

## A.1 Introduction

The following is an example to aid DSEs in using the ABC DMT and ABC BLCC Tool and to show a step by step procedure to evaluate a structure for ABC. The example will explain logical steps and provide explanations for the assumptions used for the input into the tools to determine ABC Rating scores. The example will use conventional construction as a baseline, and try to prove if ABC would provide a benefit to the project by using the requirements of Section 27.0 of the Structure Design Manual, project specific constraints and engineering judgment. The example will not provide a final recommendation or a cost comparison breakdown for bridge alternatives as required for the Bridge Type Study in accordance with Articles 27.3.2 and 27.3.3.

The Jane Addams Memorial Tollway (I-90) over Fox River dual structures were used for the example since ABC methods were considered during design and eventually used to construct the structures.

## A.2 Data Collection

The first step in the process is to collect the project specific data necessary as part of the Pre-Concept or Master Plan Phase. For the purposes of this example, the construction documents from contract I-13-4144R were referenced and pertinent contract document plan sheets are included at the end of the example as well as the completed ABC DMT and BLCC Tool spreadsheets. These documents are included as the Figures listed below:

Figure A.2.1 – General Plan and Elevation  
Figures A.2.2 to A.2.3 – Existing ROW  
Figures A.2.4 to A.2.11 – Construction Staging  
Figures A.2.12 to A.2.13 – Construction Schedule  
Figures A.2.14 to A.2.16 – ROW Acquisition  
Figures A.3.1 to A.3.3 – Completed ABC DMT  
Figures A.4.1 to A.4.5 – Completed ABC BLCC Tool

Per Article 27.3.1, existing bridges that are to be replaced require an ABC DMT to be completed to determine if ABC should be evaluated further. Based on the previous performed inspection and Structure Condition Report, the scope of work for the project is complete replacement so the ABC DMT is required. Only one ABC DMT will be completed to represent both structures.

The ABC DMT consists of ten (10) input variables that shall be scored to assess the impact that ABC technologies may have on a project when compared to conventional construction. The following is a breakdown of the project specific data obtained from Figures A.2.1 thru A.2.16 that are necessary to complete the ABC DMT:

**Roadway Data**

Jane Addams Memorial Tollway (I-90) WB and EB over Fox River

Milepost 55.70

ADT = 108,590

Tangent Alignment

Fox River is considered a navigable waterway; however, does not carry commercial boat traffic.

**Economic Impacts**

There are several businesses along Airport Road adjacent to the structure that could be impacted by construction. Airport Road turns into River Road and crosses under the structure. Access to the businesses could potentially be impacted during construction.

**Environmental Impacts**

There are potential noise impacts on the southwest side of the structure since a large housing community exists south of River Road.

A forest preserve is adjacent to the structure on the northwest side. In addition, a nature preserve with a highly sensitive forested fen (plant community) is located on the eastern side of the bridge. Both of these preserves could be impacted by construction activities.

The structure crosses the Fox River and construction activities could cause waterway impacts since the existing piers in the river will be removed and proposed piers will be placed in the river.

Construction activities are prohibited in the river from April 1 to June 15 due to the spawning of the River Redhorse fish. No more than 1 acre of river encroachment is allowed in the river at any one time.

**Right-of-Way (ROW)**

The scope of work for the project is to widen the roadway and completely replace the Fox River structures. Since the roadway is being widened, ROW was acquired.

To accommodate the bridge construction, temporary easements were obtained at aerial power line locations and ROW was acquired to allow the contractor access to a staging area via a haul road along Airport Road on the northwest side of the structure.

**Proposed Structure**

Scope of work: complete structure replacement using staged construction

Illinois Tollway Structure Numbers: 549 and 550

Proposed 8 span structure

No skew

8" cast-in-place concrete deck

90" PPC Bulb T-beams

Cast-in-place concrete, multi-column bents founded on drilled shafts

Stub abutments founded on multi-row steel H-piles

### **Construction Staging**

The construction schedule includes a pre-stage to build the proposed piers under the existing structure without affecting live traffic (no MOT). The estimated construction timeframe is approximately 9 months for the pre-stage. Per Article 27.4.5, advance foundation construction shall not be considered an ABC technology or scored as a separate bridge alternative in the Decision Framework for ABC.

The structure will utilize a conventional 3-staged construction scheme that will last 2 construction seasons with a winter shutdown. The estimated construction timeframe is approximately 19 months for staged construction.

### **A.3 ABC DMT Input and Results**

The second step in the process is to use the project specific data collected in Article A.2 and input the data into the ABC DMT. For additional information on the input variables and basic guidance for the specific scoring criteria for the tool, see Article 27.3.1 in the Structure Design Manual. A completed ABC DMT is included in Figures A.3.1 and A.3.2 at the end of this example.

The following is a list of the assumptions and variable inputs to score the tool:

**Average Daily Traffic:** The ADT should include traffic both over and under the structure. The ADT for the I-90 Jane Addams Memorial Tollway is 108,590. Information is not provided for Airport Road or Duncan Avenue and therefore can be ignored. The ADT total is between 101,000 and 150,000.

As a result, this variable shall be input with a score = 4.

**Traffic Impact:** Use the Severity Index tab in the ABC DMT, sort the spreadsheet by Interstate (I-90), both E and W Direction, and from MP 54.6 to MP 56.2. The most critical weekly severity index shall be used for either EB or WB. For structures 549 and 550 at MP 55.7, the severity index = 3.0.

As a result, this variable shall be input with a score = 3.

**Maintenance of Traffic:** The construction schedule includes a 9 month pre-stage for substructure construction which does not affect MOT and therefore should not be included in the time duration component of this variable. The structure will utilize a conventional 3-staged construction scheme that will last 2 construction seasons with a winter shutdown. The estimated construction timeframe is approximately 19 months for staged construction. The 19 month time frame is greater than the 9 month window for “normal duration” therefore “long duration” shall be used. Since more than a 2 stage construction scheme is being utilized, “multiple staging” shall be used.

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As a result, this variable shall be input with a score = 5.

**Economic Impact:** There are several businesses along Airport Road adjacent to the structure that could be impacted by construction. Airport Road will be maintained by the Contractor during construction and used as a haul road. Traffic must be maintained at all times and temporary closures shall be coordinated a minimum of 24 hours in advance of a closure. Access to the businesses could potentially be impacted during construction; therefore, a medium business impact is assumed based on engineering judgment.

As a result, this variable shall be input with a score = 3.

**Bridge Classification:** Based on AASHTO Sections 1.3.5 and 3.10.5, the structure is categorized as Typical and designed with an operational classification factor  $n_l = 1.0$ .

As a result, this variable shall be input with a score = 0.

**Railroad/Waterway Impact:** The structures cross one waterway that is navigable but does not carry any commercial boat traffic.

As a result, this variable shall be input with a score = 3.

**Environmental Impact:** There are potential noise impacts on the southwest side of the structure, a forest preserve on the northwest side of the structure, and a nature preserve and a highly sensitive forested fen on the eastern side of the structure. In addition, there are spawning fish in the river with construction limitations. Therefore, a maximum environmental impact is assumed based on engineering judgment.

As a result, this variable shall be input with a score = 5.

**Economy of Scale:** The proposed structure is an 8 span PPC Bulb T-Beam bridge and has more than 5 spans.

As a result, this variable shall be input with a score = 5.

**Use of Typical Details:** The proposed structure is classified as “Simple” since the bridge geometry does not have any curvature or varying deck width, the structure is on a tangent alignment, the substructure units are parallel and there is no skew.

As a result, this variable shall be input with a score = 5.

**Accessibility:** The structure is classified as “some ROW available” since there is open area along the approaches.

As a result, this input variable shall be input with a score = 3.

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After all the variables are scored and input into the tool, the ABC DMT calculates an ABC Rating Score of 73 (see Figure A.3.2). Based on the Decision Flow Chart tab in the spreadsheet (see Figure A.3.3), the ABC Rating Score of 73 is greater than the 60 threshold; therefore, based on the flow chart, Accelerated Bridge Construction should be evaluated further and an ABC BLCC should be completed.

However, prior to providing a recommendation in this step and completing the ABC BLCC, the DSE shall take evaluate the project from a global perspective and determine if ABC technologies provide a benefit with all the project-specific information considered. The DSE shall provide justification for the recommendation including the major factors affecting the ABC DMT Rating Scores. The completed ABC DMT, any supporting material and a summary stating the recommendation from the DSE shall be included in the Master Plan Study or a technical memorandum (if no Master Plan).

The following is a summary of the ABC DMT input and results:

VARIABLE	DATA	SCORE
Average Daily Traffic	108,590	4
Traffic Impact	3	3
Maintenance of Traffic	Long/ Multiple Stages	5
Economic Impact	Medium Impact	3
Bridge Classification	Typical	0
Waterway Impact	One Waterway (no traffic)	3
Environmental Impact	Maximum Impact	5
Economy of Scale	8 span	5
Use of Typical Details	Simple	5
Accessibility	Some ROW Available	3

<b>ABC Rating Score:</b>	<b>73</b>
<b>Evaluate Accelerated Bridge Construction</b>	

The structure is not located within a corridor with additional structure work; therefore, the project is isolated to the structures over the Fox River and no additional project-specific information needs to be considered. The factors that justify the higher ABC Rating Score are as follows:

- Higher ADT supports the use of ABC methods
- Longer MOT with multiple stages supports the use of ABC methods
- High environmental impact supports the use of ABC methods
- High potential for economy of scale supports the use of ABC methods
- Simple geometry supports the use of typical details
- Some ROW available for staging area supports the use of ABC methods

#### A.4 ABC BLCC Tool Input and Results

The third step in the process is to use the ABC DMT recommendations and determine if the ABC BLCC Tool shall be completed. Per Article 27.3.2, all ABC DMT results that recommend ABC to be evaluated further shall require an ABC BLCC analysis. The ABC DMT recommendation for the Fox River structures is to evaluate Accelerated Bridge Construction further; therefore, the ABC BLCC shall be completed.

The ABC BLCC Tool consists of three (3) major categories with multiple input variables to evaluate the long-term economic efficiency between bridge alternatives. The first step in the BLCC process is to identify the appropriate bridge alternatives for the project site. As stated in Article 27.3.2, bridge alternatives may consist of individual ABC technologies or a combination of ABC technologies and at a minimum shall be compared to a conventional construction bridge alternative. As stated in article 27.1.1, the most common construction approaches that are used in ABC applications are expediting the construction of bridges by using Prefabricated Bridge Elements and Systems (PBES) and using bridge movement and installation methods. These applications shall be investigated further for the specific bridge site to determine logical bridge alternatives. In addition to identifying the logical bridge alternatives, the DSE shall try to eliminate bridge alternatives that do not benefit the project construction.

Article 27.4.1 lists the most commonly used PBES on ABC Projects. Since the Fox River structures have a high potential for economy of scale and the potential use of repetitive details with simple geometry, PBES could provide a benefit to construction. In addition, there are available staging areas which would support the use of PBES. The pre-stage construction requires the proposed piers to be built within the waterway. Utilizing precast pier caps and columns could reduce the construction timeframe of the pier construction and help limit the impacts to the waterway.

In addition per Article 27.4.1, constructability and erection procedures shall be thoroughly investigated prior to consideration of PBES. The DSE shall evaluate the most appropriate and feasible PBES for the bridge based on site constraints, construction procedures, cost and impacts to traffic. For the purposes of this example, no further investigation was performed. As a result, both precast deck panels and precast substructure units will be investigated further.

Article 27.4.4 lists the most commonly used ABC installation methods on ABC projects. Since the Fox River structures are over a waterway and valley it would be beneficial to look at ABC installation methods that would allow work from the top of the structure. Since the structure is to be built in stages and the MOT is controlled by the roadway (maintaining 3 lanes of traffic during construction), it is logical to eliminate Lateral Sliding. Lateral Sliding would require a complete closure of the structure. In addition,

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tall temporary piers and construction activities would be required in the waterway thus increasing impacts to the Fox River. Lateral slide-ins are also typically not economical for a multi-span structure. Self-Propelled Modular Transporter (SPMT) could also be eliminated from consideration since it is not logical to have an SPMT raise a proposed structure over 30'-0" into the air. Therefore, both Longitudinal Launches and Crane Based Projects (Gantry Crane) shall be considered.

For the purposes of this example, only a precast superstructure is being considered to limit the number of alternatives to 5 for ease of use. A steel superstructure could be considered for this location and additional alternatives could be included. The number of alternatives shall be based on engineering judgment, site constraints, and project goals and there is no upper limit on the number allowed.

The Fox River Bridges are under the complete jurisdiction of the Illinois Tollway and there is no Inter-Governmental Agreement (IGA) with local agencies. Therefore, no additional coordination is required to determine permitted ABC technologies.

Based on the assumptions described above, the following table identifies the 5 ABC BLCC Tool Bridge Alternatives to be considered:

<b>ABC BLCC TOOL – BRIDGE ALTERNATIVES</b>					
	Bridge Alt #1	Bridge Alt #2	Bridge Alt #3	Bridge Alt #4	Bridge Alt #5
Construction Type	<b>Conventional</b>	ABC	ABC	ABC	ABC
Deck	CIP	CIP	CIP	<b>Precast</b>	CIP
Super	Precast	Precast	Precast	Precast	Precast
Sub	CIP	CIP	<b>PBES</b>	<b>PBES</b>	CIP
Method	Conventional	<b>Long Launch</b>	Conventional	Conventional	<b>Crane Based</b>

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Once the bridge alternatives are identified, the next step in the BLCC process is to input the scoring criteria into the ABC BLCC Tool for each of the 5 bridge alternatives. A separate ABC BLCC score shall be calculated for each bridge alternative investigated and the Individual and Total ABC BLCC Rating Scores obtained for each bridge alternative shall manually be entered into the summary tab of the spreadsheet. For additional information on the input variables and basic guidance for the specific scoring criteria for the tool, see Article 27.3.2 in the Structure Design Manual. A completed ABC BLCC Tool for Bridge Alternative #3 is included in Figures A.4.1 and A.4.5 at the end of this example.

The following is breakdown of the input variables and a list of the major assumptions that differentiate the bridge alternatives for the three major categories in the tool. Only the input variables that require engineering judgment or further explanation are discussed in more detail in this example. The variable inputs that have straight forward scoring are not explained further. It should be noted that the tool makes assumptions about costs and service life. If the DSE determines that cost breakdowns or service life information for a given project is different than the tool's assumptions, the input scores may be adjusted accordingly. See page A-13 for the scoring results associated with each variable for all 5 alternatives.



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<b>ABC BLCC TOOL INPUT – INITIAL COST (IC)</b>					
	Bridge Alt #1	Bridge Alt #2	Bridge Alt #3	Bridge Alt #4	Bridge Alt #5
Total Labor Duration	> 18 months	btwn 13 and 18 months	btwn 13 and 18 months	btwn 13 and 18 months	btwn 13 and 18 months
Deck	CIP	CIP	CIP	Precast	CIP
Super	Precast	Precast	Precast	Precast	Precast
Sub	CIP	CIP	Precast	Precast	CIP
Equipment	Typ CIP	Long Launch	PBES	PBES	Gantry Crane
Agency Costs	Normal	Extensive	Moderate	Extensive	Moderate
ROW	btwn 0.5 and 1.0 acres	btwn 0.5 and 1.0 acres	> 1.0 acre	> 1.0 acre	btwn 0.5 and 1.0 acres
Environmental Impacts	Maximum	Maximum	Medium	Medium	Medium

**Duration:** The conventional construction schedule (Bridge Alt #1) includes a 9 month pre-stage to construct the piers under the existing structure and a 19 month staged construction scheme for the superstructure. The total construction timeframe for labor costs would then be 28 months which is greater than the 18 month upper limit.

ABC technologies are assumed to speed up the construction timeframe but a 10 month reduction (to change the scoring for this variable) in construction timeframe is unrealistic. However, to realize a benefit in the BLCC Tool, the Total Labor scores for Bridge Alternatives that utilized ABC technologies (Bridge Alt #2, #3 #4 and #5) were adjusted down one level because a benefit would be realized.

**Agency Costs:** Based on the ABC BLCC Guidance, "Normal agency coordination" shall be defined for conventional construction (Bridge Alt #1). Construction projects that use methods that are less familiar to the agency and contracting community present a higher likelihood for more agency involvement and coordination; therefore, Longitudinal Launch (Bridge Alt #2) is scored as "Extensive agency coordination" since this is not typically done on Illinois Tollway projects. Precast Deck Panels (Bridge Alt #4) would

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also require “Extensive agency coordination” due to complex erection procedures, additional joints, and the use of UHPC etc. It is assumed that both PBES (Bridge Alt #3) and Gantry Cranes (Bridge Alt #5) would require less agency coordination than a longitudinal launch but would require more agency coordination than conventional construction; therefore, are scored as “Moderate agency coordination.”

**ROW:** This accounts for the ROW acquisition for the bridge construction only. Roughly 0.341 acres of temporary easement is being acquired due to aerial power lines at the bridge site. This area is not considered to be significant and would be required for all bridge alternatives; therefore, shall not be included in the total ROW acquisition.

