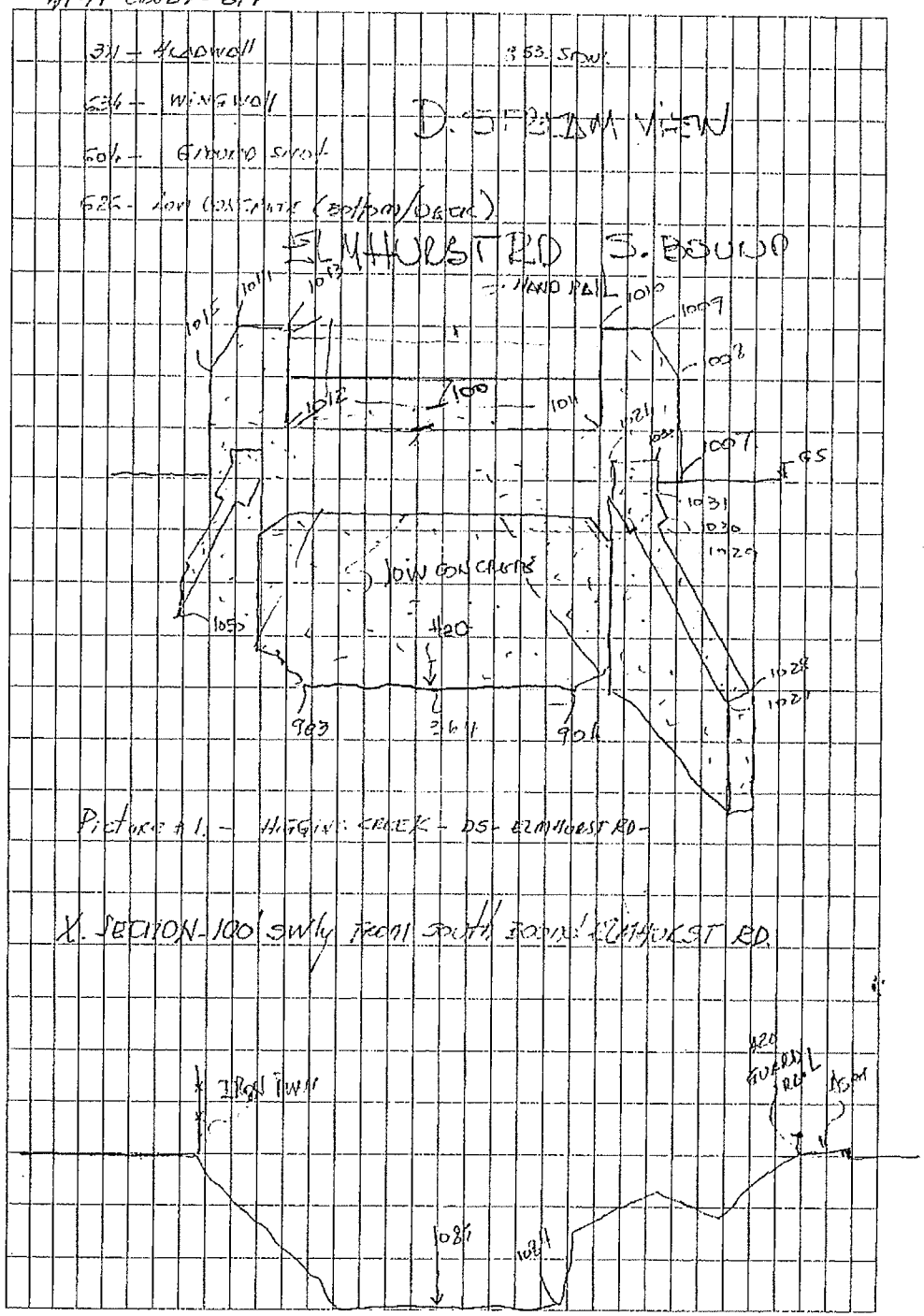
Autopoint # 1007 → 1061
1085 → 1086

SM # 45 → HINST = 4.92 ΔHER = +0.032

B/S # 51 → H B/S = 5.00 ΔVER = +0.056

Autopoint # 1087 → 1176

AP-TY-CROSS - GIF



Picture # 1. - HIGGINS CREEK - DS - ELMHURST RD -

X. SECTION - 100' SWLY FROM SOUTH BOUND ELMHURST RD.

AP-TV-Cloudy-61°F.

UPSTREAM VIEW

ELMHURST RD N. BOOSTER

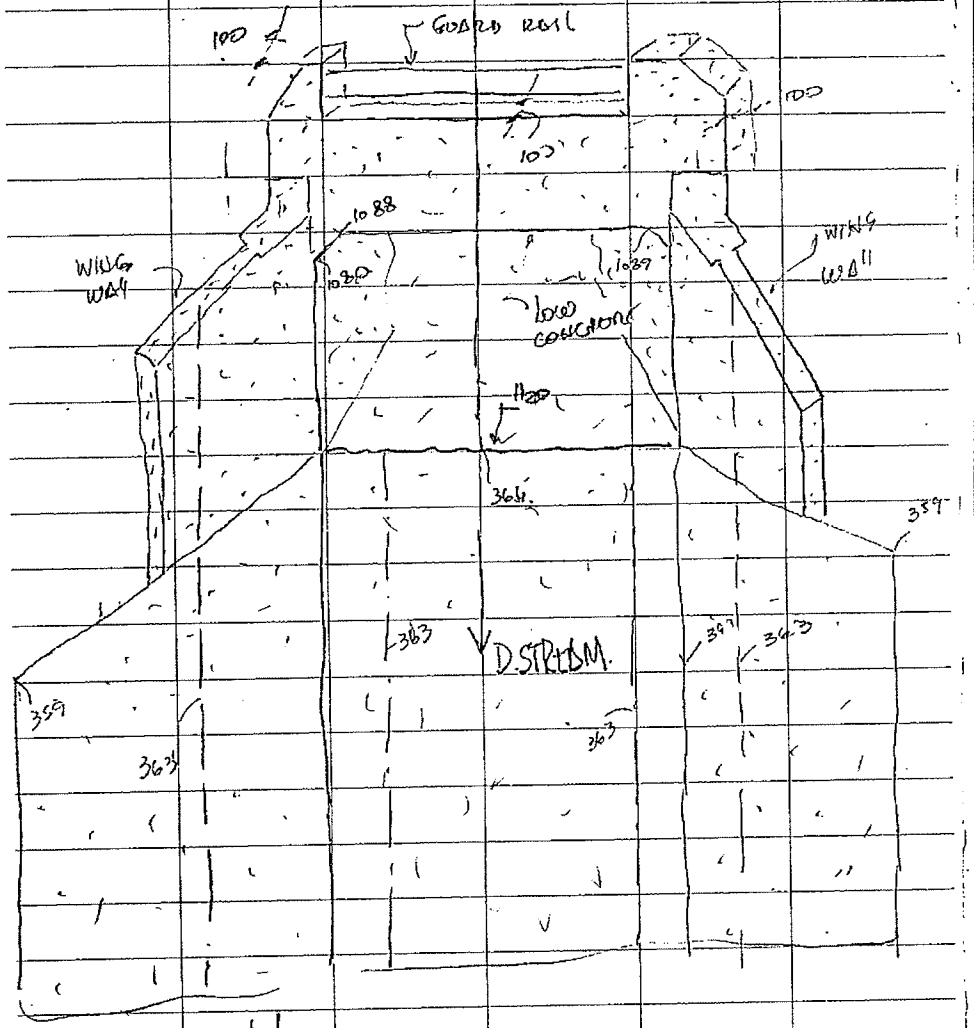


Photo #2

X. SECTION 100' EAST FROM UPSTREAM VIEW

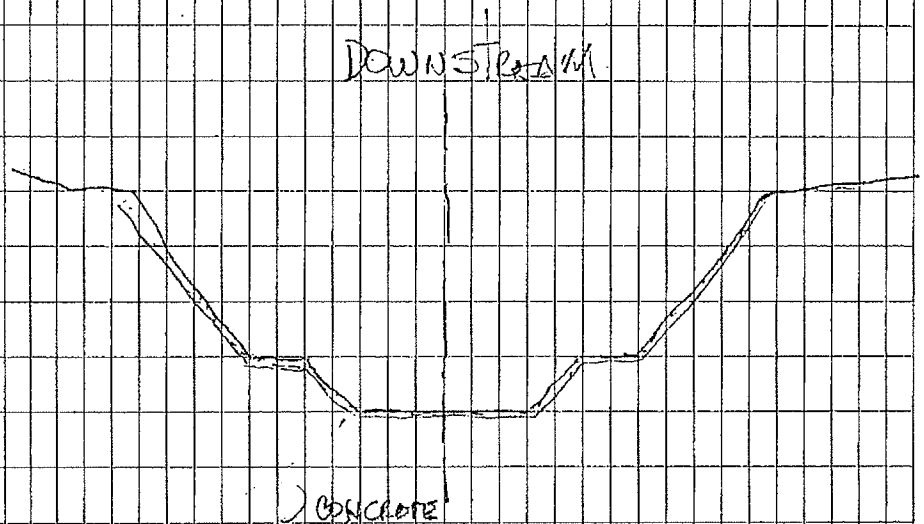


Photo #3

HIGGINS CREEK - TRIBUTARY

FILE NAME: HIGGINS1100Y - GPS -

Autopoint #1196 →

AP-TV-CLOUDY - 54°F

1959650.298

CHAIN # EM2/4-6

1090964.181

658.592

X-SECT 1000 - D/S

↑ DOWNSTREAM

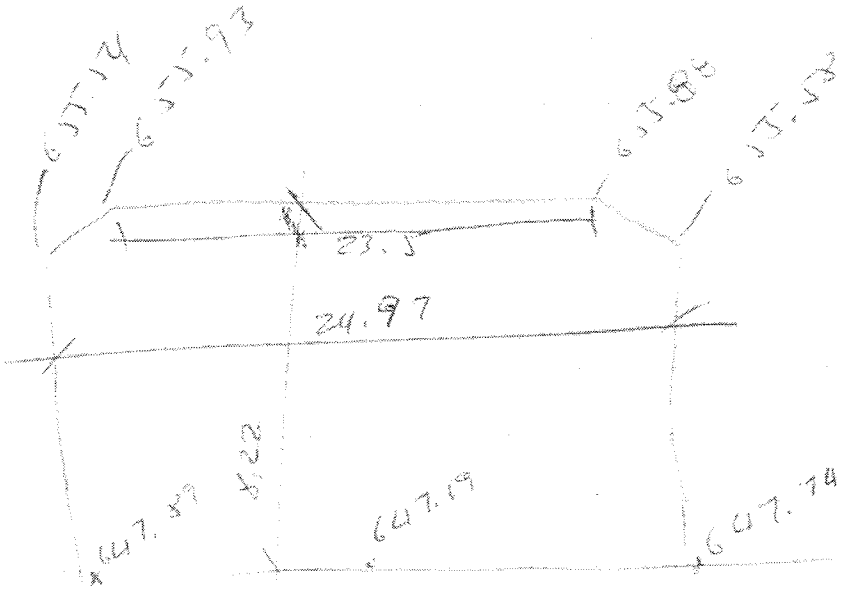
EL MARSH RD

X-SECTION - 500 D/S

X SECTION - 250 D/S

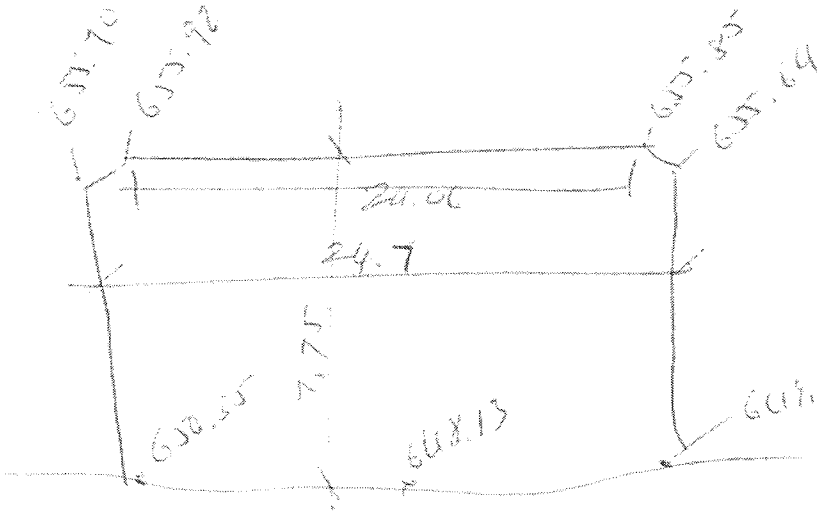
ASPH PARKING

ELMHURST ROAD



D/S FACE

looking west.



U/S FACE

looking East.

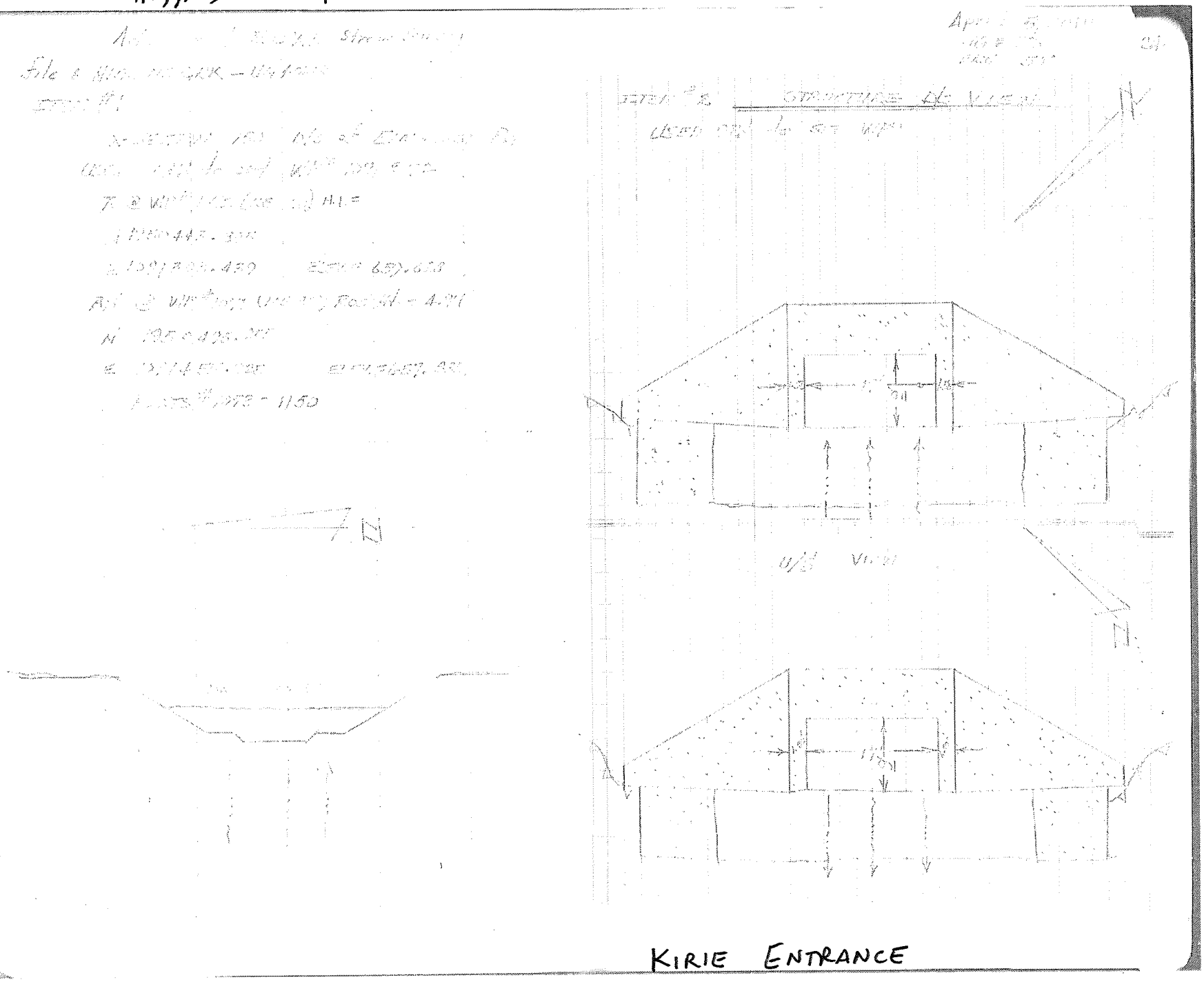
Elmhurst Rd structure

Elmhurst Structure.pdf

DB STERLIN SURVEY NOTES

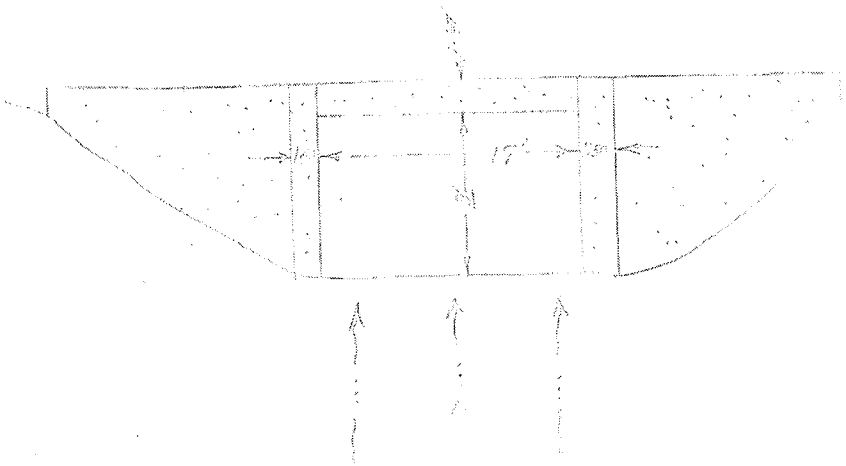
KIRIE WRP ENTRANCE
WILLE ROAD

Higgins Creek.pdf

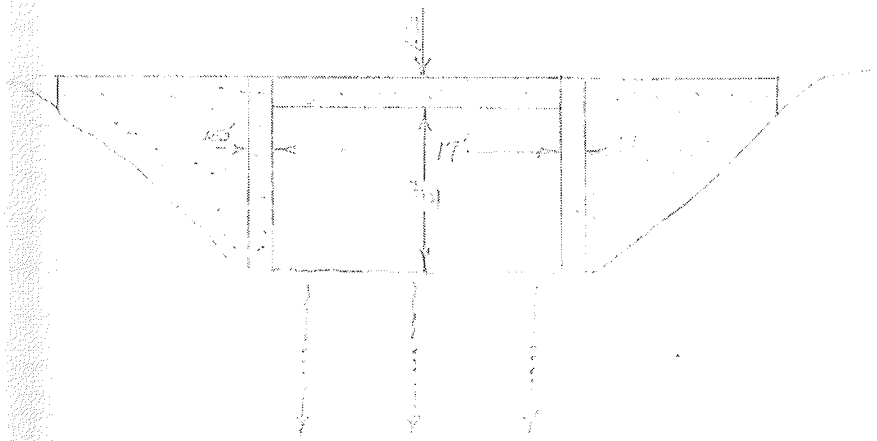


KIRIE ENTRANCE

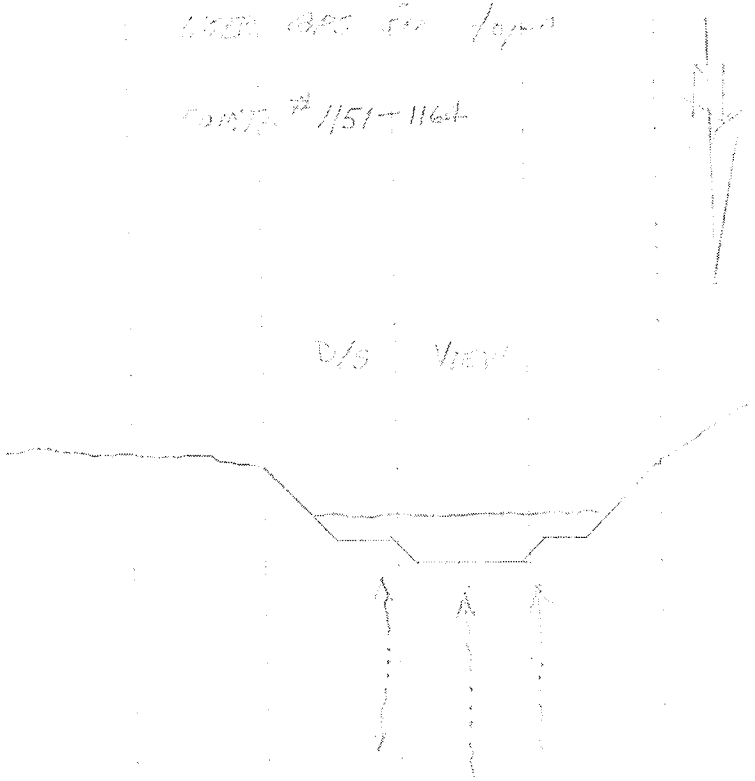
DOWN STREAM VIEW



UP STREAM VIEW



WILLE ROAD



DB STERLIN SURVEY NOTES

II 72 (TOUHY AVENUE)

Field Notes Pg 34-40, pdf

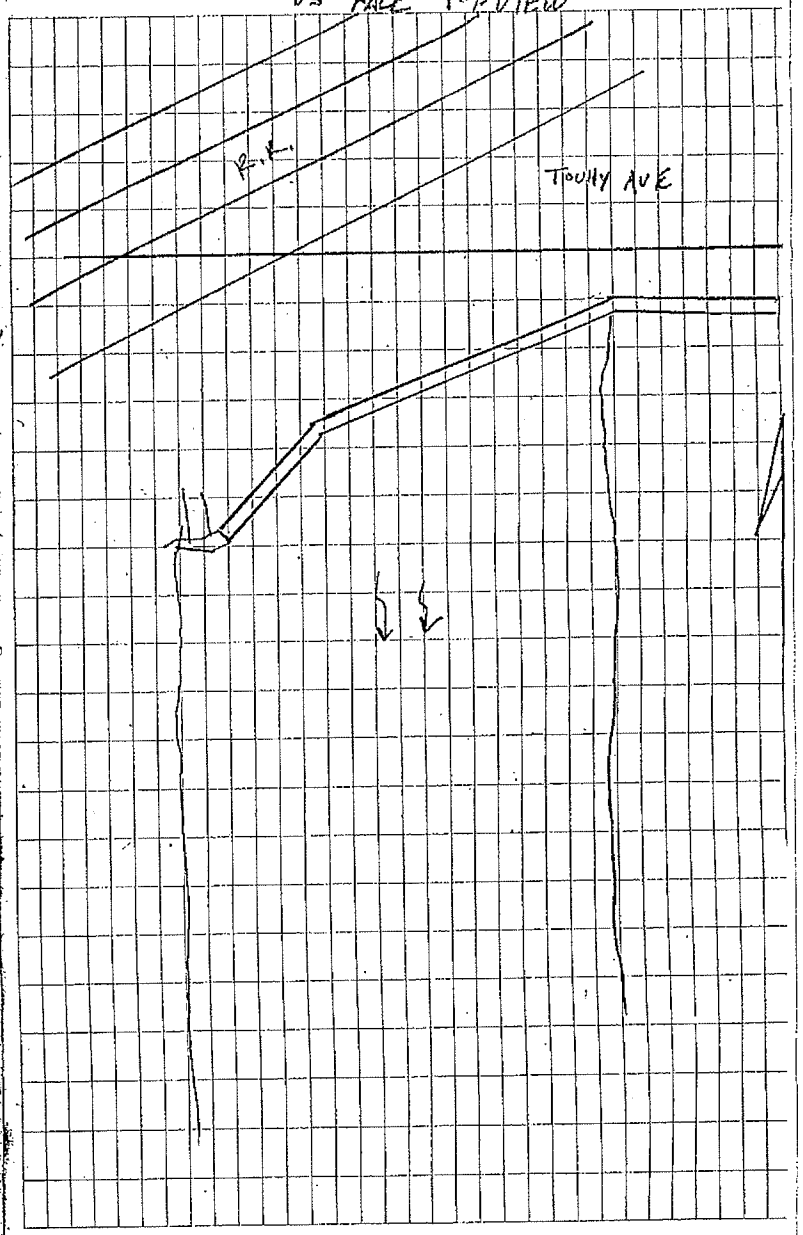
3-27-10
CME/TG

HIGGINS CREEK
XS 500' US of S. MAIN STRUCTURE

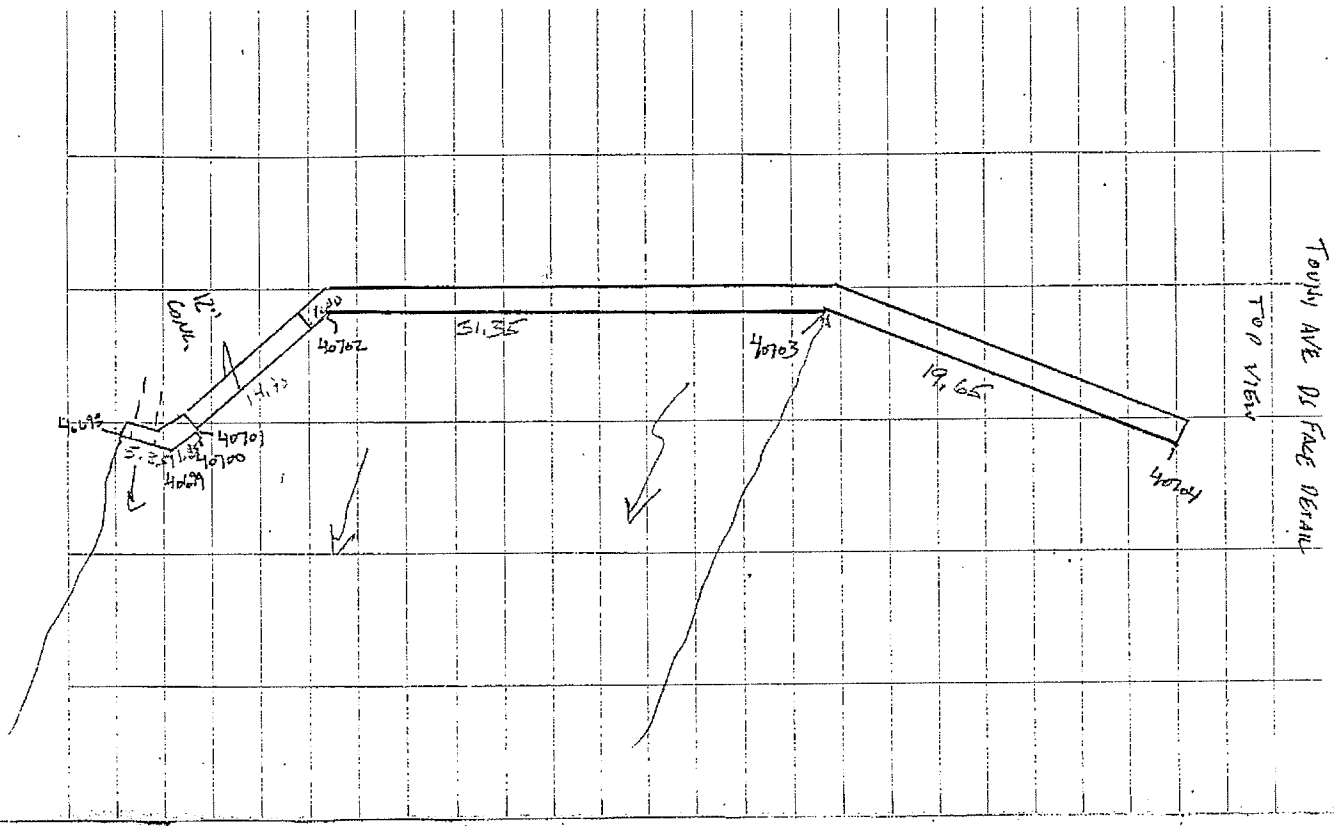
21/145

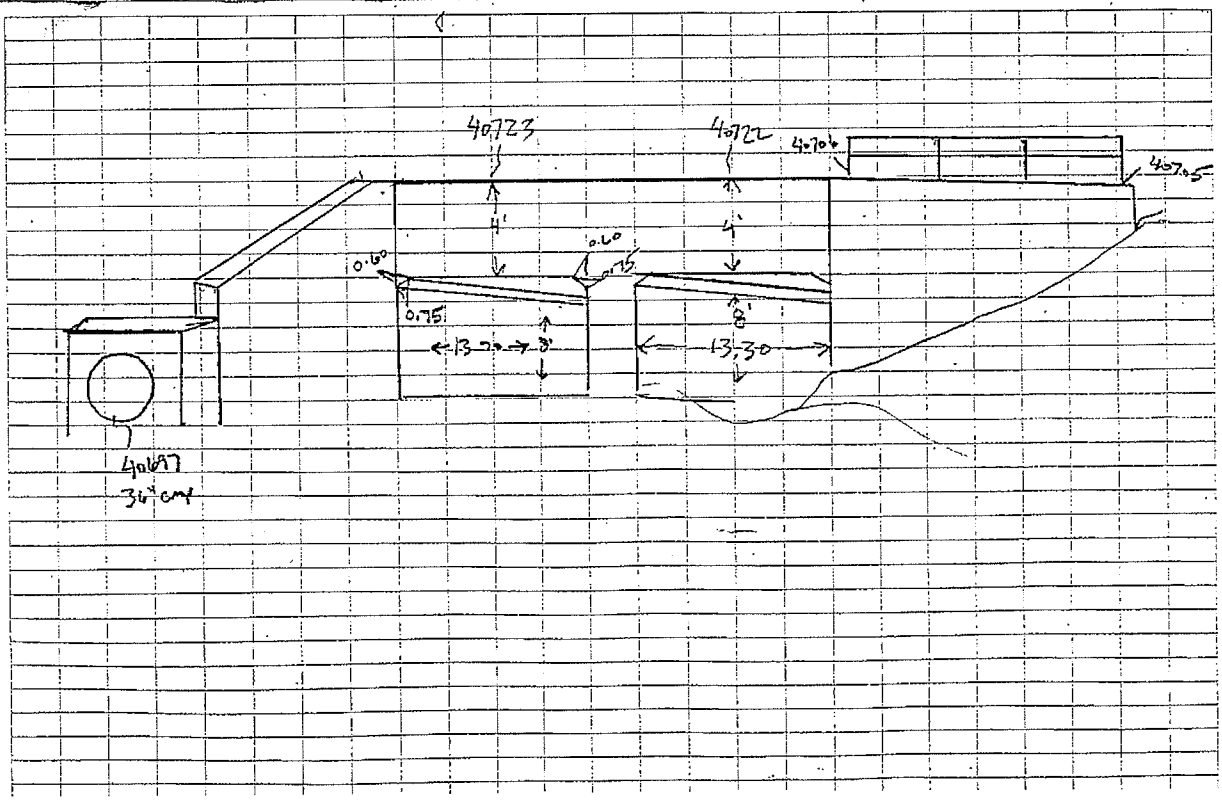
40660 - 40676	XS 500' US FROM FENCE @ CL			
	K9 TRAIN W/ GROUND TO TOP OF BANK @ RESERVOIR SEE PG 40			
	TOUHY AVE CROSSING			
40678 - 40696	XS 500' DS FROM TOUHY AVE			
40697 - 40706	DS FACE DETAIL			
40707 - 40721	XS @ DS FACE: G @ CURB → TOP OF BALLAST @ R.R.			
40722	TOP OF HEADWALL ABOVE E. INVERT			
40723	TOP OF HEADWALL ABOVE W. INVERT			
	HAMILTON CROSSING			
40737 - 40744	US STRUCTURE DETAIL			
40741 - 40744	DS STRUCTURE DETAIL			
40745	40744 WP - PK			
	⊼ 40745	HI = 9.91	BS 40746	
✓ 40746	ΔH = .079	ΔV = .011	45747	
40748	DS INV E. SIDE		10.5' X 6.8' RCP	
40749	DS INV. W. SIDE		10.5' X 6.8' RCP	
40750 - 40763	X-SEC @ DS FACE			
40764	US INV E. SIDE		10.5' X 6.8' RCP	
~~40765~~	~~US INV W. SIDE~~			
40765 - 40777	XS @ US FACE		W - E	
40780	✓ @ 40746			

TOUHY AVE. STRUCTURE
DS FACE TOP VIEW



IL 72 (TOUHY AVE)

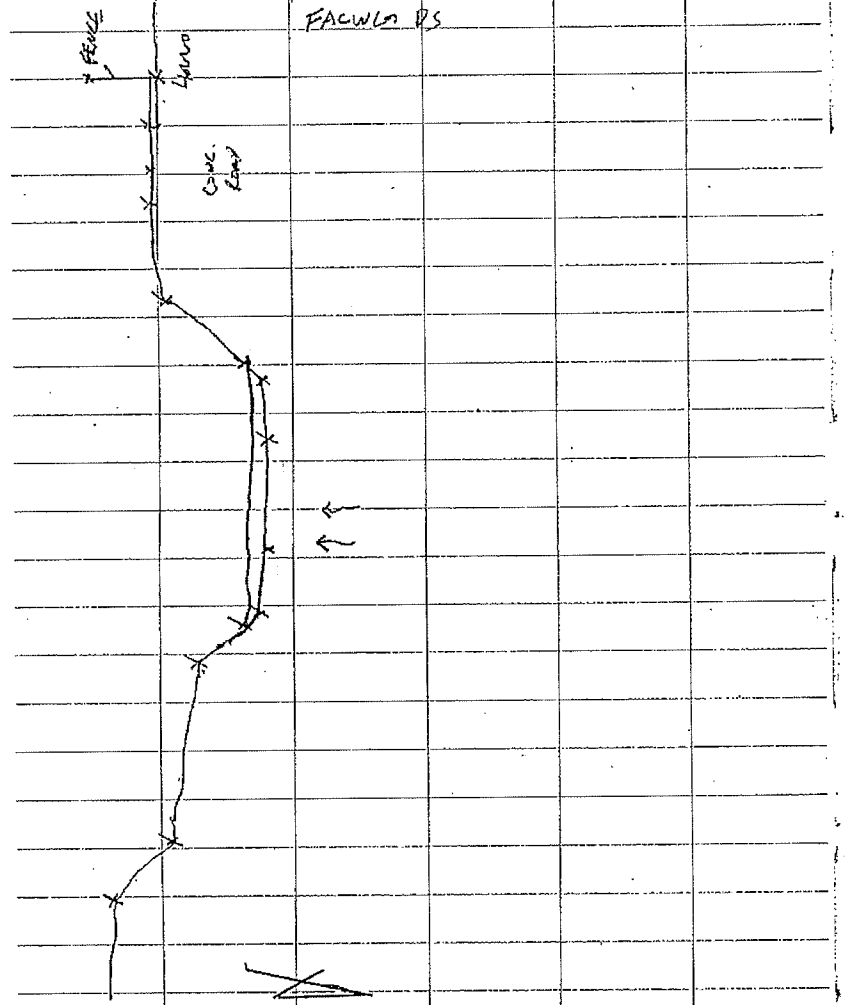

TOUHY AVE DS FACE DETAIL
TOP VIEW
12'
Conc.
1.50
40702
31.35
40703
19.65
40704
40698
40701
40700
40699


40723
40722
40706
40705
4'
4'
0.60
0.60
0.75
0.75
13.30
8'
13.30
8'
40697
36" CMP

XS 500' DS of Touhy
FACING DS

XS @ Touhy Ave DS face
FACING DS

XS 500' US of S. MIDDLE STEVENSVILLE
FACING DS



Field Notes Pg 45-46.pdf

HIGGINS CREEK
TOUHY AVE CROSSING

40862 - 40867 WP_005

Δ @ 40862 ΔH: -5.34 BS 40863

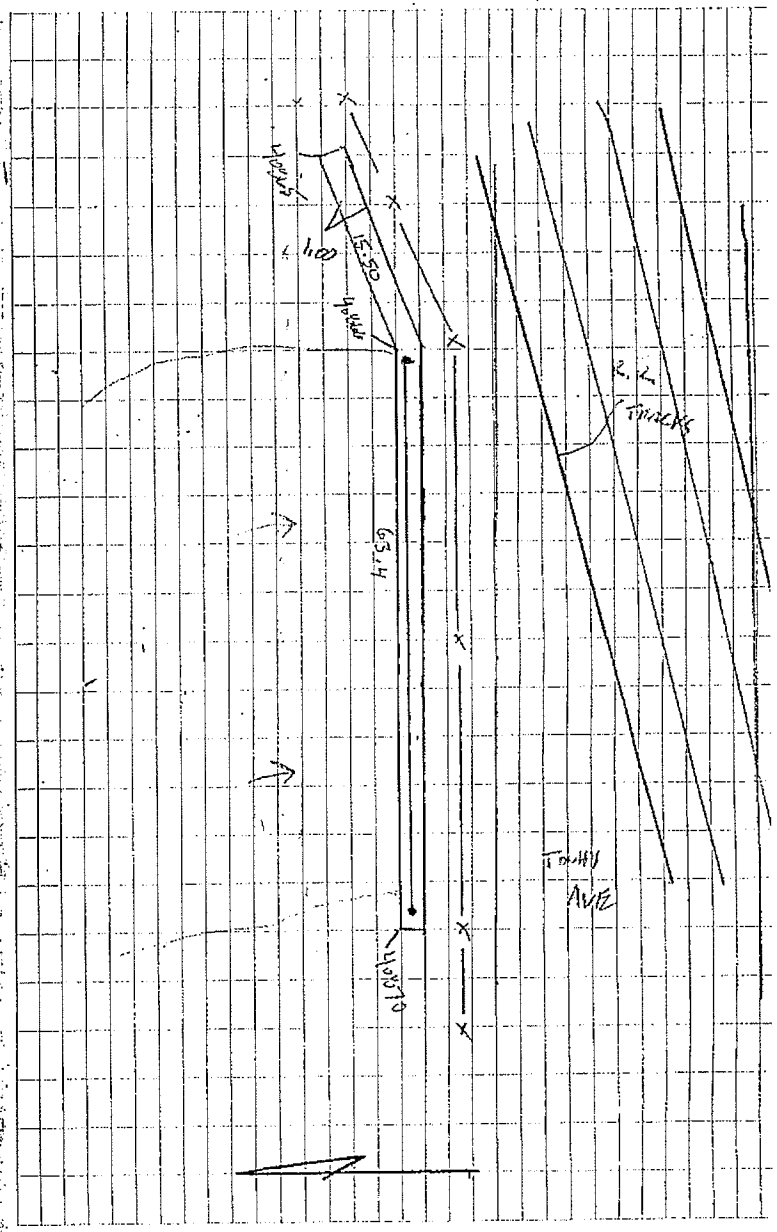
✓ 40863 ΔH: -6.031 ΔV: 0.000 40864

40865 - 40871 STRUCTURE DETAIL

40872 - 40880 XS @ US FACE

40881 ✓ 40863

US STRUCTURE TOP VIEW



45

XS@ US FACE FACING DS

TOUHY AVE
US FACE FACING DS

VERTCON
DATUM CONVERSION

Questions concerning the VERTCON process may be mailed to NGS

Latitude: 42 00 58.87

Longitude: 087 55 55.84

NGVD 29 height: 655 FT

Datum shift(NAVD 88 minus NGVD 29): -0.295 feet

Converted to NAVD 88 height: 654.705 feet

Location: I-90 (Jane Addams Tollway) at Higgins Creek.

i.e. NGVD29 is 0.30' higher than NAVD 88 at this location, per NOAA VERTCON Conversion.