Approximately 0.924 acres of ROW is being acquired along Airport Road for the Contractor Haul Road. This area shall be used for conventional construction (Bridge Alt #1) as well as for the longitudinal launch (Bridge Alt #2) and Gantry Crane (Bridge Alt #5) since no additional ROW would be acquired for these bridge alternatives. It is realistic to assume that PBES (Bridge Alts #3 and #4) will be fabricated on site. Since a contractor staging area is already being provided, no additional ROW would be required. However, to realize a benefit in the BLCC Tool, the ROW scores for Bridge Alternatives that utilized PBES (Bridge Alts #3 and #4) were adjusted up one level because these bridge alternatives would require more available lay down area, fabrication area, etc. than the other bridge alternatives.

**Environmental Impacts:** All bridge alternatives would have impacts to the Fox River since the piers are being built in the waterway. The bridge alternatives that would build the piers faster would have a lower impact and would limit the impacts to the spawning fish in the river. It is assumed that the options that utilize cast-in-place piers (Bridge Alt #1 and #2) will receive a lower score compared to bridge alternatives that utilize precast pier caps and columns (Bridge Alt #3 and #4). The gantry crane (Bridge Alt #5) will limit impacts to the forest and nature preserves adjacent to the structure since removal and replacement work via cranes would occur on top of the deck and can be scored the same as the precast pier cap and column alternatives.

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<b>ABC BLCC TOOL INPUT – TRAFFIC IMPACT COSTS (TIC)</b>					
	Bridge Alt #1	Bridge Alt #2	Bridge Alt #3	Bridge Alt #4	Bridge Alt #5
MOT	Extended/Multi Stages	Extended /Simple MOT	Extended /Simple MOT	Extended /Simple MOT	Extended /Simple MOT
Economic Impacts	Medium	Low	Low	Low	Low
Waterway Impacts	No disruption	No disruption	No disruption	No disruption	No disruption

**MOT:** This accounts for the safety of workers and travelers, and the amount of time and cost of staging during the construction process. The 19 month time frame (the pre-stage should not be included since no MOT impacts) is greater than the 9 month window for “extended duration” therefore “extended duration” shall be used. Since more than a 2 stage construction scheme is being utilized, “multiple staging” shall be used. Since the MOT scheme is controlled by the roadway all bridge alternatives should use the same input score. ABC technologies are assumed to speed up the construction timeframe but a 10 month reduction (to change the scoring for this variable) in construction timeframe is unrealistic. However, to realize a benefit in the BLCC Tool, the MOT scores for Bridge Alternatives that utilized ABC technologies (Bridge Alts, #2, #3, #4, and #5) were adjusted down one level because a benefit would be realized.

**Economic Impacts:** All bridge alternatives will have an impact to several businesses along Airport Road adjacent to the structure since Airport Road will be maintained by the Contractor during construction and used as a haul road. It is logical to assume that the bridge alternatives (Bridge Alts #2, #3, #4 and #5) that can reduce the construction timeframe will limit the economic impacts.

**Waterway Impacts:** The structures cross one waterway that is navigable but does not carry any commercial boat traffic. Therefore, there are no waterway traffic impacts.

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<b>ABC BLCC TOOL INPUT – MAINTENANCE COST (MC)</b>					
	Bridge Alt #1	Bridge Alt #2	Bridge Alt #3	Bridge Alt #4	Bridge Alt #5
Frequency	No Precast	No Precast	One Precast	Two Precast	No Precast
Cost of Repair	None	None	One	Two	None
Replace Costs	Precast Super	Precast Super	Precast Super & Sub	Precast Super & Sub	Precast Super
Future TIC Maintenance	Weekend/Night	Weekend/Night	Weekend/Night	Extended MOT	Weekend/Night
Future TIC Replace	Extended MOT	Medium MOT	Medium MOT	Medium MOT	Medium MOT
Joint Durability	Jointed	Jointed	Additional Joints	Additional Joints	Jointed
Unforeseen Performance	No PBES	No PBES	Single PBES	More than one PBES	No PBES
Salvage Value	Precast Beam	Precast Beam	Precast Beam	Precast Beam	Precast Beam

**Future TIC for Routine Maintenance:** This accounts for the cost associated with future routine maintenance of the structure. The bridge alternatives (Bridge Alts #1, #2, #3 and #5) that include CIP decks would follow the normal Illinois Tollway Routine Maintenance schedule which would require either off peak, weekend or night time closures. For bridge alternatives (Bridge Alt #4) that include precast deck panels a weekday peak shift or Extended MOT would be required since it is logical to assume that the entire panel would need to be replaced. Since the structure is over a waterway and two low traffic roadways, substructure repair would not require a closure.

**Future TIC for Rehabilitation and Replacement:** It is logical to assume that the MOT scheme for replacement of the proposed structure would be the same as the MOT scheme for replacement of the existing structure.

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**TOTAL ABC BLCC RATING SCORE SUMMARY – All Bridge Alternatives**

INITIAL COSTS (IC)					
Variable	Bridge Alt #1	Bridge Alt #2	Bridge Alt #3	Bridge Alt #4	Bridge Alt #5
Total Labor	1	2	2	2	2
Deck Material	1	1	1	2	1
Superstructure Material	2	2	2	2	2
Substructure Material	1	1	2	2	1
Equipment	5	4	4	4	3
Agency Costs	3	1	2	1	2
Right-of-Way	2	2	1	1	2
Environmental Impact Costs	1	1	2	2	2
<b>IC Rating Score:</b>	<b>60</b>	<b>56</b>	<b>62</b>	<b>64</b>	<b>55</b>
				High	Low

TRAFFIC IMPACT COSTS (TIC)					
Variable	Bridge Alt #1	Bridge Alt #2	Bridge Alt #3	Bridge Alt #4	Bridge Alt #5
MOT Costs	1	2	2	2	2
Economic Impacts	2	3	3	3	3
Waterway Impacts	5	5	5	5	5
<b>TIC Rating Score:</b>	<b>50</b>	<b>67</b>	<b>67</b>	<b>67</b>	<b>67</b>
	Low		High		

MAINTENANCE COSTS (MC)					
Variable	Bridge Alt #1	Bridge Alt #2	Bridge Alt #3	Bridge Alt #4	Bridge Alt #5
Maintenance/Rehab Costs	1	1	2	3	1
Cost of Repair	4	4	3	2	4
Total Replacement Costs	1	1	2	2	1
Future TIC Maintenance	2	2	2	1	2
Future TIC Rehab/Replace	1	2	2	2	2
Joint Durability	2	2	1	1	2
Unforeseen Performance	3	3	2	1	3
Salvage Value	1	1	1	1	1
<b>MC Rating Score:</b>	<b>59</b>	<b>60</b>	<b>62</b>	<b>57</b>	<b>60</b>
			High	Low	

<b>TOTAL RATING SCORE:</b>	<b>56</b>	<b>61</b>	<b>63</b>	<b>63</b>	<b>61</b>
	Low		High		

## **A.5 ABC BLCC Tool Summary and Conclusions**

The final step in the process is to evaluate the results of the ABC BLCC analysis to identify the applicable ABC or conventional construction technologies that best fit the project specific goals.

The DSE shall review the Individual and Total ABC BLCC Rating scores to identify the bridge alternatives that shall be carried forward to the Bridge Type Study and included in the cost comparison to determine a final recommendation. The Total ABC BLCC Rating Score Summary provides a visual comparison of individual and overall scores for each bridge alternative considered. The higher scores represent the potential for lower costs for the bridge alternative being considered when compared to the other bridge alternatives. It is suggested that multiple bridge alternatives be carried forward and should be based on engineering judgment.

Prior to providing a recommendation in this step and completing the Bridge Type Study and cost comparison, the DSE shall again evaluate the project from a global perspective and determine if the bridge alternatives with the higher scores provide a benefit with all the project-specific information considered. The DSE shall also discuss with the Illinois Tollway if any additional analysis is required to help compare alternatives prior to making a final recommendation.

Based on the Individual ABC BLCC Scoring results and comparison, the following results are visualized:

- Gantry Crane (Bridge Alt #5) would have the highest initial cost (lowest BLCC score)
- Precast Deck Panels (Bridge Alt #4) would have the lowest initial cost (highest BLCC score)
- Conventional Construction (Bridge Alt #1) would have the highest traffic impact costs (lowest BLCC score)
- PBES Substructure (Bridge Alt #3) would have the lowest maintenance costs (highest BLCC score)
- Precast Decks (Bridge Alt #4) would have the highest maintenance costs (lowest BLCC score)

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Based on the Total ABC BLCC Scoring results and comparison, the following results are visualized:

- PBES Substructure (Bridge Alt #3) would have the lowest overall cost (highest BLCC score)
- Conventional Construction (Bridge Alt #1) would have the highest overall cost (lowest BLCC score)

For the purpose of this example, no additional analysis is required to compare bridge alternatives. Based on the final scoring results, it would be logical to consider bridge alternatives #2, #3, #4 and #5 and perform a cost summary comparison in accordance with Article 3.2 in the Bridge Type Study to determine a final recommendation. The final recommendation shall then be incorporated into the Type, Size and Location (TS&L) Plans in accordance with Section 3.0.

It should be noted that several of the bridge alternatives are considered Contractor's means and methods such as ABC Installation Methods. Contracting Provisions shall be established and discussed with the Illinois Tollway to determine how the project will be bid and packaged. Article 27.5 of the Structure Design Manual references the most commonly used contracting provisions on ABC projects.

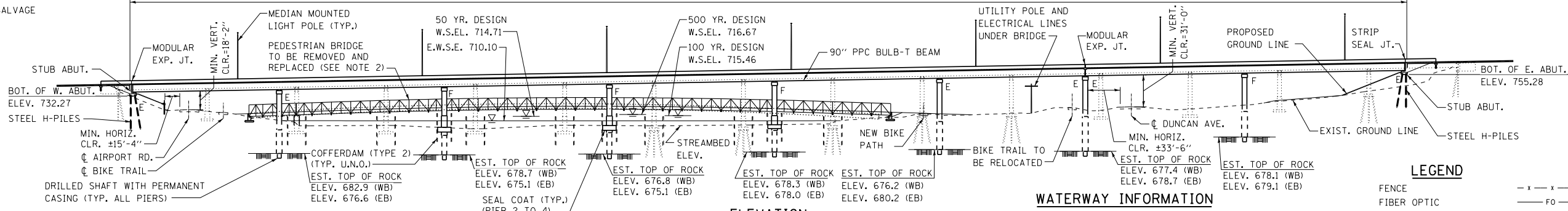
BENCHMARK: B.M. NH1087-DISK FOUND IN TOP AND ABOUT IN THE CENTER OF THE CONCRETE BASE IN THE FIRST PIER WEST OF THE BIKE PATH AND UNDER I-90 BRIDGE NO. 549, 7 FT. SOUTH OF THE SOUTH EDGE OF THE NORTH LEG OF THE PIER, 2 FT. EAST OF THE WEST EDGE OF THE BASE. ADJ. ELEV. 723.39.

EXISTING STRUCTURES: BRIDGE NO. 549 AND BRIDGE NO. 550 WERE ORIGINALLY CONSTRUCTED IN 1957 UNDER CONTRACT N-5A, B.N. 549 CARRIES EASTBOUND TRAFFIC AND B.N. 550 CARRIES WESTBOUND TRAFFIC. BOTH STRUCTURES WERE WIDENED TOWARDS THE MEDIAN IN 1989 UNDER CONTRACT GRE-83-077A. BOTH STRUCTURES ARE 1383'-11" BACK TO BACK ABUTMENTS AND HAVE AN OUT TO OUT WIDTH OF 57'-7" FROM THE CL I-90. THE SUPERSTRUCTURE CONSISTS OF SIMPLE SPAN PPC I-BEAMS MADE CONTINUOUS FOR LIVE LOAD AND SUPERIMPOSED DEAD LOAD, AND 7 1/2" REINFORCED CONCRETE DECK WITH A 1 1/2" RIGID CONCRETE OVERLAY. THE SUBSTRUCTURE CONSISTS OF REINFORCED CONCRETE MULTI-COLUMN PIERS AND REINFORCED CONCRETE ABUTMENTS SUPPORTED ON METAL SHELL CONCRETE PILE FOOTING. BRIDGE NO. 549 & 550 SUPERSTRUCTURE UNITS WERE REPAIRED UNDER CONTRACT RR-05-5347 IN 2008 AND UNDER CONTRACT RR-09-5582 IN 2009. EXISTING STRUCTURES TO BE REMOVED AND REPLACED.

TRAFFIC CONTROL: TRAFFIC TO BE MAINTAINED UTILIZING STAGE CONSTRUCTION.

BRIDGE OMISSION STA. 2898+75.60 TO STA. 2911+90.35

NO SALVAGE



DESIGN SCOUR ELEVATION TABLE

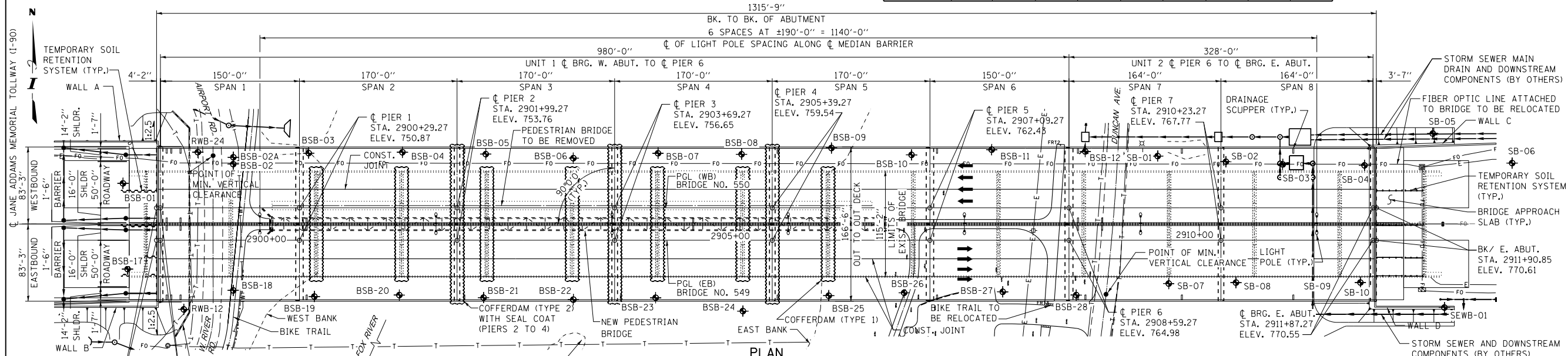
DESIGN SCOUR ELEVATION (FT.)									
	W. ABUT.	PIER 1	PIER 2	PIER 3	PIER 4	PIER 5	PIER 6	PIER 7	E. ABUT.
$Q_{100}$	732.27	687.30	686.00	686.00	686.00	703.80	722.71	723.12	755.23
$Q_{500}$	732.27	686.30	685.00	685.00	685.00	702.40	722.71	723.12	755.23

ELEVATION

WATERWAY INFORMATION									
DRAINAGE AREA = 1,446 SQ. MI. PROPOSED LOW GRADE ELEV. 748.26 @ STA. 2898+76.02									
FLOOD	FREQ. YR.	$Q (f+3 S)$	OPENING SO. FT.		NAT. H.W.E.	HEAD - FT.		HEADWATER EL.	
			EXIST.	PROP.		EXIST.	PROP.	EXIST.	PROP.
DESIGN	50	8950	5911.54	6001.74	714.71	0.01	0	714.72	714.71
BASE	100	10540	6503.74	6628.22	715.46	0.01	0	715.47	715.46
OVERTOPPING	-	-	-	-	-	-	-	-	-
MAX. CALC.	500	13475	7493.78	7655.07	716.66	0.01	0.01	716.67	716.67

LEGEND

- FENCE — x — x — x —
- FIBER OPTIC — FO —
- GUARDRAIL — □ — □ — □ —
- OVERHEAD ELECTRICAL — A —
- SOIL BORING — BSB-02
- STORM SEWER — T —
- TELEPHONE — E —
- UNDERGROUND ELECTRICAL — E —
- UNDERGROUND WATER — W —



NOTES:

- ALL ELEVATIONS ARE GIVEN IN NAVD 1988 DATUM UNLESS NOTED.
- FOR PEDESTRIAN BRIDGE RECONSTRUCTION AND DETAILS, SEE SHEET S-170.
- FOR PROFILE GRADE, SEE SHEET S-5.

CONSTRUCTION SPECIFICATIONS

ILLINOIS DEPARTMENT OF TRANSPORTATION GUIDE BRIDGE SPECIAL PROVISIONS (GBSP's).

TOLLWAY SUPPLEMENTAL SPECIFICATIONS TO THE ILLINOIS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION ISSUED JANUARY, 2012.

ILLINOIS DEPARTMENT OF TRANSPORTATION SUPPLEMENTAL SPECIFICATIONS AND RECURRING SPECIAL PROVISIONS ADOPTED JAN. 1, 2012.

ILLINOIS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION ADOPTED JAN. 1, 2012.

HIGHWAY CLASSIFICATION

I-90 JANE ADDAMS MEMORIAL TOLLWAY  
 FUNCTIONAL CLASS: INTERSTATE  
 ADT: 108,590 (2010), 145,430 (2030)  
 ADTT: 13,200 (2010), 17,450 (2030)  
 DHV: 10,859 (2010), 14,543 (2030)  
 DESIGN SPEED: 70 M.P.H.  
 POSTED SPEED: 55 M.P.H.  
 TWO-WAY TRAFFIC  
 DIRECTIONAL DISTRIBUTION: 50:50

DESIGN SPECIFICATIONS

2012 AASHTO LRFD BRIDGE DESIGN SPECIFICATION 6TH EDITION, FEBRUARY 2012  
 ISTHA STRUCTURES DESIGN MANUAL, MARCH 2013  
 IDOT BRIDGE MANUAL, JANUARY 2012

LOADING HL-93 AND IL 120

ALLOW 50% SO. FT. FOR FUTURE WEARING SURFACE.

DESIGN STRESSES

FIELD UNITS  
 $f'_c$  = 3,500 PSI (SUBSTRUCTURE)  
 $f'_c$  = 4,000 PSI (SUPERSTRUCTURE)  
 $f_y$  = 60,000 PSI (REINFORCEMENT)  
 PRECAST PRESTRESSED UNITS  
 $f'_c$  = 7,500 PSI (SPANS 1 THRU 6)  
 $f'_c$  = 5,600 PSI (SPANS 1 THRU 6)  
 $f'_c$  = 8,000 PSI (SPANS 7 AND 8)  
 $f'_c$  = 6,000 PSI (SPANS 7 AND 8)  
 $f_{pu}$  = 270,000 PSI (0.6"  $\phi$  LOW LAX. STRANDS)  
 $f_{pb}$  = 202,500 PSI (0.6"  $\phi$  LOW LAX. STRANDS)

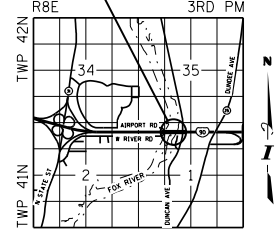
SEISMIC DATA

SEISMIC PERFORMANCE ZONE (SPZ) = 1  
 DESIGN SPECTRAL ACCELERATION AT 1.0 SEC ( $S_{D1}$ ) = 0.059 g  
 DESIGN SPECTRAL ACCELERATION AT 0.2 SEC ( $S_{D0.2}$ ) = 0.111 g  
 SOIL SITE CLASS = C

BRIDGE RATING

INVENTORY 1.29 HL-93  
 OPERATING 1.67 HL-93

PROJECT LOCATION



LOCATION SKETCH

S-1

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CHECKED BY	D.S.E.	DATE	3-13-14

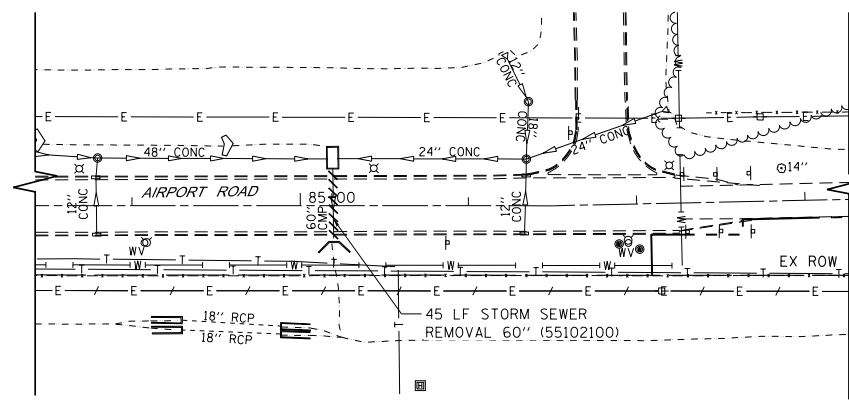
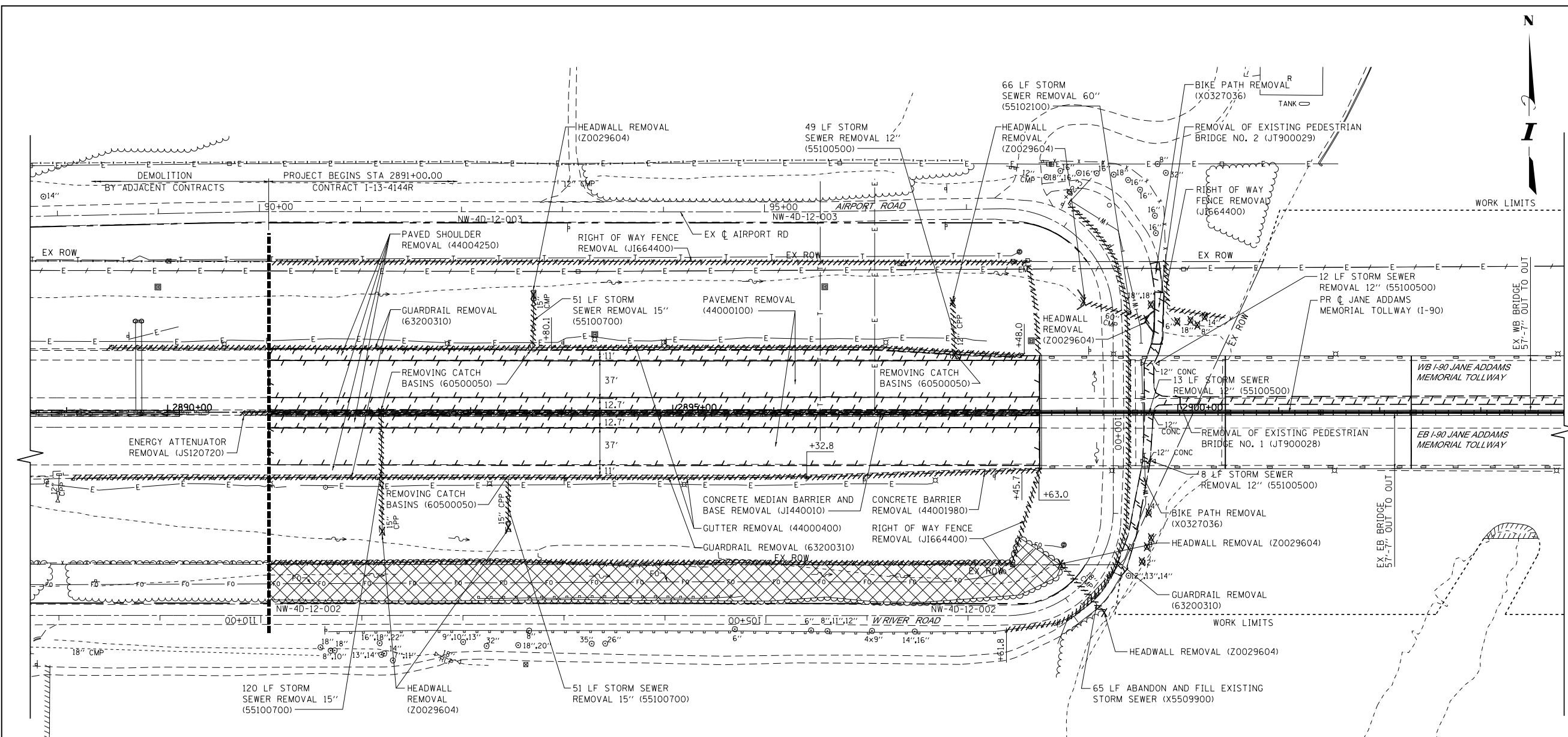


REVISIONS		
NO.	DATE	DESCRIPTION

CONTRACT NO. I-13-4144R  
 BRIDGE NO. 549 & 550  
 GENERAL PLAN AND ELEVATION  
 I-90 OVER FOX RIVER

DRAWING NO.  
 190 OF 564



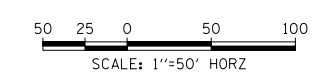


**LEGEND:**

- ⊗<sub>4"</sub> TREE REMOVAL (6" TO 15" DIA) (20100110)
- ⊗<sub>25"</sub> TREE REMOVAL (OVER 15" DIA) (20100210)
- ⊗<sub>ACRES</sub> TREE REMOVAL (ACRES) (20100500)

**NOTES:**

1. WATER MAIN REMOVAL SHOWN ON SHEET WTR-2.
2. ALL GUARDRAILS LOCATED IN FRONT OF BREAKAWAY LIGHT POLES SHALL REMAIN UNTIL LIGHT POLES HAVE BEEN REMOVED.



REM-1

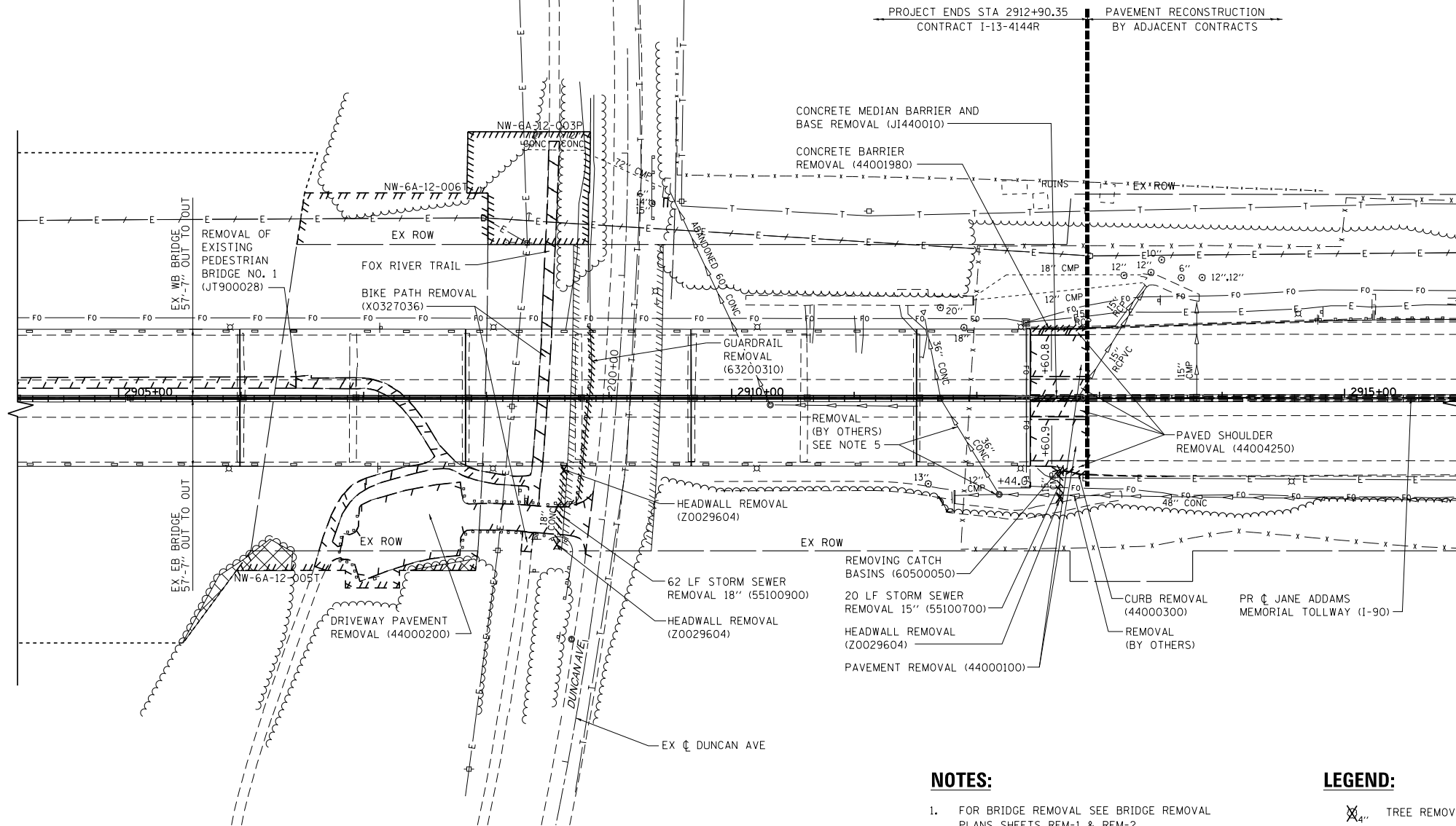
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	CHECKED BY R.M.K.	DATE 3-13-14

REVISIONS	
NO.	DESCRIPTION

CONTRACT NO. I-13-4144R  
I-90 OVER FOX RIVER  
REMOVAL PLAN

DRAWING NO.  
76 OF 564

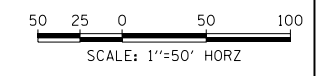


**NOTES:**

1. FOR BRIDGE REMOVAL SEE BRIDGE REMOVAL PLANS SHEETS REM-1 & REM-2.
2. EXISTING WHEEL STOPS SHALL BE REMOVED AND PAID FOR AS REMOVE EXISTING PARKING BLOCKS (X0301339).
3. ALL GUARDRAILS LOCATED IN FRONT OF BREAKAWAY LIGHT POLES SHALL REMAIN UNTIL LIGHT POLES HAVE BEEN REMOVED.
4. EXISTING STORM SEWER, PAVED DITCHES, CULVERTS AND APPURTENANCES EAST OF DUNCAN AVE WILL BE REMOVED BY ADJACENT CONTRACT.
5. 36" SEWER TO BE REMOVED AFTER MAIN DRAIN COMPLETED BY ADJACENT CONTRACT.

**LEGEND:**

- TREE REMOVAL (6" TO 15" DIA) (20100110)
- TREE REMOVAL (OVER 15" DIA) (20100210)
- TREE REMOVAL (ACRES) (20100500)



REM-2

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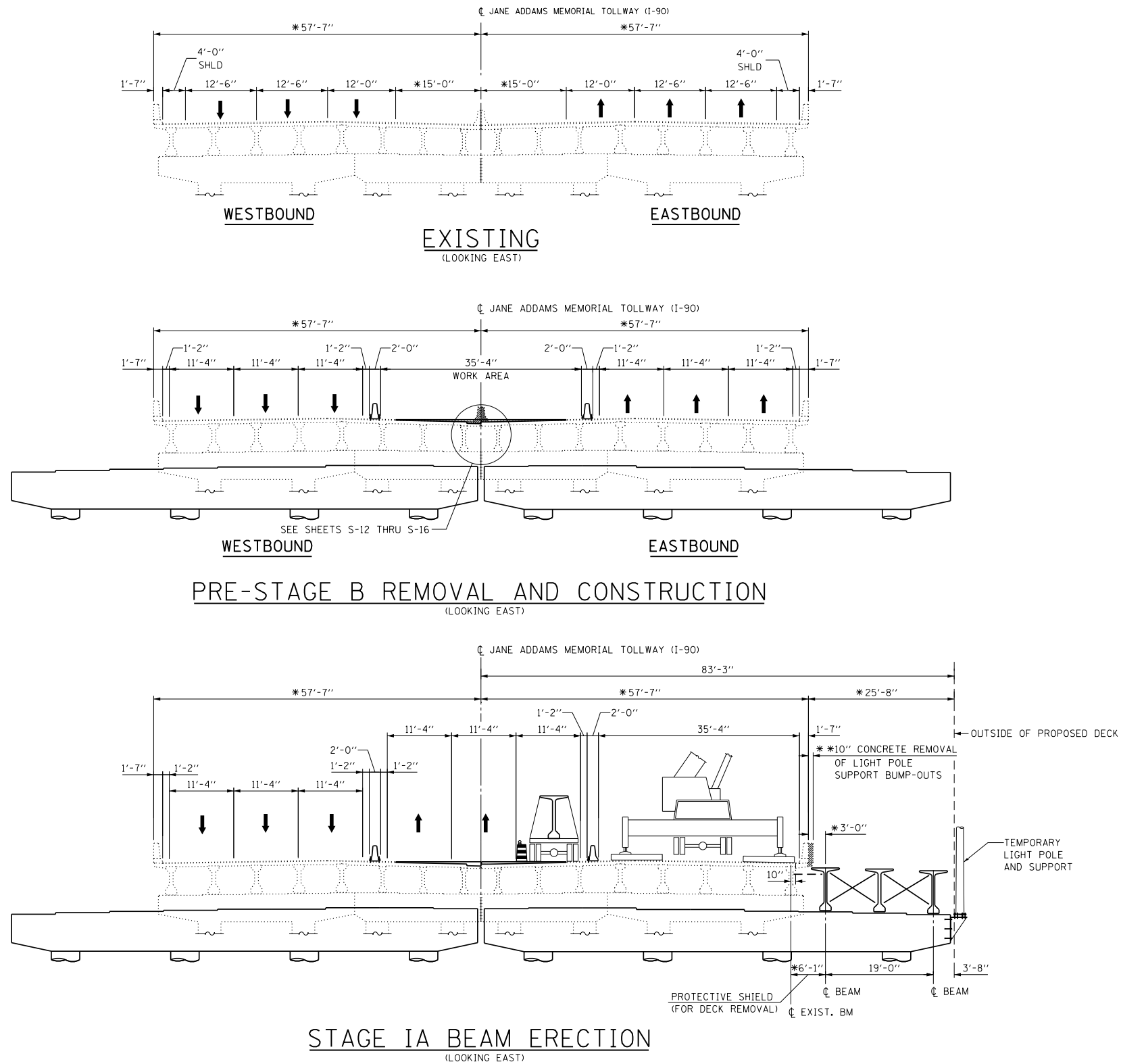
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NO.	DATE	DESCRIPTION

CONTRACT NO. I-13-4144R  
I-90 OVER FOX RIVER  
REMOVAL PLAN

DRAWING NO.  
77 OF 564



**PRE-STAGE B REMOVAL AND CONSTRUCTION**

- REMOVE EXISTING MEDIAN BARRIER AND PERFORM DECK MODIFICATIONS IN PREPARATION FOR MAINTENANCE OF TRAFFIC USE
- CONSTRUCT CAUSEWAY AND BEGIN CONSTRUCTION OF EB AND WB PIERS

**STAGE IA BEAM ERECTION**

- CONSTRUCT EB STAGE I ABUTMENTS
- PLACE EB STAGE I BEAMS DURING OFF-PEAK HOURS
- CONTINUE CONSTRUCTION OF EB AND WB PIERS
- INSTALL TEMPORARY LIGHT POLES ON SOUTH END OF EACH EB PIER

**NOTES:**

THIS SHEET IS FOR BRIDGE STAGE CONSTRUCTION ONLY AND ILLUSTRATES THE USE OF CRANES ON EXISTING OR PROPOSED BRIDGE STRUCTURE TO FACILITATE BEAM ERECTION. FOR COMPLETE MAINTENANCE OF TRAFFIC SHOWING ALL STAGES AND PRE-STAGES SEE ROADWAY M.O.T. SHEETS.