NGVD 29 to NAVD 88 CONVERSION

FLOOD INSURANCE STUDY
DATUM INFORMATION

FIS DATUM INFORMATION

FLOOD INSURANCE STUDY



COOK COUNTY, ILLINOIS
AND INCORPORATED AREAS

Volume 1 of 5

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

* NO SPECIAL FLOOD HAZARD AREAS IDENTIFIED WITHIN COOK COUNTY

REVISED: AUGUST 19, 2008

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
17031CV001G

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

Stream	Channel "n"	Overbank "n"
Thorn Creek Tributary A	0.030-0.060	0.045-0.065
Thorn Creek Tributary B	0.035-0.080	0.037-0.060
Tinley Creek	0.040-0.120	0.021-0.084
Underwriters Tributary	0.05	0.05
Union Drainage Ditch	0.055-0.060	0.040-0.045
Union Drainage Ditch Northern Tributary	0.06	0.045
Unnamed Tributary to Salt Creek Tributary D	0.050-0.060	0.060-0.080
Weller Creek	0.030-0.300	0.015-0.08
Wheeling Drainage Ditch	0.070-0.080	0.055-0.074
White Pine Ditch	0.030-0.070	0.035-0.070
Willow Creek	0.027-0.085	0.025-0.085

3.3 Vertical Datum

All FISs and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FISs and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD 29). With the finalization of the North American Vertical Datum of 1988 (NAVD 88), many FIS and FIRMs are being prepared using NAVD 88 as the referenced vertical datum.

All flood elevations shown in this FIS and on the FIRM are referenced to NAVD 88. Structure and ground elevations in the community must, therefore, be referenced to NAVD 88. It is important to note that adjacent counties may be referenced to NGVD 29. This may result in differences in base flood elevations (BFEs) across the county boundary.

Effective information for this FIS was converted from NGVD 29 to NAVD 88 based on data presented in Figure 3 and Table 18a "Vertical Datum Conversions - Single Conversion Factor (countywide) Method." Computations show an average conversion factor of -0.284 feet (NGVD 29 – 0.284 = NAVD 88) for the county. The conversion factor was applied uniformly across the county and used to prepare the Summary of Stillwater Elevations Table, Floodway Data Tables, Flood Profiles, and FIRMs.

However, there were two instances where this countywide conversion factor could not be used and instead, the Multiple Conversion Factors (stream-by-stream) method was required. The stream-by-stream conversion factor was applied when a stream was located in two or more counties (multi-county stream), whereby the average conversion factor determined for each county differed from each other by more than one-tenth of a foot. For the stream-by-stream method,

each studied stream was assigned an average conversion factor based on the conversion factors at three points along the stream. These results are shown in Table 18b, "Vertical Datum Conversions - Multiple Conversion Factors (Stream by Stream) Method."

For more information on NAVD 88, see *Guidelines and Specifications for Flood Hazard Mapping Partners Appendix B: Guidance for Converting to the North American Vertical Datum of 1988* (Reference 177) available at http://www.fema.gov/plan/prevent/fhm/dl_cgs.shtm or contact the Vertical Network Branch, National Geodetic Survey, Coast and Geodetic Survey, National Oceanic and Atmospheric Administration, Rockville, Maryland 20910 (Internet address http://www.ngs.noaa.gov).

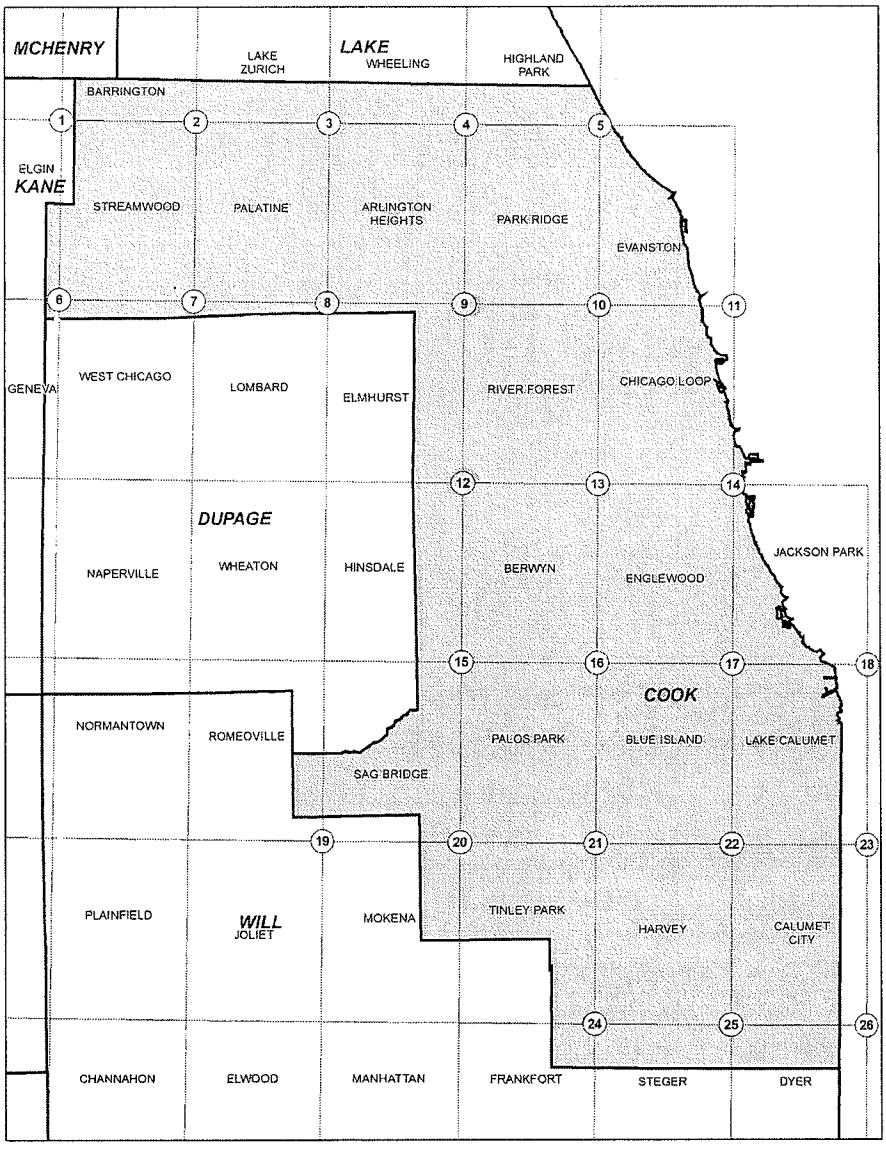


Figure 3 – Vertical Datum Conversions
USGS Quadrangle Corner Intersections

The change in elevation for each Point ID is listed in Table 18a.

Table 18a - Vertical Datum Conversions
Single Conversion Factor (countywide) Method
Cook County

Point ID #	Quadrangle Name	Corner	NAD83 Latitude (dec. deg.)	NAD83 Longitude (dec. deg.)	NGVD29 to NAVD88 Elevation Change (feet)
1	Streamwood	NW	42.125	88.250	-0.203
2	Palatine	NW	42.125	88.125	-0.226
3	Arlington Heights	NW	42.125	88.000	-0.256
4	Park Ridge	NW	42.125	87.875	-0.233
5	Evanston	NW	42.125	87.750	-0.230
6	West Chicago	NW	42.000	88.250	-0.262
7	Lombard	NW	42.000	88.125	-0.272
8	Elmhurst	NW	42.000	88.000	-0.282
9	River Forest	NW	42.000	87.875	-0.308
10	Chicago Loop	NW	42.000	87.750	-0.272
11	Chicago Loop	NE	42.000	87.625	-0.305
12	Berwyn	NW	41.875	87.875	-0.295
13	Englewood	NW	41.875	87.750	-0.272
14	Jackson Park	NW	41.875	87.625	-0.282
15	Palos Park	NW	41.750	87.875	-0.282
16	Blue Island	NW	41.750	87.750	-0.289
17	Lake Calumet	NW	41.750	87.625	-0.325
18	Lake Calumet	NE	41.750	87.500	-0.351
19	Mokena	NW	41.625	88.000	-0.279
20	Tinley Park	NW	41.625	87.875	-0.285
21	Harvey	NW	41.625	87.750	-0.302
22	Calumet City	NW	41.625	87.625	-0.325
23	Calumet City	NE	41.625	87.500	-0.348
24	Steger	NW	41.500	87.750	-0.289
25	Dyer	NW	41.500	87.625	-0.302
26	Dyer	NE	41.500	87.500	-0.308

Avg. = -0.295

Range of conversion values	-0.351 through -0.203
Average conversion factor	-0.284 for Cook Co.
Maximum variance from the average conversion	0.081
Maximum variance from a no-conversion value	-0.351

HISTORIC WILLOW CREEK GAGE INFORMATION

Station list Available data

ILLINOIS RIVER BASIN

05530480 WILLOW CREEK AT ORCHARD PLACE, IL

LOCATION.-- Lat 41°59'49", long 87°52'47" (NAD of 1927), in SE1/4SW1/4 sec. 33, T. 41 N., R. 12 E., Cook County, Hydrologic Unit 07120004, on downstream side of bridge on State Highway 72, 0.2 mi south of Orchard Place, 1.5 mi south of Des Plaines.

DRAINAGE AREA.-- 18.1 mi^2.

PERIOD OF RECORD.--
SURFACE-WATER DISCHARGE AND STAGE
PARTIAL RECORD: Annual maximum, water years 1961 to 1979.

GAGE.-- Crest-stage gage. Datum is 629.85 ft above NGVD of 1929 (629.54 ft NAVD 1988).

EXTREMES FOR PERIOD OF RECORD.--
SURFACE-WATER DISCHARGE AND STAGE: Maximum discharge, 2100 ft^3/sec, June 10, 1967, gage height, 7.21 ft.

EXTREMES FOR PERIOD OF RECORD.--
SURFACE-WATER DISCHARGE AND STAGE: Flood of October 10, 1954 reached a stage of 4.80 ft, discharge 782 ft^3/s. Flood of July 13, 1957 reached a stage of 5.78 ft, discharge 1200 ft^3/s.

Table of Contents | Introduction | Station Descriptions | Surface-Water Data | Ground-Water Data | Meteorological Data | Biological Data

Station list Available data

ILLINOIS RIVER BASIN

05530480 WILLOW CREEK AT ORCHARD PLACE, IL

LATITUDE 415949 LONGITUDE 0875247 NAD27 DRAINAGE AREA 18.10 CONTRIBUTING DRAINAGE AREA DATUM 629.85 NGVD29

WATER YEAR	DATE	TIME	PEAK DISCHARGE (CFS)	DISCHARGE CODES	GAGE HEIGHT (FT)	GAGE HEIGHT CODES	HIGHEST SINCE	MAX GAGE HEIGHT (FT)	DATE	TIME	GAGE HEIGHT CODES	NUMBER PARTIAL PEAKS
1955	10/10/1954		782	7	4.80							0
1957	07/13/1957		1200	7	5.78							0
1961	09/14/1961		322		2.68							0
1962	03/19/1962		310		2.59							0
1963	07/19/1963		126		0.80							0
1964	04/05/1964		210		1.77							0
1965	02/07/1965		184		1.50							0
1966	05/12/1966		692		4.52							0
1967	06/10/1967		2100		7.21							0
1968	08/17/1968		340		2.80							0
1969	06/08/1969		494		3.71							0
1970	06/02/1970		845		4.97							0
1971	08/24/1971		366		2.98							0
1972	08/26/1972		1350		6.06							0
1973	12/30/1972		718		4.61							0
1974	01/27/1974		494		3.71							0
1975	04/18/1975		1070	2								0
1976	03/05/1976		754		4.72							0
1977	09/01/1977		426		3.34							0
1978	09/13/1978		1680		6.62							0
1979	04/12/1979		1010		5.38							0

Table of Contents Introduction Station Descriptions Surface-Water Data Ground-Water Data Meteorological Data Biological Data

(LAKE ZURICH)

mytopo

ELMHURST QUADRANGLE
ILLINOIS
TOPOGRAPHIC SERIES

(HIGHLAND PARK)

087° 56' 59.04" W
042° 01' 45.94" N

(WHEELING)

087° 51' 40.67" W
042° 01' 45.94" N

(PALATINE)

End of EDWB Higgins Creek Study.
DA = 7.1 sq.mi.
Q_{100} = 730 cfs

USGS Gage
05530480
1954-1979
DA = 18.1 sq.mi.
Qpeak = 1200 cfs,
July 13, 1957

(PARK RIDGE)

041° 58' 58.37" N
087° 56' 59.04" W

(ELMHURST)

Printed: Thu Jul 05, 2012

041° 58' 58.37" N
087° 51' 40.67" W

(LOMBARD)

(RIVER FOREST)

Declination
MN
GN

GN 0.60° W
MN 3.24° W

SCALE 1:24000

0 1 2
MILES

0 1000 2000 3000 40
YARDS

CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM1929

Produced by MyTopo Terrain Navigator
Topography based on USGS 1:24,000 Maps

North American 1983 Datum (NAD83)
Transverse Mercator Projection

To place on the predicted North American 1927 move the projection lines 3M N and 5M W

ELMHURST, IL
1999

TAB 14

SECTION 14

CORRESPONDENCE AND NOTES

REVIEW COMMENT FORM

Project Name:	Elgin O'Hare - West Bypass	Reviewing Agency:	IDOT
Milestone:	Hydraulic Report - Higgins Creek and Trib. A, Fifth Review	Reviewed By:	S. Batista
Submittal Date:	10/14/2012	Review Date:	10/22/2012
Consultant:	CBBEL	Response By:	I. Dailey, CBBEL
Comment Due Date:	n/a	Response Date:	11/6/2012

Designer's Response Code:
A = Agree Completely; will revise (no written response required)
RFS = Requires Further Study in next design phase (no written response required)
P = Agree Partially...Will revise to some degree (see written response)
D = Disagree...Will not revise (see written response)

Reviewer				*Designer*		
Issue No.	*Location (Sheet number/type, road name and/or station)*	*Reviewed By:*	*Comments*	** Response Code*	*Response*	*Markup Complete*
1	Section 12 - Comp. Storage at Elmhurst Bridge	SB	All cross sections for Elmhurst Bridge have an error in the vertical scale. The elevation index at the left of the sheet show a different elevation than the call out elevations on the plotted cross section. The remainder of the comments assumed that plots are to scale and do have the correct vertical scale (therefore, calculated areas from cross sections are valid). Check vertical scale and assure that all WSE are where they should be. It seems to be some about 5' or so off vertically, and that the vertical scale is 1"=5' not 1"=10' (but not sure).	A	The cross-section plots have been updated.	✓
2	Section 12 - Comp. Storage at Elmhurst Bridge	SB	Check cross sections for missing information or cutoff information. Cross sections 111+50 and 112+50 are missing the floodway label (or add a note that says entire section in floodway). Sections 107+00 to 116+00 look to have been cut off at the bottom and are missing information.	A	Floodway labels have been added at applicable cross-sections. Where the floodway is not applicable, a note such as "Roadside ditch, no floodway" has been added.	✓
3	Section 12 - Comp. Storage at Elmhurst Bridge	SB	Check cross section 114+50. This section is listed twice. Geometry looks similar, but the elevations do not match. Please investigate and report proper elevations.	A	The cross-section plots have been updated.	✓
4	Section 12 - Comp. Storage at Elmhurst Bridge	SB	There are a number of typos on the floodplain and floodway calculation sheets (EXCEL printout). The station labels for both F/P F/W sets need to be revised from station 108+65 to 110+50 (108+65 was not included and it threw the above stations off). For the Floodplain set, the 10YR-100 YR volume between stations 111+00 and 111+50 should read 0.17 Ac-Ft (this value was correct in FW set). In the Floodway set, there is no fill in the floodway between sections 110+50 and 111+00. The excel sheet calculated a value because of its setup, but floodway actually start just north of station 111+00. The above corrections will change totals, so make corrections to these and other exhibits/narrative as necessary. It might be helpful to label the station in which the floodway start station in similar faction as the floodway's end station.	A	The Excel spreadsheet has been updated as suggested.	✓
5	Section 12 - Comp. Storage on Higgins Creek Trib. A	SB	Draw in and label all 10 year WSE on cross sections. The fill between normal and 10 year is denoted separately, but no water level is drawn. (typical comment for all cross sections)	A	The 10 year WSE has been added to all applicable cross-sections.	✓
6	Section 12 - Comp. Storage on Higgins Creek Trib. A	SB	Check vertical scale on left margin of cross sections (similar to comment#1). The vertical scale is off by varying amounts depending on which cross section you are on. The cross section and WSE plots relative to the roadway seem to be drawn correctly, so it is assumed that the area calculation is correct. (Error in vertical scale at various locations. Mainly from 3844+00 to at least 6848+50, but some cases exist before these locations).	A	The cross-section plots have been updated.	✓
7	Section 12 - Comp. Storage on Higgins Creek Mainstem	SB	Once again there is a similar problem with the vertical scale as noted above, and should be checked accordingly. However, here, a lot of cross sections actually look like they were plotted correctly here (including correct elevations) but the WSE were plotted wrong. This means that fill calculations will be off. This problem is more prominent between sections 3875+50 to 6879+50 (but all sections should be checked). If there is an error in the fill area calculation, it is localized to fill in the floodplain. Update cross sections, check fill values (F/P and F/W), and update any applicable exhibits/narrative as necessary.	A	The cross-section plots have been updated.	✓

Reviewer				Designer		
Issue No.	Location (Sheet number/type, road name and/or station)	Reviewed By:	Comments	* Response Code	Response	Markup Complete
8	Section 12 - Comp. Storage on Higgins Creek Mainstem	SB	Plot the normal, 10 year, and 100 year WSE wherever applicable. Make sure to include their elevations (typical comment for all sections). Also, locate and include arrows in the direction of the floodway wherever applicable. There are a number of cross sections which may not have floodway encroachments, but come really close to the floodway. These sections should show the limit of the floodway (mainly sections 3861+00 to 3868+00).	A	The WSE's and floodway arrows have been added to all applicable cross-sections. Regulatory floodway shown outside of the delineated floodplain on the plan view was adjusted to match floodplain extents.	✓
9	Section 12 - Comp. Storage on Higgins Creek Mainstem	SB	Update cross section 3857+00. This section does not display proposed geometry (forgot to turn on layer)	A	The cross-section has been updated.	✓
10	Section 12 - Comp. Storage on Higgins Creek Mainstem	SB	According to the cross section, there will be some fill in the floodway between sections 3872+00 to 3874+00. The cross section plots showing the location and direction of the floodway, as well as the notes on the plots support this. There is no fill in the floodway designated for these sections and no entries in the tables. Please revise as necessary. This will also change other related exhibits such as the summary tables so please revise accordingly.	A	The cross-sections have been updated to show no fill under the bridge. A small amount of floodway fill (3 sq ft) is shown on section 3874+00.	✓
11	Section 5 - Streambed Plan and Profile	SB	Conflict between what is shown as low beam in the WIT/ profile plot vs. the plan view for the I-90 over Higgins Creek Bridge. Maybe change to be consistent?	A	The profile view of the I-90 bridge over Higgins Creek has been revised. This is Phase I, so the details of the Ramp bridge extensions are approximated. Adequate clearance and freeboard are provided.	✓
12	Section 6 - Stream Cross-Section Plots	SB	Draw in Obstruction in cross sections 602+77.66 and 600+57.28	A	The obstruction has been added to both cross sections. This is not a surveyed obstruction, but a representation of the proposed fill within retaining walls for the Touhy Avenue overpass.	✓
13	Section 6 - Structure Opening Plots	SB	In the waterway opening plot for the proposed Elmhurst Rd Culvert option, the bottom of the culvert is drawn in too deep (the embedment portion). The elevation call outs are correct. Also, for the proposed Mt. Prospect Rd. opening plots, there is a typo for the twin relief structure invert. The inverts here should be 648.1.	A	The structure opening plots for Elmhurst Road and Mt. Prospect Road have been revised.	✓
14.1	Section 2 - WIT	SB	Elmhurst Bridge Option. There is a note at the bottom that states max opening for bridge is 241sf. However, the waterway opening column under propose states that the max opening area is 247sf. Investigation of the supporting calculation page reviles that the max opening should be 247sf as listed in the column. Please investigate, and correct note and/or column as necessary. (just a typo issue, the WSE, inverts and size are not in question)	A	The note on the WIT has been revised to reflect the correct waterway opening of 247 sft.	✓
14.2	Section 2 - WIT	SB	A similar situation is present for the Elmhurst Rd. Culvert option. Here, the waterway opening column for proposed condition reflects what is stated in the note below that the max opening is 336sf. However, investigation of the supporting calculation sheet show that the calculated max opening of 384.00 is correct. Please investigate and correct as necessary. (just a typo issue, the WSE, inverts and size are not in question)	P	The opening of 336 sft as shown on the WIT is correct. The waterway opening on the supporting calculation sheet has been revised to reflect that the culverts are two different sizes.	✓
15	Section 2 - WIT	SB	I-90 over Higgins Creek Bridge. Move note that states WSELs are lowered in scope of work to bottom of page?	A	The note on the WIT has been moved.	✓
16.1	Section 12 - Comp. Storage	SB	Provide complete individual plan view printout of the three compensatory storage sites. CS6-E, CS7-W and CS7-E. Make sure existing contours are readable like proposed lines so that we can check areas being used for calculation of volume. Make sure elevations of all contour lines are identifiable.	A	PDP sheets have been provided in the compensatory storage Section, along with printouts of each of the basins to scale without aerial background for contour clarity.	✓
16.2	Section 12 - Comp. Storage	SB	For CS6-E, how does water gets into the pond from normal to 10-year if berm elevation is 657 and the storage between normal to 10 year is being counted, or should the volume of 1.14 Ac-Ft be in the 10 to 100-year volume? Update Available Storage Volume table if necessary.	P	A culvert at the basin bottom connects the basin to the creek. The berm is proposed to remain in place to minimize impacts to the Waters of the United States (WOUS).	✓
16.3	Section 12 - Comp. Storage	SB	For CS7-W, what are the inverts of the equalizer pipe? Is there a 649 contour?	A	The backflow prevention device invert of El. 649.0 has been added to the PDP. Compensatory storage basins CS7-W and CS7-E are proposed to have sloped bottoms toward their outlets for positive drainage, therefore El. 649 is only a spot elevation at the CS7-W outlet. Call-outs have been added to the compensatory storage basin outlets.	✓

Illinois Department of Transportation

Design Exception Request
Project Identification

Route: FAU 2678	Street: Elmhurst Road	Marked:
Contract #:	State Job #: P-91-443-06	Section:
County: Cook	Municipality:	
Local Agency: IDOT	LRS Section #:	
Permit Applicant:	Permit #:	
Project Limits: From south of Landmeier Road to north of Oakton Street		
Project Length: 1 mile	FHWA Oversight?: ☐ Yes ☒ No	
Estimate of Cost: $48,000,000 (EOWB Project C)	Functional Classification: Minor Arterial	
Design Year: 2030	Design Traffic: ADT 42,400 DHV 3,240	Current Posted Speed: 45 mph
On the NHS System? ☐ Yes ☒ No	Structure Numbers: 016-0677	
Type of Project (Construction, Reconstruction, 3R, HES, etc): Reconstruction		
Brief Project Description: Reconstruction of Elmhurst Road Interchange with I-90		

EXCEPTION DOCUMENTATION

Level of Exception: Level I ☒ Level II ☐	
Design Element for Which an Exception Is Requested: Clearance from 50-yr natural WSEL to bridge low beam elevation.	
Design Element Policy Value: 2 feet	
Proposed Design Element Value: -0.04' to -0.22'	
Location(s) of Exception: Elmhurst Road Bridge over Higgins Creek	
Accident History and Potential of Exception Location(s): None	
Cost of Using Policy Value: N/A	Cost of Using Proposed Exception Value: N/A
Impacts Other Than Cost, of Using Policy Value: Additional ROW and easement requirements, adverse impacts to local access, and larger structure opening would result in delays to project implementation.	
Proposed Mitigation To Address Exception: None	
Geometric Compatibility with Adjacent Sections: N/A	
Potential Effects On Other Design Elements: Raising the profile would require additional ROW and easements.	
Potential Impacts On Mobility or Traffic Operations: Raising the profile would adversely impact local access and maintenance of traffic.	
Summary of Justification for Exception: Geometric constraints, including driveways, limit profile options. The proposed bridge opening is larger than existing. Creek overtopping has never been observed in this area.	
Coordination Meeting Date: 10/23/2012	
Prepared By: CBBEL	Date: 11/5/2012

PAVEMENT/RESURFACING EXCEPTIONS

☐ New Pavement ☐ Pavement Widening ☐ Resurfacing			
Design Period/Expected Service Life:		Design Year:	
Structural Design Traffic:	%PV:	%SU:	%MU:
Design Element Policy Value:		Proposed Design Element Value:	
Location(s) of Exception:			
Cost of Using Policy Value:		Cost of Using Proposed Exception Value:	
Summary of Justification:			
Prepared By:		Date:	

APPROVAL/DISAPPROVAL

BDE Approval Date:	BDE Disapproval Date:
BDE Comments on Disapproval:	
DOH Approval Date:	DOH Disapproval Date
DOH Comments on Disapproval:	
FHWA Approval Date:	FHWA Disapproval Date:

Illinois Department of Transportation

Design Exception Request
Project Identification

Route: FAU 2678	Street: Elmhurst Road	Marked:
Contract #:	State Job #: P-91-443-06	Section:
County: Cook	Municipality:	
Local Agency: IDOT	LRS Section #:	
Permit Applicant:	Permit #:	
Project Limits: From south of Landmeier Road to north of Oakton Street		
Project Length: 1 mile	FHWA Oversight?: ☐ Yes ☒ No	
Estimate of Cost: $48,000,000 (EOWB Project C)	Functional Classification: Minor Arterial	
Design Year: 2030	Design Traffic: ADT 42,400 DHV 3,240	Current Posted Speed: 45 mph
On the NHS System? ☐ Yes ☒ No	Structure Numbers: 016-0677	
Type of Project (Construction, Reconstruction, 3R, HES, etc): Reconstruction		
Brief Project Description: Reconstruction of Elmhurst Road Interchange with I-90		

EXCEPTION DOCUMENTATION

Level of Exception: Level I ☒ Level II ☐	
Design Element for Which an Exception Is Requested: Freeboard from 50-yr headwater to low edge of pavement.	
Design Element Policy Value: 3 feet	
Proposed Design Element Value: 1.4' (culvert option) or 1.5' (bridge option)	
Location(s) of Exception: Elmhurst Road Structure over Higgins Creek	
Accident History and Potential of Exception Location(s): None	
Cost of Using Policy Value: N/A	Cost of Using Proposed Exception Value: N/A
Impacts Other Than Cost, of Using Policy Value: Additional ROW and easement requirements, adverse impacts to local access, and larger structure opening would result in delays to project implementation.	
Proposed Mitigation To Address Exception: None	
Geometric Compatibility with Adjacent Sections: N/A	
Potential Effects On Other Design Elements: Raising the profile would require additional ROW and easements.	
Potential Impacts On Mobility or Traffic Operations: Raising the profile would adversely impact local access and maintenance of traffic.	
Summary of Justification for Exception: Geometric constraints, including driveways, limit profile options. The proposed structure opening is larger than existing. Creek overtopping has never been observed in this area.	
Coordination Meeting Date: 10/23/2012	
Prepared By: CBBEL	Date: 11/5/2012

PAVEMENT/RESURFACING EXCEPTIONS

☐ New Pavement ☐ Pavement Widening ☐ Resurfacing			
Design Period/Expected Service Life:		Design Year:	
Structural Design Traffic:	%PV:	%SU:	%MU:
Design Element Policy Value:		Proposed Design Element Value:	
Location(s) of Exception:			
Cost of Using Policy Value:		Cost of Using Proposed Exception Value:	
Summary of Justification:			
Prepared By:		Date:	

APPROVAL/DISAPPROVAL

BDE Approval Date:	BDE Disapproval Date:
BDE Comments on Disapproval:	
DOH Approval Date:	DOH Disapproval Date
DOH Comments on Disapproval:	
FHWA Approval Date:	FHWA Disapproval Date:

BDE/FHWA MONTHLY COORDINATION MEETING
AGENDA ITEM #16

Project. No. P-91-443-06
Elgin O'Hare – West Bypass
Hydraulic Design Exceptions
Elmhurst Road over Higgins Creek, SN: 016-0677

October 23, 2012

CH2MHill and Christopher B. Burke Engineering, Ltd. (CBBEL) met with IDOT and FHWA representatives to request Design Exception approval for the design of Elmhurst Road at the crossing of Higgins Creek in the Village of Des Plaines. At this location, Elmhurst Road is under IDOT jurisdiction.

CBBEL explained that Design Exceptions are requested from two IDOT Drainage Design Criteria, as follows:

1. Providing 2 feet of clearance from the 50-year design storm natural high water level to the proposed bridge low beam elevation, and
2. Providing 3 feet of freeboard from the 50-year design storm high water level to the proposed low edge of pavement (EOP).

The existing 25' single-span bridge will be replace by either a 34' single-span bridge or a group of four reinforced concrete box culverts.

CBBEL briefly explained the geometric constraints, including existing driveways, limited ROW, and the need to meet the intersections of Wille Road and Oakton Street.

There was also a brief discussion of the existing theoretical flood overtopping of Elmhurst Road. Although the regulatory flood model shows overtopping north of the existing bridge, this has not been observed, even during the large flood event of July 2011.

The geometric constraints and flood overtopping considerations limit the available bridge clearance and pavement freeboard, as detailed on the accompanying Table 1.

FHWA asked for a recommendation from IDOT's Hydraulics Section. IDOT stated that they recommend approving the clearance and freeboard Design Exception requests for the design of Elmhurst Road at the crossing of Higgins Creek. The approval was granted.

Ilene Dailey - CBBEL

Elgin O'Hare – West Bypass: Level One Design Exception Criteria List

Project Design Section Layout:

West Section - Elgin-O'Hare, Gary Ave to Plum Grove
Central Part A Section - Elgin-O'Hare, Plum Grove to Salt Creek (including I-290)
Central Part B Section - Elgin-O'Hare, Salt Creek to West Terminal and West Bypass
South Section - West Bypass, South of West Terminal to I-294 (including I-294)
North Section - West Bypass, North of West Terminal to I-90 (including I-90)

TABLE 1
Design Exception List – Level One

No.	Project Design Section	Location	Agency Jurisdiction	Design Criteria Reference	Agency Design Criteria	Project Design Met	Justification
					Clearance		
	North	Elmhurst Road	IDOT	IDOT Drainage Manual Section 1-305	2 feet Clearance to Low Beam for 50-year Design Storm Natural HWL	-0.04 to -0.22 foot (bridge) n/a (culvert)	1. Raising profile further may require right-of-way/easement takings. 2. Raising profile further will adversely impact local access and cause driveway closures. 3. Raising profile further will require much larger bridge opening to offset an increase in created head. 4. A much larger opening will adversely impact driveways. 5. Raising profile and enlarging bridge opening further will delay the project implementation and increase cost. 6. The existing roadway has never experienced overtopping.
					Freeboard		
	North	Elmhurst Road	IDOT	IDOT Drainage Manual Section 1-305	3 feet Freeboard to Low EOP for 50-year Design Storm HWL	1.5 feet (bridge) 1.4 feet (culvert)	1. Raising profile further may require right-of-way/easement takings. 2. Raising profile further will adversely impact local access and cause driveway closures. 3. Raising profile further will require much larger bridge opening to offset an increase in created head. 4. A much larger opening will adversely impact driveways. 5. Raising profile and enlarging bridge opening further will delay the project implementation and increase cost. 6. The existing roadway has never experienced overtopping.

50-year Design Natural HWL = 656.5. Proposed bridge low beam = 656.46 (N), 656.28 (S).
Bridge clearance = 656.46-656.5 = -0.04'; 656.28-656.5 = -0.22'

50-year Proposed HWL = 656.5 for bridge. 50-year Proposed HWL = 656.6 for culvert. Proposed Low EOP = 658.0
Freeboard = 658.0-656.5 = 1.5' (bridge); 658.0-646.6 = 1.4' (culvert)

REVIEW COMMENT FORM

Project Name:	Elgin O'Hare - West Bypass	Reviewing Agency:	IDOT
Milestone:	Hydraulic Report - Higgins Creek and Trib. A, Fourth Review	Reviewed By:	S. Batista
Submittal Date:	8/20/2012	Review Date:	8/20/2012
Consultant:	CBBEL	Response By:	I. Dailey, CBBEL
Comment Due Date:	n/a	Response Date:	10/4/2012

Designer's Response Code:
A = Agree Completely; will revise (no written response required)
RFS = Requires Further Study in next design phase (no written response required)
P = Agree Partially...Will revise to some degree (see written response)
D = Disagree...Will not revise (see written response)

Reviewer				*Designer*		
Issue No.	*Location (Sheet number/type, road name and/or station)*	*Reviewed By:*	*Comments*	** Response Code*	*Response*	*Markup Complete*
1	Section 1 - Narrative	SB	Datum correlation. State if final HEC-RAS model was adjusted to NAV88.	A	Text added.	✓
2	Section 1 - Narrative	SB	Modified Existing Condition Models. Typo on page 10, in the second to last sentence in the first paragraph (repeat words: "throughout the")	A	Text corrected.	✓
3	Section 1 - Narrative	SB	Proposed condition model narrative, make sure it is clear that the culvert's opening being modeled is 12' X 8' because of the embedment, although a 12'X9' culvert is being used.	A	Text added.	✓
4	Section 1 - Narrative	SB	Conclusion and Design Recommendations. The 500-year event is not used for freeboard criteria as noted in the narrative for I-90 Bridge for Higgins Creek and I-90 Culvert for Higgins Creek Trib. A. Remove words "meeting freeboard requirement", 2 locations.	D	Per the Illinois Tollway Drainage Design Manual dated March 2012, the 500-year event is a required check flood, and the roadway must not be overtopped by the 500-year flood event, which is considered a freeboard requirement.	✓
5	Section 1 - Narrative	SB	PERMIT Table 1, IDOT Survey XSEC D20, Typo in the 100 YR WSEL. WSEL should be 656.99. Currently, model looks like it jumps 1 foot between XSEC. Also, section D18 (5.650) 10 year Ex. Mod. Conditions should be 653.03.	A	PERMIT Tables revised.	✓
6	Section 2 - WIT	SB	All datum notes on the WITs need to be updated. FIS datum (NAV29) is different form IDOT HWY datum (NAV88). HWY = FIS -0.30'	D	While the original regulatory models were on the NGVD 1929 datum, the current published Flood Insurance Study (FIS) Tables and Flood Insurance Rate Maps (FIRMs) are all on the NAVD 1988 datum, as is the IDOT survey. No change made to WITs.	✓
7	Section 2 - WIT	SB	I-90 culvert for Higgins Trib. A. backup calculations. No clearance criteria required for this structure. (This does show Tollway's HW/D>1 requirement)	P	Agreed that clearance is not a required criteria for this culvert. No change made to backup calculations.	✓
8	Section 2 - WIT	SB	Elmhurst Rd. Conc. Slab. Low beam elevation is 656.28 not 656.46 for the proposed structure according to the streambed profile and XSEC. Revise clearance or figure as needed. It may be helpful to show 656.46 elevation labeled for U/S and 656.28 for D/S.	A	The low beam elevation has been revised on the WIT, Streambed Profile, and Structure Opening Plot. 656.28 is the proposed low beam elevation at the north end of the bridge, 656.46 is the low beam elevation at the south end.	✓
9	Section 2 - WIT	SB	I-90 over Higgins Creek. The difference in the waterway opening figures is a bit misleading. The difference might be due to the wider bridge being closer to the U/S cross section, but in reality, we are only widening the bridge and keeping the same waterway opening cross section. It might be helpful to display the same values for waterway opening area for existing and proposed.	A	The existing waterway opening area is now displayed for both the existing and proposed conditions.	✓
10	Section 2 - WIT	SB	Elmhurst Rd culvert, IL 72, and Mt. Prospect, no clearance figures needed in WIT backup calculations.	P	Agreed that clearance is not a required criteria for these culverts. No change made to backup calculations.	✓
11	Section 5 - Streambed Plan and Profile	SB	Sheet 2 of 2 for Higgins Trib. A. The culvert size seems off. The normal WSE is not same as what is used in comp. storage calculations (650.74 for comp. storage vs. 652.53-651.2 on plan sheet). Also, 12" embedment not shown. Revise as needed.	A	The culvert representation was revised. The normal WSEs on the Streambed Profile are correct.	✓
12	Section 5 - Streambed Plan and Profile	SB	Sheet 3 of 9, Elmhurst Bridge and sheet 6 of 9, I-90 Bridge. Normal WSE different than what is used in comp. storage section. Check low beam elevations vs. what is displayed in WITs.	A	The normal WSEs on the Streambed Profile are correct. The low beam elevations have been revised as necessary on the WITs, Streambed Profile, and Structure Opening Plots.	✓
13	Section 5 - Roadway Plan and Profile	SB	Roadway plan sheet. Question regarding ditch to the north of I-90 east of I-90 Bridge over Higgins Creek remains. Please label invert of what seems like two outlet pipes for the detention ponds north of station 3878+50 and equalizer pipe north of station 6880+00. We are concerned with how this ditch drains, what it drains, and how much flow it carries. GIS exhibits forwarded separate from this document. Study of this area should continue to be conducted. The hydraulic report may need to be revised if an alternative is devised that interrupted the internal XSEC of the I-90 bridge (n-values might need to be changed).	A	A separate Drainage Investigation has been prepared for the ditch in question. No revision to the Hydraulic Report is necessary.	✓

Reviewer				Designer		
Issue No.	Location (Sheet number/type, road name and/or station)	Reviewed By:	Comments	* Response Code	Response	Markup Complete
14	Section 6 - Stream Cross-Section Plots	SB	Sheet 1 of 2. NWL differs from what is in the comp. storage calculations.	A	The NWLs are now consistent.	✓
15	Section 6 - Structure Opening Plots	SB	Waterway opening plots, I-90 Trib. A and Elmhurst Road openings do not have normal WSEL plotted.		The NWLs have been added on all Structure Opening Plots.	✓
16	Section 6 - Structure Opening Plots	SB	Elmhurst Road Box Culvert alternative not shown.	A	The Box Culvert alternative has been added.	✓
17	Section 11 - Proposed Condition Model	SB	X-sections 4.611 and 4.612 providing conveyance D/S of IL 72 crossing that looks to be cut off and should not provide conveyance. This conveyance looks to be generated from a roadside ditch in the x-section. There was an obstruction included in the model, which should probably be modeled as a levy. This way, the area to the north of IL 72 will not provide conveyance for the 500 year unless the water goes up and over the roadway. This conveyance area is small and should not have a large effect on the model's results.	D	This ditch provides floodplain conveyance for the 500-year flood event as the railroad overtops north of Touhy Avenue, even with the proposed overpass fill (modeled as an obstruction in the proposed conditions model) in place. No change made to proposed conditions HEC-RAS.	✓
18	Section 12 - Permit Summaries	SB	Elmhurst Road over Higgins Creek. Item 6b. should be corrected to say "no". Check item 6a.	A	Item 6b. has been revised.	✓
19	Section 12 - Proposed Condition Compensatory Storage Calculations	SB	Missing structure opening and structure fill in the floodway sketches and calculations for the culvert at Higgins Creek Trib. A.	P	Fill in the floodplain and floodway were calculated by roadway cross-section up to the 30 percent submittal. A note has been added to the fill by cross-section calculations at the culvert location.	✓
20	Section 12 - Proposed Condition Compensatory Storage Calculations	SB	Station 3841+50 on the FW summary table. 32.8 SF of fill area in the floodway is missing. The total value should be 66.8 SF	A	Station 3841+50 fill in the floodway has been updated based on revised water surface elevations and Project C roadway cross-sections.	✓
21	Section 12 - Proposed Condition Compensatory Storage Calculations	SB	STATION 3842+00 on the FW summary table. Fill area is in the floodway is incorrect. The total value should be 67.3 SF.	A	Station 3842+00 fill in the floodway has been updated based on revised water surface elevations and Project C roadway cross-sections.	✓
22	Section 12 - Proposed Condition Compensatory Storage Calculations	SB	Label floodway limits (right and left) with arrows pointing towards the floodway. Label which floodway it is (Higgins Creek or Higgins Creek Trib. A). It is especially confusing when two floodway limits are shown for the two Creek, but they both point outwards (away from centerline) stating at station 3832+00 versus where the two limits of the floodway are shown at Elmhurst Road and point inward (towards centerline).	A	Floodway labels and arrows pointing toward the floodway have been added.	✓
23	Section 12 - Proposed Condition Compensatory Storage Calculations	SB	19) X-sections 3842+00 to 3845+00 (o/s LT), and 6858+00 seem to be drawn wrong. The embankment and proposed geometry cross at stations 3842+00 to 3845+00 and the cross section is not completely drawn in at station 6858+00. The fill in the cross sections seem correct. The fill in the cross section should be checked once correct geometry drawn.	A	Floodplain and floodway fill calculations have been updated based on revised water surface elevations and Project C roadway cross-sections.	✓
24	Section 12 - Proposed Condition Compensatory Storage Calculations	SB	The I-90 Bridge over Higgins Creek low cord is drawn below the 100 year at stations 3872+50 and 3873+00. Is the low cord this low? The WIT and the HEC-RAS model has this bridge having plenty of clearance.	A	The low beam elevation of 656.94 is now shown on cross section 3873+00.	✓
25	Section 12 - Proposed Condition Compensatory Storage Calculations	SB	Draw in cross section 3876+50.	A	The cross-section is drawn in and included in the calculations.	✓
26	Section 12 - Proposed Condition Compensatory Storage Calculations	SB	Summary table FW 2/3 (for Higgins Creek floodway) shows 0 volume for floodway. According to the roadway cross-sections, this is correct; however, there is not a bridge opening cross sections and its applicable impacts. Widening the bridge should impact the floodway in that the channel banks may need to change a bit up and down stream because of fill of the bridge's abutments (or possible pier construction). This impact needs to be documented. Overall, there seems to be plenty of storage provided as a whole, but a quantity needs to be stated for this impact in the floodway.	P	Floodway fill calculations should be refined in the design phase, however currently no fill in the floodway is proposed at the bridge due to piers or abutments.	✓
27	Section 12 - Proposed Condition Compensatory Storage Calculations	SB	FW 3/3 table. Station 112+47. There is no floodway impacts here. A value of 67.6 is displayed. It seems that it is not being counted or used in the calculations, but should be corrected.	A	The spreadsheet has been updated.	✓

Reviewer				Designer		
Issue No.	Location (Sheet number/type, road name and/or station)	Reviewed By:	Comments	* Response Code	Response	Markup Complete
28	Section 12 - Proposed Condition Compensatory Storage Calculations	SB	Thought should be given here as to how to quantify the impact to the floodway. As is, the floodway is counted using cross sections at every 50 feet. However, the cross sections jump over the bridge between x-sections 111+50 and 112+00, accounting for fill through the structure. Maybe a more suitable approach is to quantify the roadway fill with cross sections leading up to the south face of the bridge and resume at the north face of the bridge. Through the bridge opening, there will have to be a similar study as noted in comment # 28 above (I-90 Bridge) of the impacts to the floodway because of widening the bridge. Structure opening cross sections and its impact to the floodway needs to be documented.	P	As suggested, fill within the bridge opening has been removed for the bridge crossings. Floodway fill calculations at the structure opening will be completed in the design phase.	✓
29	Section 12 - Proposed Condition Compensatory Storage Calculations	SB	Comp. site CS6-W summary table. There is a negative number that may have resulted from a typo in the elevation (negative number is in DElevation). The elevation 656.00 should probably be 657.00. Please show the grading plan on the plan sheets. The cut at elevation 655.00 seems excessive and would like to see on plans. There is no cut beyond 659.00 shown on plan so this figure should be removed from table. 2.06 ac-ft should be total storage. During the last drainage meeting it was stated that site CS6-W was not going to be used. Please confirm if it is going to be a compensatory storage site. It is preferred to keep it in use since it will provide compensatory storage for fill in Tributary A.	P	Comp. Storage Site CS6-W was removed due to the proximity of the oil pipeline.	✓
30	Section 12 - Proposed Condition Compensatory Storage Calculations	SB	Comp. site CS6-E. Elevation 656.50 should be 656.10 and elevation 658.90 should be 658.60. Corrections should be made from the results of the above corrections. There is no Cut shown above the elevation 659.00 so this figure should be removed from the table. The total storage should be 4.65 ac-ft.	P	Storage volume calculations have been updated based on revised water surface elevations and Project C geometry. Cut area at elevation 659.00 is used to interpolate the cut at the 100-year WSE. Cut at elevation 659.00 and above is provided by removing the existing exit ramp and re-grading the northwest berm.	✓
31	Section 12 - Proposed Condition Compensatory Storage Calculations	SB	Comp. Sites CS7-W and CS7-E. The area decreases as elevation goes up. This area should increase as elevation goes up. Correct as needed, including resulting calculations. Regarding the proposed plan sheets at this area; there seems to be a berm to the west and south of CS7-E that can probably block water from getting into CS7-W. There is an equalizer pipe connecting the two, but with a backflow preventer. Because of this, there is concern as to how exactly will CS7-W fill. We are aware that CS7-W is only being used for 10-100 year flood stage, but the berm to the west seems higher than 653.30, which is the 100 year HWL. Please clarify. Show all relevant information on plan sheets. Also, the natural, 10 year, and 100 year WSEL should be 647.69, 655.10, and 658.60 at this site. Please correct exhibits on plan and profile sheets, as well as all applicable calculations for this site.	P	Compensatory storage tables summarize available storage, and do not double-count existing floodplain storage volume. Area decreases as elevation goes up because the available storage area is the difference between existing and proposed elevation contours. The 10- to 100-year level pool is designed so water overtops the berm between CS7-E and CS7-W above the 10-year WSEL. The berm elevation (651.00 feet) has been revised to be just above the updated 10-year WSEL (650.60 feet). The backflow prevention device prevents water from flooding CS7-W prior to overtopping the berm, and allows the basin to drawdown with the creek as floodwaters recede.	✓
32	Section 12 - Proposed Condition Compensatory Storage Calculations	SB	As a general note, the NWL is consistent throughout calculations, but does not agree with NWL in streambed profile and x-sections. Revise profile/x-section or comp. storage calculations as needed.	A	The Streambed Profile has been updated at Elmhurst Road. The downstream NWL at each bridge was used to be conservative.	✓
33	Section 12 - Proposed Condition Compensatory Storage Calculations	SB	EOWB Fill and Comp. Storage summary sheet. Floodway summary. Higgins Trib. A fill in the floodway shows 5.23 AC-FT required, but calculations show only 1.68. (Old report had something close to 1.68). Not sure this value is incorrect since it might include structure fill in the floodway volume, but structure fill in the floodway calculations not included in report. Check all values and revise as needed.	A	The reference to 5.23 AC-FT is probably an old floodplain fill value prior to completing floodway fill calculations. The floodway fill calculations have been revised.	✓
34	Section 12 - Proposed Condition Compensatory Storage Calculations	SB	EOWB Fill and Comp. Storage summary sheet. CS8 is not used, or no information is given that it will be servicing these structures. This should be removed from the floodway summary table.	A	The reference has been removed.	✓
35	Section 15 - CD	SB	Please include PDF copy of final report in CD	A	The PDF copy of the final report will be included.	✓
36	Section 16 - Scour Calculations	SB	Elmhurst Bridge. No analysis is made for the storm event when the water profile is just below overtopping. At this stage, contraction scour might be at its worst as no flow is lost over the weir flow of the road, thus forcing all water through the bridge opening. According to the WIT, this event is around the 210 year event. Analysis should be made of this event, or an event that puts the water level U/S of the bridge just below overtopping, and reported at the very least as a check for worst condition contraction scour	A	The additional scour run output has been added in Section 16, and the results discussed in the Narrative.	✓

REVIEW COMMENT FORM

Project Name:	**Elgin O'Hare - West Bypass**	Reviewing Agency:	IDOT
Milestone:	**Hydraulic Report - Higgins Creek and Trib. A, Third Review**	Reviewed By:	S. Batista
Submittal Date:	**5/18/2012**	Review Date:	6/19/2012
Consultant:	**CBBEL**	Response By:	I. Dailey, CBBEL
Comment Due Date:	**n/a**	Response Date:	7/11/2012

**** Designer's Response Code:***
A = Agree Completely; will revise (no written response required)
RFS = Requires Further Study in next design phase (no written response required)
P = Agree Partially...Will revise to some degree (see written response)
D = Disagree...Will not revise (see written response)

Reviewer				*Designer*		
Issue No.	***Location (Sheet number/type, road name and/or station)***	***Reviewed By:***	***Comments***	**** Response Code***	***Response***	***Markup Complete***
1	HR Narrative	SB	Elmhurst Road Structure, the current design does not reduce created head to less than 0.1 feet since there is a sensitive building just upstream. The Part 3708 rules require that the feasibility of reducing created to 0.1 feet be determined. If there are site constraints that preclude constructing an opening that reduces created head to 0.1 feet, the report needs to clearly document this. Also the report should note that the corrected FIS includes field conditions not in the FIS. Based on this analysis the proposed structure does reduce created head to 0.1 feet. Resize the structure or justify why we should keep it as currently proposed. Update WIT and HRDS if necessary.	**A**	The Narrative was expanded as requested.	
2.1	HR Narrative	SB	Narrative, Manning's n-values, must document why the changes done to all the internal cross section in the Design model as compare to the FIS models is justifiable at each structure, else reset to match the internal bridge cross section n-values used by the regulatory model. In general state that most bridges don't use internal cross section, so model set to match U/S and D/S cross section. For I-90 and Elmhurst Rd structure document why the changes were done to the internal cross section.	**A**	The Narrative was expanded as requested.	
2.2	HR Narrative	SB	The FIS had internal cross section at the IL 72 structure on Tributary A reach and Willie Rd structure in Mainstem reach, document why these were changed or put back to match FIS values.	**P**	For the IL 72 culvert on Tributary A, no changes were made from the FIS model. When selecting "Internal Bridge Cross Sections" under the "Options" Tab, data are displayed; however, those data exactly match the upstream and downstream cross section data. If user changes had been made, a note stating "Internal XS defined" would display at the bottom of the Bridge Culvert Data screen.	
2.3	HR Narrative	SB	The FIS had internal cross section at the IL 72 structure on Tributary A reach and Willie Rd structure in Mainstem reach, document why these were changed or put back to match FIS values.	**P**	For the Wille Road culvert no Internal XS was defined. However, the culvert was updated from the FIS model with current survey data. As shown on Permit Table 1, at the first cross section upstream of Wille Road the differences in WSEL from the FIS Model to the Mod. Ex. Cond. Model are 0.15', 0.10', -0.05', and -.08' for the 500-, 100-, 50-, and 10-year flood events. The difference in the 500-year WSEL is due to the use of the RR grade as the (higher) overtopping elevation at the downstream Touhy Avenue crossing. All other WSELs are within 0.1' of the FIS profile, which is generally acceptable.	
3	PERMIT Table 1	SB	Narrative, Existing Condition Models, investigate why at river station 5.650 there is about a 1.0 foot jump in the 10-year WSE. if necessary add explanation to narrative.	**A**	The 10-year WSE in PERMIT Table 1 at river station 5.650 has been revised from 652.03 to 653.03 to match the HEC-RAS output. There is no jump in WSE at this location.	

Reviewer				Designer		
Issue No.	Location (Sheet number/type, road name and/or station)	Reviewed By:	Comments	* Response Code	Response	Markup Complete
4.1	HR Narrative	SB	Narrative, Proposed Condition Models, add another paragraph for Mount Prospect to explain that the old road will be removed but the existing 60 inch sewer east of the road will remain and state if old roadway is removed with this project. State they should make sure there will be some inlets to allow water to enter the 60 inch sewer if the 500-year event overtops the railroad. Explain without the inlets the quadrant between the railroad and the new Mount Prospect road will be cut off from the floodplain.	A	The Narrative was expanded as requested.	
4.2	HR Narrative, Waterway Information Table	SB	For the Elmhurst road alternatives, add a paragraph to state that Phase II should decide if to go with a slab bridge or the box culvert option based on ease of constructability. Revise the WIT so it says concrete slab bridge. Since this structure is feasible it is the preferred bridge type. Remove the reference to deck structure.	A	The Narrative was expanded and WIT revised as requested.	
4.3	HR Narrative	SB	I-90 at Tributary A, second sentence, what is the HW/D requirement? State this is a ISTHA requirement.	A	HW/D is explained and the Narrative expanded as requested.	
4.4	HR Narrative	SB	There is an Existing ditch at the north east quad of I-90 and Higgins Creek that flows from the east, explain if this creek is to be maintained. If the flow from the ditch is significant give some thought on how the wing wall of the extended I-90 structure should be oriented and check if additional ROW is required or Rip-Rap protection for the bend. What is decided to be done with this area might affect the n-value in the Hec-Ras model.	P	The flow from the ditch will be maintained, and a retaining wall constructed to minimize the Tollway footprint. Design details are not complete at this time.	
5	HR Narrative	SB	Narrative Scour Analysis, add a few sentence to specifically discuss the existing and proposed scour finding at Elmhurst road and I-90. At Elmhurst road make sure to cover if the existing north abutment is to be left in place, then the Rip-Rap counter measures must be replaced and the new widened parts must be designed to have foundations to handle the proposed scour. If Rip-Rap is left in place, make sure it is accounted in the n-value of the Hec-Ras model. For I-90 ask the Tollway if they have existing scour condition calculations (not an IDOT structure).	A	The Narrative was expanded as requested.	
6	HR Narrative	SB	Compensatory Storage Requirements, explain that IDOT and Tollway requirements are being considered. Explain IDOT compensates for fill in the Floodway at a 1:1. The Tollway compensates at a 1.5:1 for fill in the floodplain. State the project expects to compensate at the Tollway's requirements. Give the compensatory storage requirement for each agency.	A	The Narrative was expanded as requested.	
7	HR Narrative	SB	Conclusion, second to last bullet point, remove the part that states "Meeting the freeboard requirement".	A	The Narrative was revised as requested.	
8	Waterway Information Tables	SB	For all Waterway Information Tables, state the datum correlation between Highway and FIS.	A	The datum correlation was added to all WITs. The FIS and Highway survey datum are both NAVD 1988.	
9	Waterway Information Tables	SB	WIT, for IL 72 at Higgins Creek, check why the 500-year drops 0.2 feet for proposed condition, add a note that it is due to the added relief structure at Mount Prospect.	A	The requested note was added to the WIT.	
10	Waterway Information Tables, HR Narrative	SB	WIT, for I-90, check why proposed opening is larger than existing. Double check note that the existing unlined channel at northeast quad can be lined if the existing tributary from the east is to remain.	P	The WIT has been updated. The existing channel at the northeast quad is lined at the south corner of its confluence with Higgins Creek. We recommend that this lining be reinstated.	
11	Section 6	SB	Make sure the Culvert options at Elmhurst road have sufficient cover between the top of culvert and the bottom of the proposed pavement subgrade.	A	Our understanding from consultation with CH2MHill is that the cover is sufficient.	
12.1	Section 5	SB	Section 5, page 3 of 9, remove or correct the two lines that are labeled Existing and Proposed Flow Limit.	A	On page 3 of 9 the existing and proposed flow limit lines have been removed.	

Reviewer				Designer		
Issue No.	Location (Sheet number/type, road name and/or station)	Reviewed By:	Comments	* Response Code	Response	Markup Complete
12.2	Section 5	SB	Section 5, page 8 of 9, draw in the new crossing over the Creek on profile and on plan view.	P	On page 8 of 9, the new West Bypass crossing is shown in plan view, and the proposed low chord is above elevation 665.0, so it does not show on the profile view. See sheet 162 of 230 of the Proposed Drainage Plan for the West Bypass profile.	
12.3	Section 5	SB	Section 5, page 9 of 9, draw proposed new road on the profile.	P	On page 9 of 9, the new Touhy Avenue overpass is shown in plan view, and the proposed low chord is above elevation 675.0, so it does not show on the profile view. See sheet 217 of 230 of the Proposed Drainage Plan for the Touhy Avenue profile.	
13	Section 5	SB	EOWB plan, page 91, double check the normal and 10-year WSE given at compensatory storage site. Page 94, check if existing ditch on north has to be reinstated.	A	On page 91 the WSEs have been revised. On page 94, the ditch flow will be maintained, and a retaining wall constructed to minimize the Tollway footprint. Design details are not complete at this time.	
14.1	Section 6	SB	Missing waterway opening sketch with roadway profile of Mount Prospect, TAR cell 2 and EOWB over TAR cell and Higgins Creek.	P	The TAR Cell 1, TAR Cell 2, and Mt. Prospect Road waterway opening drawings have been added to Section 6. The proposed West Bypass crossing over Higgins Creek and TAR Cell 2 is a high level bridge, and the opening is shown on Proposed Drainage Profile Sheet 162 of 230 in Section 5 of the Hydraulic Report. As discussed, CH2MHill has been advised that no abutments or piers may be placed in the Higgins Creek floodplain for the West Bypass or Touhy Avenue overpasses.	
14.2	Section 6	SB	IL 72 opening sketch missing stations.	A	The stations have been added to the IL 72 opening sketch.	
15	Section 11	SB	HEC-RAS model, update all proposed cross sections downstream of IL 72 to end at the new embankment of IL 72. The models are using areas left of IL 72 as conveyance.	A	A blocked obstruction has been added to each applicable cross section to represent the proposed IL 72 embankment.	
16	Section 12	SB	Permit Summary for Elmhurst Rd. check if item 6 should be Yes and update item 6a and 6b.	A	The Permit Summary Forms have been updated.	
17.1	Section 12	SB	Compensatory storage calculations, check all natural WSE elevations being used. The I-90 Higgins creek 100-year elevation should be 653.3. The Trib A 10-year elevation should be 656.50. I did not check the floodplain fill calculations since not necessary for IDOT requirements.	A	All fill and compensatory storage calculations have been updated according to current WSEs.	
17.2	Section 12	SB	Trib A Floodway calculations, consider if you separate fill in the floodway for Higgins Creek verses Trib A volumes. Correct the 10-year elevation to 656.50. The Floodway on Higgins Creek is from station 3832+50 to 3844+00. The floodway on Trib A is from station 3835+50 to 3841+00. There should be no fill in the floodway calculated outside of these stations above. Mark Limits of Floodway on summary table or truncate table.	P	Higgins Creek Tributary A and Higgins Creek (Stations 3826+00 to 3848+00) calculations are together since their compensatory storage sites are provided by watershed. Beyond Station 3848+00, Higgins Creek Tributary A merges with Higgins Creek. Floodway intersects with roadway fill in other locations than the stated stations due to the extent of the roadway expansion. Floodway is labeled at all cross sections affected by proposed fill. Cross sections without fill in the floodway do not include floodway labels.	
17.3	Section 12	SB	I-90 at Higgins Creek, no document provided for how the fill volumes calculated. No cross section or waterway opening provided. Mark limits of Floodway on summary table or truncate table.	P	Documentation for fill calculations is provided in the cross sections.	
17.4	Section 12	SB	Elmhurst Rd. at Higgins, the floodway is from station 111+50 to 112+00. Mark limits of floodway on summary table. There should be no floodway fill calculated outside of these stations. No backup information is provided to support the calculations in the summary table or truncate table.	P	There is floodway fill south of the bridge on the west side of Elmhurst Rd. Other than that, all affected floodway is at the bridge location, as shown in the summary tables.	

Reviewer				Designer		
Issue No.	Location (Sheet number/type, road name and/or station)	Reviewed By:	Comments	* Response Code	Response	Markup Complete
17.5	Section 12	SB	Correct incorrect WSE in all cross sections. Label the floodway limits on each cross section. Differentiate between the Trib A Floodway and the Higgins Creek Floodway west of Elmhurst. I-90 stations 3830+00 to 3831+00, reinstate the ditch adjacent to the new retaining wall on the left.	P	All WSE are corrected in cross sections and plan view. Floodway limits were added at all affected cross sections. Floodway calculations west of Elmhurst were not differentiated because the compensatory storage is provided by watershed. Proposed ditch to be designed.	
17.6	Section 12	SB	Available compensatory storage volume table, correct the normal, the 10 and 100-year WSE being used. Provide copies of the comp storage site following the table to cross check values.	A	WSEs and Compensatory storage areas updated in both summary tables in the beginning of the section.	
18.1	Section 16	SB	Scour calculations for Elmhurst Rd. Update the total 500-year scour value, from HEC-RAS I get 8.66'+9.57'=18.23'	A	The Elmhurst Road scour output from HEC-RAS is included in Section 16. The 500-year total scour is 9.43' contraction plus 8.66' abutment = 18.09'.	
18.2	Section 16	SB	Scour at I-90, give total scour as 5.5'+5.0'=10.5', ask Tollway if they have scour calculations for existing structure, include in report if available.	A	The I-90 scour output from HEC-RAS is included in Section 16, along with the Tollway report. The 500-year pier scour is 5.25', which matches well with the Tollway computed value of 5.36'. Contraction scour is negligible at this bridge.	
19	Section 11	SB	The proposed profile for IL 72 going east and west of the railroad should be included in the model. Check if proposed profile of Mount Prospect should be updated too. This should not have any effect on the WSE levels but should be done for thoroughness of the models.	P	After discussion, it was agreed that the IL 72 (Touhy Avenue) profile will not be added to the HEC-RAS model. The main storm sewers in the vicinity of IL 72 and Mt. Prospect Road have been added to the Cross Section Location and Reach Length Exhibit. The proposed Mt. Prospect Road profile is in the proposed condition HEC-RAS plan.	
20	Waterway Information Tables	SB	There are typos throughout some of the WIT and supporting backup calculations for WIT sheets. Some of these values do not match the values in the models where they designated to be found in the model. Please see attachment for typos found. Please revise typos and recheck rest of values to insure they are correct.	A	The requested review and revisions have been completed.	

Illinois Tollway
Open Roads for a Faster Future

SUBMITTAL REVIEW COMMENTS FORM

Project Name:	Elgin O'Hare West Bypass (P-91-443-06)
Project No.:	Hydraulic Report: IL72, I-90 and Elmhurst Road over Higgins Creek
Milestone:	Final Hydraulic Report, dated May 2012 (three volumes)
Consultant:	CH2M Hill (by Chris Burke Engineering)
Reviewing Agency:	AECOM
Date of Review:	6/21/2012

This review by AECOM was performed solely to determine compliance with established Tollway Policies, Criteria and Standards and is limited to facilities under Tollway jurisdiction. AECOM has not performed this review for the purpose of determining any design errors or omissions and assumes no responsibility, nor liability for any errors or omissions in any of these designs. The Design Section Engineer is responsible for completing its own review for technical adequacy and performance of internal QC/QA reviews.

NO.	DWG NO./ SPEC NO./ SECTION NO., ETC.	REVIEWED BY:	COMMENTS	RESPONSE BY:	ACTION REQ'D	RESPONSES	CURRENT STATUS (OPEN/ CLOSED)
1	Narrative	Kent Olson	Historical Flooding Observations: The USGS website (http://nwis.waterdata.usgs.gov) has stream gage data from 1954 to 1979 for USGS 05530480 (Willow Creek near Mannheim Road). Although this is about 2 miles downstream, the data should be investigated and mentioned in the report.	Ilene Dailey, CBBEL	A	The USGS gage data is now included in Section 13, and a brief discussion was added to the Narrative. This gage was discontinued in 1979. Since then, many changes have been made in the watershed, including construction of the TAR Cells. For that reason, the current regulatory FIS flows are used for the Higgins Creek modeling.	
2	General Comment	Kent Olson	If natural bottom box culverts are proposed for culverts over 48" diameter (for fish passage) will this be accounted for in the hydraulic calculations?	Ilene Dailey, CBBEL	A	Culvert embedment applies only to the proposed culverts at Tributary A and the culvert option at Elmhurst Road. The embedment is accounted for in the hydraulic calculations. No changes are proposed to the other culverts along Higgins Creek. The proposed 500-year relief culvert under relocated Mt. Prospect Road is outside the floodplain limits, and per the O'Hare wetland delineation is not in a jurisdictional ditch, so embedment is not required.	
3	General Comment	Kent Olson	Will O'Hare and the MWRD be given a copy of this report to review, since their property is adjacent to Higgins Creek?	Ilene Dailey, CBBEL	A	Coordination with MWRD and O'Hare Airport is continuing, and will include providing copies of the approved Hydraulic Report.	
4	General Comment	Kent Olson	I am concerned that the cost of replacing the existing culvert under I-90 for Higgins Creek Tributary A is justified. Instead of replacing the existing culvert (double 9' x 5.75') with a larger one (double 12' x 8'), would it be feasible to construct an overflow culvert under Elmhurst Road, south of I-90, and regrade the ditch along the south side of I-90? The idea is to reuse the existing culvert, but have large events flow east into Higgins Creek.	Ilene Dailey, CBBEL	RFS	Adding overflow culverts along the south side of I-90 will require over 100' of pipe culvert, and may require a junction structure to meter flow between the culverts under I-90 and the new overflow culverts under Elmhurst Road and ramps. Also, there are many utilities running parallel to Elmhurst Road south of I-90, including a JAWA water main and fiber optic lines. Rerouting the flow may create newfloodplain/floodway. For these reasons we recommend maintaining the existing flow paths.	
5	Narrative	Kent Olson	Several detention ponds are shown on the exhibits, but detention is not discussed in the Narative section, nor are there any detention calculations.	Ilene Dailey, CBBEL	P	Detention calculations have been completed and are included in a separate Study. They are not part of the Hydraulic Report.	
6	Bridge Scour	Kent Olson	Bridge scour calculations for I-90 over Higgins Creek (Tollway Bridges # 535 and 536) are available. The 2008 reports by Collins Engineers were emailed to CBBEL on 6/21.	Ilene Dailey, CBBEL	A	The 2008 Scour Reports are now included in Section 16 of the Report.	

RESPONSES FOR ACTION REQ'D
A: AGREE FULLY WILL COMPLY.
B: AGREE PARTLY WITH, AS NOTED EXCEPTIONS.
C: DISAGREE FULLY. REASONS ARE NOTED.
D: COMMENT HAS BEEN SUPERCEDED BY DESIGN DEVELOPMENT.
E: QUESTION ONLY. ANSWER THE QUESTION.

Ilene Dailey

From: Olson, Kent [kolson@getipass.com]
Sent: Thursday, June 21, 2012 10:45 AM
To: 'idailey@cbbel.com'
Cc: cwang@cbbel.com; Nashif, Manar
Subject: Elgin O'hare over Higgins Creek - Bridge Scour Reports
Attachments: RP_Collins_Br535-ScourAnalysis_0328-2008.pdf; RP_Collins_Br536-ScourAnalysis_0328-2008B.pdf

Ilene-
As we discussed, here are the bridge scour reports that Collins Engineering did for I-90 over Higgins Creek. If you need anything else, let me know.
The Elgin O'Hare hydraulic reports have been difficult to review, because they are so well done! It's been taking me along time trying to find problems with them. Keep up the good work!

Kent Olson, P.E.
Civil Engineer
AECOM / Illinois Tollway
2700 Ogden Avenue
Downers Grove, IL 60515
(630) 241-6800 x 3870
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kolson@getipass.com

Ilene Dailey

From: Ilene Dailey [idailey@cbbel.com]
Sent: Friday, June 15, 2012 5:51 PM
To: 'Batista, Santos'
Cc: 'cwang@cbbel.com'
Subject: EOWB Higgins Creek bridge n-values
Attachments: I90-BRIDGE-UPS FACE-p16-.jpg; I90-DS-p14-.jpg

Santos,

As we discussed, for the Higgins Creek Permit models, the n-values through the I-90 and Elmhurst Road bridges match the channel n-values of the adjacent cross sections.

For the Design models, the n-values through the Elmhurst Road bridge match the channel n-values of the adjacent cross sections. These values vary internally upstream and downstream because the upstream channel is more natural/lined with riprap, while the downstream channel is fully lined with concrete. The "internal bridge cross section" option was not used for the Elmhurst Road bridge.

For the Design models, the n-value through the I-90 bridge was set to 0.17 using the "internal bridge cross section" option. This value was selected to represent the existing concrete-lined spillthrough abutments, as shown on the attached photos. I assumed the same lining for the proposed widening. If you feel a different n-value is more appropriate, please let me know.

Thanks,
Ilene

Ilene A. Dailey, P.E., CFM
Senior Drainage Engineer
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Ilene Dailey

From: Pete M. Knysz [pknysz@cbbel.com]
Sent: Thursday, June 14, 2012 12:50 PM
To: idailey@cbbel.com; Keith.Mockenhaupt@CH2M.com
Cc: cwang@cbbel.com; Larry.Martin@CH2M.com; eanderson@cbbel.com; jedd@cbbel.com
Subject: RE: Higgins at I-90

Thanks...that helps

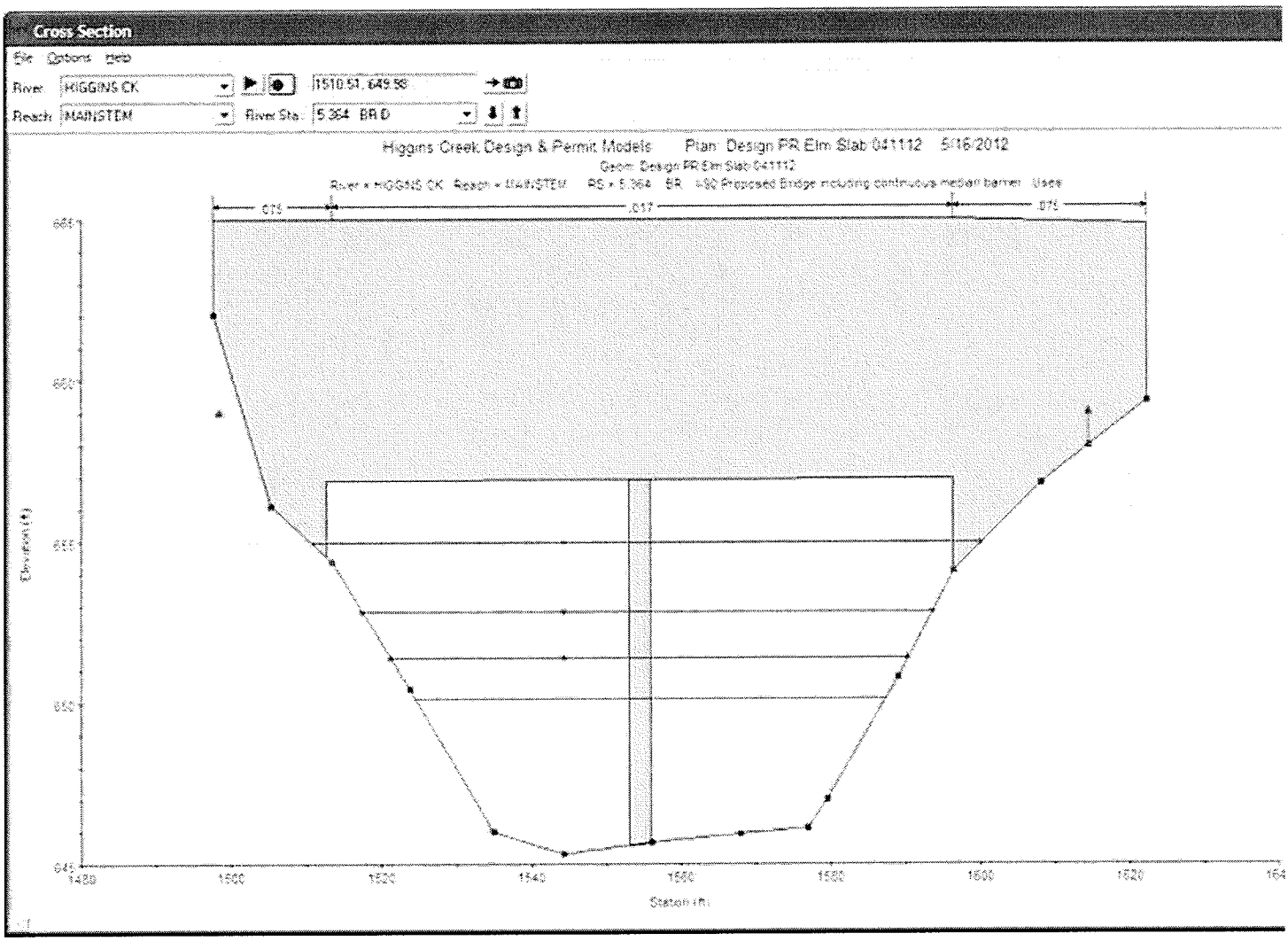
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Phone: (847) 823-0500 Fax: (847) 318-9793 Cell: (847) 833-0278
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From: Ilene Dailey [mailto:idailey@cbbel.com]
Sent: Thursday, June 14, 2012 12:46 PM
To: pknysz@cbbel.com; Keith.Mockenhaupt@CH2M.com
Cc: cwang@cbbel.com; Larry.Martin@CH2M.com; eanderson@cbbel.com; jedd@cbbel.com
Subject: RE: Higgins at I-90

As the existing bridge pier and spill-through abutments will remain in place, adding a shelf will reduce the waterway opening and add fill in the floodway, which are adverse effects from a hydraulic modeling standpoint.

Upstream face of I-90 Bridge, for reference.