FOR LONGITUDINAL LIMITS OF PROTECTIVE SHIELD SEE SHEETS S-20 AND S-149.

\*\* DISTANCES SHOWN FROM PROPOSED CENTERLINE JANE ADDAMS MEMORIAL TOLLWAY (I-90) AND FROM PROPOSED BRIDGE ELEMENTS TO EXISTING BRIDGE ELEMENTS ARE BASED ON EXISTING PLANS ASSUMING THE PROPOSED CENTERLINE I-90 IS COLLINEAR WITH THE EXISTING I-90 CENTERLINE. HOWEVER, SINCE THE CENTERLINES ARE NOT COLLINEAR, ACTUAL TRANSVERSE DIMENSIONS FROM PROPOSED ELEMENTS TO EXISTING ELEMENTS MAY VARY BY UP TO 3" FROM THOSE SHOWN. DIMENSIONS THAT DO NOT HAVE AN ASTERISK (\*) SHOULD BE HELD AS SHOWN.

\*\* EXISTING EB LIGHT POLE SUPPORT BUMP-OUTS WILL NEED TO BE REMOVED WHEN ERECTING BEAMS FROM DECK. EXISTING EB PARAPET TO REMAIN. IF BEAMS ARE NOT FULLY ERECTED PRIOR TO WINTER CONDITION 2014, BEAMS IN SPANS 1, 2, 4, 5 AND 6 MAY BE ERECTED FROM SOUTH SIDE OF BRIDGE.

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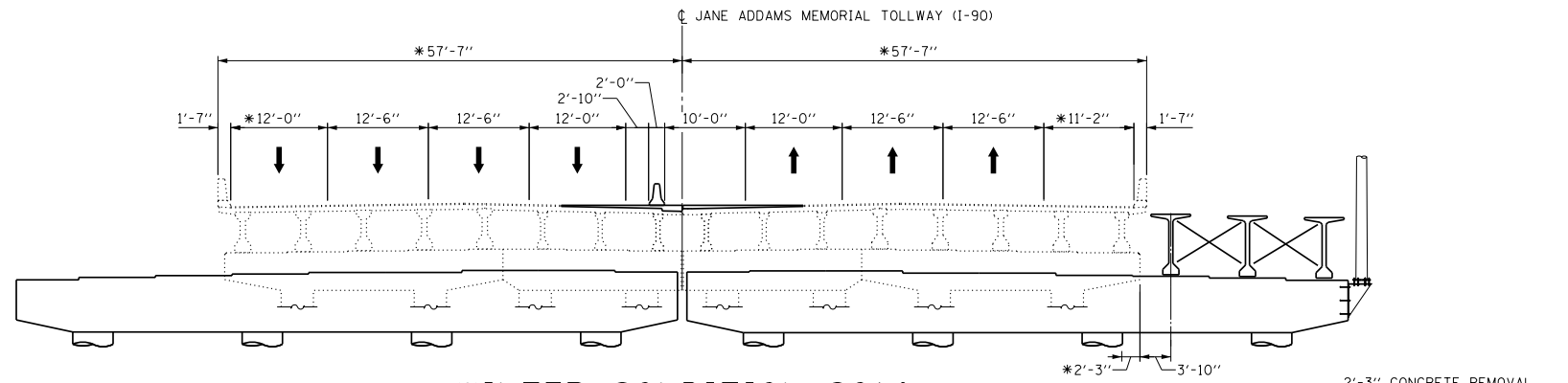
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2700 OGDEN AVENUE  
DOWNERS GROVE, ILLINOIS 60515

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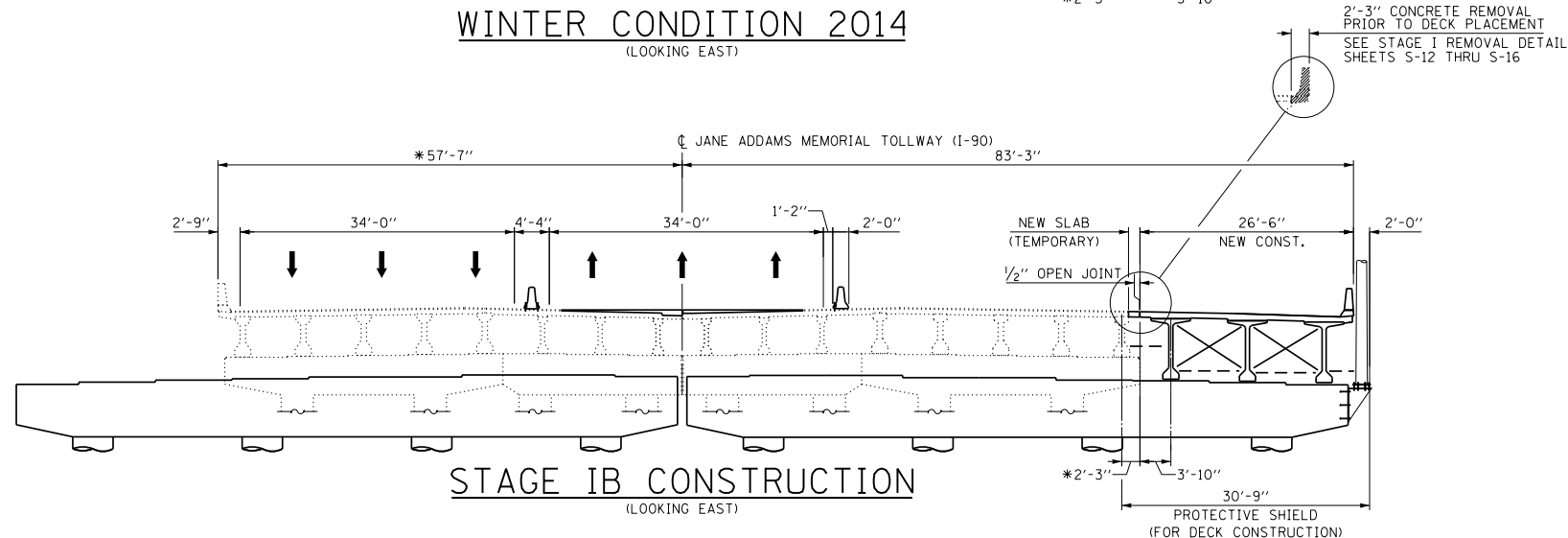
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BRIDGE NO. 549 & 550  
STAGE CONSTRUCTION  
AND REMOVAL

S-6

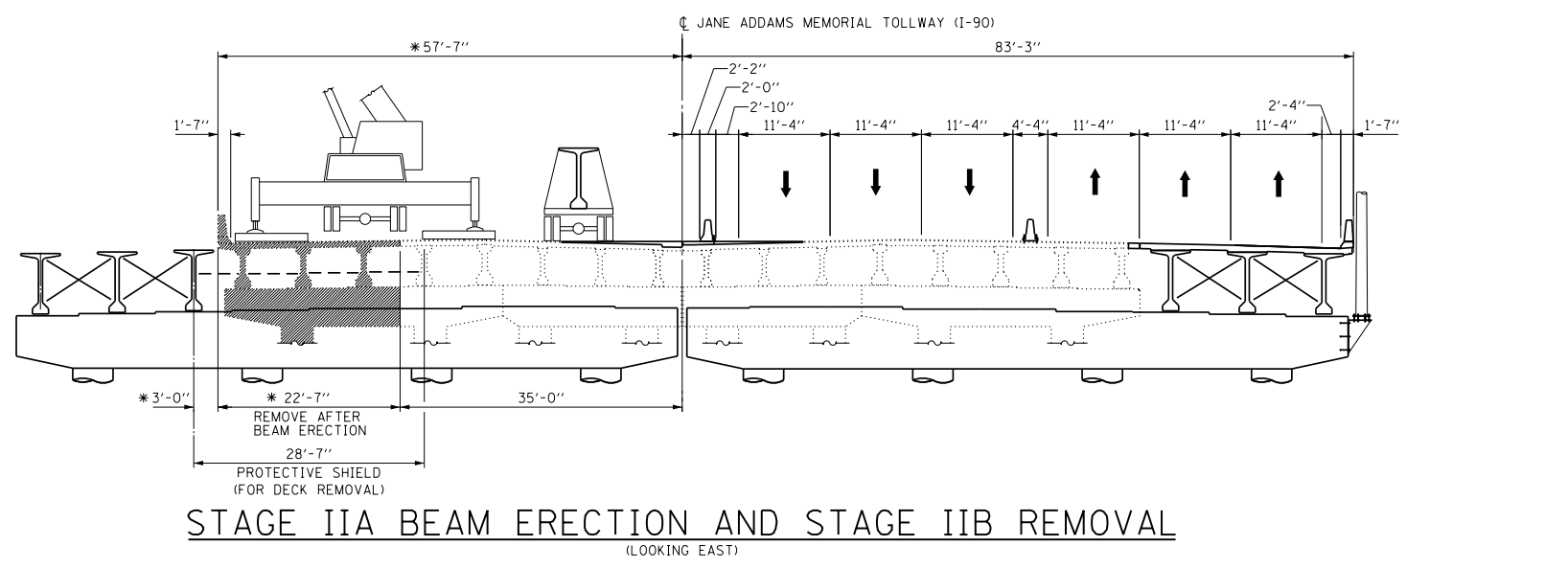
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195 OF 564



**WINTER CONDITION 2014**  
(LOOKING EAST)



**STAGE IB CONSTRUCTION**  
(LOOKING EAST)



**STAGE IIA BEAM ERECTION AND STAGE IIB REMOVAL**  
(LOOKING EAST)

**WINTER CONDITION 2014**

- CONTRACTOR MAY CONTINUE CONSTRUCTION OF EB PIERS AND/OR SET EB BEAMS IN SPANS 1, 2, 4, 5 AND 6
- CONTRACTOR MAY CONTINUE CONSTRUCTION OF WB PIERS

**STAGE IB CONSTRUCTION**

- REMOVAL EB PARAPET
- CONSTRUCT EB STAGE I DECK AND PARAPET
- CONSTRUCT TEMPORARY DECK TO MATCH STAGE I DECK
- COMPLETE CONSTRUCTION OF WB PIERS

**STAGE IIA BEAM ERECTION**

- CONSTRUCT WB STAGE IIA ABUTMENTS
- PLACE WB STAGE IIA BEAMS

**STAGE IIB REMOVAL**

- REMOVE WB STAGE IIB EXISTING DECK, BEAMS AND SUBSTRUCTURES AS REQUIRED TO INSTALL IIB BEAMS
- CONSTRUCT WB STAGE IIB ABUTMENTS

**NOTES:**

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FOR LONGITUDINAL LIMITS OF PROTECTIVE SHIELD SEE SHEETS S-20 AND S-149.

\* DISTANCES SHOWN FROM PROPOSED CENTERLINE JANE ADDAMS MEMORIAL TOLLWAY (I-90) AND FROM PROPOSED BRIDGE ELEMENTS TO EXISTING BRIDGE ELEMENTS ARE BASED ON EXISTING PLANS ASSUMING THE PROPOSED CENTERLINE I-90 IS COLLINEAR WITH THE EXISTING I-90 CENTERLINE. HOWEVER, SINCE THE CENTERLINES ARE NOT COLLINEAR, ACTUAL TRANSVERSE DIMENSIONS FROM PROPOSED ELEMENTS TO EXISTING ELEMENTS MAY VARY BY UP TO 3" FROM THOSE SHOWN. DIMENSIONS THAT DO NOT HAVE AN ASTERISK (\*) SHOULD BE HELD AS SHOWN.

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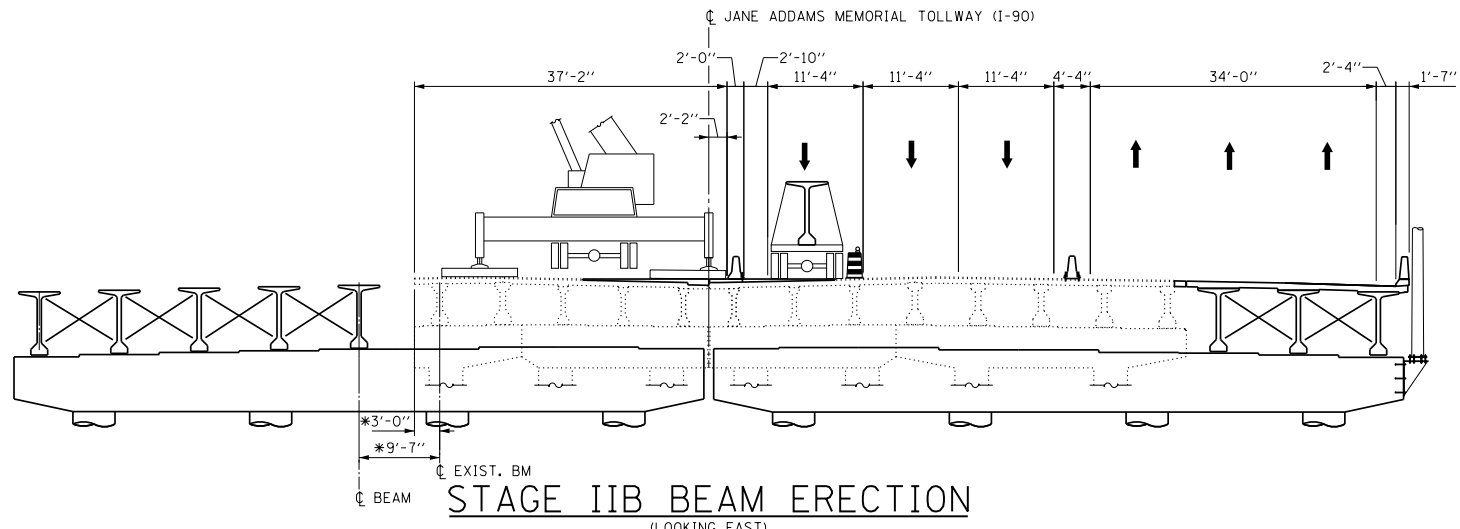
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BRIDGE NO. 549 & 550  
STAGE CONSTRUCTION  
AND REMOVAL

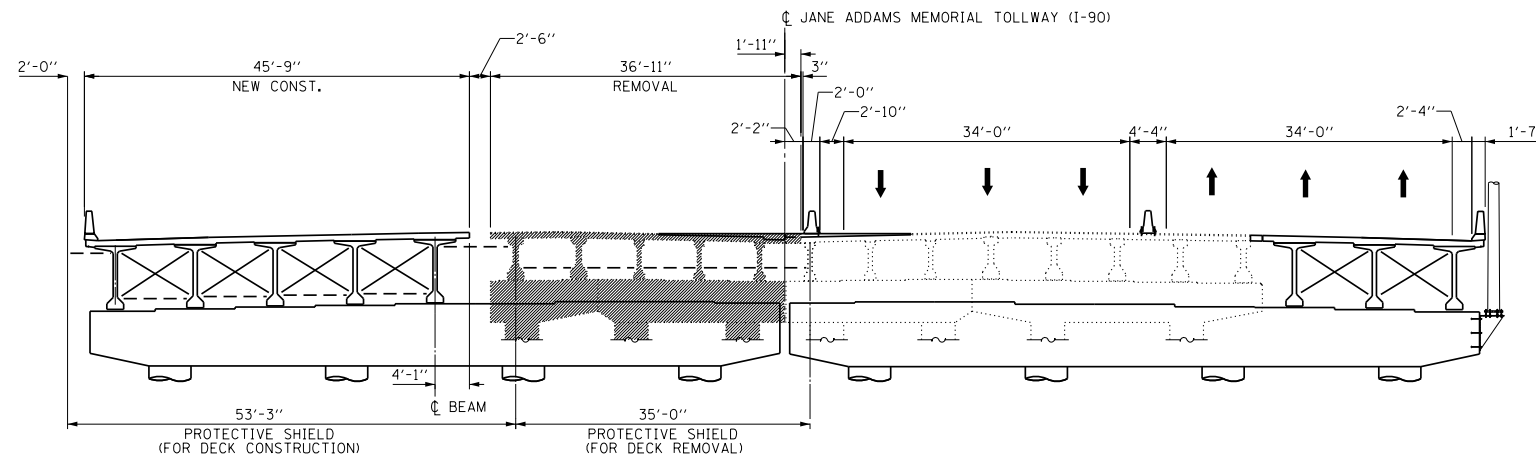
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196 OF 564



**STAGE IIB BEAM ERECTION**  
(LOOKING EAST)

**STAGE IIB BEAM ERECTION**

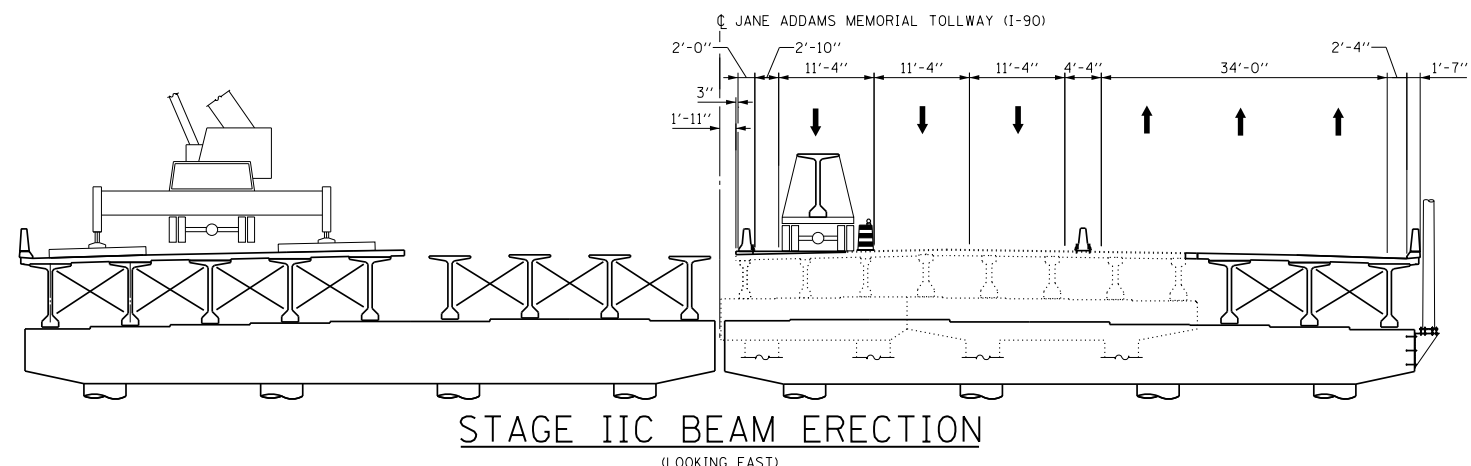
- PLACE WB STAGE IIB BEAMS DURING OFF-PEAK HOURS



**STAGE IIB CONSTRUCTION AND STAGE IIC REMOVAL**  
(LOOKING EAST)

**STAGE IIB CONSTRUCTION AND STAGE IIC REMOVAL**

- CONSTRUCT WB STAGE IIB DECK
- REMOVE WB STAGE IIC EXISTING DECK, BEAMS, AND SUBSTRUCTURE AS REQUIRED TO INSTALL IIC BEAMS
- CONSTRUCT WB STAGE IIC ABUTMENTS



**STAGE IIC BEAM ERECTION**  
(LOOKING EAST)

**STAGE IIC BEAM ERECTION**

- PLACE WB STAGE IIC BEAMS DURING OFF-PEAK HOURS

**NOTES:**

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FOR LONGITUDINAL LIMITS OF PROTECTIVE SHIELD SEE SHEETS S-20 AND S-149.

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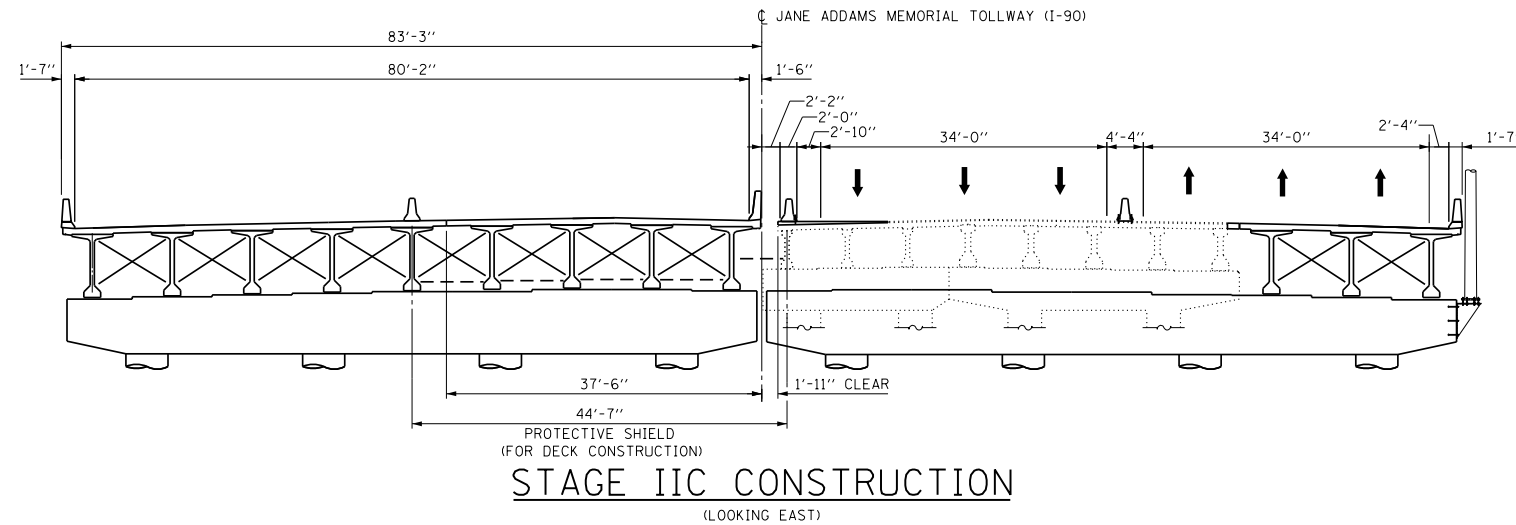
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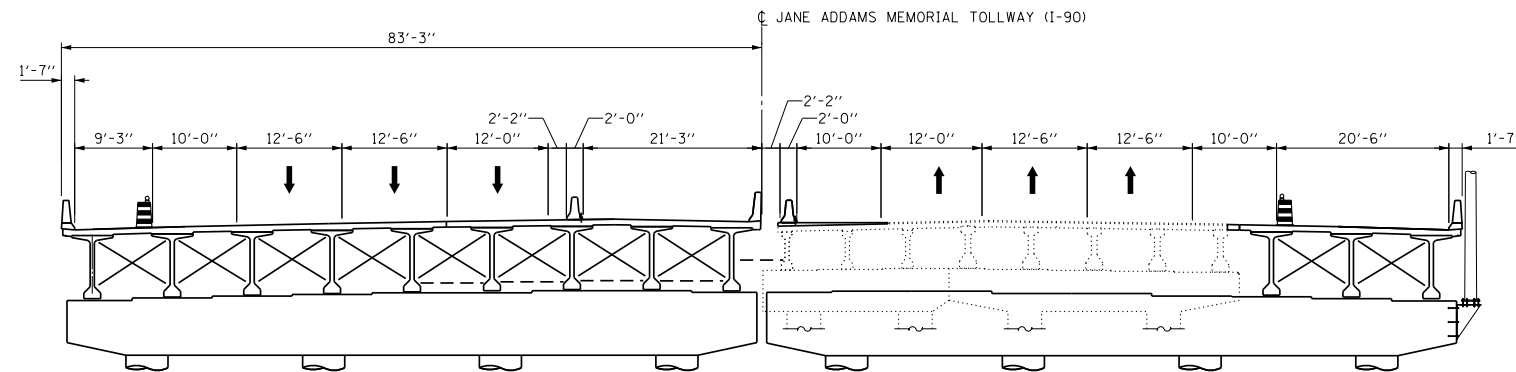
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BRIDGE NO. 549 & 550  
STAGE CONSTRUCTION  
AND REMOVAL

S-8  
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197 OF 564



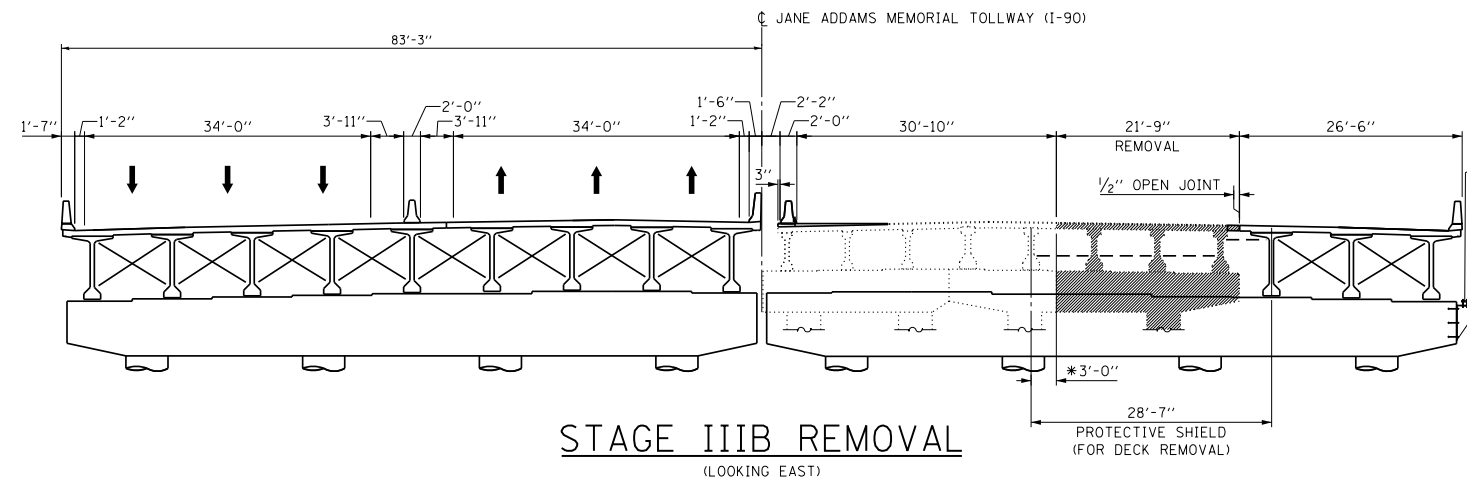
**STAGE IIC CONSTRUCTION**

(LOOKING EAST)



**WINTER CONDITION 2015**

(LOOKING EAST)



**STAGE IIIB REMOVAL**

(LOOKING EAST)

**STAGE IIC CONSTRUCTION**

- CONSTRUCT REMAINING WB DECK AND PARAPET
- INSTALL REMAINING CROSS-FRAMES BETWEEN STAGE IIB AND IIC BEAMS FOLLOWING DECK POUR

**WINTER CONDITION 2015**

- NO BRIDGE WORK REQUIRED

**STAGE IIIA - (NOT SHOWN)**

- SEE ROADWAY TYPICAL SECTIONS, STAGE IIIA FOR LANE SHIFT
- NO BRIDGE WORK REQUIRED

**STAGE IIIB REMOVAL**

- REMOVE EB STAGE IIIB EXISTING DECK, BEAMS, AND SUBSTRUCTURE
- CONSTRUCT EB STAGE IIIB ABUTMENTS

**NOTES:**

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FOR LONGITUDINAL LIMITS OF PROTECTIVE SHIELD SEE SHEETS S-20 AND S-149.

\* DISTANCES SHOWN FROM PROPOSED CENTERLINE JANE ADDAMS MEMORIAL TOLLWAY (I-90) AND FROM PROPOSED BRIDGE ELEMENTS TO EXISTING BRIDGE ELEMENTS ARE BASED ON EXISTING PLANS ASSUMING THE PROPOSED CENTERLINE I-90 IS COLLINEAR WITH THE EXISTING I-90 CENTERLINE. HOWEVER, SINCE THE CENTERLINES ARE NOT COLLINEAR, ACTUAL TRANSVERSE DIMENSIONS FROM PROPOSED ELEMENTS TO EXISTING ELEMENTS MAY VARY BY UP TO 3" FROM THOSE SHOWN. DIMENSIONS THAT DO NOT HAVE AN ASTERISK (\*) SHOULD BE HELD AS SHOWN.

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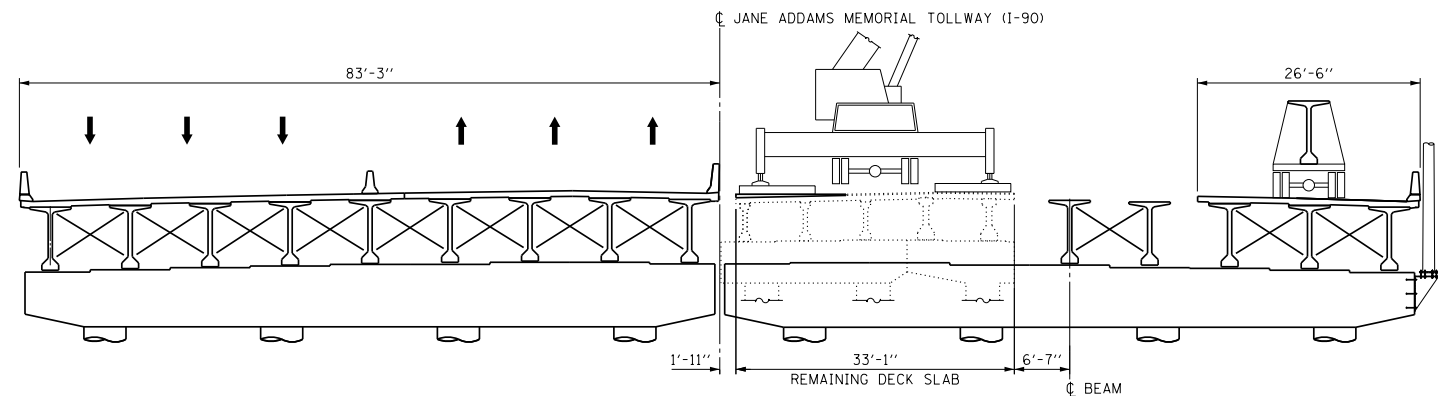
THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY  
2700 OGDEN AVENUE  
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REVISIONS		
NO.	DATE	DESCRIPTION

CONTRACT NO. I-13-4144R  
BRIDGE NO. 549 & 550  
STAGE CONSTRUCTION  
AND REMOVAL

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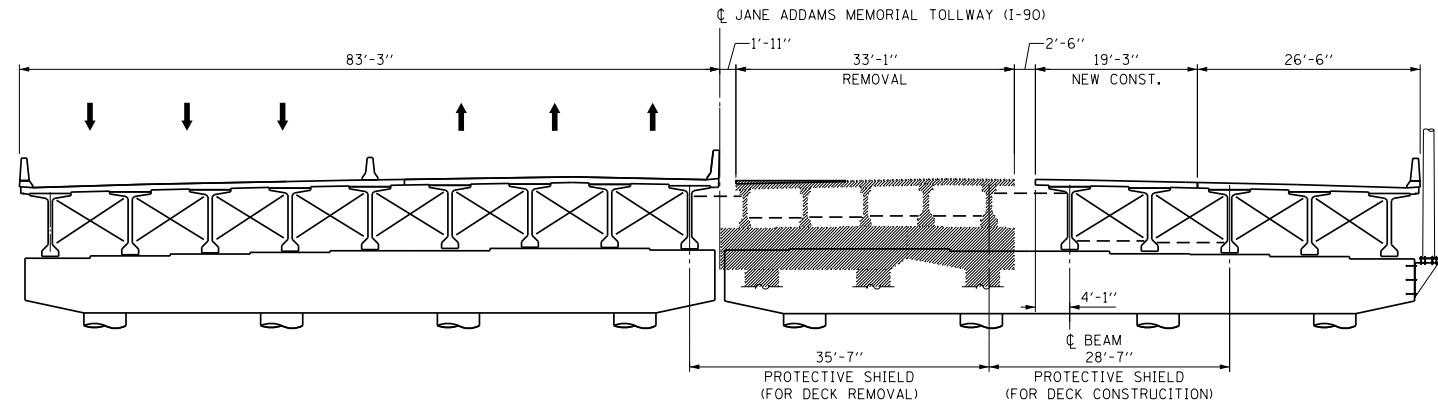
S-9