Ilene A. Dailey, P.E., CFM
Senior Drainage Engineer
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
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From: Pete M. Knysz [mailto:pknysz@cbbel.com]
Sent: Thursday, June 14, 2012 11:44 AM
To: Keith.Mockenhaupt@CH2M.com
Cc: cwang@cbbel.com; idailey@cbbel.com; Larry.Martin@CH2M.com; eanderson@cbbel.com; jedd@cbbel.com
Subject: RE: Higgins at I-90

For now...locate the abutments where they need to be (as long as they are outside of the jurisdictional creek limits). If you could move them without too much trouble, it would be best if the abutments were located as far back from the creek as possible (within reason) to minimize potential impacts to the creek.

Based on agency comments, we should evaluate if there is room for a terrestrial wildlife walkway at this location. I realize that it might not be feasible due to the existing EB/WB I-90 abutments, steep sideslopes, and/or limited available

space (but please check anyways so that we can say it was evaluated). This is near a location along the project corridor where a higher number of deer/vehicle collisions were recorded.

- For large mammals, such as deer, the minimum width of the walkway is about 6.5 feet (preferred width is >10 feet). Minimum clearance between the walkway and the ceiling of the underpass is about 10 feet (preferred clearance is ≥13 feet).
- For small and medium sized animals, a minimum walkway width of 1.6-2.3 feet is recommended (preferred width is about 3.3 feet). Minimum clearance between the walkway and the ceiling of the underpass is about ≥2 feet.
- The walkway would basically be a shelf that could accommodate the passage of deer and other animals under the proposed bridges.

To appease the agencies, we should also evaluate potential terrestrial wildlife crossings at new Higgins Creek culverts (including tributaries), as practical and feasible (e.g., oversized culverts ≥36" with shelves on one or both sides of the stream, etc.). All new culverts need to accommodate fish passage.

Peter M. Knysz
Manager, NPDES Policy and Enforcement
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 318-9793 Cell: (847) 833-0278
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From: Keith.Mockenhaupt@CH2M.com [mailto:Keith.Mockenhaupt@CH2M.com]
Sent: Thursday, June 14, 2012 10:11 AM
To: pknysz@cbbel.com
Cc: cwang@cbbel.com; idailey@cbbel.com; Larry.Martin@CH2M.com; eanderson@cbbel.com
Subject: RE: Higgins at I-90

Pete:

The existing bridges are 2-span configuration with span lengths ~50 ft. So, the center pier could easily be removed on the proposed CD Road/Ramp pavements adjacent to the mainline widening. Might need to bump up the profiles a tad as the longer span structures will require more depth but I would say this can be accomplished. Would we need to move the proposed abutments back from the existing location?

KSM

From: Pete M. Knysz [mailto:pknysz@cbbel.com]
Sent: Thursday, June 14, 2012 9:53 AM
To: Mockenhaupt, Keith/CHI
Cc: cwang@cbbel.com; idailey@cbbel.com; Martin, Larry/CHI; eanderson@cbbel.com
Subject: Higgins at I-90

Hi Keith,
We briefly discussed this a couple weeks ago...just wanted to follow up and confirm.

If we can minimize impacts to Higgins Creek at the EB/WB I-90 bridge (around STA 3873) that would be best. My understanding is that the existing EB/WB I-90 bridge with center pier(s) in the creek would be widened...this necessitates widening the existing pier(s) in the creek...this impact is unavoidable.

But if the ramps could span and not install piers in the creek this would help show avoidance/minimization for the regulatory agencies. Please avoid/minimize impacts to wetlands and creeks to the extent practicable.

Please confirm that this is possible...let me know if we can revise the FEIS to reflect this change (i.e., the only creek impacts at this location will consist of widening the existing pier(s) for EB/WB I-90 bridge and that the ramps will span the creek without installing piers in the creek).

Thanks,

Peter M. Knysz
Manager, NPDES Policy and Enforcement
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 318-9793 Cell: (847) 833-0278
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Ilene Dailey

From: Chiliang Wang [cwang@cbbel.com]
Sent: Tuesday, June 05, 2012 1:50 PM
To: idailey@cbbel.com
Subject: FW: Elmhurst Road over Higgins Creek

Ilene:

The topic of the day.

Chinliang R. Wang, PE
Vice President
Head, Drainage Department
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
E-Mail: cwang@cbbel.com

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-----Original Message-----
From: Masouridis, Eleftherios P [mailto:Eleftherios.Masouridis@illinois.gov]

Sent: Tuesday, June 05, 2012 1:43 PM
To: Nashif, Manar; 'cwang@cbbel.com'; 'Kevin.Nichols@CH2M.com'
Cc: Larry Martin (Larry.Martin@ch2m.com); 'Lidia.Pilecky@CH2M.com'; Brazas, Wesley; Wojcik Rick (Rick.Wojcik@illnois.gov); 'edward.yousif@aecom.com'; Batista, Santos; Krall, Ronald D
Subject: RE: Elmhurst Road over Higgins Creek

We were looking at something like you describe. The scour depth is from the Hydraulic Report prepared by CBBEL.

E. Perry Masouridis, P.E.
Hydrology and Hydraulics Engineer
Illinois Department of Transportation, Region 1 Bureau of Programming, Hydraulics Section
201 West Center Court
Schaumburg, IL. 60196-1096

Phone: (847) 705-4474 Fax: (847) 221-3052
Email: eleftherios.masouridis@illinois.gov

-----Original Message-----
From: Nashif, Manar [mailto:mnashif@getipass.com]
Sent: Tuesday, June 05, 2012 1:10 PM
To: Masouridis, Eleftherios P; 'cwang@cbbel.com'; 'Kevin.Nichols@CH2M.com'
Cc: Larry Martin (Larry.Martin@ch2m.com); 'Lidia.Pilecky@CH2M.com'; Brazas, Wesley; Wojcik Rick (Rick.Wojcik@illnois.gov); 'edward.yousif@aecom.com'; Batista, Santos; Krall, Ronald D
Subject: RE: Elmhurst Road over Higgins Creek

Perry, understood. We were also anticipating that the rip rap would need to be removed. We agree that it is not a permanent fix. Another thought if a box culvert were constructed would be to break down the north abutment below pavement but not entirely and then place cells from the north abutment to to the south. The portion of the existing north abutment to remain could essentially act as temporary retention and help to maintain the channel during construction. The south side would still need to be addressed but that would at least that would help mitigate impacts. Can CBBEL confirm the 9' scour depth noted? That could complicate construction also. In any case, we just wanted to offer some ideas. thanks,

MN

From: Masouridis, Eleftherios P [Eleftherios.Masouridis@illinois.gov]
Sent: Tuesday, June 05, 2012 12:20 PM
To: Nashif, Manar; 'cwang@cbbel.com'; 'Kevin.Nichols@CH2M.com'
Cc: Larry Martin (Larry.Martin@ch2m.com); 'Lidia.Pilecky@CH2M.com'; Brazas, Wesley; Wojcik Rick (Rick.Wojcik@illnois.gov); 'edward.yousif@aecom.com'; Batista, Santos
Subject: RE: Elmhurst Road over Higgins Creek

The new structure would have to be constructed to account for scour.
Rip-rap is not a permanent scour countermeasure. We would a new bridge constructed so it can be coded as an 8 for scour. The current bridge is scour critical so this rating would probably remain if the north abutment is salvaged. We would not support this.

Since a closed abutment bridge is proposed abutment scour is being evaluated and total scour is currently projected around 9' in the Hydraulic Report. A spread footing would need to be below this depth or piles appropriately designed would be needed. Depending on the soils there could be some reduction in computed scour.

Generally 8'-10' behind an existing abutment is needed to construct a new abutment without conflict. There is about that much room to do this on the south but not the north as noted. The north abutment is going to be a problem for most scenarios we have looked at.

Perry
E. Perry Masouridis, P.E.
Hydrology and Hydraulics Engineer
Illinois Department of Transportation, Region 1 Bureau of Programming, Hydraulics Section
201 West Center Court
Schaumburg, IL. 60196-1096
Phone: (847) 705-4474 Fax: (847) 221-3052
Email: eleftherios.masouridis@illinois.gov
From: Nashif, Manar [mailto:mnashif@getipass.com]
Sent: Tuesday, June 05, 2012 10:04 AM
To: 'cwang@cbbel.com'; 'Kevin.Nichols@CH2M.com'
Cc: Larry Martin (Larry.Martin@ch2m.com); 'Lidia.Pilecky@CH2M.com'; Brazas, Wesley; Masouridis, Eleftherios P; Wojcik Rick (Rick.Wojcik@illnois.gov); 'edward.yousif@aecom.com'
Subject: Elmhurst Road over Higgins Creek

Kevin/Chin,

Wes visited the Elmhurst Road over Higgins Creek site yesterday and took some photos. One photo is attached. We can provide the others but they are too large to email. It seems that building the new abutment south of the existing abutment makes the most sense. There is limited room to lengthen to the north. The north abutment could be salvaged and widened in kind if condition warrants. The new south abutment could then be constructed under dry conditions. Let us know your thoughts.

Ilene Dailey

From: Brian.Connor@CH2M.com
Sent: Friday, May 18, 2012 1:21 PM
To: Jason.Moller@CH2M.com; idailey@cbbel.com
Subject: RE: Higgins Creek response items

See below...

Regarding 27 – I will forward off to see if we have documentation. I am unaware at this time.

bjc

Brian J. Connor, P.E.

CH2M HILL
8735 West Higgins Road
Suite 400
Chicago, IL 60631
Direct: 773.458.2816
Fax: 773.693.3823
www.ch2mhill.com

From: Moller, Jason/CHI
Sent: Friday, May 18, 2012 1:10 PM
To: Connor, Brian/CHI
Cc: idailey@cbbel.com
Subject: FW: Higgins Creek response items

Brian, see below from CBBEL.

From: Ilene Dailey [mailto:idailey@cbbel.com]
Sent: Friday, May 18, 2012 12:02 PM
To: Moller, Jason/CHI
Cc: cwang@cbbel.com
Subject: Higgins Creek response items

Jason,

Two comments on our Higgins Creek Hydraulic Report need additional input from your office. The comments and our responses are listed below:

27	Section 10	SB	Provide correspondence between all design teams for the project in regards of leaving the structure at IL72/RR crossing in place. IDOT agrees with leaving the existing culvert in place, however, coordination between the Toll Way and the project managers need to be documented.	**RFS**	We have not been invol structure condition.

34	Higgins Creek Hydraulic Report, page 8	Kent Olson	The Hydraulic Report for I-90 over Higgins Creek lists the length that the bridge will be extended. Has a Level 3 Barrier Warrant Analysis been performed to determine the length of this extension? Barrier W.A. for Project C, as well as the I-90 improvements, will be performed by Tollway DSE's to those projects. CH2M HILL's scope of work will identify and provide to the DSE's preliminary hazard locations and level of analysis need during the Concept Design Phase.	E	The question will be for CH2MHill for dispositior

If you have correspondence regarding the IL 72/RR crossing discussion, or Barrier Warrant Analyses for any of the Higgins Creek structures, please forward them to me for inclusion. Thanks.

Ilene

Ilene A. Dailey, P.E., CFM
Senior Drainage Engineer
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
E-Mail: idailey@cbbel.com

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Ilene Dailey

From: Chiliang Wang [cwang@cbbel.com]
Sent: Friday, May 04, 2012 11:14 AM
To: Kevin.Nichols@CH2M.com
Cc: Keith.Mockenhaupt@CH2M.com; idailey@cbbel.com
Subject: RE: EOWB Elmhurst Road options

Kevin:

The box culvert size has been given by IDOT. The idea is driven by construction cost. Its hydraulic performance very similar to the 34' slab bridge. Although the box culvert is wider than the bridge, the culvert depth is not uniform. Outer culverts are 2' shallower than the inner culverts. Generally, I consider a bridge is more efficient than a box culvert hydraulically. For this case, the four culverts have three inside walls that are estimated to have a total wall thickness of 6'. More walls create more friction loss. Additionally, I do not anticipate the effective waterway opening between culvert and bridge will be identical because their modeling techniques are different.

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Vice President
Head, Drainage Department
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E-Mail: cwang@cbbel.com

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From: Kevin.Nichols@CH2M.com [mailto:Kevin.Nichols@CH2M.com]
Sent: Wednesday, May 02, 2012 11:11 PM
To: cwang@cbbel.com
Cc: Keith.Mockenhaupt@CH2M.com
Subject: RE: EOWB Elmhurst Road options

Why is the box culvert wider (4 cells at 12' = 48') versus a 34'bridge? It should b no more than 3 – 12's which is 36' so the openings are about the same.

Kevin S. Nichols
Project Manager/MW Geographic Operations Manager
Transportation Business Group

NEW ADDRESS

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Fax 773.693.4711
Mobile 618.407.6217
knichols@ch2m.com
www.ch2mhill.com

From: Chiliang Wang [mailto:cwang@cbbel.com]
Sent: Wednesday, May 02, 2012 10:20 AM
To: Nichols, Kevin/CHI
Cc: Pilecky, Lidia/CHI
Subject: FW: EOWB Elmhurst Road options

Kevin:

FYI

Chinliang R. Wang, PE
Vice President
Head, Drainage Department
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Phone: (847) 823-0500 Fax: (847) 823-0520
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From: Ilene Dailey [mailto:idailey@cbbel.com]
Sent: Tuesday, May 01, 2012 7:16 PM
To: Keith.Mockenhaupt@CH2M.com
Cc: cwang@cbbel.com
Subject: EOWB Elmhurst Road options

Keith,

After much ado, we are moving forward with two options at Elmhurst Road. One is a 34' slab bridge, the other is 4 RCBC.

The slab bridge has low chord elevations of 652.46 at Station 11153, and 652.28 at Station 11187.

The box culverts, as generally described by the IDOT reviewer, are two 12'X8' in the middle plus two 12'X6' that will be placed one on each side of the middle 2- 12'X8' and have inverts two feet higher so that the low flows stay in the middle of the channel. The proposed inverts for the middle two culverts are 648.2 upstream and 647.9 downstream. The proposed inverts for the wing culverts are 650.2 upstream and 649.9 downstream. I estimated a length of 114'. If that is off, please let me know. It is not clear to me whether the center culverts will need to be 12'x9' and embedded one foot to meet Corps requirements, but that does not significantly impact the hydraulic analysis.

The Waterway Information Tables will be forthcoming. Let me know if you have any questions or concerns.

Ilene

Ilene A. Dailey, P.E., CFM
Senior Drainage Engineer
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
E-Mail: idailey@cbbel.com

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Ilene Dailey

From: Ilene Dailey [idailey@cbbel.com]
Sent: Friday, April 20, 2012 10:14 AM
To: 'Batista, Santos'; 'cwang@cbbel.com'; 'Masouridis, Eleftherios P'
Cc: 'Wojcik, Rick F'
Subject: RE: Elmhurst Road options

Santos,

I will put this new configuration into the model. Thanks.

Ilene A. Dailey, P.E., CFM
Senior Drainage Engineer
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
E-Mail: idailey@cbbel.com

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From: Batista, Santos [mailto:Santos.Batista@illinois.gov]
Sent: Friday, April 20, 2012 9:41 AM
To: 'cwang@cbbel.com'; Masouridis, Eleftherios P; Ilene Dailey
Cc: Wojcik, Rick F
Subject: RE: Elmhurst Road options

Chin and Ilene, please also investigate using Box culverts as was discussed previously to try to meet the permit and design criteria at Elmhurst Road. From looking at the models Ilene has created so far, I believe a multiple box culvert system could be used here. Please see if using 2-12'X8 in the middle plus two 12'X7 will work. The 12'X7' will be placed one on each side of the middle 2- 12'X8' and have inverts one foot higher so that the low flows stay in the middle of the channel.
If you would like to discuss further please give me a call.

Santos Batista
Hydraulics Engineer
IDOT/Disrtrict One
(847) 705-4764

From: Chinliang R. Wang [mailto:cwang@cbbel.com]
Sent: Saturday, April 14, 2012 12:08 PM
To: Masouridis, Eleftherios P; Ilene Dailey; Batista, Santos
Cc: 'Chin Wang'; Wojcik, Rick F
Subject: Re: Elmhurst Road options

Thank you for your prompt response. Ilene accompanies her daughter to visit a college on Monday. We will consult with you on Tuesday prior to moving forward. Have a great weekend.

Chinliang R. Wang, PE

Vice President
Head, Drainage Department
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
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Sent on the Sprint® Now Network from my BlackBerry®

From: "Masouridis, Eleftherios P" <Eleftherios.Masouridis@illinois.gov>
Date: Sat, 14 Apr 2012 12:39:02 +0000
To: 'idailey@cbbel.com'<idailey@cbbel.com>; Batista, Santos<Santos.Batista@illinois.gov>
Cc: 'Chin Wang'<cwang@cbbel.com>; Wojcik, Rick F<Rick.Wojcik@illinois.gov>
Subject: RE: Elmhurst Road options

As I understand it the proposed structure along with the currently proposed profile reduces flood elevations up to and including the 100-year flood event.
Based on the summary tables for the 100-yr event attached to the email, all the options except the one incorporating the replacement of the Kirie crossing yield very similar WSE to the current proposal. Little additional benefit to the 100-yr is realized by any of the other options intended to improve performance for the 500-yr event.

The maximum calculated flood is the 500-yr event and there is at most a 0.2' increase in the flood profile. At what frequency the proposed geometry and bridge transitions from a decrease to an increase is not clear.

Let's look at the various options:

Option 3: Enlarging the downstream structures at Touhy and Mt Prospect road provides insignificant benefits upstream and the scope does not call for their replacement. While reviewing the HR Santos had looked into this for other reasons and came to the same conclusion.

Further evaluation of Touhy and Mt Prospect seems fruitless unless there is a significant benefit to comp storage needs which I do not recall is the case. My understanding is that there is adequate comp storage to be provided. This eliminates option 3.

Option 4: This option is not feasible due to impacts on an adjacent driveway.

Option 5: This option increases created head above the current proposal so it can be ruled out because the extra cost and difficulty of constructing the overflow culverts do not provide any benefit. Even for the 100-yr there is less benefit than the current proposal.

Option 6: Option 6 still shows an increase that rounds to 0.1' and it requires IDOT to replace a downstream restrictive structure that belongs to a different agency. This requires work beyond the ROW and it should not be the responsibility of IDOT to replace another agencies structure that contributes to upstream flooding. Even the current option 6 concept for the Kirie structure does not reduce created head to 0.1' so it would require additional evaluation.

Option 7 : Option 7 shows the limitations of the site due to existing constraints imposed by existing land use/development and the improvements shown do not change the results derived from the current scope.

My understanding is that the currently proposed roadway profile is based on geometric needs that relate to the safe and efficient operation of the roadway. Since we have designed a structure that reduces created head to the greatest extent practicable (at a minimum up to and including the 100-yr flood event) within the given site constraints, it does seem prudent to trade one risk for another. The roadway is used every day so it should be designed to operate safely and efficiently. The low floor elevation noted below is below the 100-yr flood elevation and the project will reduce the depth of flooding for that event. Assuming flood waters can reach the finished floor elevation it appears the structure will be susceptible to flooding for all the alternatives that were explored.

There appears to be no reasonable alternative to the current proposal, the project is permissible under the Part 3708 rules and does provide upstream benefits for some flood event between the 100-yr and 500yr frequency. The roadway project provides a reasonable balance between geometric and hydraulic needs so the current design should proceed.

Perry

E. Perry Masouridis, P.E.
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Illinois Department of Transportation, Region 1
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Schaumburg, IL. 60196-1096

Phone: (847) 705-4474 Fax: (847) 221-3052
Email: eleftherios.masouridis@illinois.gov

From: Ilene Dailey [mailto:idailey@cbbel.com]
Sent: Friday, April 13, 2012 5:52 PM
To: Masouridis, Eleftherios P; Batista, Santos
Cc: 'Chin Wang'
Subject: Elmhurst Road options

Perry and Santos,

As we discussed, the Elmhurst Road profile has been raised from the existing condition, impacting the 500-year flood profile along Higgins Creek. A PDF showing the road profile comparison is attached. The existing road overtopping elevation is 658.23. The proposed road overtopping elevation is 658.61, based on the effective flow area north of the bridge. The existing 100-year and 500-year flood elevations upstream of Elmhurst Road at XS 5.9994 are 658.34 and 659.49 respectively.

Three "door sills" were surveyed by DB Sterlin for buildings upstream of Elmhurst Road. From north to south the door sill elevations are 660.70, 659.68, and 660.00. One "finished floor" elevation of 656.96 was shot for the large warehouse/industrial building north of the Tributary A confluence.

Several Elmhurst Road options were run using the HEC-RAS "Design" model as a base. All elevations are in NAVD 88. All proposed options use CH2MHill's proposed road profile and cross sections received April 3, 2012, and include the proposed floodplain fill along Higgins Creek and the compensatory storage area west of Elmhurst Road. The model plan options are:

1. Design EXHigg 88 – The existing condition model using the existing road profile and 25' slab bridge.

2. DesElmSlab041112 – A proposed option using the proposed road profile (PRP) and a 34' slab bridge. Max. 500 WSEL diff. = 0.19'
3. DesBigDS 041112 – A proposed option with a 38' slab bridge, and greatly enlarged downstream openings under Mt. Prospect Road and Touhy Avenue/RR. Opening the DS structures has no effect up at Elmhurst Road. Max. 500 WSEL diff. = 0.17'
4. PrElmBIGSlab0412 – A proposed option with a 49' slab bridge (required deck depth may be greater than modeled) that spans the downstream concrete channel. This option would impact the adjacent driveway. Max. 500 WSEL diff. = 0.11'
5. DesElmMult041112 – A proposed option with a 30' slab bridge and three 10'x3' RCB culverts to the south. The multiple opening analysis option was used, and downstream effective areas modified. Max. 500 WSEL diff. = 0.24'
6. DesElmKIRIE0413 – A proposed option with a 30' slab bridge and a downstream 25' slab bridge to replace the existing 17'x9' box culvert at the Kirie Water Treatment Plant entrance. Max. 500 WSEL diff. = 0.08'
7. DesPrElmUSChan – A proposed option with a 34' slab bridge and providing channel widening at cross section 6.029. Due to existing building and parking lot, the cross sections between 6.029 and the Elmhurst bridge cannot be expanded. Max. 500 WSEL diff. = 0.19'

A zip file of the model with all the associated plans is attached, as are summary sheets for the 500-year and 100-year WSELs. (Please note that to compare on-screen *profile geometry* between the existing and any of the proposed plans, the existing plan must be the first plan selected.) I will attempt to send a scan of the XS worksheet in a separate email.

The most effective option for reducing upstream elevations includes enlarging the downstream Kirie entrance structure. We look forward to discussing these options, and their potential impacts, with you in more detail.

Ilene A. Dailey, P.E., CFM
Senior Drainage Engineer
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
E-Mail: idailey@cbbel.com

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Ilene Dailey

From: Chinliang R. Wang [cwang@cbbel.com]
Sent: Friday, April 06, 2012 12:47 PM
To: idailey@cbbel.com
Cc: mantas@cbbel.com
Subject: RE: EOWB Project C / I-90

Ilene:

Both IDOT and ISTHA are desirous of doing that.

Chinliang R. Wang, PE
Vice President
Head, Drainage Department
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
E-Mail: cwang@cbbel.com

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From: Ilene Dailey [mailto:idailey@cbbel.com]
Sent: Friday, April 06, 2012 12:30 PM
To: cwang@cbbel.com
Cc: mantas@cbbel.com
Subject: RE: Project C / I-90

Chin,

I asked Brian Connor about the timing between Project C and the I-90 mainline. His understanding is that CH2M will be coordinating the two projects, and to assume that the I-90 mainline construction will coincide or go before Project C. He mentioned that the Tollway has decisions to make regarding the Oasis, etc.

For the Higgins Creek Tributary A culverts under I-90, I will analyze a proposed larger skewed structure to completely replace the existing culverts.

Ilene

Ilene A. Dailey, P.E., CFM
Senior Drainage Engineer
Christopher B. Burke Engineering, Ltd.
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Phone: (847) 823-0500 Fax: (847) 823-0520
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From: Chinliang R. Wang [mailto:cwang@cbbel.com]
Sent: Friday, April 06, 2012 10:46 AM

To: idailey@cbbel.com
Subject: RE: Elmurst Road / I-90

Please

Chinliang R. Wang, PE
Vice President
Head, Drainage Department
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
E-Mail: cwang@cbbel.com

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From: Ilene Dailey [mailto:idailey@cbbel.com]
Sent: Friday, April 06, 2012 10:38 AM
To: cwang@cbbel.com
Subject: RE: Elmurst Road / I-90

I did not ask. Shall I call him back?

Ilene A. Dailey, P.E., CFM
Senior Drainage Engineer
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
E-Mail: idailey@cbbel.com

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From: Chinliang R. Wang [mailto:cwang@cbbel.com]
Sent: Friday, April 06, 2012 10:38 AM
To: idailey@cbbel.com
Subject: FW: Elmurst Road / I-90

Ilene:

I have not heard from Ed about this. Did Brian know the proposed scope of the I-90 pavement?

Chinliang R. Wang, PE
Vice President
Head, Drainage Department
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
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From: Yousif, Edward [mailto:Edward.Yousif@aecom.com]
Sent: Wednesday, April 04, 2012 3:22 PM

To: cwang@cbbel.com
Subject: Elmurst Road / I-90

Chin,

I left Manar a message, but he hasn't responded yet. He may be at a meeting.

Edward Yousif, PE
AECOM
Technical Leader
303 E. Wacker Drive, Suite 600
Chicago, IL 60601-5212
P: (312) 373-6786 / F: (312) 373-6834

Ilene Dailey

From: Chinliang R. Wang [cwang@cbbel.com]
Sent: Tuesday, April 03, 2012 11:21 AM
To: idailey@cbbel.com
Subject: FW: Scour info. for Elhurst Rd. Bridge over Higgins Creek
Attachments: Scour Calcs. for Elhurst Rd. over Higgins Creek.pdf; CN 60J05 PLANS.PDF

IN SECTION 16 OF REPORT.

Ilene:

FYI

Chinliang R. Wang, PE
Vice President
Head, Drainage Department
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
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From: Batista, Santos [mailto:Santos.Batista@illinois.gov]
Sent: Tuesday, April 03, 2012 10:50 AM
To: cwang@cbbel.com
Subject: FW: Scour info. for Elhurst Rd. Bridge over Higgins Creek

Hi Chin, attached is the existing scour information at Elmhurst Rd over Higgins Creek. This information goes with the previous comments I sent to you but forgot this attachment. Please forward this information to Ilene. Thanks.

Santos Batista
Hydraulics Engineer
IDOT/Disrtrict One
(847) 705-4764

From: Jimenez, Jorge L.
Sent: Tuesday, April 03, 2012 10:36 AM
To: Batista, Santos
Subject: Scour info. for Elhurst Rd. Bridge over Higgins Creek

Santos,

Attached is the scour calculations and a memo written for the recommended scour countermeasures project. I also attached a copy of the plans for the scour countermeasures project.

I-90 bridge over Higgins creek is not in our set of files so I think the bridge is the Toll way's responsibility.

-Jorge

Ilene Dailey

From: Chinliang R. Wang [cwang@cbbel.com]
Sent: Wednesday, March 21, 2012 4:45 PM
To: Jason.Moller@CH2M.com
Cc: idailey@cbbel.com
Subject: FW: EOWB Drainage Design Exception
Attachments: Design Exceptions_Level 1 all sections_v2Jan2012.020412.doc

Jason:

Per your request.

Chinliang R. Wang, PE
Vice President
Head, Drainage Department
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
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From: Chinliang R. Wang [mailto:cwang@cbbel.com]
Sent: Monday, February 06, 2012 4:52 PM
To: 'Jason.Moller@CH2M.com'
Subject: EOWB Drainage Design Exception

Jason:

Attached is the spreadsheet listing drainage design exception per your request. Should I bring the Technical Memorandums to the meeting at IDOT?

Chinliang R. Wang, PE
Vice President
Head, Drainage Department
Christopher B. Burke Engineering, Ltd.
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Elgin O'Hare – West Bypass: Level One Design Exception Criteria List

Project Design Section Layout:

West Section – Elgin-O'Hare, Gary Ave to Plum Grove
Central Part A Section – Elgin-O'Hare, Plum Grove to Salt Creek (including I-290)
Central Part B Section – Elgin-O'Hare, Salt Creek to West Terminal and West Bypass
South Section – West Bypass, South of West Terminal to I-294 (including I-294)
North Section – West Bypass, North of West Terminal to I-90 (including I-90)

TABLE 1
Design Exception List – Level One

No.	Project Design Section	Location	Agency Jurisdiction	Design Criteria Reference	Agency Design Criteria	Project Design Met	Justification
					Clearance		
	North	Elmhurst Road	IDOT	IDOT Drainage Manual	2 feet	0.15 foot	1. Raising profile further will require right-of-way takings. 2. Raising profile further will adversely impact local access and cause driveway closures. 3. Raising profile further will require much larger bridge opening to offset an increase in created head. 4. A much larger opening may adversely impact Willie Road and driveways. 5. Raising profile and enlarging bridge opening further will delay the project implementation and increase cost. 6. The existing roadway has never experienced overtopping.
					Freeboard		
	North	Elmhurst Road	IDOT	IDOT Drainage Manual	3 feet	1.54 feet	1. Raising profile further will require right-of-way takings. 2. Raising profile further will adversely impact local access and cause driveway closures. 3. Raising profile further will require much larger bridge opening to offset an increase in created head. 4. A much larger opening may adversely impact Willie Road and driveways. 5. Raising profile and enlarging bridge opening further will delay the project implementation and increase cost. 6. The existing roadway has never experienced overtopping.
	Central Part A	IL Route 83	IDOT	IDOT Drainage Manual	3 feet	-0.9 foot	1. Raising profile further will require right-of-way acquisition. 2. Raising profile further will require retaining walls and adversely impact the surrounding property access. 3. Raising profile further will require much larger culvert opening to offset an increase in created head and may require improvements of outlet structures outside the IL Route 83 right-of-way. 4. Raising profile further will require extension of the project limit. 5. Raising profile and enlarging culvert opening further will delay the project implementation. 6. The proposed roadway profile and proposed culvert opening have been optimized within the existing right-of-way.

Ilene Dailey

From: Chinliang R. Wang [cwang@cbbel.com]
Sent: Wednesday, March 07, 2012 6:43 PM
To: Kevin.Nichols@CH2M.com
Cc: idailey@cbbel.com; 'Miroslaw Antas'
Subject: RE: EOWB Elmhurst/Higgins Creek Bridge

Kevin:

There is not a change in direction from our perspective. IDOT instructed us and your staff to pursue a deviation approval for the bridge last December. Subsequently, the hydraulic report was submitted accordingly.

Last Monday, your staff mentioned about looking into the alternatives including raising the profile of Elmhurst Road. I cautioned them that raising the profile further might request a longer span or dual spans to reduce created head. We will have to rerun the hydraulic model if roadway profile and bridge opening are changed. Then, I reminded them that IDOT instructed us to not finalize the hydraulic report until the BCR is complete and bridge type including beam type is selected.

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From: Kevin.Nichols@CH2M.com [mailto:Kevin.Nichols@CH2M.com]
Sent: Wednesday, March 07, 2012 6:00 PM
To: cwang@cbbel.com
Cc: mantas@cbbel.com
Subject: Elmhurst/Higgins Creek Bridge

Chin,
I was out of town and not able to be at our Monday meeting. One question arose when I got a debrief from Brian relates to the Elmhurst Bridge over Higgins Creek. They heard that we do not want to raise the profile or the elevation of the bottom chord at all due to some upstream hydraulic concerns. This sounds very strange to me given all of the discussion we have had to date on this issue. Can you provide me an explanation for the change in direction and what the driving factors are? Thanks.

Kevin S. Nichols
Project Manager/MW Geographic Operations Manager
Transportation Business Group

NEW ADDRESS

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Tel 773.693.3809, x 43879
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Mobile 618.407.6217
knichols@ch2m.com
www.ch2mhill.com

Structure Narrative Memorandum

Prepared By: Ilene A. Dailey, PE, CBBEL

Subject: Elgin O'Hare-West Bypass
I-90 and Elmhurst Road Structures along Higgins Creek
Des Plaines, IL

Project No: P-91-443-06

Date: February 22, 2012

The I-90 bridge (SN: 016-9975 EB, 019-9869 WB) is a two-span structure with open abutments and a single continuous pier. The abutments and pier will be extended to accommodate the proposed roadway widening and ramps. The slight reduction in created head is due to improved hydraulic efficiency at the upstream end of the bridge. In the existing condition, the upstream channel is overgrown, while in the proposed condition, the extended bridge will tie into the improved channel (paved channel upstream and revetment mat downstream). Based on lengthening the piers and abutments a small portion of unlined channel is eliminated so that there is a net decrease in water surface elevation for all flood events.

The Elmhurst Road bridge (SN: 016-0677) is a single span bridge. It will be replaced to improve hydraulic characteristics and to accommodate proposed roadway widening and ramps. To minimize the span length and thereby minimize the deck beam depth, vertical closed abutments are considered, as geometric constraints do not allow a significant grade raise. The proposed structure details are preliminary and subject to refinement. The bridge opening will be increased. The overtopping elevation will be slightly increased, largely due to the proposed raised median. The channel shape beneath the bridge will be maintained. As the new structure will extend slightly over the existing downstream concrete-lined channel, design details of the channel transition and scour protection will be critical. As currently analyzed, the proposed bridge maintains the location of the north abutment due to the driveway that is immediately adjacent. All proposed bridge widening is to the south. There is a net decrease in water surface elevation for the 10-, 50-, and 100-year flood events.

The I-90 culverts are proposed to be extended to accommodate the proposed roadway widening and ramps. The existing opening is maintained. Due to the replacement of the Elmhurst Road bridge and the proposed culvert lengthening, the downstream and upstream conditions are different. At the downstream end, in the existing condition, the culverts discharge into a short vegetated channel that enters a pond along the main Higgins Creek. In the proposed condition, the culverts will extend all the way into the pond. The water surface elevations in the pond are affected by the proposed work to the Elmhurst Road bridge. In the proposed condition, the 10-, 50-, and 100-year pond elevations are lower, while the 500-year elevation is higher. (There is no change to the normal pool elevation, as that is controlled by a small dam upstream of Elmhurst Road.) Also, in the proposed condition, the culverts will extend upstream past a constricting cross section to a wider channel section, although the upstream floodplain width is affected longitudinally by the proposed widening. The result is a net decrease in water surface elevation for the 10-, 50-, and 100-year flood events.

Ilene Dailey

From: Masouridis, Eleftherios P [Eleftherios.Masouridis@illinois.gov]
Sent: Wednesday, February 22, 2012 12:49 PM
To: keith.mockenhaupt@ch2m.com; idailey@cbbel.com
Cc: Wojcik, Rick F; Batista, Santos; cwang@cbbel.com; lidia.pilecky@ch2m.com; sarah.archer@ch2m.com
Subject: RE: EOWB Higgins Creek DESIGN WITs

Thanks,

I understand the issue of freeboard and clearance and see we are trying to get these the most improvement we can within the constraints of the project site. Different structure types have different advantages and disadvantages. If Phase I gets completed with a deck beam design there will be little likelihood that it will be reevaluated when it goes to Phase II.

As currently proposed the new bridge will have the low beam above the 50-yr which is an improvement. Ideally it should be above the 100-yr but I understand there are constraints. Since a closed abutment structure is proposed and the beam will be submerged the computed scour values may be deep which could impact the foundation design. This needs to be kept in mind.

I am in favor of the higher beam elevation. Again a 3-sided structure does not have to meet the clearance requirement so this could help shape the decision.

Also we will be processing a design exception in Phase I so when the BCR is prepared the preferred alternative should not be less than the design exception or it will need to be justified all over again and may need a revised hydraulic analysis. This could be an issue if the low beam elevation is based on the deck beam concept so that a revised concept can no longer achieve this.

Perry

E. Perry Masouridis, P.E.
Hydrology and Hydraulics Engineer
Illinois Department of Transportation, Region 1
Bureau of Programming, Hydraulics Section
201 West Center Court
Schaumburg, IL. 60196-1096

Phone: (847) 705-4474 Fax: (847) 221-3052
Email: eleftherios.masouridis@illinois.gov

From: Keith.Mockenhaupt@CH2M.com [mailto:Keith.Mockenhaupt@CH2M.com]
Sent: Wednesday, February 22, 2012 11:41 AM
To: Masouridis, Eleftherios P; idailey@cbbel.com
Cc: Wojcik, Rick F; Batista, Santos; cwang@cbbel.com; Lidia.Pilecky@CH2M.com; Sarah.Archer@CH2M.com
Subject: RE: EOWB Higgins Creek DESIGN WITs

Perry:

Scour is basically a concern for any bridge type. The reason I mentioned it with the 3-sided is the typical use of spread footing foundations. That is certainly not to say deep foundations (piles) cannot be used with a 3-sided structure.

The real issue is we do not have clearance or freeboard. Raising the profile to obtain this is costly/impractical due to the location of nearby roads, driveways, etc. As such, we were simply testing the District's preference as to potential structure types that would be on the order of the existing structure depth so as not to make matters worse. All potential bridge types will be addressed in the BCR.

Thanks.

KSM

From: Masouridis, Eleftherios P [mailto:Eleftherios.Masouridis@illinois.gov]
Sent: Wednesday, February 22, 2012 11:28 AM
To: Mockenhaupt, Keith/CHI; idailey@cbbel.com
Cc: Wojcik, Rick F; Batista, Santos; cwang@cbbel.com; Pilecky, Lidia/CHI; Archer, Sarah/CHI
Subject: RE: EOWB Higgins Creek DESIGN WITs

Keith,

Scour is going to be similar for a slab bridge and a precast 3 sided. If a 3-sided is selected then the clearance criteria does not apply so that is an advantage. Sometimes they are built using piles (I think IL 176 over Skokie River used piles). We have also used other measures to address scour like using a concrete bed 1' below the stream invert (Il 68 over Wheeling D.D.).

If a 3-sided is feasible and a CIP slab with an increased span that meets current structure depth is possible wouldn't that be preferred over a deck beam structure assuming there is no significant cost increase?