**STAGE IIIB BEAM ERECTION**  
(LOOKING EAST)

**STAGE IIIB BEAM ERECTION**

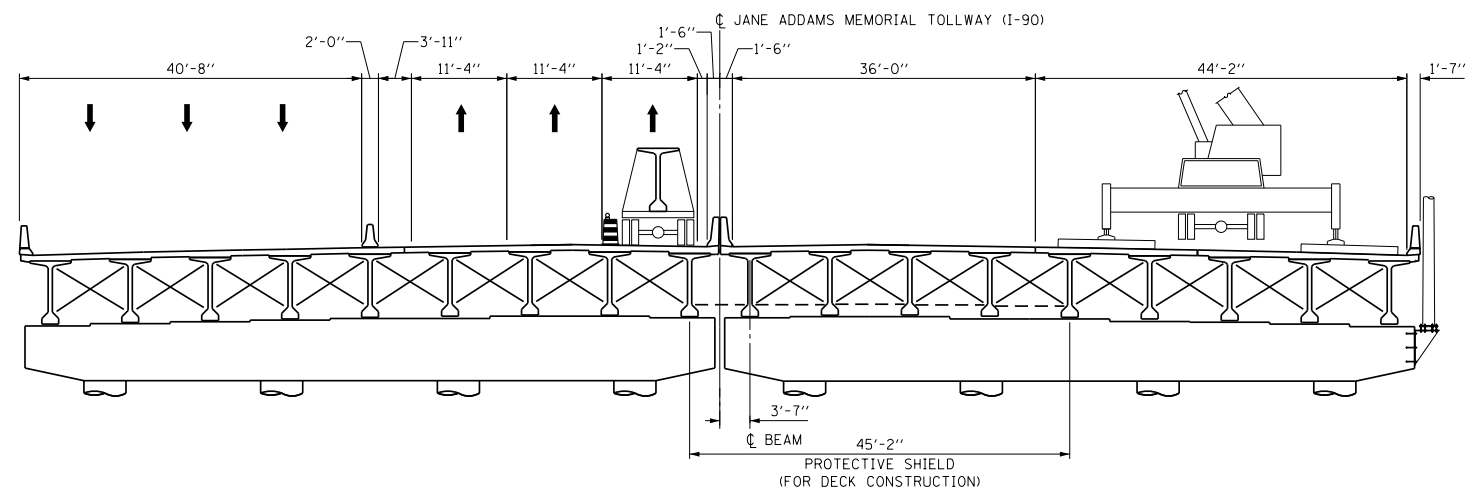
- PLACE EB STAGE IIIB BEAMS



**STAGE IIIB CONSTRUCTION AND  
STAGE IIIC REMOVAL**  
(LOOKING EAST)

**STAGE IIIB CONSTRUCTION AND IIIC REMOVAL**

- CONSTRUCT EB STAGE IIIB DECK
- INSTALL REMAINING CROSS-FRAMES BETWEEN STAGE I AND IIIB BEAMS FOLLOWING DECK POUR
- REMOVE EB STAGE IIIC EXISTING DECK, BEAMS, AND SUBSTRUCTURE
- CONSTRUCT WB STAGE IIIC ABUTMENTS



**STAGE IIIC BEAM ERECTION AND  
STAGE IIIC CONSTRUCTION**  
(LOOKING EAST)

**STAGE IIIC BEAM ERECTION AND  
STAGE IIIC CONSTRUCTION**

- PLACE EB STAGE IIIC BEAMS DURING OFF PEAK HOURS
- CONSTRUCT EB STAGE IIIC DECK
- INSTALL REMAINING CROSS-FRAMES BETWEEN STAGE IIIB AND IIIC BEAMS FOLLOWING DECK POUR

**NOTES:**

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FOR LONGITUDINAL LIMITS OF PROTECTIVE SHIELD SEE SHEETS S-20 AND S-149.

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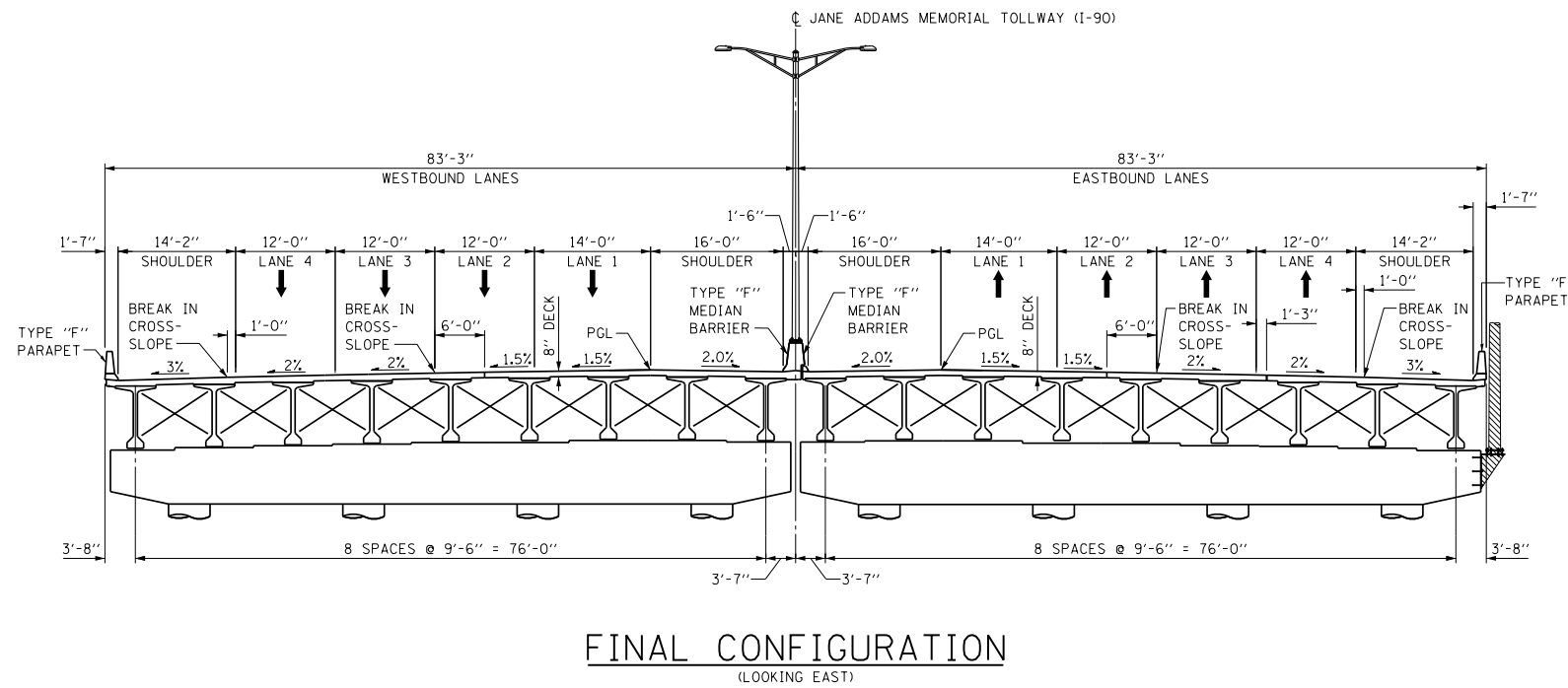


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CONTRACT NO. I-13-4144R  
BRIDGE NO. 549 & 550  
STAGE CONSTRUCTION  
AND REMOVAL

S-10

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- FINAL CONFIGURATION**
- INSTALL PERMANENT LIGHT POLES
  - REMOVE TEMPORARY LIGHT POLES AND GROUT HOLES FLUSH WITH CONCRETE
  - STRIPE AND OPEN TO TRAFFIC

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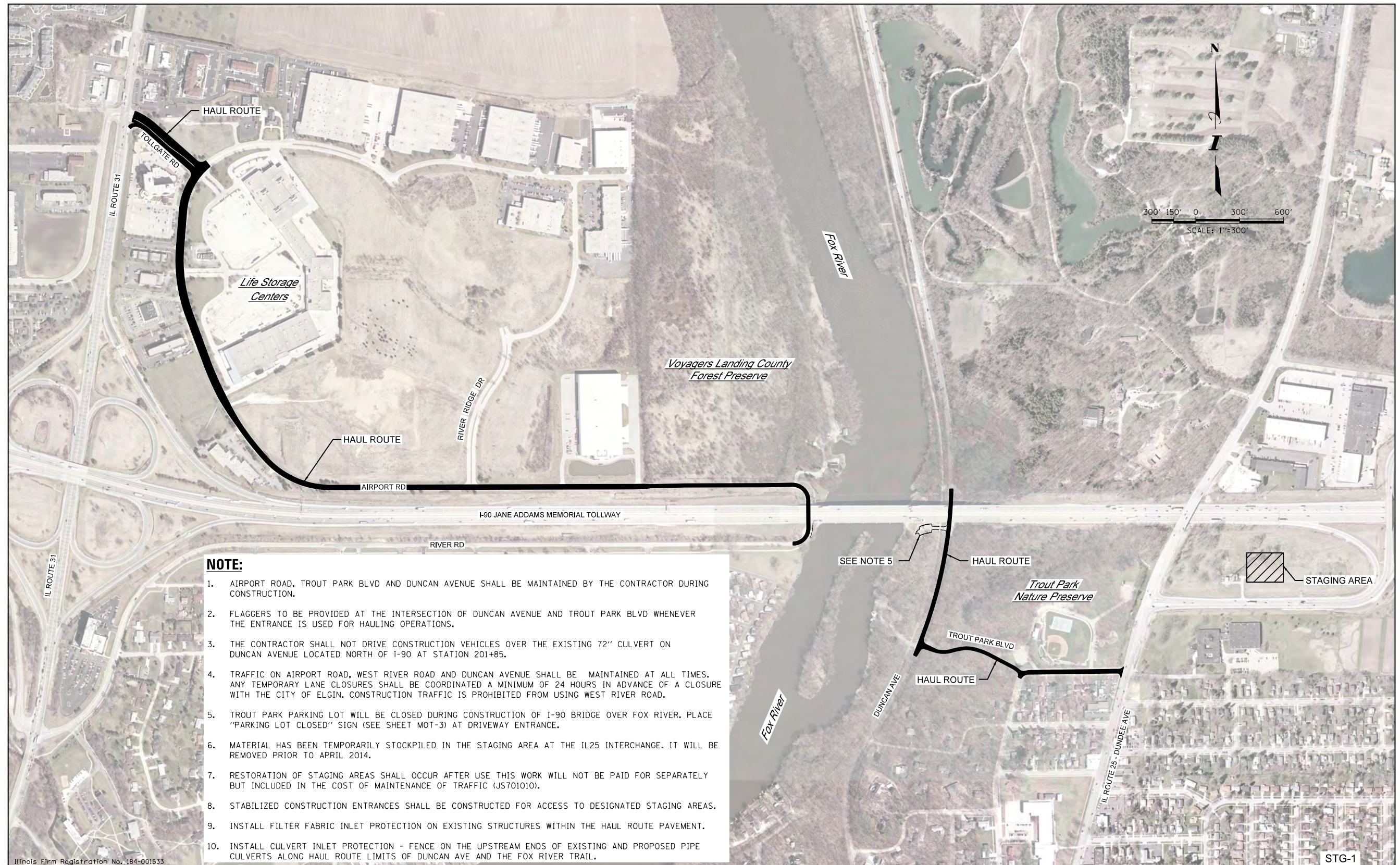
REVISIONS		
NO.	DATE	DESCRIPTION

CONTRACT NO. I-13-4144R  
BRIDGE NO. 549 & 550  
STAGE CONSTRUCTION  
AND REMOVAL

S-11

*DRAWING NO.*  
200 OF 564





**NOTE:**

1. AIRPORT ROAD, TROUT PARK BLVD AND DUNCAN AVENUE SHALL BE MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION.
2. FLAGGERS TO BE PROVIDED AT THE INTERSECTION OF DUNCAN AVENUE AND TROUT PARK BLVD WHENEVER THE ENTRANCE IS USED FOR HAULING OPERATIONS.
3. THE CONTRACTOR SHALL NOT DRIVE CONSTRUCTION VEHICLES OVER THE EXISTING 72" CULVERT ON DUNCAN AVENUE LOCATED NORTH OF I-90 AT STATION 201+85.
4. TRAFFIC ON AIRPORT ROAD, WEST RIVER ROAD AND DUNCAN AVENUE SHALL BE MAINTAINED AT ALL TIMES. ANY TEMPORARY LANE CLOSURES SHALL BE COORDINATED A MINIMUM OF 24 HOURS IN ADVANCE OF A CLOSURE WITH THE CITY OF ELGIN. CONSTRUCTION TRAFFIC IS PROHIBITED FROM USING WEST RIVER ROAD.
5. TROUT PARK PARKING LOT WILL BE CLOSED DURING CONSTRUCTION OF I-90 BRIDGE OVER FOX RIVER. PLACE "PARKING LOT CLOSED" SIGN (SEE SHEET MOT-3) AT DRIVEWAY ENTRANCE.
6. MATERIAL HAS BEEN TEMPORARILY STOCKPILED IN THE STAGING AREA AT THE IL25 INTERCHANGE. IT WILL BE REMOVED PRIOR TO APRIL 2014.
7. RESTORATION OF STAGING AREAS SHALL OCCUR AFTER USE THIS WORK WILL NOT BE PAID FOR SEPARATELY BUT INCLUDED IN THE COST OF MAINTENANCE OF TRAFFIC (J5701010).
8. STABILIZED CONSTRUCTION ENTRANCES SHALL BE CONSTRUCTED FOR ACCESS TO DESIGNATED STAGING AREAS.
9. INSTALL FILTER FABRIC INLET PROTECTION ON EXISTING STRUCTURES WITHIN THE HAUL ROUTE PAVEMENT.
10. INSTALL CULVERT INLET PROTECTION - FENCE ON THE UPSTREAM ENDS OF EXISTING AND PROPOSED PIPE CULVERTS ALONG HAUL ROUTE LIMITS OF DUNCAN AVE AND THE FOX RIVER TRAIL.

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DRAWN BY T.K.      DATE 3-13-14  
CHECKED BY R.M.K.      DATE 3-13-14



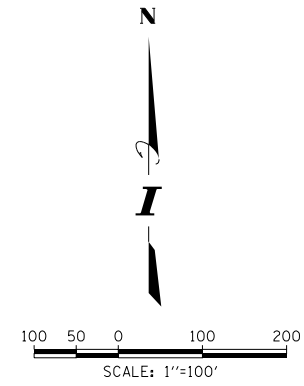
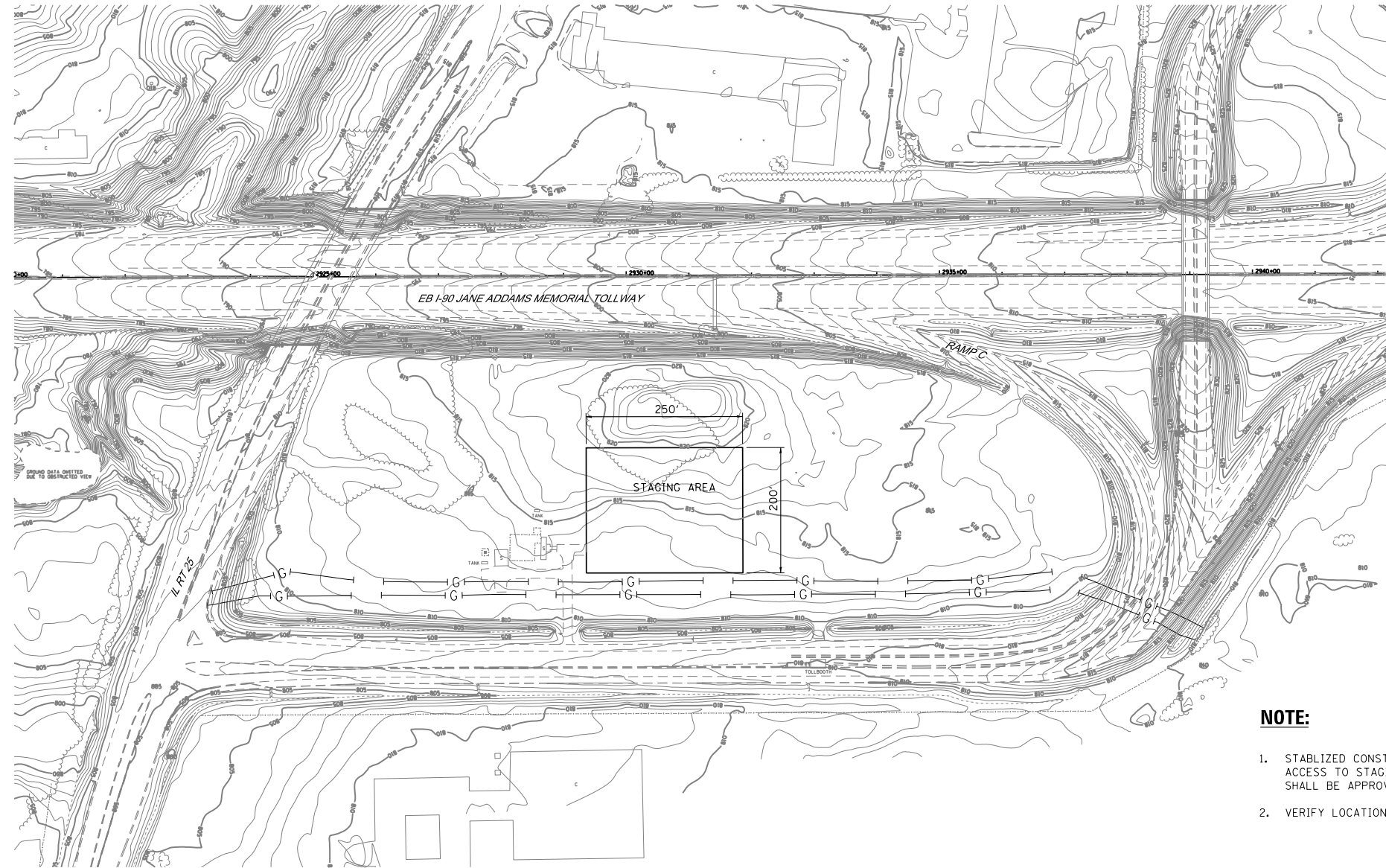
**THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY**  
2700 OGDEN AVENUE  
DOWNERS GROVE, ILLINOIS 60515

REVISIONS		
NO.	DATE	DESCRIPTION

CONTRACT NO. I-13-4144R  
I-90 OVER FOX RIVER  
CONTRACTOR HAUL ROUTE  
OVERALL PLAN

DRAWING NO.  
74 OF 564

STG-1

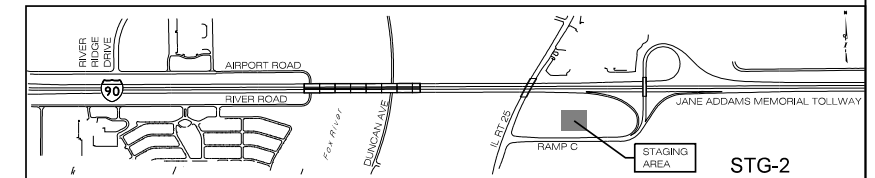


**NOTE:**

1. STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROVIDED FOR ACCESS TO STAGING AREAS. THE LOCATION OF THE ENTRANCE SHALL BE APPROVED BY THE ENGINEER.
2. VERIFY LOCATION OF GAS LINES. MODIFY STAGING AREA IF NECESSARY.