Generally a BCR would investigate this including a steel beam structure which may be the most costly and may also have the most profile impacts.

Perry

E. Perry Masouridis, P.E.
Hydrology and Hydraulics Engineer
Illinois Department of Transportation, Region 1
Bureau of Programming, Hydraulics Section
201 West Center Court
Schaumburg, IL. 60196-1096

Phone: (847) 705-4474 Fax: (847) 221-3052
Email: eleftherios.masouridis@illinois.gov

From: Keith.Mockenhaupt@CH2M.com [mailto:Keith.Mockenhaupt@CH2M.com]
Sent: Wednesday, February 22, 2012 8:28 AM
To: idailey@cbbel.com; Masouridis, Eleftherios P
Cc: Wojcik, Rick F; Batista, Santos; cwang@cbbel.com; Lidia.Pilecky@CH2M.com; Sarah.Archer@CH2M.com
Subject: RE: EOWB Higgins Creek DESIGN WITs

Ilene:

I spoke with Sarah Wilson this AM. While she is not particularly in favor of using precast deck beams at this location, she will not rule them out. She mentioned we would be required to use a 5" concrete overlay on the top of the beams. So, a 17" deck beam with a 5" overlay is 22" which is less than what I can tell from existing drawings as the structure depth.

Sarah also mentioned a 3-sided, precast type structure or a CIP slab bridge. The CIP slab bridge would likely be a little deeper than the deck beams but should be at the existing structure depth even with the increased span.

Concerns about a 3-sided structure would be scour and foundation treatment. They are typically set on spread footings. The existing bridge is on piling.

Based on the above, I would assume we will be able to propose a structure that will have a similar depth to the existing thereby not changing the low beam elevation?

If you have any questions, please drop me a line or give me a call.

KSM

From: Ilene Dailey [mailto:idailey@cbbel.com]
Sent: Tuesday, February 21, 2012 2:44 PM
To: 'Masouridis, Eleftherios P'
Cc: 'Wojcik, Rick F'; 'Batista, Santos'; cwang@cbbel.com; Mockenhaupt, Keith/CHI
Subject: RE: EOWB Higgins Creek DESIGN WITs

Perry,

Thanks for the comments. I will add the suggested notes to the WITs and provide a short narrative to accompany them.

Regarding the Elmhurst Road bridge, the channel shape beneath the bridge was maintained. Attached are HEC-RAS XS print-outs that demonstrate that. Photographs are also attached. As the new structure will extend slightly over the existing downstream concrete-lined channel, design details of the channel transition and scour protection will be critical. As currently analyzed, the proposed bridge maintains the location of the north abutment due to the driveway that is immediately adjacent. All proposed bridge widening is to the south.

The structural engineer at CH2MHill is handling the coordination with Sarah Wilson and the BB&S, as low beam clearance is already an issue, and is copied on this email. We will let you know the results of the structural coordination ASAP.

Ilene

Ilene A. Dailey, P.E., CFM
Senior Drainage Engineer
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
E-Mail: idailey@cbbel.com

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From: Masouridis, Eleftherios P [mailto:Eleftherios.Masouridis@illinois.gov]
Sent: Thursday, February 16, 2012 3:11 PM
To: idailey@cbbel.com

Cc: Wojcik, Rick F; Batista, Santos; cwang@cbbel.com
Subject: RE: EOWB Higgins Creek DESIGN WITs

Thanks.

For I-90 I thought it was mentioned at the Des Plaines meeting that the bridge would be replaced but it will not. So based on lengthening the piers and abutments a small portion of unlined channel is to be eliminated so that there is a net decrease in water surface elevation. This could be noted on the WIT. I am assuming the approach section is u/s of this segment of the channel. The WIT looks ok.

For Elmhurst Rd I understand the bridge is to be replaced and in the revised WIT the 10-yr decrease in area is now an increase so this looks better. However, the section through the bridge should try to mimic the natural channel so that it will be less likely to silt in and the model does not represents area that will be lost in the future. For example, if below the NWL the upstream channel is roughly 20' wide then we should not expect the bridge opening to maintain a 32' wide channel over time. IDNR has made IDOT revise bridge designs in the past to reflect this.

Another comment for Elmhurst Rd is that deck beam structures are not preferred so this should be coordinated with Sarah Wilson and the BB&S. If the design gets changed to steel later we should be sure the proposed low beam elevation can be achieved. If these two issues are addressed then the WIT looks ok.

For Higgins Creek Trib 'A', the note on the WIT should help explain why the HWE is being reduced. The area now shows no reduction.

When we resend the information to Des Plaines it may be helpful to provide a brief narrative similar to what you did below. The WIT can be labeled draft or prefinal pending review of the Hydraulic Report by Santos.

Perry

E. Perry Masouridis, P.E.
Hydrology and Hydraulics Engineer
Illinois Department of Transportation, Region 1
Bureau of Programming, Hydraulics Section
201 West Center Court
Schaumburg, IL. 60196-1096

Phone: (847) 705-4474 Fax: (847) 221-3052
Email: eleftherios.masouridis@illinois.gov

From: Ilene Dailey [mailto:idailey@cbbel.com]
Sent: Tuesday, February 14, 2012 6:38 PM
To: Masouridis, Eleftherios P
Cc: Wojcik, Rick F; Batista, Santos; cwang@cbbel.com
Subject: RE: EOWB Higgins Creek DESIGN WITs

Perry,

Attached are the revised Design WITs for I-90 bridge at Higgins Creek, the Elmhurst Road bridge at Higgins Creek, and the I-90 twin culverts at Tributary A. The effective waterway openings are calculated as the flow area at the surveyed opening sections under the Natural High Water Elevations.

The I-90 bridge is a two-span structure with open abutments and a single continuous pier. The abutments and pier will be extended to accommodate the proposed roadway widening and ramps. The slight reduction in created head is due to improved hydraulic efficiency at the upstream end of the bridge. In the existing condition, the upstream channel is overgrown, while in the proposed condition, the extended bridge will tie into the improved channel (paved channel upstream and revetment mat downstream).

The Elmhurst Road bridge is a single span bridge. It will be replaced to improve hydraulic characteristics and to accommodate proposed roadway widening and ramps. To minimize the span length and thereby minimize the deck beam depth, vertical closed abutments are proposed, as geometric constraints do not allow a significant grade raise. The bridge opening will be increased. The overtopping elevation will be slightly increased, largely due to the proposed raised median.

The I-90 culverts are proposed to be extended to accommodate the proposed roadway widening and ramps. The existing opening is maintained. Due to the replacement of the Elmhurst Road bridge and the proposed culvert lengthening, the downstream and upstream conditions are different. At the downstream end, in the existing condition, the culverts discharge into a short vegetated channel that enters a pond along the main Higgins Creek. In the proposed condition, the culverts will extend all the way into the pond. The water surface elevations in the pond are affected by the proposed work to the Elmhurst Road bridge. In the proposed condition, the 10-, 50-, and 100-year pond elevations are lower, while the 500-year elevation is higher. (There is no change to the normal pool elevation, as that is controlled by a small dam upstream of Elmhurst Road.) Also, in the proposed condition, the culverts will extend past a constricting cross section to a wider channel section, although the upstream floodplain width is affected longitudinally by the proposed widening.

I hope this addresses your concerns. Please call if you have further questions.

Ilene

Ilene A. Dailey, P.E., CFM
Senior Drainage Engineer
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
E-Mail: idailey@cbbel.com

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From: Masouridis, Eleftherios P [mailto:Eleftherios.Masouridis@illinois.gov]
Sent: Friday, February 10, 2012 8:17 AM
To: cwang@cbbel.com
Cc: Wojcik, Rick F; idailey@cbbel.com; Batista, Santos
Subject: RE: EOWB Higgins Creek DESIGN WITs

Chin,

I am always concerned when the proposed area is less than existing yet the WIT shows that created head goes down.

Based on the WIT sent to Des plaines this is the case for Elmhurst Rd at the ten year and also for I-90 at Trib. A. For Trib. A the reductions may raise some concern because it seems the reductions in created head are due only to a culvert extension. This could be based on the location of the approach section.

I-90 mainline shows similar characteristics plus I thought this structure is being replaced. IDOT would use an open abutment structure which generally has more area than a closed abutment bridge. Also it seems a single span is feasible at this location. If a closed abutment design is to be used make sure to include abutment scour in the calculations. If the I-90 Higgins creek structure is to be replaced please confirm a preferred structure type with the ISTHA. On the WIT where it says type also note if the bridge is open or closed abutment.

Also we always try to maintain or increase the area of the opening (based on the natural WSE).

Perry

E. Perry Masouridis, P.E.
Hydrology and Hydraulics Engineer
Illinois Department of Transportation, Region 1
Bureau of Programming, Hydraulics Section
201 West Center Court
Schaumburg, IL. 60196-1096

Phone: (847) 705-4474 Fax: (847) 221-3052
Email: eleftherios.masouridis@illinois.gov

From: Chinliang R. Wang [mailto:cwang@cbbel.com]
Sent: Thursday, February 09, 2012 5:05 PM
To: 'Tim Oakley'
Cc: Masouridis, Eleftherios P; Wojcik, Rick F; Krall, Ronald D; Lidia.Pilecky@CH2M.com; idailey@cbbel.com; mantas@cbbel.com; Nashif, Manar
Subject: EOWB Higgins Creek DESIGN WITs

Tim:

Attached are waterway information tables for two structures under I-90 and one structure under Elmhurst Road to demonstrate that proposed structures will not increase flood stages for all storm events up to and including 100-year storm event.

Chinliang R. Wang, PE
Vice President
Head, Drainage Department
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E-Mail: cwang@cbbel.com

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Ilene Dailey

From: Chinliang R. Wang [cwang@cbbel.com]
Sent: Wednesday, January 04, 2012 3:37 PM
To: idailey@cbbel.com
Subject: FW: EOWB DWG Meeting #6 Agenda - Elmhurst road over Higgins Creek

Ilene:

Please include it into the hydraulic report.

Chinliang R. Wang, PE
Vice President
Head, Drainage Department
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
E-Mail: cwang@cbbel.com

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From: Wojcik, Rick F [mailto:Rick.Wojcik@illinois.gov]
Sent: Wednesday, January 04, 2012 3:22 PM
To: Masouridis, Eleftherios P; cwang@cbbel.com
Cc: Krall, Ronald D; Harmet, Pete E; Batista, Santos; Lockwood, Roger S.; Kessy, Marion E; Lidia.Pilecky@CH2M.com; Larry.Martin@CH2M.com; Kevin.Nichols@CH2M.com; Yousif, Edward
Subject: FW: EOWB DWG Meeting #6 Agenda - Elmhurst road over Higgins Creek

FYI

Richard F. Wojcik, P.E.
Hydraulics Section Chief
Bureau of Programming
201 West Center Court
Schaumburg, Illinois 60196

Telephone 847 705 4105
EMail Rick.Wojcik@illinois.gov

From: Landers, Jeffrey J
Sent: Wednesday, January 04, 2012 2:46 PM
To: Wilson, Sarah M; Wojcik, Rick F
Subject: RE: EOWB DWG Meeting #6 Agenda - Elmhurst road over Higgins Creek

016-0677 Elmhurst Rd over Higgins Creek is one of the scour critical bridges that had rip-rap installed in 2011. We do not have any records of flooding at this location. *

Do you want me to send one of our official drainage memos for your report?

From: Wilson, Sarah M
Sent: Wednesday, December 21, 2011 11:48 AM

To: Landers, Jeffrey J
Subject: FW: EOWB DWG Meeting #6 Agenda - Elmhurst road over Higgins Creek

Any flooding?

From: Wojcik, Rick F
Sent: Wednesday, December 21, 2011 11:48 AM
To: Wilson, Sarah M; Mahoney, Dennis A; Farmer, Tavis
Cc: Masouridis, Eleftherios P; Kessy, Marion E; Lockwood, Roger S.; 'Lidia.Pilecky@CH2M.com'; 'Larry.Martin@CH2M.com'; Harmet, Pete E; 'mmatkovic@cbbel.com'; 'Yousif, Edward'; 'Bicking, Stephen'; 'cwang@cbbel.com'; Stumpner, James A; Krall, Ronald D
Subject: RE: EOWB DWG Meeting #6 Agenda - Elmhurst road over Higgins Creek

Could the Bureau of Maintenance please check their records and advise us if there is any flooding along Elmhurst Road at the bridge crossing Higgins Creek (north of I-90). See attached location map.

The bridge could be affected by the Elgin O'Hare West Bypass project when this interchange is improved. I don't know the exact scope of bridge work but we (Hydraulics Section) need to complete our hydraulic modeling.

The Hydraulic Section has no reports of flooding along Elmhurst Road at the crossing location. The closest location we show flooding is on 5/9/90 along Oakton Street between IL 72 and IL 83. That's it. *

Thank you

Richard F. Wojcik, P.E.
Hydraulics Section Chief
Bureau of Programming
201 West Center Court
Schaumburg, Illinois 60196

Telephone 847 705 4105
EMail Rick.Wojcik@illinois.gov

From: Wojcik, Rick F
Sent: Wednesday, December 21, 2011 11:13 AM
To: 'cwang@cbbel.com'
Cc: Masouridis, Eleftherios P; Kessy, Marion E; Lockwood, Roger S.; Lidia.Pilecky@CH2M.com; Larry.Martin@CH2M.com; Harmet, Pete E; mmatkovic@cbbel.com; 'Yousif, Edward'; 'Bicking, Stephen'
Subject: RE: EOWB DWG Meeting #6 Agenda - IL 83 at Bryn Mawr flooding

Chin,

Please find the pavement flooding incident reports for Il 83 at Bryn Mahr (Between Thorndale and Foster). I can only send one set (set 1) at a time since the pdf files could be quite large.

You requested the incident reports at our 12/19/11 DWG. I can't believe you didn't already have this information when your staff came to our office and picked up all the DI reports and pavement flooding reports more than a year ago?

Il 83 ¼ mi south of Thorndale (at Bryn Mawr) is in IDOT's top twenty pavement flooding locations for arterial streets for 2010 year report. We show 18 incidents of flooding since 1987. I found 17 incident reports. Close enough.

Set 2 coming next.

Richard F. Wojcik, P.E.
Hydraulics Section Chief
Bureau of Programming
201 West Center Court
Schaumburg, Illinois 60196

Telephone 847 705 4105
EMail Rick.Wojcik@illinois.gov

From: Chinliang R. Wang [mailto:cwang@cbbel.com]
Sent: Friday, December 16, 2011 10:16 AM
To: Wojcik, Rick F; Masouridis, Eleftherios P
Subject: EOWB DWG Meeting #6 Agenda

Rick, Perry:

Would you please review the attached meeting agenda? Thanks.

Chinliang R. Wang, PE
Vice President
Head, Drainage Department
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
E-Mail: cwang@cbbel.com

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SORT	2011 RANK	2010 RANK	2009 RANK	2008 RANK	MARKED ROUTE	NAMED ROUTE	LOCATION	MUNICIPALITY	COUNTY	PUMP STA NO	1985 thru 2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	TOTAL	CURRENT AVERAGE DAILY TRAFFIC	TRAFFIC COUNT DATE	INITIAL RANKING (ADT x OCC) / 1000	LAST DATE FLOODED	COMMENTS	1	2	3	4
3			75	111	ILLINOIS ROUTE 72	TOUHY AVENUE	AT ELMHURST ROAD TO MT. PROSPECT ROAD	DES PLAINES	COOK		2	0	0	0	0	0	0	1	1	0	0	4	39500	2005	158.00	02/27/09		08/14/97	08/31/01	09/13/08	02/27/09

Report Attached? √√ ✓ ✓

IDOT Touhy Ave.
Pavement Flooding
Reports

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DISTRICT 1, OPERATIONS AND COMMUNICATIONS CENTER

ICING ☐ FLOODING ☒ DATE 8/14/87 DAY Friday ROUTINE ☐

DISP	TIME RECD	INFORMANT	LOCATION	INCI-DENT	CONTACTED	TIME	VERIFIED (NAME)	TIME&DATE	D
Che	12:35A	DesPlaines Public Works Pat	Touhy @ Mt Prospect	Flood	RC 395 Arlington	1AM	?		
Che	12:35A	"	Rand @ River	"	RC 395 Northbrook	1:16A			
Che	12:35A	"	83 @ Algonquin	"	RC 395 Arlington	1AM			
Che	12:45A	State 3	NB53 @ I1162	"	Tollefson I-290	1:16A			
Che	12:45A	Warrenville PD # 396	59 @ Edgewood	"	Boebel Naperville	1:15A	CLEAR		
Che	1:43A	Lisle PD # 97	Ogden @ 1mi w/o Belmont	"	BOEBEL NAPERVILLE	—			
SMS	1 53 AM	RC#949 FABRY	NW KENNEDY IN JEFFERSON TUNNEL	FLOOD	KUTA KENNEDY	2 15 AM	CLEAR		
SMS	2 12 AM	RC-969 DILLING	SE KENNEDY @ ADDISON	FLOOD	KUTA KENNEDY	2 15 AM	CLEAR		
SMS	2 18 AM	RC 969 DILLING	NW @ Bryn Mawr	FLOOD	KUTA KENNEDY	2 23 AM	CLEAR		
SMS	2 19 AM	RC-969 DILLING	NW @ KB Barrington RAMP	FLOOD	KUTA KENNEDY	2 23 AM	CLOSED		
SMS	2 18 AM	RC 969 DILLING	SE @ Central	FLOOD	KUTA KENNEDY	2 23 AM	CLEAR		
SMS	2 21 AM	RC 49 FABRY	NW & SE KENNEDY MONTROSE TO WILSON	FLOOD	KUTA KENNEDY	2 23 AM	CLEAR		

ILLINOIS DEPARTMENT OF TRANSPORTATION DISTRICT 1
OPERATIONS AND COMMUNICATIONS CENTER INCIDENT REPORT

DATE:	DAY:	TIME: AM/PM	INFORMANT:
8/31/01	FRIDAY	02:39AM	RC392 POLADIAN

SUBJECT: CLOSURE OF RT 72 DUE TO FLOODING

LOCATION:	COUNTY:	LOAD AND WEIGHT:
EB RT72 FROM ELMHURST RD TO MT. PROSPECT RD.	COOK	

*** PUBLIC/MEDIA EMERGENCY INFORMATION DISTRIBUTION***

CONGESTION LIMITS DUE TO INCIDENT:

IAR	CMS	CRT	DOT-INFO EXT#

SPRINGFIELD NOTIFIED (WHO/TIME) Gary 8/31/01 930am **FAX TO SPFLD. (TIME)**

DETAILS AND NOTIFICATIONS IN CHRONOLOGICAL ORDER

TIME (AM/PM)	
02:39AM	RC392 WHILE ENROUTE TO ANOTHER CALL ENCOUNTERED FLOODING ON RT72, BETWEEN ELMHURST AND MOUNT PROSPECT, AND NOTIFIED US THAT IT WOULD HAVE TO BE CLOSED ON THE EASTBOUND SIDE.
02:45AM	ELK GROVE PD INFORMED US THAT IT WAS UNDER COUNTY JURISDICTION.
02:46AM	A CALL WAS PLACED TO UNITED RENTAL PER RC392'S REQUEST.
02:49AM	LOUIE AT SPRINGFIELD WAS NOTIFIED.
02:54AM	NC MR ZELENKOVICH WAS NOTIFIED.
03:03AM	COUNTY ARRIVED ON THE SCENE. COOK COUNTY PD ASSISTING.
03:15AM	PAT FROM UNITED RENTAL RESPONDED.
03:40AM	RC392 NOTIFIED US OF RECENT CONSTRUCTION WORK ON THIS AREA OF ROADWAY, AND THAT THEY MAY SHARE SOME RESPONSIBILITY.
03:43AM	**RC392 ALSO NOTIFIED US OF THE NEED FOR CLOSURE OF ELMHURST RD. BOTH NORTH AND SOUTHBOUND AT LANDMEIR BETWEEN 72 TO NORTH OF THE TOLLWAY.**
04:22AM	**ATTEMPTED TO CONTACT MR CORCORAN FROM PLOTE CONSTRUCTION, LEFT MESSAGE.**
04:40AM	**NOTIFIED MR HEALY,HE SAID HE WOULD NOTIFY PLOTE.**
06:23AM	MIKE POLADIAN RC392 CALLED WITH UPDATE ON AREA: RT 72ELMHURST TO MT. PROSPECT, EB CLOSED COMPLETELY, EB & WB ON WB SIDE. ELMHURST AT LANDMEIR SB CLOSED COMPLETELY, USING NB FOR NORTH& SOUTH TRAFFIC. OLD HIGGINS ROAD CLOSED COMPLETELY HAS APPROXIMATELY 6FT OF WATER ON IT.
9:25AM	George got a call from Mr. Mara to call United Rentals and have them pick up the barricades. United Rentals advised. When they are picked up the road will be opened.(GS) Poladian/LW, Gary/Springfield, Sue/supv, Richardson for Chiarugi all advised. Mr. Tyszkiewicz, Fonda, Aling and Mara all alpha paged.(GS)
0:30am	RC# 392 will check it again in an hour and let us know.(GS)

VEHICLE INFO:	PLATE #	STATE:
DRIVER / OWNER NAME:	TRAILER PLATE#	STATE:
ADDRESS:	CITY:	STATE:
D / ACCIDENT RPT. #	E.M.C. #	
COMMERCIAL M.C.S. (METAL COILS)#:		

VERIFIED DATE: 8/31/01 **TIME:** 11:33a **AM/PM** **NAME:** RC 613 **SPECIALIST (INT):** OAT

COPIES SENT TO:	OP. COM. SPECIALIST(S)
FITZGERALD, FONDA, WANG, JONAK, TYSZKIEWICZ VAITLA, COMSUP5	GEORGE HAMBACH
	INCIDENT REPORT #
	01 -3280

OPERATIONS AND COMMUNICATIONS CENTER

*** FLOODING ***

DATE: 9-12 DAY: Sat. PAGE: 4 OF:

DISP. INIT. / TIME	INFORMANT / NAME OR #	LOCATION OF FLOODING CONDITION	LANE #'S	EST. DEPTH	PASSABLE (YES / NO)	PUMP STATION / YES CONT. NAME / TIME	MAINT. NOTIFIED NAME / TIME	VERIFICATIONS NAME / TIME	VERIFICATIONS INIT / D
JP 6:59	ISP Sarah	NB 94° 147 (IL83) NB 94° 159			1/ yes		M. Bell	1441	9-12
WP 7:24	Wheeler PO #367	EB & WB Palatine Road at Wolf Road → Both Lanes				See IR-	Ford 655A Rc302 7:55AM	Disp RC 311	MF GM
WP 7:27	Kane Co; #19	Route 47 NORTH OF Route 72 - Stanley Center					Hartshorn RC537 / 8:33AM	1051A RICH	9/1 9/8
WP 7:29	Batavia PO #384	Route 31 at Bayn Manor.					St Charles	1138A 506	9/6 9/6
7:31	Des Plaines PD.	~~Des Plaines PD.~~					OAKbrook	1125A	
7:32 am	Des Plaines PD 395	~~Hot Hoof Pt. to of~~ Golf at Rand Road					Altmeyer	RC 401	GM
7:38 am	Des Plaines PD 395	300 E. Touhy Ave Des Plaines (By Railroad Tracks) → Near Wolf Road					Arlington Altmeyer	10 51A P1000	9/1 9/5
WP	Hanover Park	Lake Street - WB R/Lane By Walgreens WALNUT	Under Water	?			Arlington McFarland	1235P Frederick	9/5 9/5
		Route 64 and RAMSDELL (B/O 47)	Flooded	?			Roseberry RC537 / 8:33AM	1235P RICH	9/5 9/5
							St Charles	1138A	

BT
PB
318

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2008

S/SS/FORMS/DAILY/TREFIC

BLT 03/21/0

ILLINOIS DEPARTMENT OF TRANSPORTATION
DISTRICT ONE
OPERATIONS AND COMMUNICATIONS CENTER

*** FLOODING ***

DATE: 2.27.09 DAY: FRIDAY PAGE: 1 OF:

DISP. INIT. / TIME	INFORMANT / NAME OR #	LOCATION OF FLOODING CONDITION	LANE #'S	EST. DEPTH	PASSABLE (YES / NO)	PUMP STATION / YES CONT. NAME / TIME	MAINT. NOTIFIED NAME / TIME	VERIFICATIONS NAME / TIME	VERIFICATIONS INIT / DATE
SKJ	ISP-HOTLINE	WB RT 72, 1 mi W/O Del.	RL/LL	12"	YES		RC414 - AH	WOP Bob 2:45pm	SKJ
147A		HTS RD					154A	RC393 2-27-09-2	
SKJ	DES PLAINES	EB TOUHY, just W/O MOUNT	2 LANES	N/A	YES		RC 395 (1990)	RC 419	SKJ
233A	PD #903	PROSPECT RD					245A	404	2.27
SKJ	MCHENRY	NB/SB RT 14 e STATE LINE	ALL	6"	YES		RC 272	WOPS RC288	SKJ
248A	CO #1981	BIGFOOT					302A	356	2.27

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2009

BLT 03/21/0

Images: Record rainfall hits suburbs - DailyHerald.com - Windows Internet Explorer

dailyherald.com

willow creek gage

File Edit View Favorites Tools Help

Favorites | Images: Record rainfall hits subu...

Page Safety Tools

Images: Record rainfall hits suburbs

Buy this photo

3 of 20



Flooding on eastbound Touhy Road caused a traffic jam right before the train tracks in Des Plaines Saturday morning.

Samantha Bowden | Staff Photographer









Internet 100%

http://www.dailyherald.com/article/20110723/news/707239758/photos/

Ilene Dailey

From: Masouridis, Eleftherios P [Eleftherios.Masouridis@illinois.gov]
Sent: Tuesday, January 04, 2011 12:15 PM
To: pprocaccio@cbbel.com
Cc: idailey@cbbel.com
Subject: RE: Higgins Creek Structures under I-90 - IDOT structure numbers

Peter,

I did not see numbers for these. If it is a culvert or bridge that spans less than 20' historically those did not require one for IDOT needs. That has been changing recently as we issue them at least for tracking purposes but since these are owned by the Tollway we probably would not do so.
I found I-90 over Higgins creek 016-9975 (EB) & 016-9869 (WB) which have a scour rating of 5. I also found Elmhurst Rd 016-0677 which is scour critical so we would probably look to replace it.

Perry

E. Perry Masouridis, P.E.
Hydrology and Hydraulics Engineer
Illinois Department of Transportation, Region 1
Bureau of Programming, Hydraulics Section
201 West Center Court
Schaumburg, IL. 60196-1096

Phone: (847) 705-4474 Fax: (847) 221-3052
Email: eleftherios.masouridis@illinois.gov

From: Peter Procaccio [mailto:pprocaccio@cbbel.com]
Sent: Tuesday, January 04, 2011 10:40 AM
To: Masouridis, Eleftherios P
Cc: idailey@cbbel.com
Subject: Higgins Creek Structures under I-90 - IDOT structure numbers

Perry,

We can't seem to find IDOT structure numbers for the Higgins Creek Tributary A culvert under I-90 and the I-90 bridge over Higgins Creek (main stem) in any of our files. While we do have the ISTHA structure numbers, we'd like to be thorough. Would you be able to quickly check with the bridge office or maintenance?

Thanks,

Peter A. Procaccio
Civil Engineer
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
E-Mail: pprocaccio@cbbel.com

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Ilene Dailey

From: Masouridis, Eleftherios P [Eleftherios.Masouridis@illinois.gov]
Sent: Thursday, December 16, 2010 11:29 AM
To: idailey@cbbel.com
Cc: Winograd, Esther B
Subject: RE: Elmhurst Road at Higgins Creek

Ilene,

Scour ratings are based on a scour evaluation that includes theoretical scour computations. How much of the piers are exposed or if scour is below the footing affects the scour rating. You will be doing similar calculations for the Hydraulic Report.

We met with MWRD yesterday and they also note the upstream erosion and have provisions in their watershed plan (prepared by CBBEL) to address them. This is separate from bridge scour.

Esther is doing the counter measure design and is more familiar with the bridge so you should give her a call to discuss this bridge.

Perry

E. Perry Masouridis, P.E.
Hydrology and Hydraulics Engineer
Illinois Department of Transportation, Region 1
Bureau of Programming, Hydraulics Section
201 West Center Court
Schaumburg, IL. 60196-1096

Phone: (847) 705-4474 Fax: (847) 221-3052
Email: eleftherios.masouridis@illinois.gov

From: Ilene Dailey [mailto:idailey@cbbel.com]
Sent: Thursday, December 16, 2010 10:01 AM
To: Masouridis, Eleftherios P
Subject: RE: Elmhurst Road at Higgins Creek

Perry,

I'm curious about the scour at this bridge. During my site visit there was evidence of scour upstream, but not so much at the structure. The Master Structure Report for SN 016-0677 says "scour critical". What am I missing?

Ilene

Ilene A. Dailey, P.E., CFM
Senior Drainage Engineer
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018
Phone: (847) 823-0500 Fax: (847) 823-0520
E-Mail: idailey@cbbel.com

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From: Masouridis, Eleftherios P [mailto:Eleftherios.Masouridis@illinois.gov]
Sent: Monday, December 06, 2010 3:36 PM
To: idailey@cbbel.com
Subject: FW: Elmhurst Road at Higgins Creek

Ilene,

We are looking at some scour related issues and the FIS does not have much published at this location.

Isn't this the same location that we are studying as part of the EOWB?

If so can you provide us the flow rates at this location that we are using?

Perry

E. Perry Masouridis, P.E.
Hydrology and Hydraulics Engineer
Illinois Department of Transportation, Region 1
Bureau of Programming, Hydraulics Section
201 West Center Court
Schaumburg, IL. 60196-1096

Phone: (847) 705-4474 Fax: (847) 221-3052
Email: eleftherios.masouridis@illinois.gov

From: Winograd, Esther B
Sent: Monday, December 06, 2010 1:54 PM
To: Masouridis, Eleftherios P
Subject: Elmhurst Road at Higgins Creek

Perry,

For the construction of the scour countermeasures we will need the 2 year water elevation at the subject crossing. We do not have yet in house the backup for the latest (2008) H&H. It will be helpful to obtain the 2 year elevation information from Burke.

Thanks

Esther Winograd
847/705-4475

Ilene Dailey

From: Boyd, William [William.Boyd@Illinois.gov]
Sent: Monday, November 29, 2010 1:29 PM
To: 'idailey@cbbel.com'
Subject: RE: Higgins Creek crossing

Ilene,

We have a data base record of issuing permits to MSDGC (now MWRDGC) for work at this site. However, we have no plans or back up data on file. The information has been filmed. Permit No. 13962 was issued in 1975 and Permit No. 15871 was issued in 1979.

Bill Boyd

Bill Boyd, P.E.

Water Resources Engineer
Illinois Department of Natural Resources
Office of Water Resources
Division of Resource Management
2050 West Stearns Road
Bartlett, IL 60103

847-608-3100 ext 2025
847-931-2037 fax

From: Ilene Dailey [mailto:idailey@cbbel.com]
Sent: Tuesday, November 23, 2010 5:51 PM
To: Boyd, William
Cc: cwang@cbbel.com
Subject: Higgins Creek crossing

Bill,

Does your office have supporting documents for a floodway construction permit for the Kirie treatment plant entrance over Higgins Creek? The entrance is located east of Elmhurst Road and north of Wille Road, as shown on the attached FIRM, in the NW ¼, Section 25, T41N, R11E. The crossing is not in the FIS model we have. If possible, I would like to drop by your office to look at the plans and calculations to confirm our recently-received survey information and water surface profiles. FYI , we're working for IDOT, looking at a future bridge replacement on Elmhurst Road as part of the Elgin-O'Hare West Bypass project.

Thanks, and have a great Thanksgiving,

Ilene

Ilene A. Dailey, P.E., CFM
Senior Drainage Engineer
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600 Rosemont, IL 60018

Phone: (847) 823-0500 Fax: (847) 823-0520
E-Mail: idailey@cbbel.com

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MINUTES OF MEETING

November 01, 2010

TO: Elgin-O'Hare West Bypass Project Files
CBBEL IDOT 07-0404

FROM: IAD

SUBJECT: Higgins Creek and Higgins Creek Tributary A Hydraulic Models

ATTENDEES: Perry Masouridis – IDOT
Santos Batista – IDOT
Don Dressel – CBBEL
Ilene Dailey – CBBEL

This meeting was held at 8:30 AM in the Local Roads conference room at IDOT. The purpose of this meeting was to discuss the hydraulic modeling of Higgins Creek for the proposed Elgin-O'Hare West Bypass (EOWB).

The overall map of the area was discussed. It is anticipated that 4 major crossings will be analyzed (Higgins Creek at Touhy Avenue, I-90, and Elmhurst Road; Higgins Creek Tributary A at I-90). There is no expected change to the Higgins Creek at Mt. Prospect Road entrance crossing, and the existing crossing will be included in the models. The proposed ramps from I-90 to the West Bypass are anticipated to be high rise structures that will not impact the floodplain, and will be covered by the abbreviated hydraulic data form.

As an aside, the availability of two potential detention/compensatory storage area locations was discussed. One is a triangular open area south of I-90 and east of Elmhurst Road. The other is an open area owned by the City of Chicago south of Cell 1 of the Touhy Avenue Reservoir. Perry suggested this area may also provide space to enlarge Cell 1 if necessary to provide compensatory storage volume for proposed bridge piers. He felt the I-90/Elmhurst property could be used for detention storage.

There are several existing hydraulic models for Higgins Creek and Tributary A. Starting at the downstream end, the O'Hare Completion Phase HEC-RAS model for Willow Creek includes Higgins Creek up to Touhy Avenue. We understand that Perry has discussed use of the Willow Creek model with Bill Boyd at IDNR-OWR and it is acceptable to use as the baseline model for the downstream end of Higgins Creek.

From Touhy Avenue upstream to I-90, there is a Higgins Creek LOMR HEC-RAS model that has been reviewed and was approved in 2007 by both IDNR-OWR and FEMA. This model includes the reach through the Touhy Avenue Reservoir area. Appending the LOMR model onto the Willow Creek model matches the FIS 100-year profile within 0.07' at all locations up to I-90.

Upstream of I-90, the Higgins Creek LOMR HEC-RAS model includes cross sections converted from the original WSP-2 model, and uses the approved FIS discharges. This area was not remapped as part of the LOMR. It appears that the published FIS Higgins Creek flood profiles in this area are mislabeled, and are likely the 10-year and 100-year profiles. Based on that assumption, the HEC-RAS model provides a reasonable match that may be improved with n-value adjustment.

Tributary A has an approved LOMR HEC-RAS model that extends from the confluence with Higgins Creek upstream to near Busse Road. It was agreed that this model needs to be updated with current survey to reflect the CUP reservoir and creek relocations. Modeling for this area was done many years ago by the Corps of Engineers, but a LOMR was not pursued.

In summary, by combining the above models, a single, continuous HEC-RAS model will be prepared extending from the Higgins Creek confluence with Willow Creek to upstream of I-90 on Tributary A. The combined model will be augmented with recently surveyed cross sections to create the "existing conditions" model. This model will include the crossing upstream of Wille Road (MWRD Kirie WWTP entrance road) that is not in the current models. Based on a meeting between IDNR-OWR and IDOT on October 28, 2010, the inclusion of obvious omissions such as a bridge or culvert into the FIS will not require a LOMR in order to recognize the updated analysis for permitting purposes. IDOT can continue to issue a permit where there is a designated floodway with a drainage area greater than or equal to 1 square mile under the Part 3708 rules.

To create the "natural conditions" model, crossings will be removed from the existing conditions model. We discussed removing all affected major crossings at once vs. removing one at a time, to best determine the "natural conditions" for each location. Several iterations may be necessary.

Perry said that combining all the crossings into a single hydraulic report is acceptable.

Ilene will prepare the existing and natural conditions models, hydraulic report, and waterway information tables.

N:\Idot\070404\Drain\Docs\EOWB Higgins Mtg Minutes.110110.docx

Illinois Department of Transportation
Division of Highways/Region One / District One
201 West Center Court/Schaumburg, Illinois 60196-1096

Hydraulics Section
Route: Elgin O'Hare West Bypass
County: Cook/DuPage

October 17, 2008

City of Des Plaines
1420 Miner Street
Des Plaines, IL 60016
Attn: Tim Oakley

Dear Mr. Oakley:

This is to confirm the telephone conversation on September 29, 2008 with Peter Procaccio of Christopher B. Burke Engineering relative to the drainage study to be prepared as part of the Location Phase for the subject improvement (see attached map). We are requesting the appropriate drainage information for incorporation into the drainage study.

In particular, we request the following:

- Storm sewer plans
- Combined sewer atlas
- Utility plans
- Contour mapping
- Proposed and current drainage improvements
- Identification of flooding experience associated with the highway or adjacent properties
- Local ordinance

If you have any questions or need additional information, please contact Peter Procaccio, Drainage Engineer, at Christopher B. Burke Engineering, Ltd. (847)-823-0500

Very truly yours,

Diane M. O'Keefe, P.E.
Deputy Director of Highways,
Region One Engineer

By:
Peter E. Harmet, P.E.
Bureau Chief of Programming

Attachment

Illinois Department of Transportation
Division of Highways/ Region One / District One
201 West Center Court/Schaumburg, Illinois 60196-1096

Hydraulics Section
Route: Elgin O'Hare West Bypass
County: Cook/DuPage

October 17, 2008

Cook County Highway Department
69 West Washington Avenue -- 21st Floor
Chicago, IL 60602
Attn: Bob Mack

Dear Mr. Mack:

This is to confirm the telephone conversation on October 16, 2008 with Peter Procaccio of Christopher B. Burke Engineering relative to the drainage study to be prepared as part of the Location Phase for the subject improvement (see attached map). We are requesting the appropriate drainage information for incorporation into the drainage study.