**CONTRACTOR STAGING AREA AT IL ROUTE 25 (DUNDEE AVE)**

**KEYMAP**



Illinois Firm Registration No. 184-001533

DRAWN BY E.D. DATE 3-13-14  
 CHECKED BY R.M.K. DATE 3-13-14



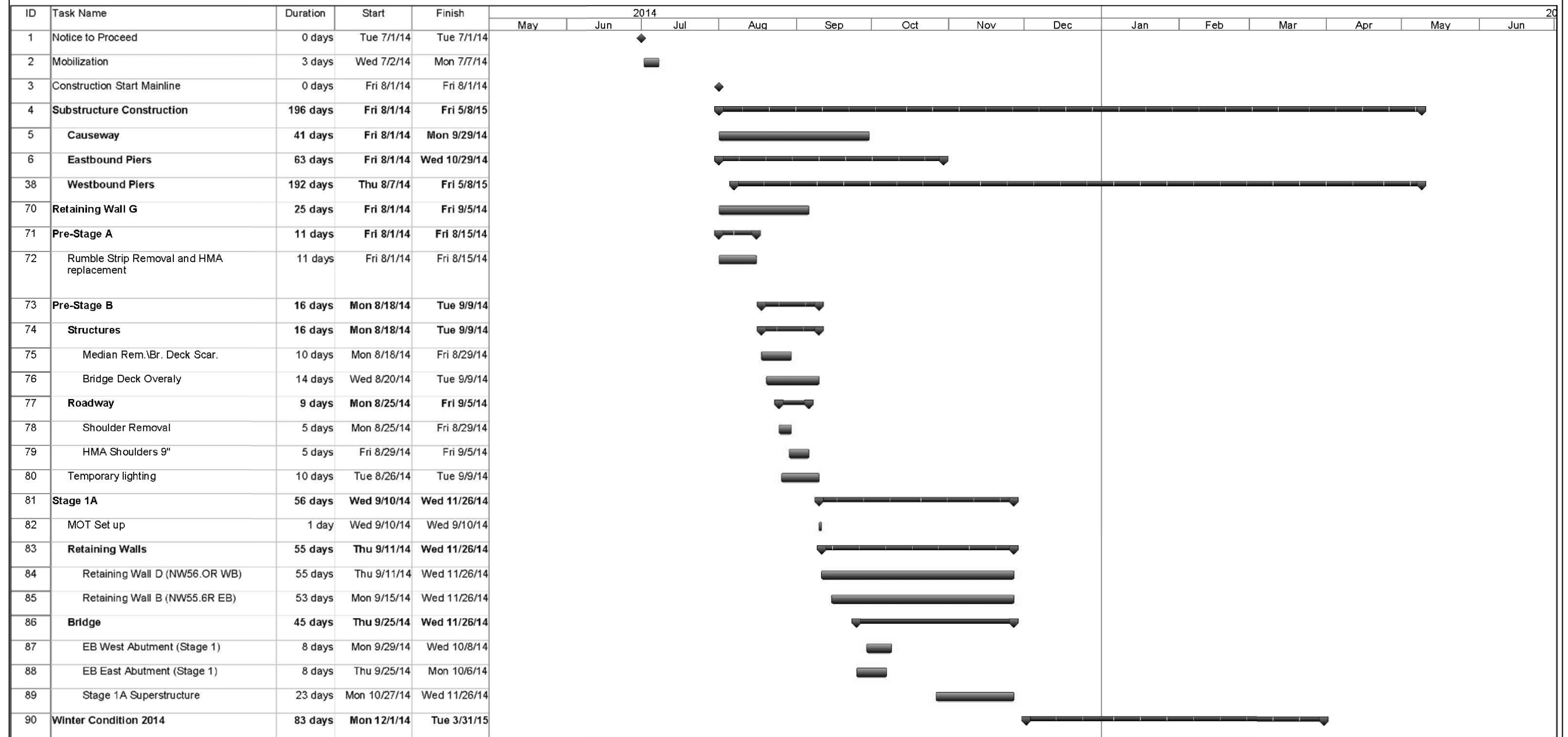
**THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY**  
 2700 OGDEN AVENUE  
 DOWNERS GROVE, ILLINOIS 60515

REVISIONS	
NO.	DATE

CONTRACT NO. I-13-4144R  
 I-90 OVER FOX RIVER  
 CONTRACTOR STAGING  
 AREAS PLAN

DRAWING NO.  
 75 OF 564

3/10/2014 2:31:43 PM  
56310c102.sht



3/10/2014 2:22:52 PM  
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Illinois Firm Registration No. 184-001533

DRAWN BY T.K. DATE 3-13-14  
CHECKED BY R.M.K. DATE 3-13-14



REVISIONS		
NO.	DATE	DESCRIPTION

CONTRACT NO. I-13-4144R  
I-90 OVER FOX RIVER  
PROGRESS SCHEDULE  
SHEET 1 OF 2

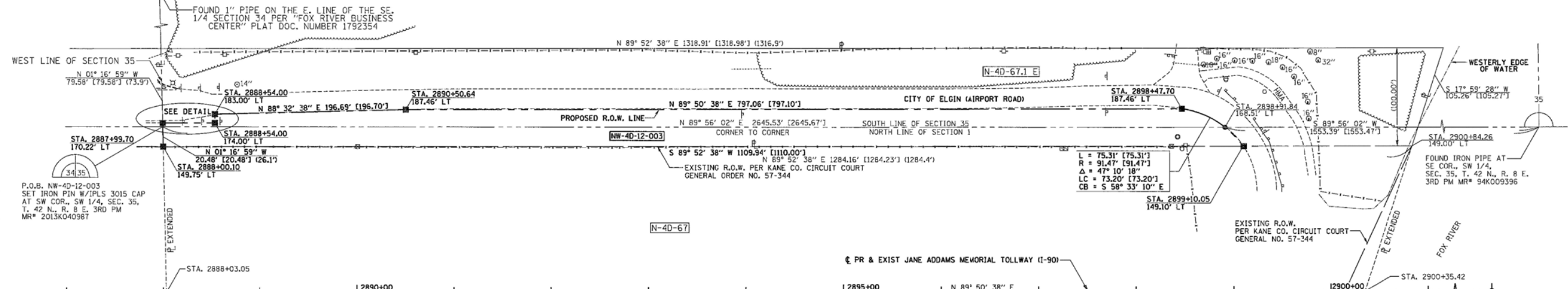
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DRAWING NO.  
7 OF 564



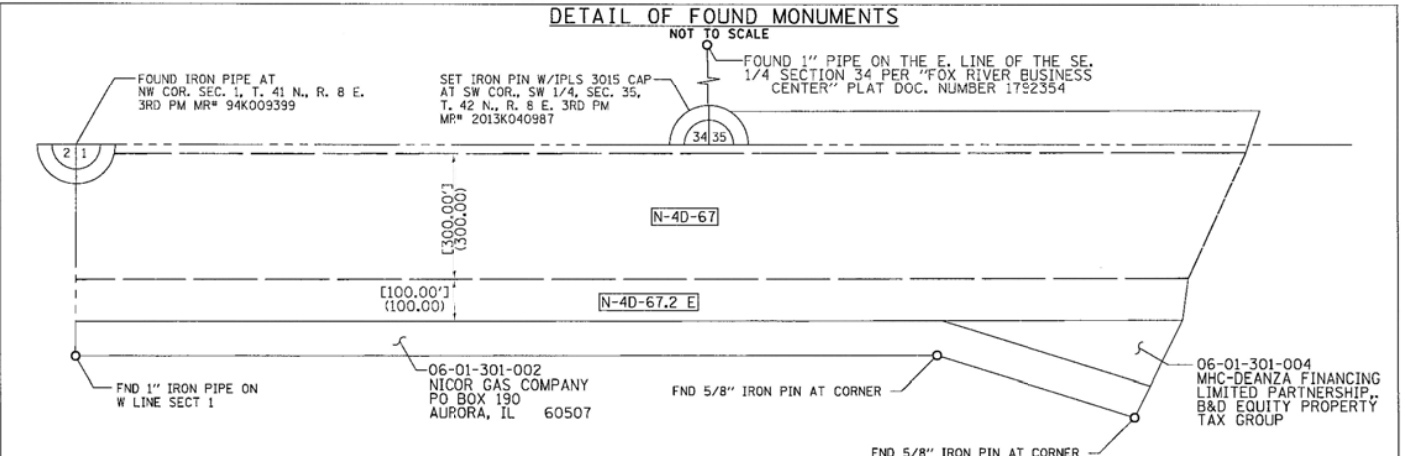
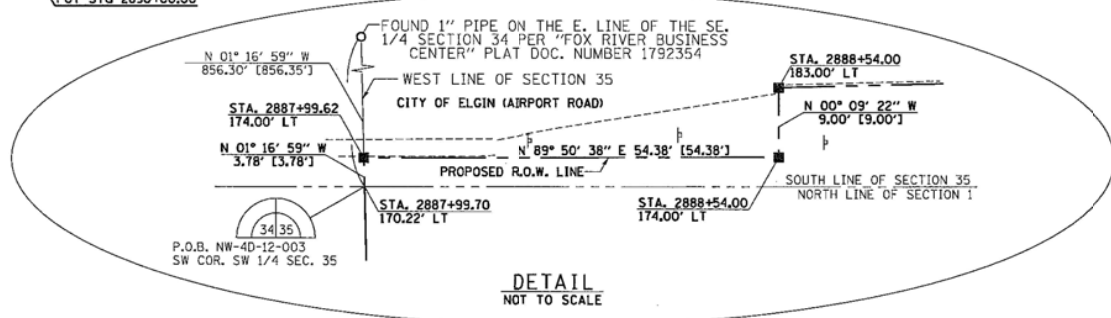
PART OF THE N. 1/2 OF SECTION 1, TWP. 41 N., R. 8 E.  
AND PART OF THE S. 1/2 OF THE SW. 1/4 OF SECTION  
35, TWP. 42 N., R. 8 E. OF THE THIRD PRINCIPAL  
MERIDIAN IN KANE COUNTY, ILLINOIS

# PARCEL PLAT THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

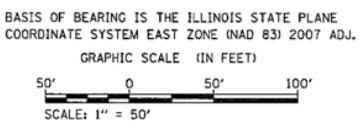


### LEGEND

- SECTION CORNER
- QUARTER SECTION CORNER
- SECTION LINE
- QUARTER SECTIONS LINE
- QUARTER, QUARTER SECTION LINE
- PLATTED LOT LINES
- PROPERTY (DEED) LINE
- APPARENT PROPERTY LINE
- EXISTING CENTERLINE
- PROPOSED CENTERLINE
- EXISTING RIGHT OF WAY LINE
- PROPOSED RIGHT OF WAY LINE
- EXISTING EASEMENT
- PROPOSED EASEMENT
- 121.45' MEASURED DIMENSION
- 121.45' (COMP) CALCULATED DIMENSION
- (121.45') RECORDED DIMENSION
- [121.45'] GROUND DIMENSION
- EXISTING BUILDING
- ORIGINAL ISTHA PARCEL NUMBER
- IRON PIPE OR ROD FOUND
- CUT CROSS FOUND OR SET
- "MAG" NAIL SET
- 5/8" REBAR SET W/ IPLS 3015 CAP
- T1** THESE STAKES REFERENCE FOUND OR SET MONUMENTATION. SET 5/8 INCH IRON ROD FLUSH WITH GROUND TO TIE FOUND IRON STAKE IDENTIFIED BY COLORED PLASTIC CAP BEARING SURVEYORS REGISTRATION NUMBER.
- T2** THESE STAKES, IN CULTIVATED AREAS, REFERENCE FOUND OR SET MONUMENTATION. BURIED 5/8 INCH IRON ROD 20 INCHES BELOW GROUND TO TIE FOUND IRON STAKE IDENTIFIED BY COLORED PLASTIC CAP BEARING SURVEYORS REGISTRATION NUMBER.
- BT1** THESE STAKES, IN CULTIVATED AREAS, REFERENCE FOUND OR SET MONUMENTATION. BURIED 5/8 INCH IRON ROD 20 INCHES BELOW GROUND TO TIE FOUND IRON STAKE IDENTIFIED BY COLORED PLASTIC CAP BEARING SURVEYORS REGISTRATION NUMBER.
- BT2** THESE STAKES, IN CULTIVATED AREAS, REFERENCE FOUND OR SET MONUMENTATION. BURIED 5/8 INCH IRON ROD 20 INCHES BELOW GROUND TO TIE FOUND IRON STAKE IDENTIFIED BY COLORED PLASTIC CAP BEARING SURVEYORS REGISTRATION NUMBER.
- BT3** THESE STAKES, IN CULTIVATED AREAS, REFERENCE FOUND OR SET MONUMENTATION. BURIED 5/8 INCH IRON ROD 20 INCHES BELOW GROUND TO TIE FOUND IRON STAKE IDENTIFIED BY COLORED PLASTIC CAP BEARING SURVEYORS REGISTRATION NUMBER.
- M** STAKING OF PROPOSED RIGHT OF WAY. SET 5/8 INCH IRON ROD WITH ALUMINUM ISTHA RIGHT OF WAY CAP
- M** STAKING OF PROPOSED RIGHT OF WAY IN CULTIVATED AREAS. BURIED 5/8 INCH METAL ROD 20 INCHES BELOW GROUND TO MARK FUTURE SURVEY MARKER POSITION IDENTIFIED BY COLORED PLASTIC CAP BEARING SURVEYORS REGISTRATION NUMBER.



PARCEL NUMBER	OWNER	TOTAL HOLDING ACRES	AREA TAKEN		REMAINDER AREA ACRES	EASEMENT AREA		EASEMENT PURPOSE	PERMANENT INDEX NUMBER	PROPERTY ACQUIRED BY
			ACRES	SQ. FT.		ACRES	SQ. FT.			
NW-4D-12-003	THE ESTATE OF ALFRED BRUNEMAN, DECEASED	2.989	0.924	40,243	0.924	2.065	N/A	N/A	N/A	



NOTE: BEARINGS AND COORDINATES ARE BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM, EAST ZONE, NAD83 (2007 ADJ.). COORDINATES ARE GRID. ALL AREAS AND DESCRIPTION DISTANCES ARE GROUND. ALL DISTANCES ARE MEASURED, UNLESS OTHERWISE SPECIFIED. TO CONVERT DISTANCES TO GRID, DIVIDE BY A GRID FACTOR OF 0.999945622.