In particular, we request the following:

- Storm sewer plans
- Combined sewer atlas
- Utility plans
- Contour mapping
- Proposed and current drainage improvements
- Identification of flooding experience associated with the highway or adjacent properties
- Local ordinance

If you have any questions or need additional information, please contact Peter Procaccio, Drainage Engineer, at Christopher B. Burke Engineering, Ltd. (847)-823-0500

Very truly yours,

Diane M. O'Keefe, P.E.
Deputy Director of Highways,
Region One Engineer

By: Peter Harmet
Peter E. Harmet, P.E.
Bureau Chief of Programming

Attachment

03-12-36

Illinois Department of
Natural Resources

Rod R. Blagojevich, Governor

One Natural Resources Way • Springfield, Illinois 62702-1271
http://dnr.state.il.us

Joel Brunsvold, Director

RECEIVED
OCT 28 2005
CHRISTOPHER B. BURKE ENGINEERING LTD.

October 24, 2005

SUBJECT: Permit No. NE2005080
O'Hare Modernization Program,
North Airfield Site Preparation Improvements
Willow Creek, Higgins Creek and Willow-Higgins Creek
Cook County
Application No. 2004314

Rosemarie S. Andolino, Executive Director
City of Chicago
O'Hare Modernization Program
P. O. Box 66142
Chicago, Illinois 60666

Dear Ms. Andolino:

We are enclosing Permit No. NE2005080 authorizing the subject project.

If any changes in the location or plans of the work are proposed, revised plans should be submitted promptly to my office for review and approval before construction begins.

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.

When the work is completed, please contact Bill Boyd of my staff at 847/608-3100 extension 2025 so we may schedule a final inspection.

Sincerely,

Gary Jereb for

Gary W. Jereb, P.E., Chief
Northeastern Illinois Regulatory Programs Section

GJ/WB:crw
Enclosure
cc: Chicago District Corps of Engineers (Chic. COE)
Ross Anderson, BPC Airport Partner
Kay Whitlock, Christopher B. Burke Engineering, Ltd.
Chicago Department of Environment
Chicago Department of Transportation

Printed on recycled and recyclable paper

PERMIT NO. NE2005080
DATE: October 24, 2005

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 66142
Chicago, Illinois 60666

to relocate and reshape channels and floodways, to construct replacement culvert crossings for Mt. Prospect Road and Wolf Road, to construct two box culvert stream enclosures, to construct, operate and maintain a replacement Class II dam (Willow-Higgins Reservoir Dam), to enlarge the North Detention Basin, and to construct other appurtenant and temporary structures as part of the North Airfield airport improvements on Willow Creek, Higgins Creek and Willow-Higgins Creek in Sections 31 and 32, Township 41 North, Range 12 East and Section 36, Township 41 North, Range 11 East of the Third Principal Meridian in Cook County,

in accordance with an application dated August 16, 2004, and the plans and specifications listed on the attached sheet entitled:

PLANS AND SPECIFICATIONS FOR PERMIT NO. NE2005080, CITY OF CHICAGO, O'HARE MODERNIZATION PROGRAM.

Examined and Recommended:

Gary Jereb 24 PM

Gary W. Jereb, Chief
Northeastern Illinois Regulatory
Programs Section

Approval Recommended:

Gary R. Clark

Gary R. Clark, Director
Office of Water Resources

Approved:

Joel Brunsvold

Joel Brunsvold, Director
Department of Natural Resources

This PERMIT is subject to the terms and special conditions contained herein.

PLANS AND SPECIFICATIONS FOR PERMIT NO. NE2005080
CITY OF CHICAGO, O'HARE MODERNIZATION PROGRAM

O'HARE MODERNIZATION PROGRAM, NORTH AIRFIELD, SITE PREPARATION DRAWINGS, VOLUME III OF IV, WILLOW-HIGGINS RELOCATION, 102 SHEETS (EXCLUDING SHEETS C-109, CG-209, SB-101, SB-102 AND SB-103), DATED AUGUST 16, 2004, LAST REVISED MARCH 4, 2005, RECEIVED APRIL 11, 2005, SHEETS C-109 AND CG-209, DATED AUGUST 16, 2004, LAST REVISED AUGUST 29, 2005, RECEIVED SEPTEMBER 6, 2005, SHEET CG-119, DATED APRIL 11, 2005, LAST REVISED AUGUST 29, 2005, RECEIVED SEPTEMBER 6, 2005, SHEETS SB-101, SB-102 AND SB-103, DATED AUGUST 16, 2004, LAST REVISED OCTOBER 21, 2005, RECEIVED OCTOBER 21, 2005,

TEMPORARY STREAM CROSSINGS, SHEET X-001, DATED AUGUST 16, 2004, RECEIVED AUGUST 24, 2005, UNTITLED PLAN AND ELEVATION VIEW DRAWINGS OF TEMPORARY SHEET PILING FOR HOT TAP AND THRUST BLOCK, 2 SHEETS, UNDATED, RECEIVED AUGUST 24, 2005

VOLUME IV OF IV, NORTH DETENTION BASIN GRADING AND STORM SEWERS, COVER SHEET AND SHEETS C-001, C-002, C-014, AND C-015, DATED APRIL 11, 2005, REVISED APRIL 11, 2005, RECEIVED SEPTEMBER 23, 2005

DAM SAFETY, OPERATION AND MAINTENANCE (O&M) MANUAL, WILLOW HIGGINS RESERVOIR, 15 SHEETS, DATED NOVEMBER 2001, REVISED SEPTEMBER 2005, RECEIVED SEPTEMBER 26, 2005.

NOTE.
100-YEAR WATER SURFACE ELEVATION USE NGVD 1929.

100-YEAR FLOODPLAIN BOUNDARY PLOTTED WITH REFERENCE TO AERIAL TOPOGRAPHY IN NAVD 1988.

LEGEND

- CHRL2 640.3 / XS-ID 100-YR WSEL — PROPOSED CONDITION CROSS-SECTION LOCATION
- PROPOSED CHANNEL
- PROPOSED CULVERT
- PROPOSED FLOODPLAIN BOUNDARY
- PROPOSED FLOODWAY BOUNDARY

SCALE 1" - 200'
0 200 400

WILLOW-HIGGINS CREEK CURRENT CHANNEL

CULVERT U/S OF LEE ST.

THIS CHANNEL HAS BEEN FILLED.

100-YR FLOODPLAIN AND FLOODWAY COINCIDENT AND CONTAINED IN CHANNEL

100-YR FLOODPLAIN AND FLOODWAY CONTAINED IN CULVERT

CENTER POINT PROPERTY

WOLF ROAD

I-90

LEE STREET

EXISTING WILLOW-HIGGINS CREEK ALIGNMENT

WILLOW-HIGGINS CREEK FLOOD CONTROL RESERVOIR CONTROL STRUCTURE

WILLOW-HIGGINS CREEK FLOOD CONTROL RESERVOIR

RUNWAY 14L-32R

MATCHLINE SEE SHEET 2 OF 3

O'Hare Modernization Program

O'HARE INTERNATIONAL AIRPORT
CITY OF CHICAGO
DEPARTMENT OF AVIATION

RICHARD M. DALEY
MAYOR

JOHN A. ROBERSON
COMMISSIONER

ROSEMARIE S. ANDOLINO
EXECUTIVE DIRECTOR

BPC Airport Partners
BPC — A JOINT VENTURE OF: BOWMAN, BARRETT & ASSOCIATES, PRIMERA, CH2M HILL, AND DB STERLIN
Master Civil Engineer

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

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

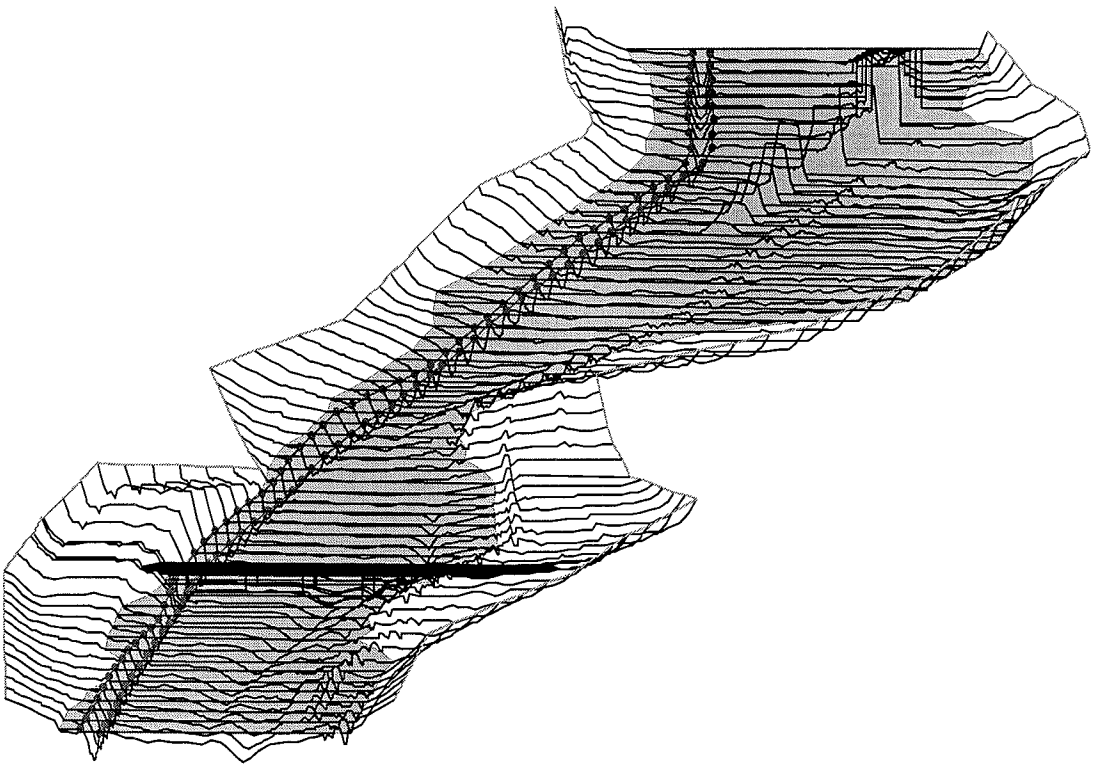
TITLE: **PROPOSED CONDITIONS CROSS-SECTION LOCATION, FLOODPLAIN AND FLOODWAY MAP**

PROJECT NO. 03-12
DATE: 8/24/2004
SHEET 1 OF 2

EXHIBIT 6

US Army Corps
of Engineers
Hydrologic Engineering Center

HEC-RAS
River Analysis System



Hydraulic Reference Manual

Version 4.1
January 2010

Approved for Public Release. Distribution Unlimited

CPD-69

Table 6-1 Manning's "n" for Closed Conduits Flowing Partly Full

Type of Channel and Description	Minimum	Normal	Maximum
Brass, smooth:	0.009	0.010	0.013
Steel:			
Lockbar and welded	0.010	0.012	0.014
Riveted and spiral	0.013	0.016	0.017
Cast Iron:			
Coated	0.010	0.013	0.014
Uncoated	0.011	0.014	0.016
Wrought Iron:			
Black	0.012	0.014	0.015
Galvanized	0.013	0.016	0.017
Corrugated Metal:			
Subdrain	0.017	0.019	0.021
Storm Drain	0.021	0.024	0.030
Lucite:	0.008	0.009	0.010
Glass:	0.009	0.010	0.013
Cement:			
Neat, surface	0.010	0.011	0.013
Mortar	0.011	0.013	0.015
Concrete:			
Culvert, straight and free of debris	0.010	0.011	0.013
Culvert with bends, connections, and some debris	0.011	0.013	0.014
Finished	0.011	0.012	0.014
Sewer with manholes, inlet, etc., straight	0.013	0.015	0.017
Unfinished, steel form	0.012	0.013	0.014
Unfinished, smooth wood form	0.012	0.014	0.016
Unfinished, rough wood form	0.015	0.017	0.020
Wood:			
Stave	0.010	0.012	0.014
Laminated, treated	0.015	0.017	0.020
Clay:			
Common drainage tile	0.011	0.013	0.017
Vitrified sewer	0.011	0.014	0.017
Vitrified sewer with manholes, inlet, etc.	0.013	0.015	0.017
Vitrified Subdrain with open joint	0.014	0.016	0.018
Brickwork:			
Glazed	0.011	0.013	0.015
Lined with cement mortar	0.012	0.015	0.017
Sanitary sewers coated with sewage slime with bends and connections	0.012	0.013	0.016
Paved invert, sewer, smooth bottom	0.016	0.019	0.020
Rubble masonry, cemented	0.018	0.025	0.030

[Chow, 1959]

US Army Corps of Engineers®

Idealized Marsh Simulations: Sensitivity of Hurricane Surge Elevation and Wave Height to Bottom Friction

by Nicholas M. Loder, Mary A. Cialone, Jennifer L. Irish, and Ty V. Wamsley

PURPOSE: The purpose of this CHETN is to examine changes in peak surge elevation and wave height due to changes in the frictional resistance of a marsh. Landscape features with vegetation have the potential to reduce storm surge elevations and dissipate wave energy. Land elevations greater than the storm surge elevation act as a physical barrier and create bathymetric resistance for the surge and waves. Landscape features such as marshes also have the potential to create frictional resistance and affect storm surge and wave energy even when below the surge elevation. This is the third in a series of technical notes on the influence of marshes on storm surge and waves. The analysis in this note isolates the sensitivity of the modeled storm surge elevation and wave height to the magnitude of bottom friction change and indicates, in a qualitative sense, the degree to which a marsh density may reduce storm surge elevation and wave height on the coast. The magnitude of bottom friction was systematically increased within a hypothetical marsh area to understand how marsh vegetation type and density may modify storm parameters (surge elevation and wave height) on the coast immediately landward of the marsh.

METHODOLOGY: A set of idealized surge simulations using ADCIRC (Westerink et al., 1992) and STWAVE (Smith et al., 2001) were made to examine changes in storm surge elevation and wave height with changes in various marsh characteristics, such as elevation, vegetation cover, shape, and continuity (degree of segmentation). This note presents results for changes in bottom friction, while accompanying technical notes evaluate other marsh characteristics. The modeling process involved an ADCIRC simulation followed by an STWAVE simulation, and finally a re-run of ADCIRC that includes wave radiation stress obtained from the STWAVE results. The modeling system applied is described by Bunya et al. (2009) and Wamsley et al. (2009). The model system was validated against high water marks for Hurricanes Katrina and Rita and results were generally within +/- 0.5 m of measurements. This study is a sensitivity analysis to assess how model results change for changes in coastal marsh-like features. Results presented in this note depict wave conditions and total surge levels driven by wind, atmospheric pressure, and wave radiation stress.

The idealized grid domain applied in this study included straight and parallel bathymetric contours on a 1:1000 continental shelf with a single perturbation (landscape feature representative of a marsh) positioned along the northern Gulf of Mexico, in the vicinity of southeastern Louisiana (Figure 1). The landscape feature is represented by a 400 km^2 portion of the coastline (the approximate size of Biloxi Marsh in southeastern Louisiana). Figure 2 depicts a cross section view of the idealized feature, representative of a marsh at high water. To estimate resistance imposed by vegetation within the water column, Manning's n is modified from the open water value of 0.020. While vegetative drag is dependent upon characteristics including vegetation density, height, and rigidity, the Manning's n value provides a qualitative estimation of the velocity reductions associated with vegetated flow. Manning's n values of 0.020, 0.035, and

ADDITIONAL INFORMATION: Questions about this CHETN can be addressed to Mary A. Cialone (601-634-2139, email: *mary.a.cialone@usace.army.mil*). This Technical Note should be referenced as follows:

> Loder, N. M., M. A. Cialone, J. L. Irish, and T. V. Wamsley. 2009. *Idealized Marsh Simulations: Sensitivity of Storm Surge Elevation to Areas of Increased Bottom Friction*, Coastal and Hydraulics Engineering Technical Note ERDC/CHL CHETN I-79. Vicksburg, MS: U.S. Army Engineer Research and Development Center. *http://chl.wes.army.mil/library/publications/chetn/*

ACKNOWLEDGEMENT: This work was supported by the Louisiana Coastal Area Science and Technology Program.

REFERENCES:

Bunya, S., J. J. Westerink, J. C. Dietrich, H. J. Westerink, L. G. Westerink, J. Atkinson, B. Ebersole, J. M. Smith, D. Resio, R. Jensen, M. A. Cialone, R. Luettich, C. Dawson, H. J. Roberts, and J. Ratcliff. 2009. *A high resolution coupled riverine flow, tide, wind, wind wave and storm surge model for southern Louisiana and Mississippi: Part I -- Model development and validation.* Accepted by *Monthly Weather Rev.*

Chow, V. T. 1959. *Open Channel Hydraulics*. New York, NY: McGraw-Hill Book Co.

Hall, B. R. 1994. *Effects of Vegetation on Hydraulic Roughness and Sedimentation in Wetlands*, WRP Technical Note SD-CP-2.2. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Järvelä, J. 2002. Flow resistance of flexible and stiff vegetation: A flume study with natural plants, *J. Hydrology*, 269, 44-54.

Loder, N. M. 2008. An Evaluation of the Potential of Coastal Wetlands for Hurricane Surge and Wave Energy Reduction, Master's thesis, Texas A&M University, College Station, TX.

Smith, J. M., A. R. Sherlock, and D. T. Resio, 2001. *STWAVE: Steady-State Spectral Wave Model User's Manual for STWAVE, Version 3.0*, ERDC/CHL SR-01-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Wamsley, T. V., M. A. Cialone, J. Westerink, and J. M. Smith. 2009. *Influence of marsh restoration and degradation on storm surge and waves*, Coastal and Hydraulics Engineering Technical Note ERDC/CHL CHETN-I-77. Vicksburg, MS: U.S. Army Engineer Research and Development Center. *http://chl.wes.army.mil/library/publications/chetn/*

Westerink, J., R. Luettich, A. Baptista, N. Scheffner, and P. Farrar, 1992. *Tide and storm surge predictions using finite element model*, ASCE *Journal of Hydraulic Engineering*, 118(10), 1373-1390.

NOTE: *The* contents *of this technical note are not to be used for advertising, publication, or promotional purposes. Citation of trade names does not constitute an official endorsement or approval of the use of such products.*

Progress Meeting #1 Meeting Minutes

PREPARED FOR: Shea Thomas / UDFCD
Steve Choi / City & County of Denver
Eric Weis / Adams County
Cory Hooper / CH2M HILL

PREPARED BY: Alan Turner / CH2M HILL

DATE: December 14, 2011

PROJECT NUMBER: 429379

FOR INFO ON OPEN WATER n-value

1. **Review Data Collection Progress**

Data received to date was discussed with the team.

i. Adams County has delivered the data that the Adams County GIS believes it has. Eric Weis was going to check with the Adams County Planning Department to see if there was additional data that would be available for the study. This would include:

- Planimetric Data
- Future Zoning and Land use Data
- Wetlands and environmental Data

ii. Denver has provided all available online data. A GIS data request has been submitted for data listed below. This data will be delivered to CH2M HILL December 16, 2011. Steve Choi will also provide the As-built contours for Heron Pond to help update the bathymetric data for the FLO-2D Model.

- Storm sewer Geodatabase
- Sanitary sewer Geodatabase
- Hydrologic Basin Boundaries
- Wetlands and environmental Data

iii. Xcel - Maps of utilities should be arriving early next week

iv. Metro- Maps of utilities should be arriving early next week

v. Suncor - There are no Suncor utilities on the west side of the South Platte River

vi. Century Link - To date there has been no response from Century link

vii. Denver Water - Data should be delivered on December 16, 2011

2. Website and Data Transfer

A. Data transfer was discussed. CH2M HILL has set up a dedicated FTP site however, it was decided that the FTP site Set up by UDFCD would become the dedicated data transfer site. The FTP site is located at:

ftp://ftp.udfcd.org/public_html/Master_Planning/Globeville/

User: ftp1
Password: drainit

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B. Project Website

i. Website domain has been set up

a. Currently, the site is blank. The website design is being completed by CH2M HILL staff. It is hoped that the site can go live by December 22, 2011

ii. The website is located at: http://projects.ch2m.com/Globeville_Utah_OSP

3. Preliminary FLO-2D model Development

A. The preliminary FLO-2D model development and results were discussed with the project team.

i. Manning's N - Manning's N was developed from available data layers that included:

a. Impervious area

b. Zoning

c. Building Footprints

Manning's N was selected based on guidance from the FLO-2D manual, *Open Channel Hydraulics, Chow, 1959* and based on previous project experience. Table 1 below contains the land use and Manning's N for the Project.

TABLE 1
Selected Manning's N Values for Use in the Globeville-Utah Junction FLO-2D Model

Land Use or Cover	Manning's N
Open Water	0.011
Impervious Surface	0.02
Buildings	0.2
Open Space	0.05
Residential	0.07
Commercial	0.06
Industrial	0.06
Residential Adams County	0.06
Open Water	0.011

ii. Hydrology - Hydrographs were entered into the FLO-2D model at the approximate centroid of the drainage basins as presented in the existing Globeville - Utah Junction OSP, 54th and Pecos OSP and City and County of Denver Stormwater Master Plan. These hydrographs have not been updated to the most recent CUHP model. This will occur once the basin delineations have been updated based on the results of the FLO-2D model.

The hydrographs that were input into the model are the 100 Year hydrographs. However, It should be noted that the "floodplain boundaries" and the flow vectors and their magnitudes are not representative of a real hydrologic response in the basin but were used to understand the dominate surface flow routes so the major basin boundary could be revised to incorporate areas that are hydrologically connected.

B. Review of Preliminary FLO-2D Results: The results of the initial FLO-2D model were reviewed. Based on the review it became evident that additional loading points would be required to be loaded to help define the

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major drainage basin boundary. CH2M HILL will add additional hydrologic loading points and re-run the model. Once this is complete, the major basin boundaries will be updated and a figure will be completed that will include:

i. Aerial Photograph

ii. FLO-2D Flow Vectors

iii. Revised Major Basin Boundaries

This figure will be turned into a PDF and delivered to the group for review by December 16, 2011.

4. Action Items

a. Adams County will talk to their planning department to see if additional GIS Data is Available.

b. Denver will provide As Built Contours for Heron Pond.

c. CH2M HILL will add additional hydrologic loading points to the FLO-2D model to help refine the project drainage basin.

d. CH2M HILL will provide a pdf map of the area by December 16, 2011 that includes:

i. Aerial Photograph

ii. FLO-2D Flow Vectors

iii. Revised Major Basin Boundaries

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TAB 15

SECTION 15

CD (HYDRAULIC MODELING AND SURVEY DATA)


C
D

Tab 16

SECTION 16

SCOUR CALCULATIONS

Elmhurst Road
500-YR Scour

Elmhurst Road
500-YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	1.36	9.08	
	Approach Velocity (ft/s):	0.51	2.99	
	Br Average Depth (ft):			
	BR Opening Flow (cfs):	221.77	1038.70	
	BR Top WD (ft):	193.88	34.00	
	Grain Size D50 (mm):	1.00	1.00	
	Approach Flow (cfs):	15.45	1242.55	
	Approach Top WD (ft):	22.24	45.76	
	K1 Coefficient:	0.590	0.640	
Results				
	Scour Depth Ys (ft):	0.67	9.42	
	Critical Velocity (ft/s):	1.75	2.40	
	Equation:	Clear	Live	

Abutment Scour

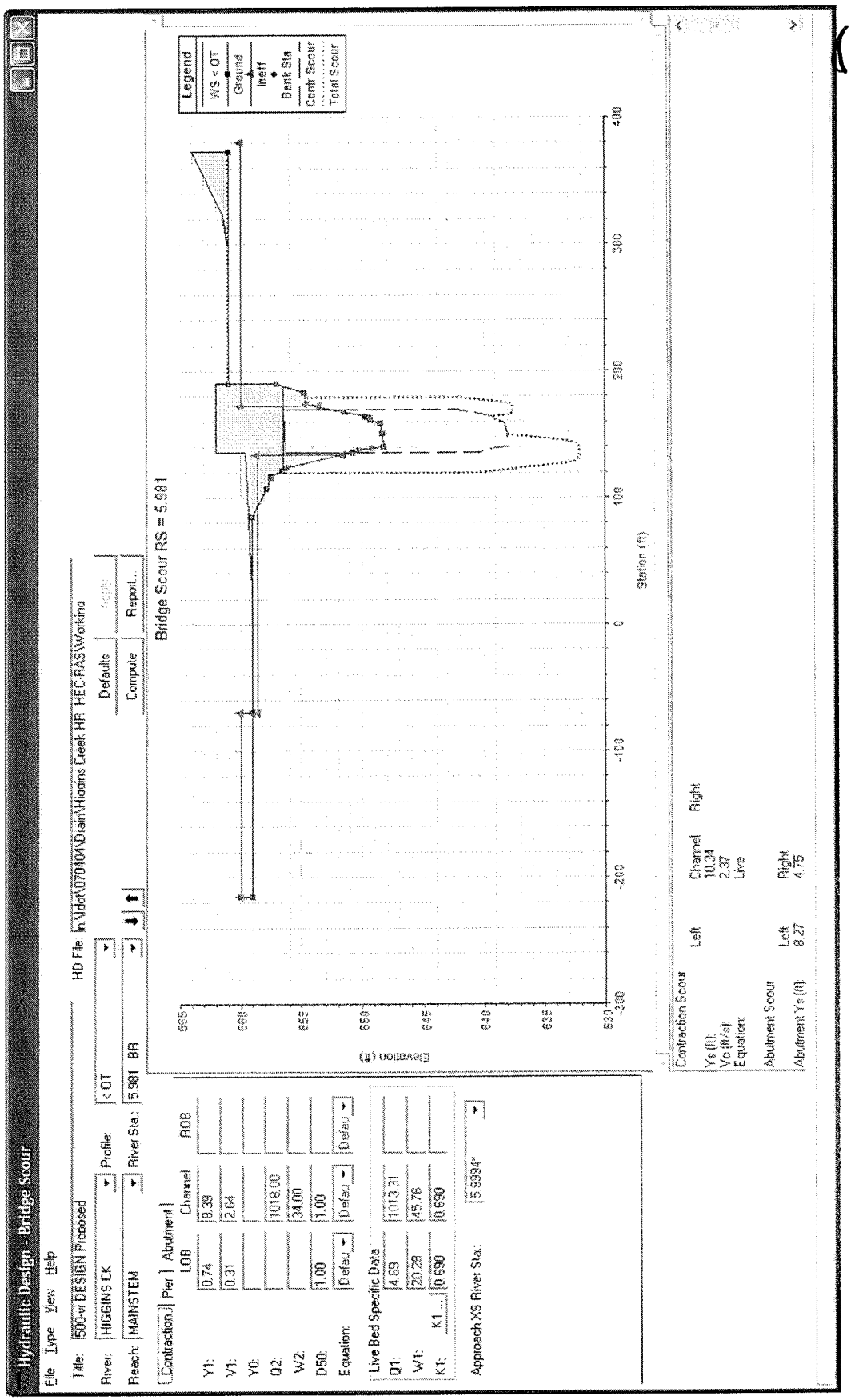
		Left	Right
Input Data			
	Station at Toe (ft):	136.00	170.05
	Toe Sta at appr (ft):	56.36	89.19
	Abutment Length (ft):	84.36	109.08
	Depth at Toe (ft):	8.97	6.96
	K1 Shape Coef:	1.00 - Vertical abutment	
	Degree of Skew (degrees):	90.00	90.00
	K2 Skew Coef:	1.00	1.00
	Projected Length L' (ft):	84.36	109.08
	Avg Depth Obstructed Ya (ft):	1.56	1.03
	Flow Obstructed Qe (cfs):	171.33	13.46
	Area Obstructed Ae (sq ft):	131.64	112.75
Results			
	Scour Depth Ys (ft):	8.56	2.66
	Qe/Ae = Ve:	1.30	0.12
	Froude #:	0.18	0.02
	Equation:	Froehlich	Froehlich

Elmhurst Road
500-YR

Combined Scour Depths

Left abutment scour + contraction scour (ft):	17.98
Right abutment scour + contraction scour (ft):	12.08

Elmhurst Road
scour at overtopping (OT)



(± 210-YR)

Elmhurst Road
scour at OT
(± 210-YR)

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	0.74	8.39	
	Approach Velocity (ft/s):	0.31	2.64	
	Br Average Depth (ft):			
	BR Opening Flow (cfs):		1018.00	
	BR Top WD (ft):		34.00	
	Grain Size D50 (mm):	1.00	1.00	
	Approach Flow (cfs):	4.69	1013.31	
	Approach Top WD (ft):	20.29	45.76	
	K1 Coefficient:	0.690	0.690	
Results				
	Scour Depth Ys (ft):		10.34	
	Critical Velocity (ft/s):		2.37	
	Equation:		Live	

Abutment Scour

		Left	Right
Input Data			
	Station at Toe (ft):	136.00	170.05
	Toe Sta at appr (ft):	56.36	89.19
	Abutment Length (ft):	32.41	20.60
	Depth at Toe (ft):	8.26	6.26
	K1 Shape Coef:	1.00 - Vertical abutment	
	Degree of Skew (degrees):	90.00	90.00
	K2 Skew Coef:	1.00	1.00
	Projected Length L' (ft):	32.41	20.60
	Avg Depth Obstructed Ya (ft):	2.42	3.51
	Flow Obstructed Qe (cfs):	123.05	10.46
	Area Obstructed Ae (sq ft):	78.38	72.29
Results			
	Scour Depth Ys (ft):	8.27	4.75
	Qe/Ae = Ve:	1.57	0.14
	Froude #:	0.18	0.01
	Equation:	Froehlich	Froehlich

Elmhurst Road
Scour at OT
(± 210-YR)

Combined Scour Depths

Left abutment scour + contraction scour (ft):	18.61
Right abutment scour + contraction scour (ft):	15.09

Elmhurst Road
100-YR Scour

Abutment Scour

		Left	Right
Input Data			
	Station at Toe (ft):	136.00	170.05
	Toe Sta at appr (ft):	56.36	89.19
	Abutment Length (ft):	16.09	18.55
	Depth at Toe (ft):	7.21	5.20
	K1 Shape Coef:	1.00 - Vertical abutment	
	Degree of Skew (degrees):	90.00	90.00
	K2 Skew Coef:	1.00	1.00
	Projected Length L' (ft):	16.09	18.55
	Avg Depth Obstructed Ya (ft):	3.38	2.81
	Flow Obstructed Qe (cfs):	94.74	8.60
	Area Obstructed Ae (sq ft):	54.37	52.10
Results			
	Scour Depth Ys (ft):	8.42	4.02
	Qe/Ae = Ve:	1.74	0.17
	Froude #:	0.17	0.02
	Equation:	Froehlich	Froehlich

* CONTRACTION SCOUR NOT COMPUTED
(no contraction - all flow in channel)

Esther Winograd

Illinois Department of Transportation

Memorandum

To:	Anthony Quigley	Attn:	Ken Eng
From:	Peter E. Harmet		
Subject:	Scour Countermeasures		
Date:	May 21, 2009		

Attached for your information and further handling is the minimum suggested riprap size and placement dimensions for the listed structures.

In order to place the rip-rap at the proper elevation, a survey of the streambed with relation to the footing elevations (and low chord elevation) is necessary. In general, the rip-rap should not be placed above the present streambed but rather the top layer should match the streambed. However, excavation below the top of the footing is discouraged.

If you have any questions or need additional information, please contact Ms. Esther Winograd, Hydraulic Analysis Engineer, at (847) 705-4475.

By: Richard F. Wojcik
Richard F. Wojcik
Hydraulics Section Chief

cc: Mel Kirchler Attn: Ed Frank
Jim Stumpner Attn: Sarah Wilson

S:\Mgr1\WP\HYDRAUL\daewMemo Scour Countermeasures.doc

****

CONTRACTION SCOUR
CASE 1 Overbank flow on a flood plain being forced back to the main channel by the approaches to the bridge.
BRIDGE NUMBER016-0677 Q- 500
ELMHURST ROAD / HIGGINS CREEK

1	flow depth @ approach	y1	ft =	5.7
2	width @ approach	w1	ft =	83
3	width @ constriction	w2	ft =	25
4	contracted flow	Qt	cfs =	850
5	main channel flow @ approach	Qc	cfs =	850
6	Vratio ShearV/FallV		=	.1
7	Manning nRatio contracted/approach		=	1

CONTRACTION SCOUR EQUATION 1 = 6 Ft

****

CONTRACTION SCOUR
CASE 1 Overbank flow on a flood plain being forced back to the main channel by the approaches to the bridge.
BRIDGE NUMBER016-0677 Q- 100
ELMHURST ROAD/HIGGINS CREEK

1	flow depth @ approach	y1	ft =	5.3
2	width @ approach	w1	ft =	82
3	width @ constriction	w2	ft =	25
4	contracted flow	Qt	cfs =	818
5	main channel flow @ approach	Qc	cfs =	818
6	Vratio ShearV/FallV		=	.1
7	Manning nRatio contracted/approach		=	1

CONTRACTION SCOUR EQUATION 1 = 5 Ft

****

CONTRACTION SCOUR
CASE 1 Overbank flow on a flood plain being forced back to the main channel by the approaches to the bridge.
BRIDGE NUMBER016-0677 Q- 50
ELMHURST ROAD / HIGGINS CREEK

1	flow depth @ approach	y1	ft =	4.8
2	width @ approach	w1	ft =	73
3	width @ constriction	w2	ft =	25
4	contracted flow	Qt	cfs =	626
5	main channel flow @ approach	Qc	cfs =	626
6	Vratio ShearV/FallV		=	.1
7	Manning nRatio contracted/approach		=	1

CONTRACTION SCOUR EQUATION 1 = 4 Ft

Location	Size	Thickness	Min. Spread	comments
016-0677 Elmhurst Road (IL 83) Higgins Creek	RR5	3.0'	11.5'	Apply across the entire span Can use 12" mattress instead *
099-0079 IL 1 Trim Creek	RR4	2.3'	21.4'	Apply across the entire span
016-2415 Western Avenue Thorn Creek	RR4	2.3'	13.4'	Apply across the entire span
016-0363 Touhy Avenue N. Br. Chicago River	RR6	3.6'	22.2'	Apply at the abutments Can use 12" mattress instead
099-0119 US 45 Prairie Creek	RR4	2.3'	18.8'	Apply across the entire span

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
VARIOUS	2009-106 I	COOK & WILL	24	1
FED. ROAD DIST. NO. 1	ILLINOIS	CONTRACT NO. 60J05		

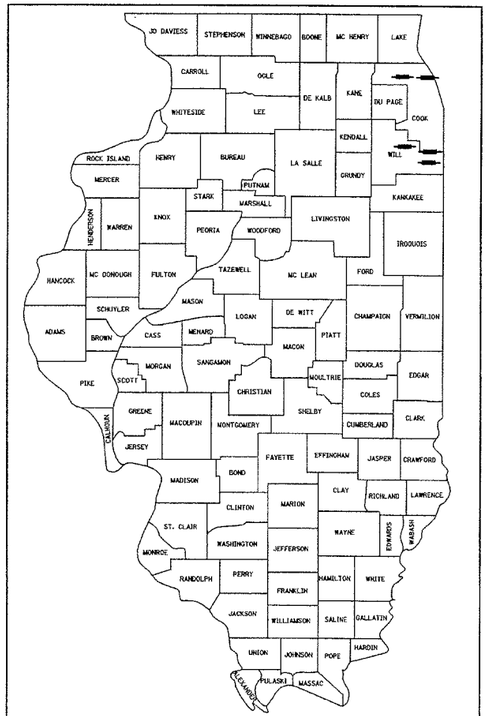
FOR INDEX OF SHEETS, SEE SHEET NO. 2

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED HIGHWAY PLANS

VARIOUS ROUTES
SECTION 2009–106 I
VARIOUS LOCATIONS
RIPRAP, SCOUR COUNTERMEASURES
COOK AND WILL COUNTIES
C–91–158–10

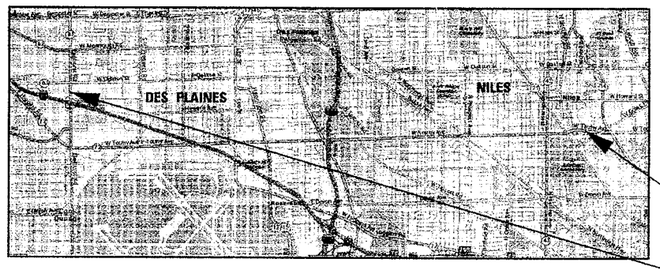
D–91–158–10



LOCATION OF SECTION INDICATED THUS: –

IMPROVEMENT LOCATED IN THE

VILLAGE OF MOUNT PROSPECT
CITY OF DES PLAINES
VILLAGE OF BEECHER
VILLAGE OF PARK FOREST
VILLAGE OF NILES
VILLAGE OF FRANKFORT



LOCATION 4: S.N. 016–0363, TOUHY AVENUE OVER N. BR. CHICAGO RIVER

LOCATION 1: S.N. 016–0677, IL 83 OVER HIGGINS CREEK

LOCATION 3: S.N. 016–2415, WESTERN AVENUE OVER THORN CREEK

LOCATION 5: S.N. 099–0119, US 45 OVER PRAIRIE CREEK

LOCATION 2: S.N. 099–0079, IL 1 OVER TRIM CREEK

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED MAY 11, 20 10
Dine M. O'Keefe
DEPUTY DIRECTOR OF HIGHWAYS, REGION ONE ENGINEER
June 25 20 10
Scott E. Stitt P.E. /bs
acting ENGINEER OF DESIGN AND ENVIRONMENT
June 25 20 10
Christine M. Reed /bs
DIRECTOR OF HIGHWAYS, CHIEF ENGINEER

100' 200' 300' — 1" = 100'
0 10' 20' 30' — 1" = 10'
0 50' 100' — 1" = 50'
0 50' 100' — 1" = 40'
0 50' 100' — 1" = 30'
0 50' 100' — 1" = 20'

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

J.U.L.I.E.
JOINT UTILITY LOCATING INFORMATION FOR EXCAVATORS
1–800–892–0123
OR 811

BIRINDER S. SACHDEVA — 62-37259 — LICENSED PROFESSIONAL ENGINEER OF ILLINOIS

Birinder S. Sachdeva
BIRINDER S. SACHDEVA, P.E.
EXPIRES: 11–30–2011

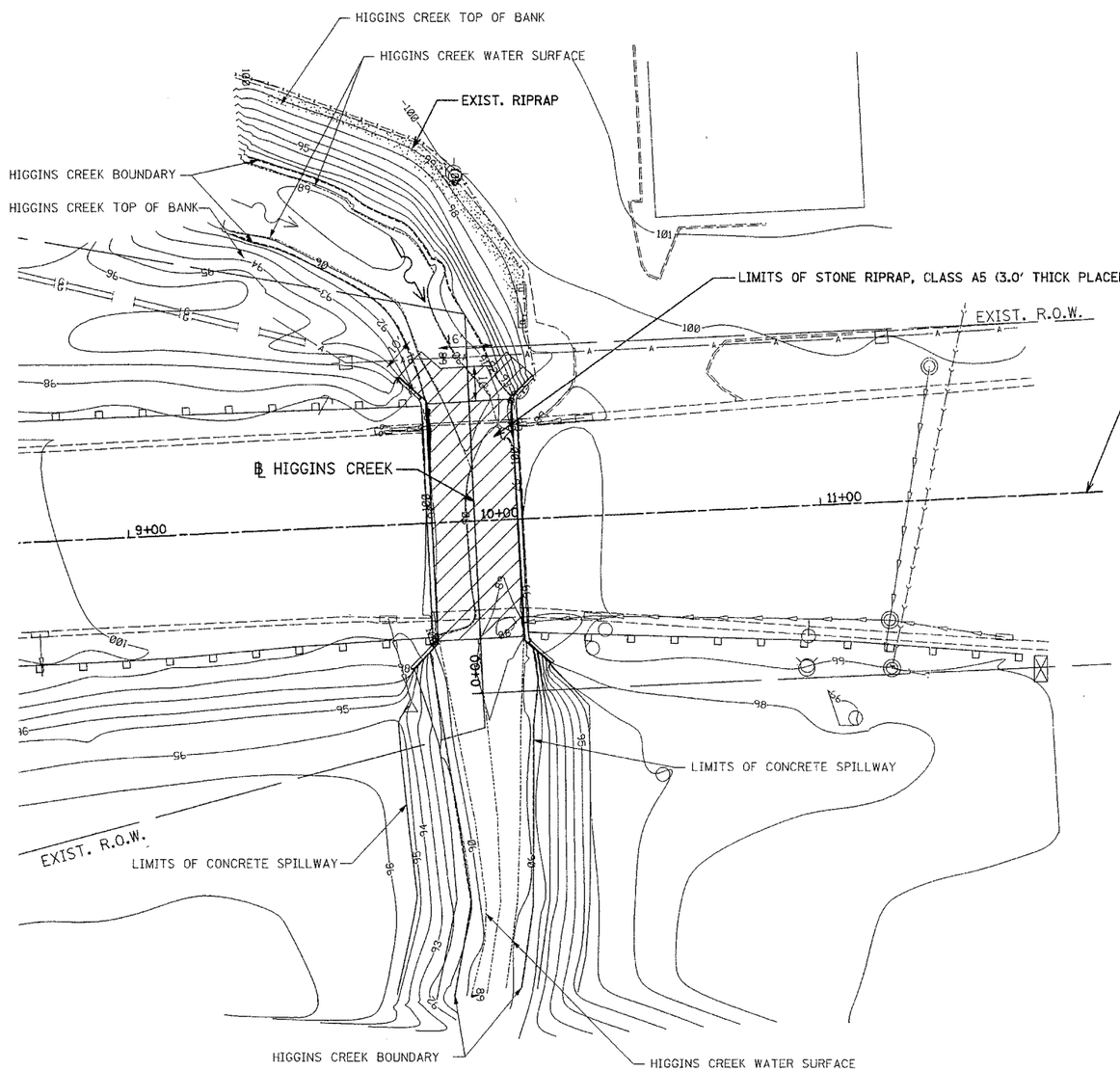
5/10/10
DATE

CONTRACT NO. 60J05

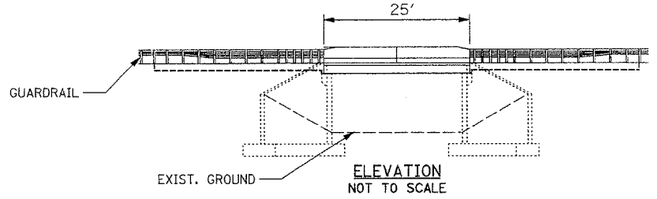
CHRISTIAN–ROGE & ASSOCIATES, INC.
ENGINEERS - PLANNERS - SURVEYORS
211 W. WACKER DRIVE CHICAGO, IL. 0 0
TELEPHONE 312-3 2-2023

PRINTED BY THE AUTHORITY OF THE STATE OF ILLINOIS

DISTRICT ONE – PLAN PREP ENGINEER: KEN ENG (847) 705–4247



HIGGINS CREEK



ELEVATION
NOT TO SCALE

ACCESS TO THIS SITE IS LIMITED. THE CONTRACTOR SHALL ONLY ACCESS THIS SITE BY RAISING AND/OR LOWERING ALL EQUIPMENT AND MATERIAL OVER THE SIDES OF THE BRIDGE. THE CONTRACTOR WILL NOT BE ALLOWED OTHER ACCESS WITHOUT WRITTEN PERMISSION FROM THE ENGINEER. THIS WORK WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE CONSIDERED AS INCLUDED IN THE CONTRACT UNIT PRICES FOR THE CONSTRUCTION ITEMS INVOLVED AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

LEGEND

STONE RIPRAP, CLASS A5 (3.0' THICK)

BM 1: FOUND BRASS DISK S.E. CORNER OF BRIDGE ON BRIDGE WALK.
ELEV. = 100.00 (ASSUMED)

NOTE:
1. FOR CREEK CROSS SECTIONS SEE SHEET NO. 15.

FILE NAME = D160J05-1-sht-eros.dgn
PLOT DATE = 5/10/2010

CHRISTIAN-ROGE & ASSOCIATES, INC.
ENGINEERS-PLANNERS-SURVEYORS
211 WEST WACKER DRIVE
CHICAGO, ILLINOIS 60606
PHONE: (312)372-2023 FAX: (312)372-5274

DESIGNED - G.F.L.	REVISED - APRIL 28, 2010	
DRAWN - J.V./K.R.K.	REVISED -	
CHECKED - E.J.M.	REVISED -	
DATE - DECEMBER 2009	REVISED -	

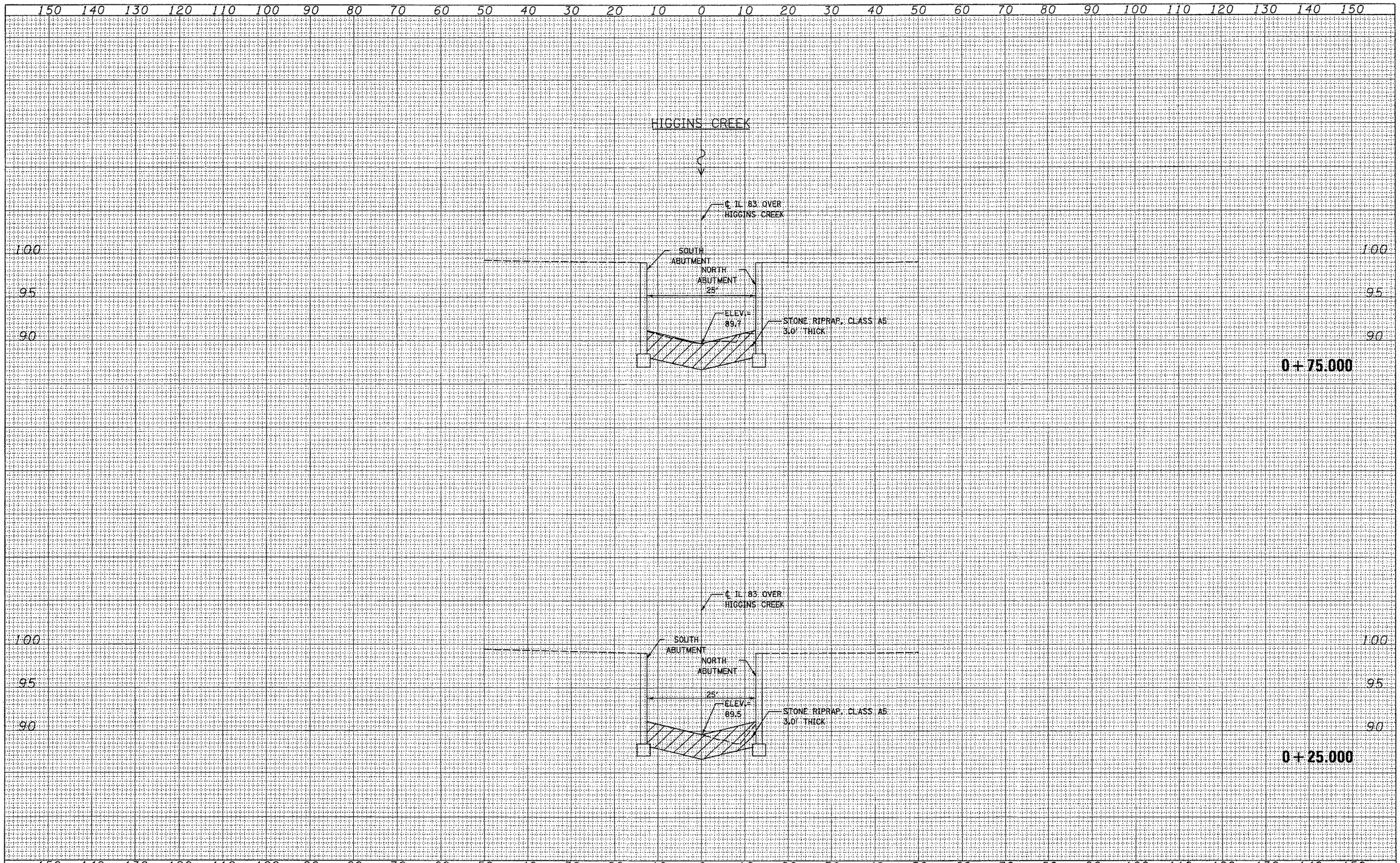
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

EROSION AND SEDIMENT CONTROL PLAN
ELMHURST ROAD (IL 83) OVER HIGGINS CREEK

SCALE: 1" = 20' | SHEET NO. 2 OF 2 SHEETS | STA. 9+00 TO STA. 11+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
VAR.	2009-106 I	COOK/WILL	24	6
		CONTRACT NO. 60J05		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		

FINAL SURVEY	SURVEYED	BY	DATE
NOTE BOOK	PLOTTED		
NO.	TEMPLATE		
	AREAS		
	AREAS CHECKED		



ORIGINAL SURVEY	SURVEYED	BY	DATE
NOTE BOOK	PLOTTED		
NO.	TEMPLATE		
	AREAS		
	AREAS CHECKED		

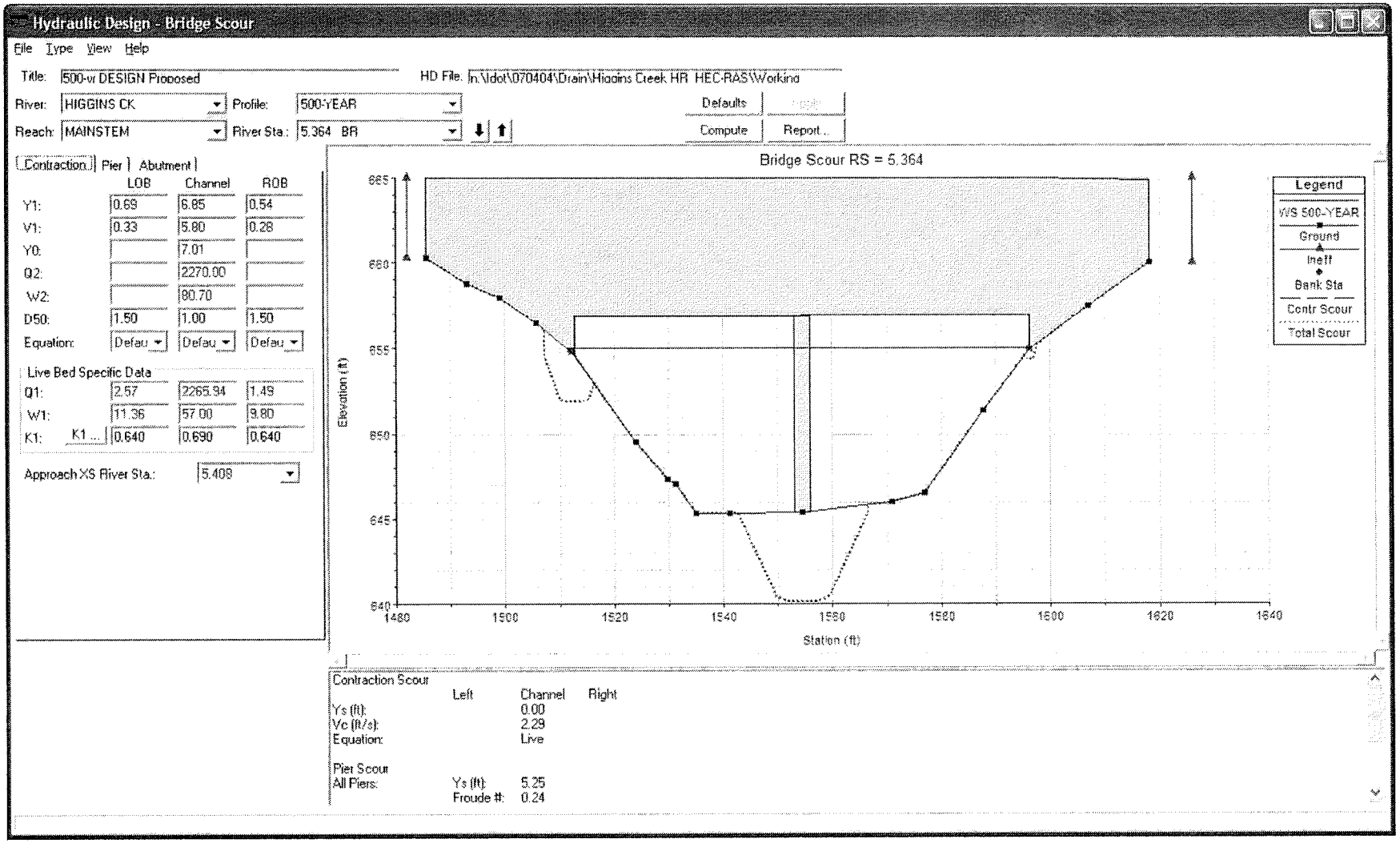
FILE NAME =	USER NAME = IDOT	DESIGNED - K.R.K.	REVISED -
I:\102466_BridgeScour\1-IL83_HigginsCrk\CADD Sheets\D160J05-1-sht-xsec.dgn		DRAWN - J.V.	REVISED -
	PLOT SCALE = 10.0000 ' / IN.	CHECKED - G.F.L.	REVISED -
	PLOT DATE = 5/10/2010	DATE - NOVEMBER, 2009	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IL 83 AT HIGGINS CREEK

SCALE: 1:10H, 1:5V | SHEET NO. 1 OF 1 SHEETS | STA. 00+25 | TO STA. 00+75

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
VAR	2009-106 I	COOK	24	15
		CONTRACT NO. 60J05		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		


Hydraulic Design - Bridge Scour
File Type View Help
Title: 500-yr DESIGN Proposed
HD File: In:\Idot\070404\Drain\Higgins Creek HR HEC-RAS\Working
River: HIGGINS CK
Profile: 500-YEAR
Reach: MAINSTEM
River Sta.: 5.364 BR
Defaults
Compute
Report...
Contraction | Pier | Abutment
LOB Channel ROB
Y1: 0.69 6.85 0.54
V1: 0.33 5.80 0.28
Y0: 7.01
Q2: 2270.00
W2: 80.70
D50: 1.50 1.00 1.50
Equation: Defau Defau Defau
Live Bed Specific Data
Q1: 2.57 2265.94 1.49
W1: 11.36 57.00 9.80
K1: K1 ... 0.640 0.690 0.640
Approach XS River Sta.: 5.408
Bridge Scour RS = 5.364
Elevation (ft)
Station (ft)
Legend
WS 500-YEAR
Ground
Ineff
Bank Sta
Contr Scour
Total Scour
Contraction Scour
Left Channel Right
Ys (ft): 0.00
Vc (ft/s): 2.29
Equation: Live
Pier Scour
All Piers: Ys (ft): 5.25
Froude #: 0.24

I-90
500-YR

I-90
500-YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	0.69	6.85	0.54
	Approach Velocity (ft/s):	0.33	5.80	0.28
	Br Average Depth (ft):		7.01	
	BR Opening Flow (cfs):		2270.00	
	BR Top WD (ft):		80.70	
	Grain Size D50 (mm):	1.50	1.00	1.50
	Approach Flow (cfs):	2.57	2265.94	1.49
	Approach Top WD (ft):	11.36	57.00	9.80
	K1 Coefficient:	0.640	0.690	0.640
Results				
	Scour Depth Ys (ft):		0.00	
	Critical Velocity (ft/s):		2.29	
	Equation:		Live	

Pier Scour

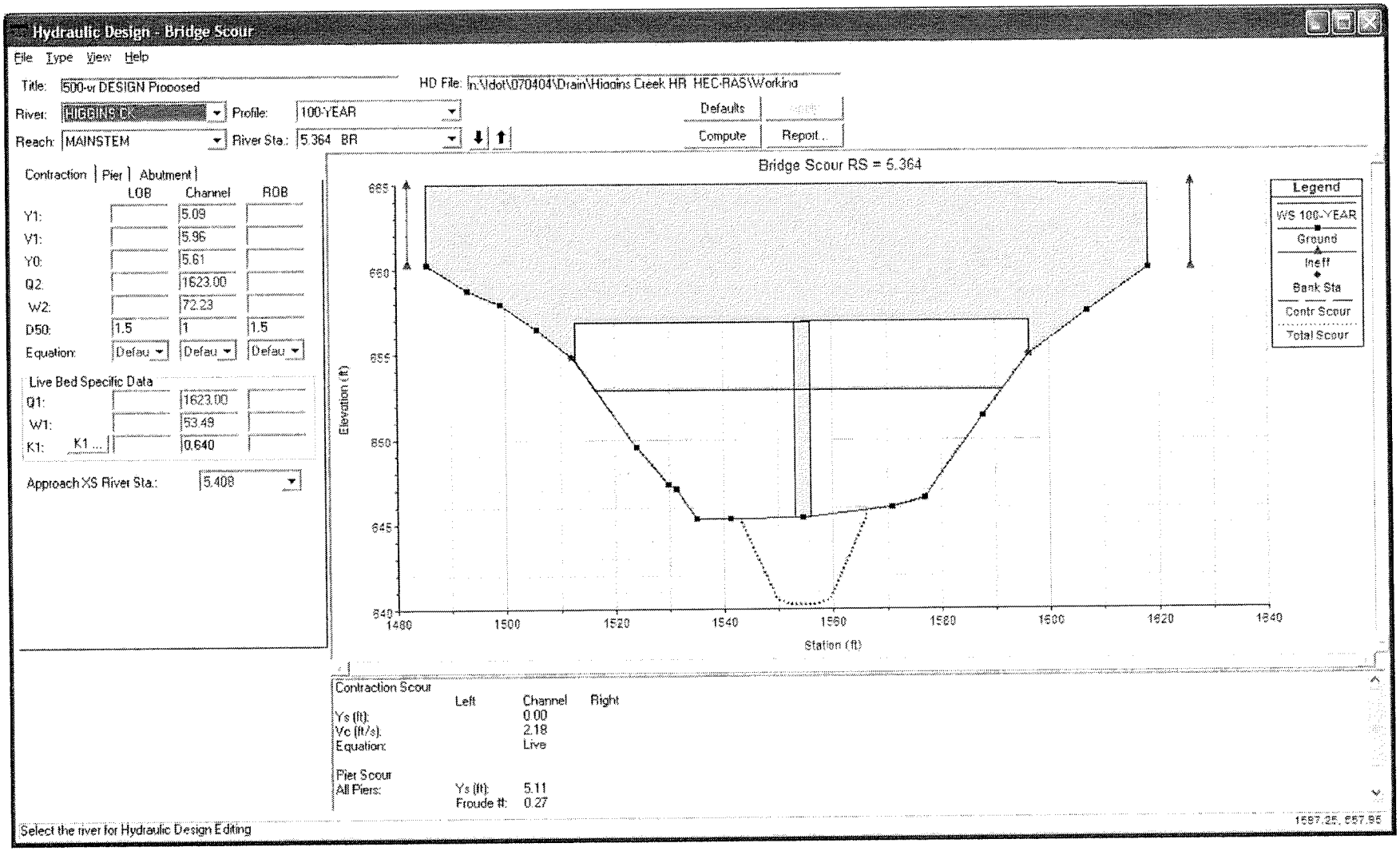
All piers have the same scour depth

Input Data		
	Pier Shape:	Round nose
	Pier Width (ft):	2.90
	Grain Size D50 (mm):	1.00000
	Depth Upstream (ft):	9.78
	Velocity Upstream (ft/s):	4.19
	K1 Nose Shape:	1.00
	Pier Angle:	0.00
	Pier Length (ft):	276.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.15000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	5.25
	Froude #:	0.24
	Equation:	CSU equation

I-90
500-YR

Abutment Scour

		Left	Right
Input Data			
	Station at Toe (ft):	1512.70	1596.30
	Toe Sta at appr (ft):	1007.50	1064.00
	Abutment Length (ft):	11.86	9.80
	Depth at Toe (ft):	0.47	0.12
	K1 Shape Coef:	1.00 - Vertical abutment	
	Degree of Skew (degrees):	90.00	90.00
	K2 Skew Coef:	1.00	1.00
	Projected Length L' (ft):	11.86	9.80
	Avg Depth Obstructed Ya (ft):	0.75	0.54
	Flow Obstructed Qe (cfs):	5.10	1.49
	Area Obstructed Ae (sq ft):	8.93	5.34
Results			
	Scour Depth Ys (ft):	2.73	0.61
	Froude #:	0.51	0.33
	Equation:	HIRE	HIRE


Hydraulic Design - Bridge Scour
File Type View Help
Title: 500-yr DESIGN Proposed
HD File: h:\Idot\070404\Drain\Higgins Creek HR HEC-RAS\Working
River: HIGGINS CK
Profile: 100-YEAR
Reach: MAINSTEM
River Sta.: 5.364 BR
Defaults
Compute
Report...
Contraction | Pier | Abutment
LOB Channel ROB
Y1: 5.09
V1: 5.96
Y0: 5.61
Q2: 1623.00
W2: 72.23
D50: 1.5 1 1.5
Equation: Defau Defau Defau
Live Bed Specific Data
Q1: 1623.00
W1: 53.49
K1: K1 ... 0.640
Approach XS River Sta.: 5.408
Bridge Scour RS = 5.364
Legend
WS 100-YEAR
Ground
Ineff
Bank Sta
Contr Scour
Total Scour
Elevation (ft)
Station (ft)
Contraction Scour
Left Channel Right
Ys (ft): 0.00
Vc (ft/s): 2.18
Equation: Live
Pier Scour
All Piers: Ys (ft): 5.11
Froude #: 0.27
Select the river for Hydraulic Design Editing

I-90 Viaduct

I-90
100-YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):		5.09	
	Approach Velocity (ft/s):		5.96	
	Br Average Depth (ft):		5.61	
	BR Opening Flow (cfs):		1623.00	
	BR Top WD (ft):		72.23	
	Grain Size D50 (mm):	1.5	1	1.5
	Approach Flow (cfs):		1623.00	
	Approach Top WD (ft):		53.49	
	K1 Coefficient:		0.640	
Results				
	Scour Depth Ys (ft):		0.00	
	Critical Velocity (ft/s):		2.18	
	Equation:		Live	

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Round nose
	Pier Width (ft):	2.90
	Grain Size D50 (mm):	1.00000
	Depth Upstream (ft):	7.69
	Velocity Upstream (ft/s):	4.24
	K1 Nose Shape:	1.00
	Pier Angle:	0.00
	Pier Length (ft):	276.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	1.50000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	5.11
	Froude #:	0.27
	Equation:	CSU equation

COLLINS
ENGINEERS INC

BRIDGE SCOUR EVALUATION

OF

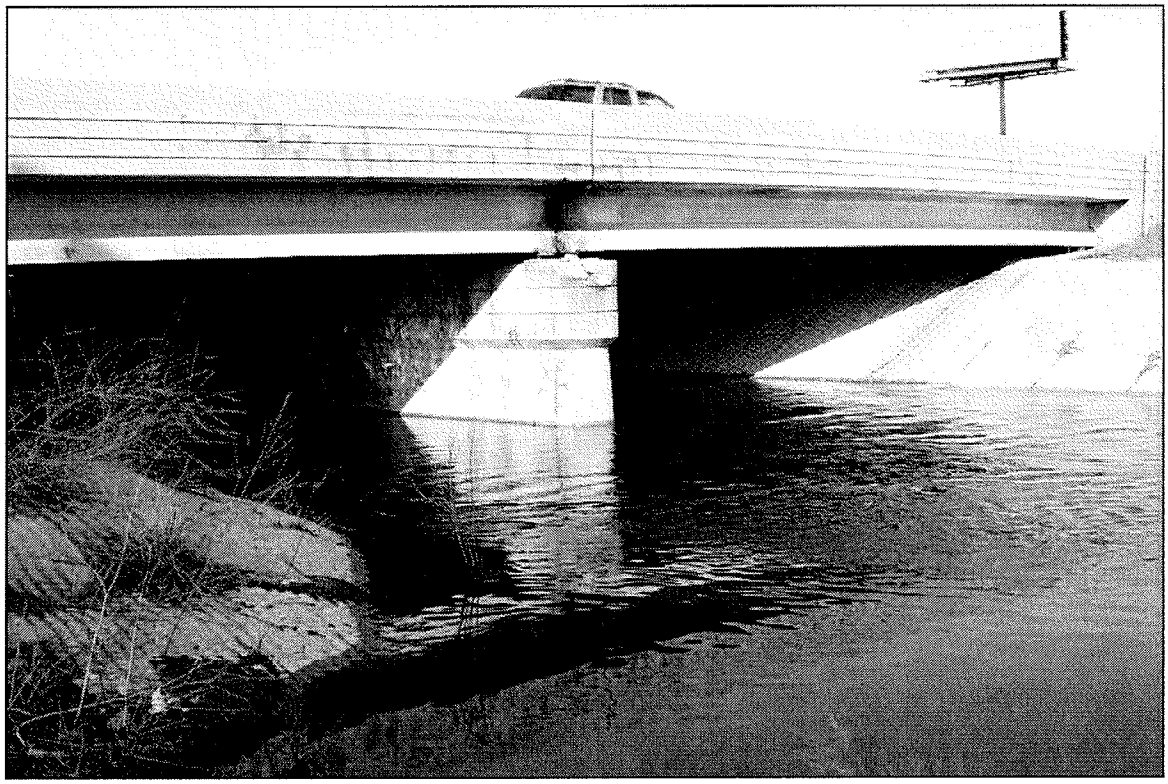
BRIDGE NO. 535

I-90 (NORTH-WEST TOLLWAY) EASTBOUND

OVER

HIGGINS CREEK

AT MILE POST 4.80



MARCH 28, 2008

PREPARED FOR

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

BRIDGE SCOUR EVALUATION

OF

BRIDGE NO. 535

I-90 (NORTH-WEST TOLLWAY) EASTBOUND

OVER

HIGGINS CREEK

AT

MILE POST 4.80

MARCH 28, 2008

Prepared For:

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

CONTRACT RR-06-5514

Prepared by:

COLLINS ENGINEERS, INC.

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COLLINS NO. 5396-10

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BRIDGE SCOUR EVALUATION

OF

BRIDGE NO. 535

I-90 (NORTH-WEST TOLLWAY) EASTBOUND

OVER

HIGGINS CREEK

1.0 INTRODUCTION

1.1 Purpose and Scope

This report consists of the results of a detailed scour analysis of Bridge No. 535 performed by Collins Engineers, Inc. (Collins) for the Illinois State Toll Highway Authority. The primary purpose of the analysis was to evaluate the bridge for susceptibility to failure due to stream bed scour.

The following report includes a description of the structure, the method of analysis, a description of existing conditions, scour analysis results, and an evaluation and recommendations based on the analysis results.

1.2 General Description of the Structure

Bridge No. 535 carries I-90 (North-West Tollway) Eastbound over the Higgins Creek in Des Plaines, Illinois. A twin structure (Bridge No. 536) located upstream carries I-90 (North-West Tollway) Westbound over Higgins Creek. Refer to Figure 1 in Appendix A for a location map. The bridge consists of a two-span prestressed concrete girder structure supported by two abutments and one intermediate pier. The abutments and pier are continuous between Bridge Nos. 535 and 536, as indicated in the 1982 Bridge Widening Design Plans. The substructure units are labeled as the West Abutment, Pier 1, and the East Abutment from west to east. The East and West Abutments are constructed of a reinforced concrete cap founded on a reinforced concrete footing supported by

piles. Pier 1 is constructed of a reinforced concrete shaft founded on a reinforced concrete footing supported by piles. Refer to Photographs 1 and 2 in Appendix B for overall views of the structure and Photographs 9 through 14 in Appendix B for views of the pier and abutments. For additional information and scour analysis of the twin structure, refer to the Bridge Scour Evaluation of Bridge No. 536.

1.3 Method of Analysis

The field data collection was performed on March 28, 2008, and consisted of a visual and tactile examination of the accessible surfaces of the substructure units, channel and embankments. Photographs were taken to document general conditions and observed deficiencies. The type of channel bottom material, the channel alignment, the presence or extent of scour, the presence or extent of riprap, the presence or extent of drift and debris, the location of any foundation exposure or undermining, and the location of any embankment erosion was noted.

At the time of field data collection, the channel was approximately 50 feet wide at the structure with a maximum depth of 3.0 feet at 100 feet upstream. The maximum depth at the bridge was 2.9 feet at the upstream nose of Pier 1. Channel cross sections were taken along the I-90 centerline, along the upstream fascia of Bridge No. 536, the downstream fascia of Bridge No. 535, and upstream and downstream of the structure fascias at a distance equal to 100 feet. Soundings were also taken around the submerged substructure units and the waterline was referenced to a known elevation on the structure.

The scour analysis was performed based on procedures outlined in the Hydrologic Engineering Center River Analysis System (HEC-RAS), Version 4, November 2006. The scour computations in HEC-RAS are based on the methods outlined in Hydraulic Engineering Circular No.18 (HEC No.18), Federal Highway Administration (FHWA), 2001. Total scour at a bridge is the sum of three (3) components: contraction scour, local scour at piers and abutments, and long term aggradation or degradation. Contraction scour usually occurs when the flow area of the waterway is reduced by a natural contraction or the constricting of flow due to a bridge. Local scour at a pier usually occurs due to the formation of eddies and flow vortices around the pier. Local scour at an abutment usually occurs due to obstruction of flow by the abutments. Long term aggradation and degradation usually occurs due to changes to the channel configuration and/or flow.

The hydraulic model for the bridge was developed using the surveyed channel cross sections at the bridge and upstream and downstream of the bridge. A steady state flow analysis was performed using a subcritical flow regime with normal depth as the downstream boundary condition. Manning's n values for channel and overbanks were based on the field observations.

The contributing drainage areas at the bridge were initially delineated using the United States Geological Survey (USGS) 7.5-Minute topographic maps. The 100-year and 500-year peak-flow discharges at the bridge were computed using rural and urban flood-frequency regression equations found in Chapter 4 – Hydrology of the Illinois Department of Transportation (IDOT) Drainage Manual. Although the imperviousness of the watershed area at the bridge site and the IDOT Drainage Manual suggested the use of the urban equation, the calculated peak-flow discharges showed higher values for the rural equation. Based on further discussion with IDOT engineers, it was recommended to use the USGS StreamStats web site for Illinois, released in February 2008. The web site provided drainage area, stream channel slope, and 100-year and 500-year peak-flow discharges for the bridge location. Although the USGS StreamStats website provided peak discharges, the IDOT rural equation using the StreamStats drainage area and stream slope data yielded greater peak discharges, and as a result, was used for the scour analysis.

Total scour depths were computed for 100-year and 500-year flood discharge events. Local pier scour was computed using the CSU equation. The live-bed equations were used to compute contraction scour at the bridge based on a bed material particle size critical velocity analysis for the approach channel cross-section. The overbanks at the bridge were evaluated using both the live-bed and clear-water equations based on the same analysis. A value of 0.5 feet was added to the total scour depth to account for the possible effect of long-term channel degradation.

2.0 EXISTING CONDITIONS

At the time of inspection, the waterline was located approximately 8.8 feet below the top of the pier cap at midpoint of Pier 1 (centerline of I-90). This corresponds to a waterline elevation of 647.3 feet according to the bridge widening design plans dated September, 1982. At the time of inspection, the river was flowing from north to south at approximately 2.0 feet per second, with visibility of up to 12 inches.

The east and west shorelines upstream of the structures consisted of steep cultivated grassy embankments lined with concrete slopewalls up to 5 feet above the waterline. The east and west shorelines downstream of the structures consisted of lightly vegetated natural embankments (grasses) lined with grout bags up to 5 feet above the waterline. The West Abutments were protected by a concrete slopewall, which was typically in fair condition with random cracks up to 1 inch wide and differential settlements up to 3 inches. The East Abutments were protected by a grout-bag slopewall, which was typically in good condition with no defects observed. Refer the Photographs 2 through 8 in Appendix B for views of the east and west shorelines. The surrounding landscape includes mostly medium-density residential and commercial areas with elevations typically between 660 feet and 670 feet.

The entire length of both abutments are founded on an 6 foot wide by 2.5 foot thick reinforced concrete footing with a bottom of footing elevation of approximately 650 feet, supported by piles of unknown material and length (12 additional piles with estimated lengths of 45 feet were added as part of the bridge widening). The entire length of Pier 1 is founded on a 6 foot wide by 3 foot thick reinforced concrete footing with a bottom of footing elevation of approximately 638.5 feet, supported by piles of unknown material and length (8 additional piles with estimated lengths of 50 feet were added as part of the bridge widening).

Soils information was obtained from field observations. Typically, the channel at the bridge consisted of sand, gravel and cobbles with up to 1 inch probe rod penetration. Portions of the channel upstream of the bridge were completely lined with grout bags. There was no evidence of scour or riprap at any Pier 1.

Higgins Creek is a sinuous channel in a low relief valley with minimal floodplains. The stream is generally not braided or anabranched, and maintains a constant stream width upstream and downstream of the structure. The pier was in line with the channel (no angle of attack).

TABLE 1: SUMMARY OF EXISTING CONDITIONS

Shoreline Stability:	Stable
Streambed Soil Type:	Non-Cohesive Soil
Subsurface Soil Type:	Non-Cohesive Soil
Timber Debris:	None
Channel Alignment:	Sinuous with No Angle of Attack
Observed Scour:	None

3.0 SCOUR ANALYSIS

3.1 Long Term Streambed Changes

A comparison of the current channel bottom and overbank with the design plans dated 1982 indicate that there has been no significant change to the channel bottom elevations at the bridge. The embankments were stable and protected by slopewalls and grout bags, with bank elevations in the vicinity of the structure typically exceeding 655 feet. Due to the high and protected embankments, and small drainage area at the structure, long term streambed alignment changes are not anticipated.

3.2 Hydrologic Analysis

Higgins Creek drains approximately 5.7 square miles of medium-density commercial and residential areas, and converges with Willow Creek approximately 1.5 miles downstream. The 100 and 500-year flood peak discharges have been established using USGS StreamStats and IDOT Drainage Manual peak flow regression equations, and are as follows:

Q100 = 805 cfs
Q500 = 990 cfs

Water surface profiles were simulated using Army Corps of Engineers HEC-RAS Version 4.0.

3.3 Scour Depths

The following tables summarize the hydraulic variables and estimated scour depths calculated for the 100-year and 500-year storm events. Refer to Figures 2 and 3 in Appendix A for cross sections at the bridge showing the 100 and 500-year scour potentials. Refer to Appendix C for detailed HEC-RAS Scour Analysis Results. Due to the continuous pier and abutments, the scour analysis results for I-90 (North-West Tollway) over Higgins Creek were applied to both Bridge Nos. 535 and 536.

TABLE 2: HYDRAULIC VARIABLES AND ESTIMATED SCOUR DEPTHS FOR 100-YEAR AND 500-YEAR STORM EVENTS

	100-Year	500-Year
Discharge (cfs)	805	990
Channel Average Velocity (fps)	3.77	4.14
High Water Elevation at Bridge (ft)	649.5	649.9
Low Chord Elevation at Bridge (ft)	656.5	656.5
Maximum Flow Depth at Pier (ft)	5.18	5.63
Long-term Channel Degradation, est. (ft)	0.5	0.5
Contraction Scour - Main Channel (ft)	0.07	0.01
Contraction Scour – Left Overbank Area (ft)	0.00	0.00
Contraction Scour – Right Overbank Area(ft)	0.00	0.00
Local Scour – West (Right) Abutment (ft)	0.00	0.00
Local Scour – Pier 1 (ft)	5.08	5.36
Local Scour – East (Left) Abutment (ft)	0.00	0.00

*

TABLE 3: COMPARISON OF ESTIMATED TOTAL SCOUR DEPTHS WITH FOUNDATION ELEVATIONS

Substructure Unit	Foundation Type	Current Channel Elev. (ft)	100-yr Estimated Scour Elev. (ft)	500-yr Estimated Scour Elev. (ft)	Bottom of Foundation Elev. (ft)
West Abutment	Concrete Footing on Piles	654.3	653.8	653.8	B/Ftg: 650.8 Pile tip: ± 605
Pier 1	Concrete Footing on Piles	645.7	640.0	639.8	B/Ftg: 638.5 Pile tip: ± 588
East Abutment	Concrete Footing on Piles	654.3	653.8	653.8	B/Ftg: 650.0 Pile tip: ± 605

4.0 EVALUATION AND RECOMMENDATIONS

The 500-year estimated scour elevations at Bridge No. 535 are a minimum of 0.5 feet above the top of the pile supported abutment footings, and a minimum of 1.3 feet above the bottom of the pier footing. As a result of the sufficient embedment of the abutment and pier footings, the bridge is considered to be stable for the calculated scour conditions. Therefore, it is recommended that National Bridge Inventory (NBI) Item 113 be coded 5.

TABLE 4: ILLINOIS DEPARTMENT OF TRANSPORTATION NBI CODING

Item 61 – Channel and Channel Protection Condition:	8
Item 71 – Waterway Adequacy Appraisal:	9
Item 113 – Scour Critical Rating:	5
Item 113A – Scour Critical Evaluation Date:	03 28 08
Item 113B – Scour Critical Evaluation Method:	A
Item 113C – Scour Critical Evaluation By:	Collins Engineers, Inc.
Item 113D – Scour Critical Remarks:	None

Respectfully Submitted,

COLLINS ENGINEERS, INC.

Bradley A. Syler, S.E., P.E.

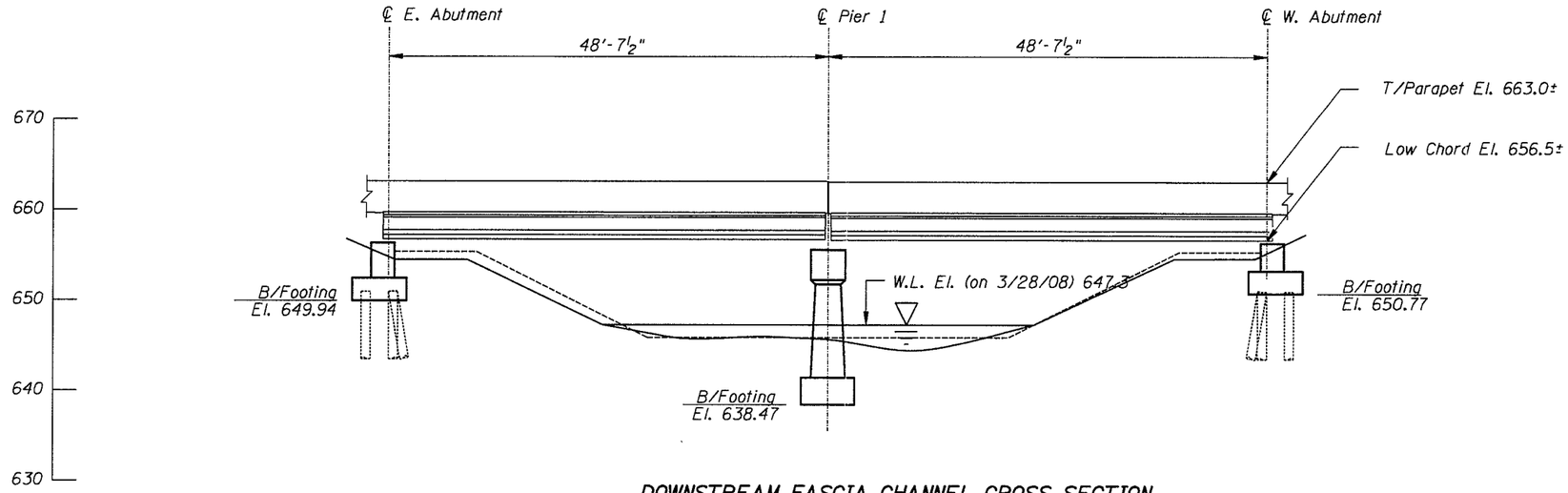
Originated By:

Brian P. Dilworth, E.I.T.

Joti Nagpal, P.E.

Hydraulic Engineer:

Ved P. Malhotra, P.E.



DOWNSTREAM FASCIA CHANNEL CROSS SECTION
(LOOKING DOWNSTREAM)

Modeling Notes:

At the time of field data collection, on March 28, 2008, the waterline was located approximately 8.8 feet below the top of the pier cap of Pier 1 at the centerline of I-90. This corresponds to a waterline elevation of 647.3 feet according to the design plans.

Structure Plan developed from field measurements and design plans dated 1982.

Type of Foundations:
Abutments: Reinforced concrete footings on piles.
PIer: Reinforced concrete footings on piles

Low Member Elevation = 656.5 ft.

High Water Elevation according to Design Plans = 654.8 ft.

Legend

———— *Channel Bottom on 3/28/08*

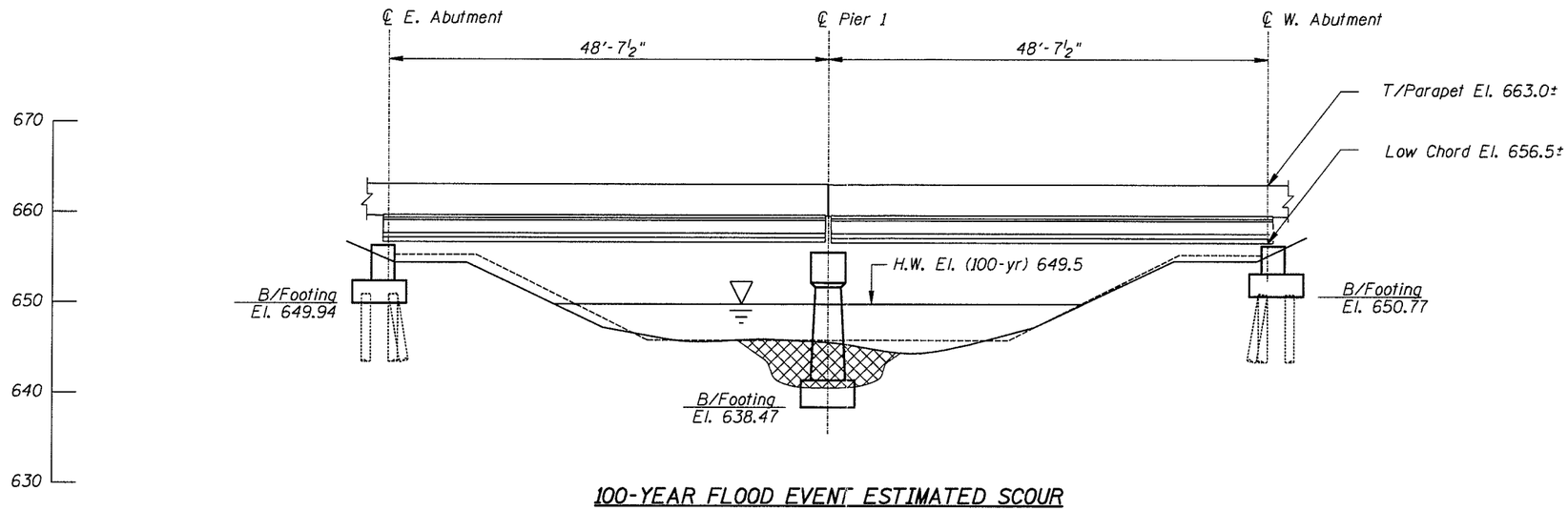
---------- *Original Channel Bottom Cross Section per Design Drwg. Dated 1982*

ILLINOIS STATE TOLL HIGHWAY AUTHORITY
CONTRACT RR-06-5514

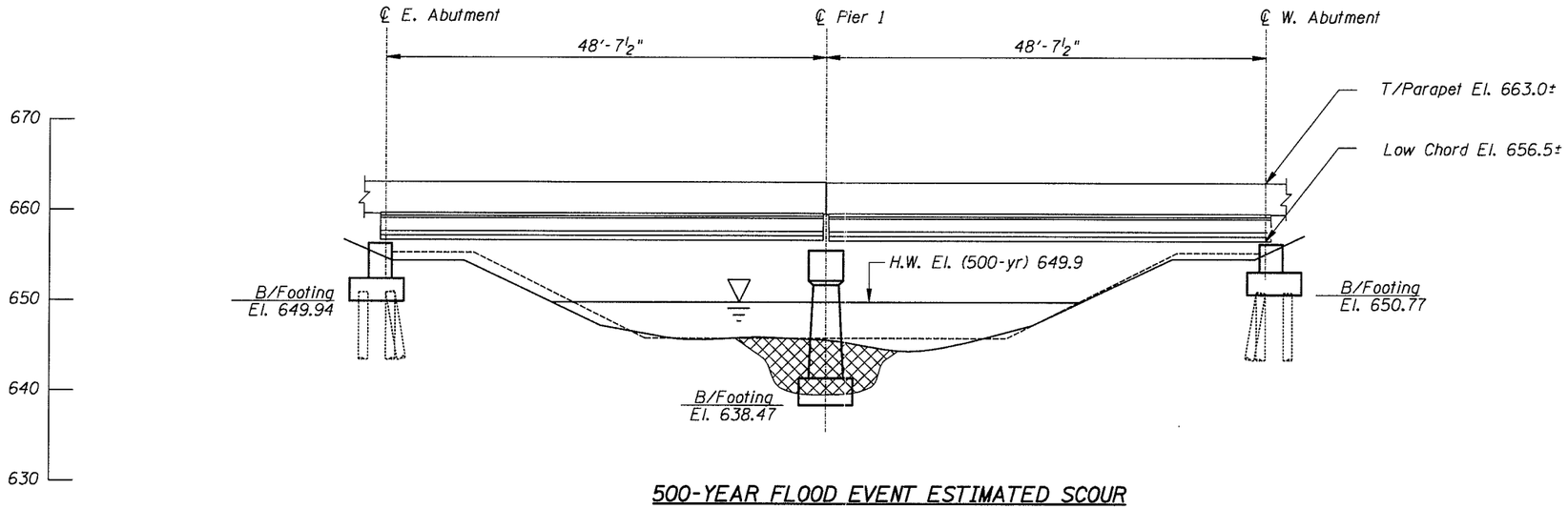
NORTHWEST TOLLWAY I-90 EASTBOUND
OVER HIGGINS CREEK
IN DES PLAINES, ILLINOIS
BRIDGE NO. 535

TOTAL SCOUR ESTIMATE - MODEL

Drawn By: PRH/BPD	COLLINS ENGINEERS INC 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: MAR., 2008
Checked By: BAS		Scale: 1/16"=1'
Code: 53960535EB		Figure No.: 2



100-YEAR FLOOD EVENT ESTIMATED SCOUR



500-YEAR FLOOD EVENT ESTIMATED SCOUR

Legend

- Channel Bottom on 3/28/08
- Original Channel Bottom Cross Section per Design Drwg. Dated 1982
- Contraction Scour
- Pier/Abutment Scour

Notes:

Structure Plan developed from field measurements and design plans dated 1982.

Q100 = 805 CFS

Q500 = 990 CFS

ILLINIOS STATE TOLL HIGHWAY AUTHORITY
CONTRACT RR-06-5514

NORTHWEST TOLLWAY I-90 EASTBOUND
OVER HIGGINS CREEK
IN DES PLAINES, ILLINOIS
BRIDGE NO. 535

TOTAL SCOUR ESTIMATE - RESULTS

Drawn By: PRH/BPD	COLLINS ENGINEERS INC 123 North Wacker Drive Suite 300 Chicago, Il. 60606 (312) 704-9300 www.collinsengr.com	Date: MAR., 2008
Checked By: BAS		Scale: 1/16"=1'
Code: 53960535EB		Figure No.: 3

500-Year Event Scour Input and Results

I-90
BRIDGE
BY
COLLINS ENGR.
2008

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	1.38	5.03	1.38
	Approach Velocity (ft/s):	1.28	4.83	1.30
	Br Average Depth (ft):	1.32	4.53	1.43
	BR Opening Flow (cfs):	18.12	943.23	28.65
	BR Top WD (ft):	7.09	45.20	9.69
	Grain Size D50 (mm):	1.50	1.00	1.50
	Approach Flow (cfs):	8.81	971.37	9.82
	Approach Top WD (ft):	5.00	40.00	5.50
	K1 Coefficient:	0.590	0.640	0.590
Results				
	Scour Depth Ys (ft):	0.00	0.01	0.00
	Critical Velocity (ft/s):	2.01	2.18	2.01
	Equation:	Clear	Live	Clear

Pier Scour

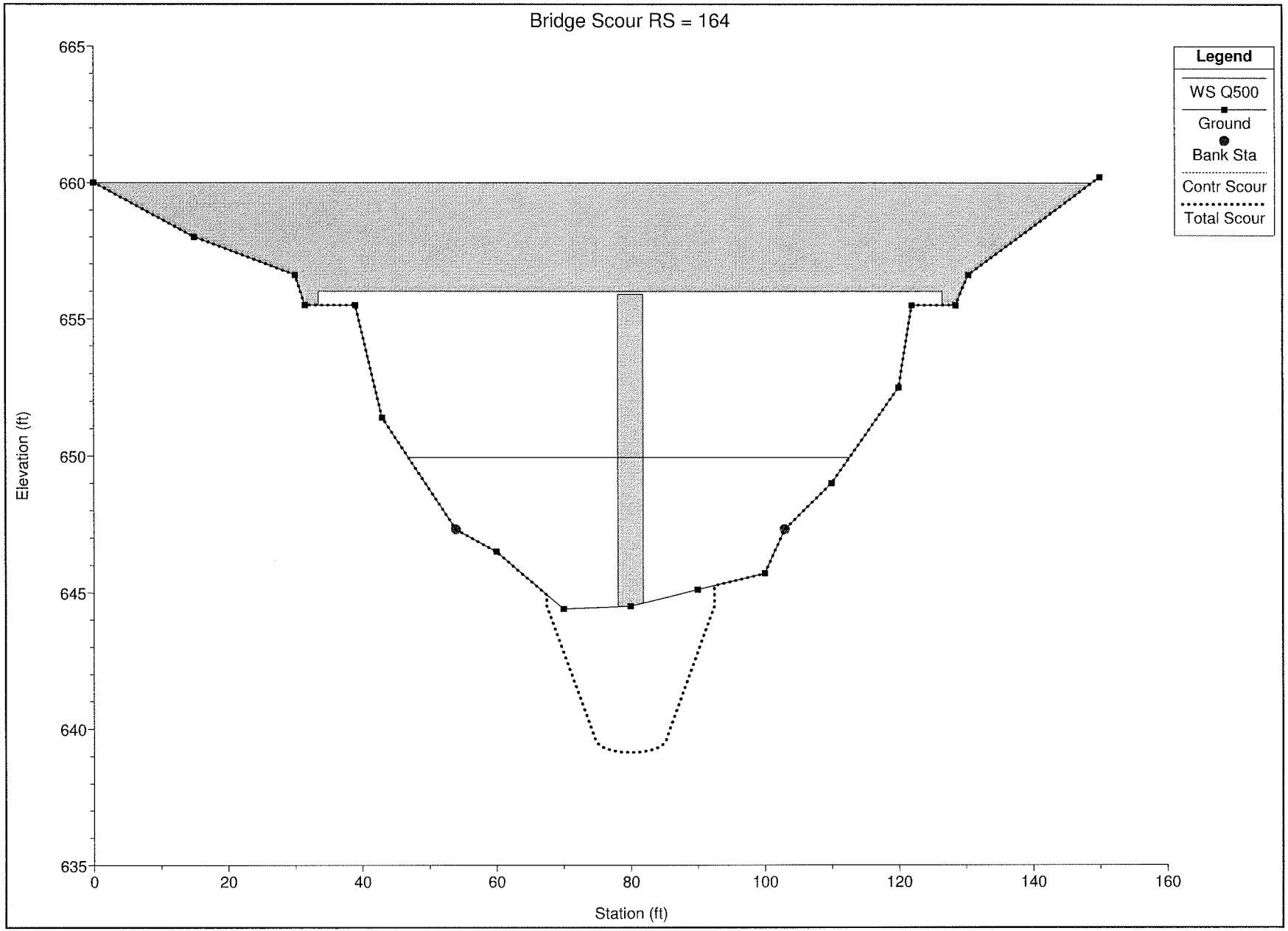
All piers have the same scour depth

Input Data		
	Pier Shape:	Round nose
	Pier Width (ft):	3.52
	Grain Size D50 (mm):	1.00000
	Depth Upstream (ft):	4.69
	Velocity Upstream (ft/s):	4.14
	K1 Nose Shape:	1.00
	Pier Angle:	0.00
	Pier Length (ft):	125.80
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.15000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	5.36
	Froude #:	0.34
	Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

	Channel:	5.37


Bridge Scour RS = 164
Legend
WS Q500
Ground
Bank Sta
Contr Scour
Total Scour
Elevation (ft)
665
660
655
650
645
640
635
0
20
40
60
80
100
120
140
160
Station (ft)

COLLINS ENGINEERS INC

BRIDGE SCOUR EVALUATION

OF

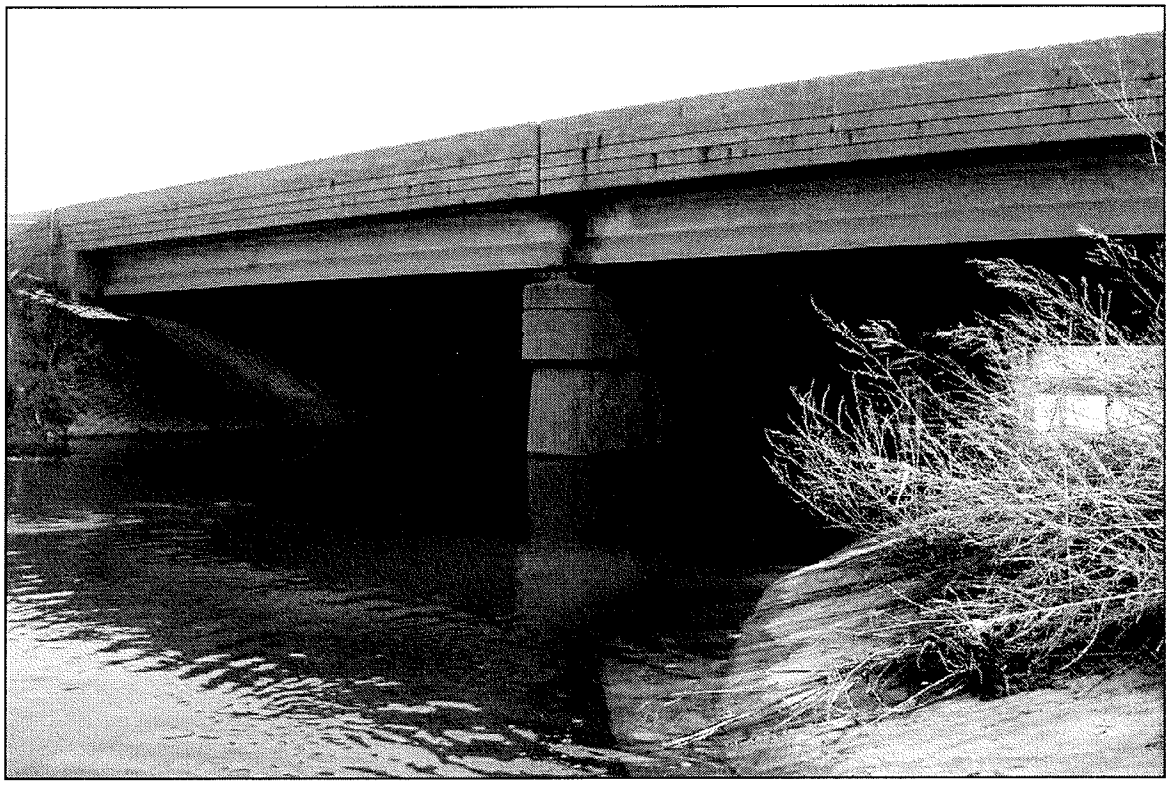
BRIDGE NO. 536

I-90 (NORTH-WEST TOLLWAY) WESTBOUND

OVER

HIGGINS CREEK

AT MILE POST 4.80



MARCH 28, 2008

PREPARED FOR

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

BRIDGE SCOUR EVALUATION

OF

BRIDGE NO. 536

I-90 (NORTH-WEST TOLLWAY) WESTBOUND

OVER

HIGGINS CREEK

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Prepared For:

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COLLINS NO. 5396-10

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BRIDGE SCOUR EVALUATION

OF

BRIDGE NO. 536

I-90 (NORTH-WEST TOLLWAY) WESTBOUND

OVER

HIGGINS CREEK

1.0 INTRODUCTION

1.1 Purpose and Scope

This report consists of the results of a detailed scour analysis of Bridge No. 536 performed by Collins Engineers, Inc. (Collins) for the Illinois State Toll Highway Authority. The primary purpose of the analysis was to evaluate the bridge for susceptibility to failure due to stream bed scour.

The following report includes a description of the structure, the method of analysis, a description of existing conditions, scour analysis results, and an evaluation and recommendations based on the analysis results.

1.2 General Description of the Structure

Bridge No. 536 carries the I-90 (North-West Tollway) Westbound over Higgins Creek in Des Plaines, Illinois. A twin structure (Bridge No. 535) located downstream carries I-90 (North-West Tollway) Eastbound over Higgins Creek. Refer to Figure 1 in Appendix A for a location map. The bridge consists of a two-span prestressed concrete girder structure supported by two abutments and one intermediate pier. The abutments and pier are continuous between Bridge Nos. 535 and 536, as indicated in the 1982 Bridge Widening Design Plans. The substructure units are labeled as the West Abutment, Pier 1, and the East Abutment from west to east. The East and West Abutments are constructed of a reinforced concrete cap founded on a reinforced concrete footing

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At the time of field data collection, the channel was approximately 50 feet wide at the structure with a maximum depth of 3.0 feet at 100 feet upstream. The maximum depth at the bridge was 2.9 feet at the upstream nose of Pier 1. Channel cross sections were taken along the I-90 centerline, along the upstream fascia of Bridge No. 536, the downstream fascia of Bridge No. 535, and upstream and downstream of the structure fascias at a distance equal to 100 feet. Soundings were also taken around the submerged substructure units and the waterline was referenced to a known elevation on the structure.

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The east and west shorelines upstream of the structures consisted of steep cultivated grassy embankments lined with concrete slopewalls up to 5 feet above the waterline. The east and west shorelines downstream of the structures consisted of lightly vegetated natural embankments (grasses) lined with grout bags up to 5 feet above the waterline. The West Abutments were protected by a concrete slopewall, which was typically in fair condition with random cracks up to 1 inch wide and differential settlements up to 3 inches. The East Abutments were protected by a grout-bag slopewall, which was typically in good condition with no defects observed. Refer the Photographs 2 through 8 in Appendix B for views of the east and west shorelines. The surrounding landscape includes mostly medium-density residential and commercial areas with elevations typically between 660 feet and 670 feet.

The entire length of both abutments are founded on an 6 foot wide by 2.5 foot thick reinforced concrete footing with a bottom of footing elevation of approximately 650 feet, supported by piles of unknown material and length (12 additional piles with estimated lengths of 45 feet were added as part of the bridge widening). The entire length of Pier 1 is founded on a 6 foot wide by 3 foot thick reinforced concrete footing with a bottom of footing elevation of approximately 638.5 feet, supported by piles of unknown material and length (8 additional piles with estimated lengths of 50 feet were added as part of the bridge widening).

Soils information was obtained from field observations. Typically, the channel at the bridge consisted of sand, gravel and cobbles with up to 1 inch probe rod penetration. Portions of the channel upstream of the bridge were completely lined with grout bags. There was no evidence of scour or riprap at Pier 1.

Higgins Creek is a sinuous channel in a low relief valley with minimal floodplains. The stream is generally not braided or anabranched, and maintains a constant stream width upstream and downstream of the structure. The pier was in line with the channel (no angle of attack).

TABLE 1: SUMMARY OF EXISTING CONDITIONS

Shoreline Stability:	Stable
Streambed Soil Type:	Non-Cohesive Soil
Subsurface Soil Type:	Non-Cohesive Soil
Timber Debris:	None
Channel Alignment:	Sinuous with No Angle of Attack
Observed Scour:	None

3.0 SCOUR ANALYSIS

3.1 Long Term Streambed Changes

A comparison of the current channel bottom and overbank with the design plans dated 1982 indicate that there has been no significant change to the channel bottom elevations at the bridge. The embankments were stable and protected by slopewalls and groutbags, with bank elevations in the vicinity of the structure typically exceeding 655 feet. Due to the high and protected embankments, and small drainage area at the structure, long term streambed alignment changes are not anticipated.

3.2 Hydrologic Analysis

Higgins Creek drains approximately 5.7 square miles of medium-density commercial and residential areas, and converges with Willow Creek approximately 1.5 miles downstream. The 100 and 500-year flood peak discharges have been established using USGS StreamStats and IDOT Drainage Manual peak flow regression equations, and are as follows:

Q100 = 805 cfs

Q500 = 990 cfs

Water surface profiles were simulated using Army Corps of Engineers HEC-RAS Version 4.0.

3.3 Scour Depths

The following tables summarize the hydraulic variables and estimated scour depths calculated for the 100-year and 500-year storm events. Refer to Figures 2 and 3 in Appendix A for cross sections at the bridge showing the 100 and 500-year scour potentials. Refer to Appendix C for detailed HEC-RAS Scour Analysis Results. Due to the continuous pier and abutments, the scour analysis results for I-90 (North-West Tollway) over Higgins Creek were applied to both Bridge Nos. 535 and 536.

TABLE 2: HYDRAULIC VARIABLES AND ESTIMATED SCOUR DEPTHS FOR 100-YEAR AND 500-YEAR STORM EVENTS

	100-Year	500-Year
Discharge (cfs)	805	990
Channel Average Velocity (fps)	3.77	4.14
High Water Elevation at Bridge (ft)	649.5	649.9
Low Chord Elevation at Bridge (ft)	656.5	656.5
Maximum Flow Depth at Pier (ft)	5.18	5.63
Long-term Channel Degradation, est. (ft)	0.5	0.5
Contraction Scour - Main Channel (ft)	0.07	0.01
Contraction Scour – Left Overbank Area (ft)	0.00	0.00
Contraction Scour – Right Overbank Area(ft)	0.00	0.00
Local Scour – West (Right) Abutment (ft)	0.00	0.00
Local Scour – Pier 1 (ft)	5.08	5.36
Local Scour – East (Left) Abutment (ft)	0.00	0.00

TABLE 3: COMPARISON OF ESTIMATED TOTAL SCOUR DEPTHS WITH FOUNDATION ELEVATIONS

Substructure Unit	Foundation Type	Current Channel Elev. (ft)	100-yr Estimated Scour Elev. (ft)	500-yr Estimated Scour Elev. (ft)	Bottom of Foundation Elev. (ft)
West Abutment	Concrete Footing on Piles	655.5	655.0	655.0	B/Ftg: 650.0 Pile tip: ± 605
Pier 1	Concrete Footing on Piles	644.5	638.9	638.6	B/Ftg: 638.5 Pile tip: ± 588
East Abutment	Concrete Footing on Piles	655.5	655.0	655.0	B/Ftg: 650.8 Pile tip: ± 605

4.0 EVALUATION AND RECOMMENDATIONS

The 500-year estimated scour elevations at Bridge No. 536 are a minimum of 4.2 feet above the top of the pile supported abutment footings, and a minimum of 0.1 feet above the bottom of the pier footing. As a result of the sufficient embedment of the abutment and pier footings, the bridge is considered to be stable for the calculated scour conditions. Therefore, it is recommended that National Bridge Inventory (NBI) Item 113 be coded 5.

TABLE 4: ILLINOIS DEPARTMENT OF TRANSPORTATION NBI CODING

Item 61 – Channel and Channel Protection Condition:	8
Item 71 – Waterway Adequacy Appraisal:	9
Item 113 – Scour Critical Rating:	5
Item 113A – Scour Critical Evaluation Date:	03 28 08
Item 113B – Scour Critical Evaluation Method:	A
Item 113C – Scour Critical Evaluation By:	Collins Engineers, Inc.
Item 113D – Scour Critical Remarks:	None

Respectfully Submitted,

COLLINS ENGINEERS, INC.

Bradley A. Syler, S.E., P.E.

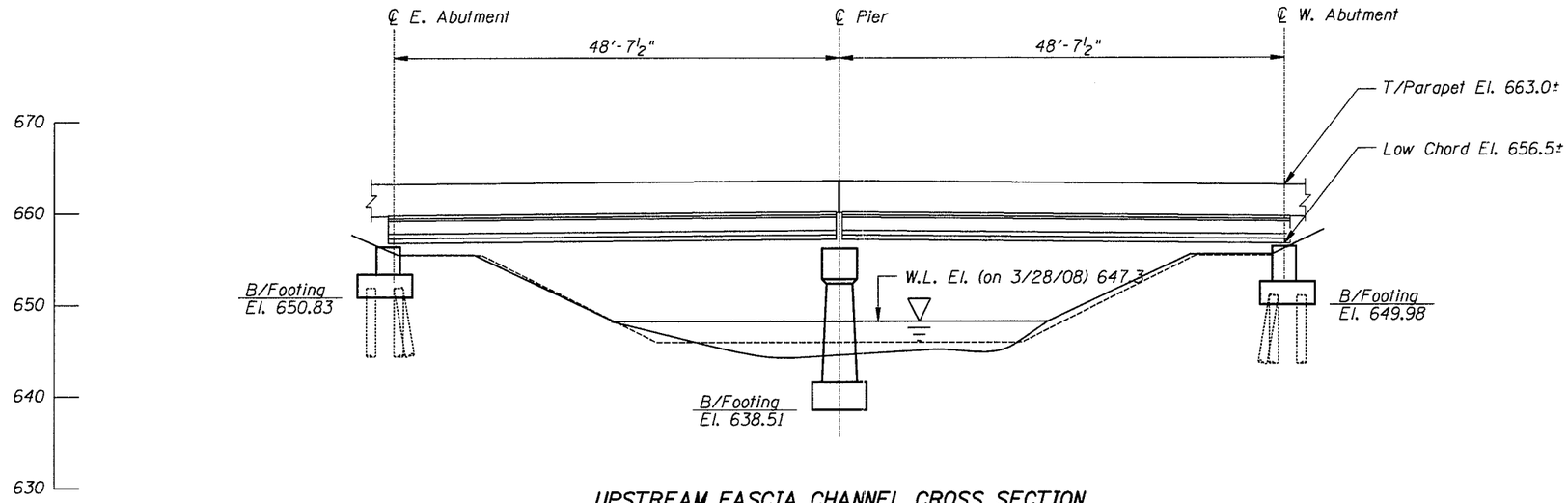
Originated By:

Brian P. Dilworth, E.I.T.

Joti Nagpal, P.E.

Hydraulic Engineer:

Ved P. Malhotra, P.E.



UPSTREAM FASCIA CHANNEL CROSS SECTION
(LOOKING DOWNSTREAM)

Modeling Notes:

At the time of field data collection, on , 2008 the waterline was located approximately feet below the top of the pier at the upstream (south) nose of Pier. This corresponds to a waterline elevation of feet according to the design plans.

Structure Plan developed from field measurements and design plans dated 1982.

Structure Hydraulic depth = 0.00 ft.

Low Member Elevation = 656.5 ft.

High Water Elevation according to Design Plans = 654.80 ft.

Legend

———— *Channel Bottom on X/XX/08*

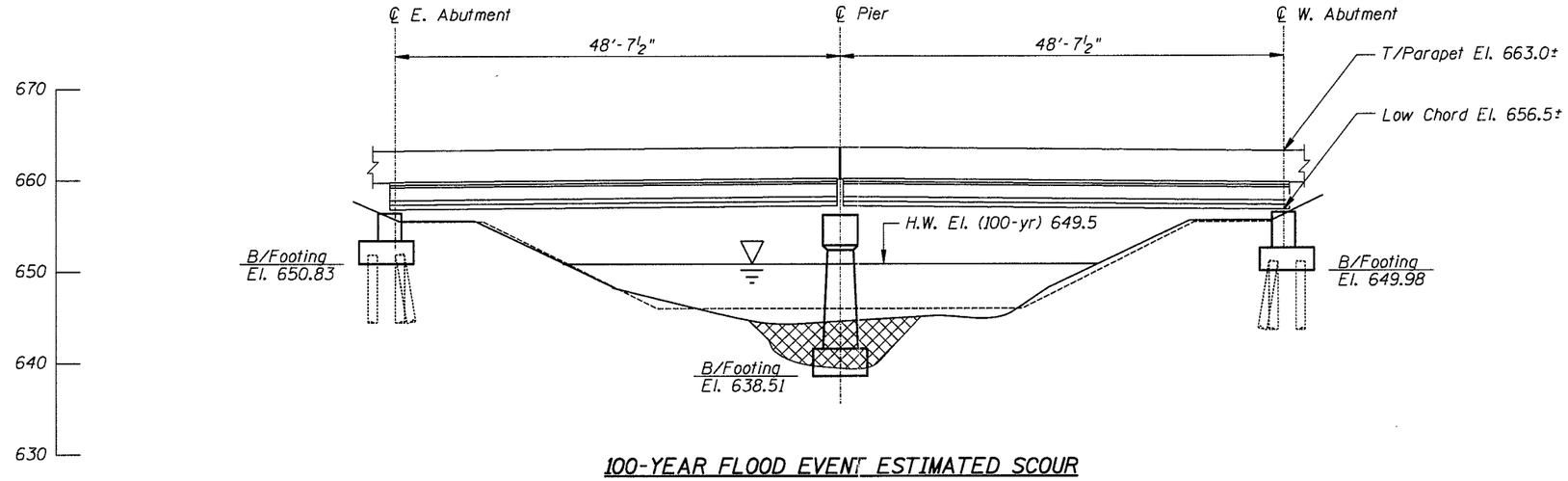
---------- *Original Channel Bottom Cross Section per Design Drwg. Dated 1982*

ILLINOIS STATE TOLL HIGHWAY AUTHORITY
CONTRACT RR-06-5514

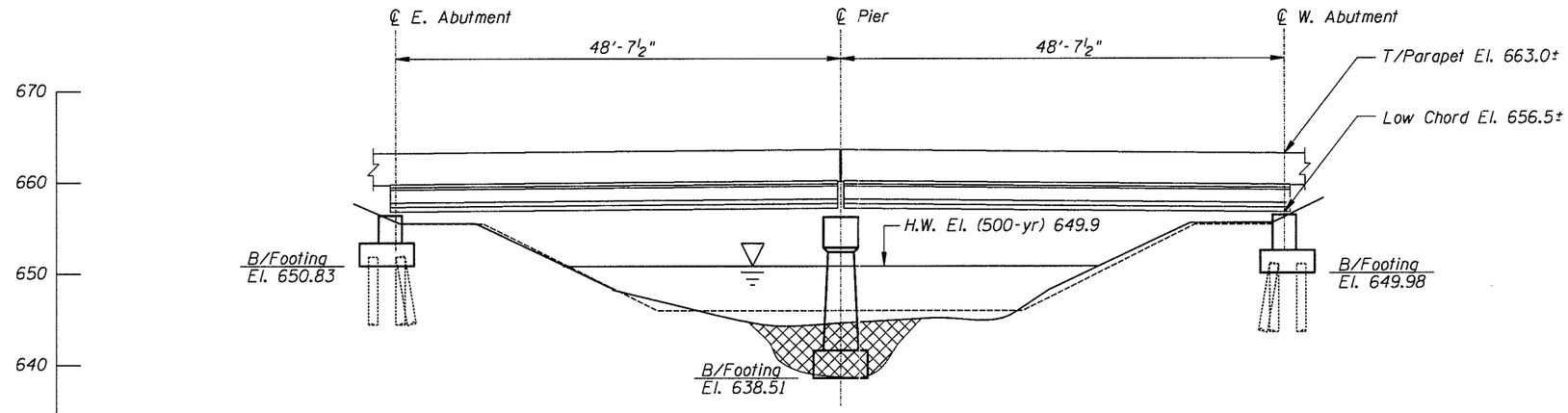
NORTHWEST TOLLWAY I-90 WESTBOUND
OVER HIGGINS CREEK
IN DES PLAINES, ILLINOIS
BRIDGE NO. 536

TOTAL SCOUR ESTIMATE - MODEL

Drawn By: PRH/BPD	COLLINS ENGINEERS INC 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: MAR., 2008
Checked By: BAS		Scale: 1/16"=1'
Code: 53960536WB		Figure No.: 2



100-YEAR FLOOD EVENT ESTIMATED SCOUR



500-YEAR FLOOD EVENT ESTIMATED SCOUR

Legend

- Channel Bottom on X/XX/08
- Original Channel Bottom Cross Section per Design Drwg. Dated 1982
- Contraction Scour
- Pier/Abutment Scour

Notes:

Structure Plan developed from field measurements and design plans dated 1982.

Q100 = 805 CFS

Q500 = 990 CFS

ILLINIOS STATE TOLL HIGHWAY AUTHORITY
CONTRACT RR-06-5514

NORTHWEST TOLLWAY I-90 WESTBOUND
OVER HIGGINS CREEK
IN DES PLAINES, ILLINOIS
BRIDGE NO. 536

TOTAL SCOUR ESTIMATE - RESULTS

Drawn By: PRH/BPD	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: MAR., 2008
Checked By: BAS		Scale: 1/16"=1'
Code: 53960536WB		Figure No.: 3