STA. / OFF	COORDINATE DATA	
	NORTH	EAST
2887+99.62 174.00' LT	1,966,988.1119	999,503.7102
2887+99.70 170.22' LT	1,966,984.3354	999,503.7948
2888+00.10 149.75' LT	1,966,983.8617	999,504.2533
2888+54.00 174.00' LT	1,966,988.2600	999,558.0857
2888+54.00 183.00' LT	1,966,997.2600	999,558.0612
2890+50.64 187.46' LT	1,967,002.2586	999,754.6925
2898+47.70 187.46' LT	1,967,004.4303	1,000,551.7476
2899+10.05 149.10' LT	1,966,966.2420	1,000,614.1947
COORDINATE DATA FOR SECTION CORNERS		
SW COR. SW 1/4 SEC. 35	1,966,984.3354	999,503.7948
SE COR. SW 1/4 SEC. 35	1,966,987.3910	1,002,149.3230
COORDINATE DATA FOR EXISTING & PROPOSED I-90		
POT STA. 2890+00.00	1,966,814.6585	999,704.5592
POT STA. 2920+00.00	1,966,822.8324	1,002,704.5481

STATE OF ILLINOIS )  
 ) SS  
COUNTY OF SANGAMON )  
  
THIS IS TO CERTIFY THAT I, GEORGE L. WOODS, AN ILLINOIS PROFESSIONAL LAND SURVEYOR, HAVE SURVEYED OR DIRECTED THE SURVEY OF THE PLAT SHOWN HEREON IN SECTION 1, TOWNSHIP 41 NORTH, RANGE 8 EAST AND SECTION 35, TOWNSHIP 42 NORTH RANGE 8 EAST OF THE THIRD PRINCIPAL MERIDIAN, KANE COUNTY, THAT THE SURVEY IS TRUE AND COMPLETE AS SHOWN TO THE BEST OF MY KNOWLEDGE AND BELIEF, THAT THE PLAT CORRECTLY REPRESENTS SAID SURVEY, THAT ALL MONUMENTS FOUND AND ESTABLISHED ARE OF PERMANENT QUALITY AND OCCUPY THE POSITIONS SHOWN THEREON AND THAT THE MONUMENTS ARE SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED, MADE FOR THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY.  
DATED AT SPRINGFIELD, ILLINOIS THIS 5TH DAY OF SEPTEMBER 2013 A.D.

*George L. Woods*  
GEORGE L. WOODS - ILLINOIS PROFESSIONAL LAND SURVEYOR NUMBER 35-003015  
LICENSE EXPIRATION DATE: 11-30-2014  
THIS PROFESSIONAL SERVICE CONFORMS TO THE CURRENT ILLINOIS MINIMUM STANDARDS FOR A BOUNDARY SURVEY.  
ROW-1

FIELDWORK COMPLETED	
DRAWN BY: DAS	07/2013
CHECKED BY: GLW	07/2013

**LE** LIN ENGINEERING, LTD. CONSULTING ENGINEERS  
326 S. MEADOWBROOK RD. SUITE 500, SPRINGFIELD, IL 62711  
PHONE: (217)-679-2928 FAX: (217)-679-2736  
PROFESSIONAL DESIGN FIRM CORPORATION  
LICENSE NUMBER 184-00181

**ILLINOIS STATE TOLL HIGHWAY AUTHORITY**  
ONE AUTHORITY DRIVE  
DOWNERS GROVE, ILLINOIS 60515

REVISIONS	
NO.	DESCRIPTION
1	08/2013 FIRST REVIEW CORRECTIONS
2	09/05/2013 FINAL CORRECTIONS

PARCEL PLAT	
NO.	DATE
1	08/2013
2	09/05/2013

SECTION: 4D	PLAT NO.
SCALE: 1" = 50'	
CONTRACT NO. 1-13-4144	1 OF 2

PART OF SECTION 1, TWP. 41 N., R. 8 E. AND PART OF SECTION 35, TWP. 42 N., R. 8 E. OF THE THIRD PRINCIPAL MERIDIAN IN KANE COUNTY, ILLINOIS

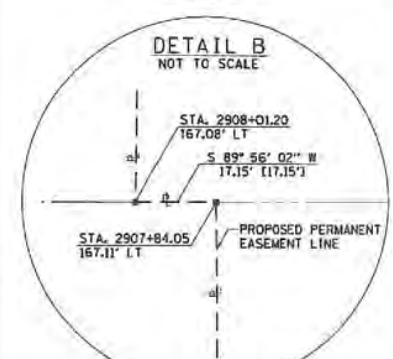
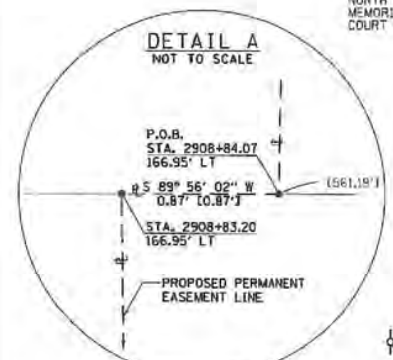
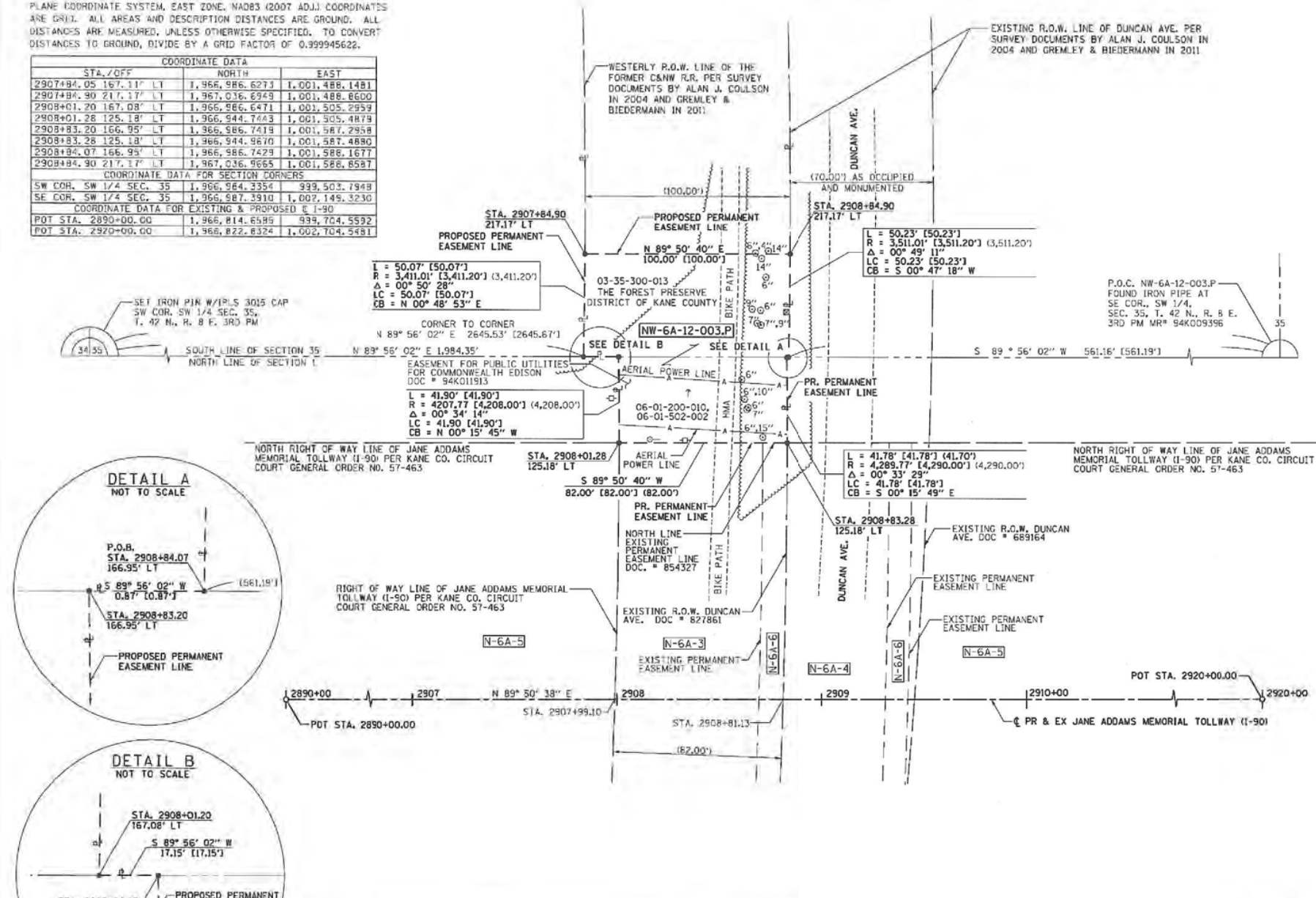
# PARCEL PLAT THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

NOTE: BEARINGS AND COORDINATES ARE BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM, EAST ZONE, NAD83 (2007 ADJ.) COORDINATES ARE GRI. ALL AREAS AND DESCRIPTION DISTANCES ARE GROUND. ALL DISTANCES ARE MEASURED, UNLESS OTHERWISE SPECIFIED. TO CONVERT DISTANCES TO GROUND, DIVIDE BY A GRID FACTOR OF 0.999945622.

COORDINATE DATA		
STA./OFF	NORTH	EAST
2907+84.05 167.11' LT	1,966,986.6273	1,001,488.1481
2907+84.90 217.17' LT	1,967,036.6949	1,001,488.8600
2908+01.28 125.18' LT	1,966,986.6471	1,001,505.2959
2908+01.28 125.18' LT	1,966,944.7463	1,001,505.4819
2908+83.20 166.95' LT	1,966,986.7419	1,001,587.2958
2908+83.28 125.18' LT	1,966,944.9610	1,001,587.4890
2908+84.07 166.95' LT	1,966,986.7429	1,001,588.1677
2908+84.90 217.17' LT	1,967,036.9665	1,001,588.8527
COORDINATE DATA FOR SECTION CORNERS		
SW COR. SW 1/4 SEC. 35	1,966,964.3354	999,503.7948
SE COR. SW 1/4 SEC. 35	1,966,987.3910	1,007,149.3230
COORDINATE DATA FOR EXISTING & PROPOSED E-90		
POT STA. 2890+00.00	1,966,814.6585	999,704.5592
POT STA. 2920+00.00	1,966,822.8324	1,002,704.5481

### LEGEND

- SECTION CORNER
- QUARTER SECTION CORNER
- SECTION LINE
- QUARTER SECTIONS LINE
- QUARTER, QUARTER SECTION LINE
- PLATTED LOT LINES
- PROPERTY (DEED) LINE
- APPARENT PROPERTY LINE
- EXISTING CENTERLINE
- PROPOSED CENTERLINE
- EXISTING RIGHT OF WAY LINE
- PROPOSED RIGHT OF WAY LINE
- EXISTING EASEMENT
- PROPOSED EASEMENT
- MEASURED DIMENSION
- CALCULATED DIMENSION
- RECORDED DIMENSION
- GROUND DIMENSION
- EXISTING BUILDING
- ORIGINAL ISTHA PARCEL NUMBER
- IRON PIPE OR ROD FOUND
- "MAC" NAIL SET
- CUT CROSS FOUND OR SET
- 5/8" REBAR SET W/IPLS 3015 CAP

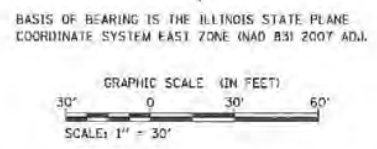


PARCEL NUMBER	OWNER	TOTAL HOLDING ACRES	AREA TAKEN ACRES	AREA IN EXISTING R.O.W. ACRES	REMAINDER AREA ACRES	EASEMENT AREA ACRES	EASEMENT PURPOSE	PERMANENT INDEX NUMBER	PROPERTY ACQUIRED BY
NW-6A-12-003.P	THE FOREST PRESERVE DISTRICT OF KANE COUNTY	0.194	N/A	N/A	0.194	0.194	STORM SEWER CONSTRUCTION AND MAINTENANCE	06-01-200-010(P.T.) 06-01-502-002(P.T.) 03-35-300-013(P.T.)	



STATE OF ILLINOIS )  
                          ) SS  
COUNTY OF SANGAMON )  
  
THIS IS TO CERTIFY THAT I, GEORGE L. WOODS, AN ILLINOIS PROFESSIONAL LAND SURVEYOR, HAVE SURVEYED OR DIRECTED THE SURVEY OF THE PLAT SHOWN HEREON IN SECTION 1, TOWNSHIP 41 NORTH, RANGE 8 EAST AND SECTION 35, TOWNSHIP 42 NORTH RANGE 8 EAST OF THE THIRD PRINCIPAL MERIDIAN, KANE COUNTY, THAT THE SURVEY IS TRUE AND COMPLETE AS SHOWN TO THE BEST OF MY KNOWLEDGE AND BELIEF, THAT THE PLAT CORRECTLY REPRESENTS SAID SURVEY, THAT ALL MONUMENTS FOUND AND ESTABLISHED ARE OF PERMANENT QUALITY AND OCCUPY THE POSITIONS SHOWN THEREON AND THAT THE MONUMENTS ARE SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED, MADE FOR THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY.  
DATED AT SPRINGFIELD, ILLINOIS THIS 23RD DAY OF SEPTEMBER, 2013 A.D.

*George L. Woods*  
GEORGE L. WOODS - ILLINOIS PROFESSIONAL LAND SURVEYOR NUMBER 35-003015  
LICENSE EXPIRATION DATE: 11-30-2014  
THIS PROFESSIONAL SERVICE CONFORMS TO THE CURRENT ILLINOIS MINIMUM STANDARDS FOR A BOUNDARY SURVEY.  
ROW-5



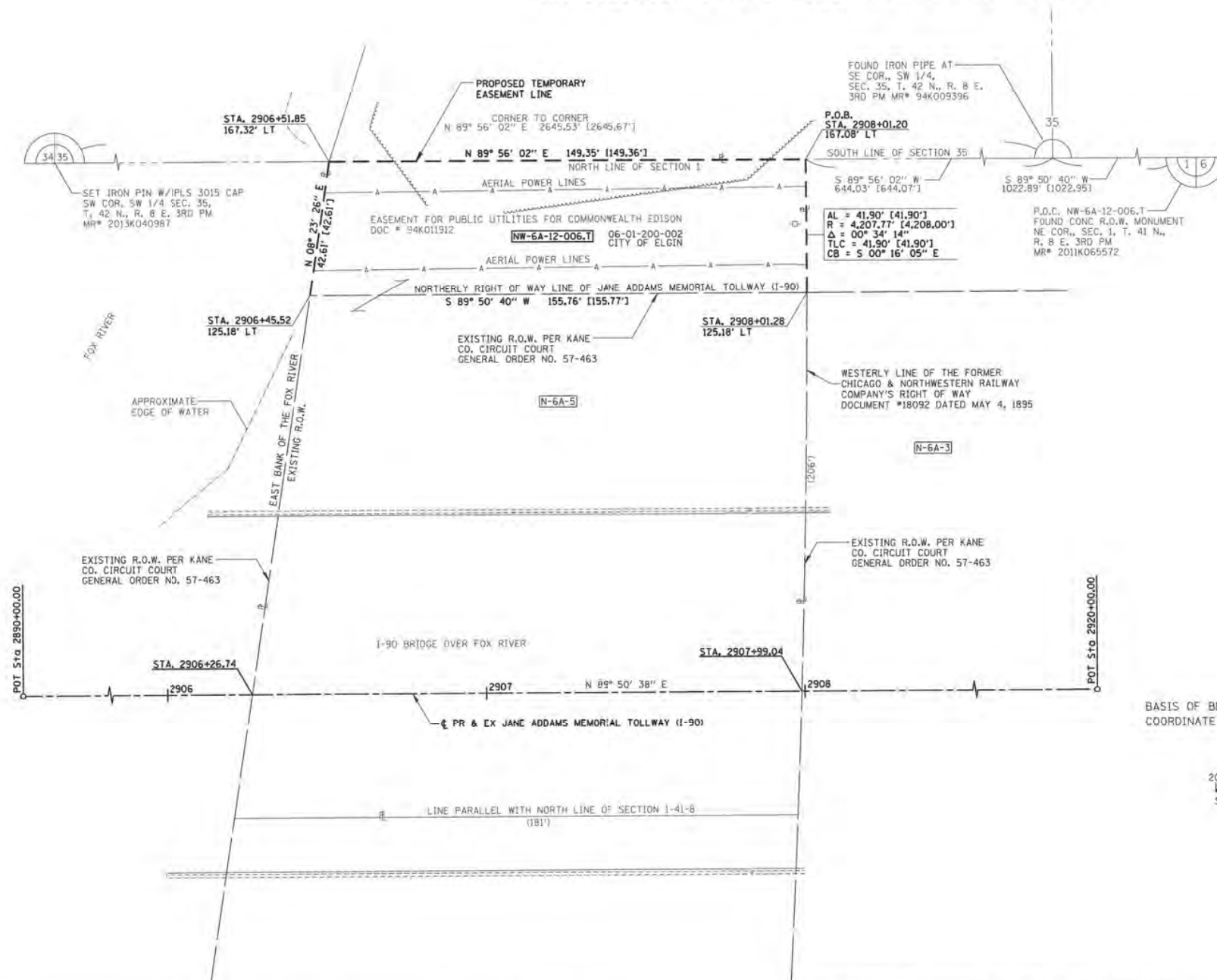
FIELDWORK COMPLETED	06/2013		LIN ENGINEERING, LTD. CONSULTING ENGINEERS 3261 S. MEADOWBROOK RD. SUITE 500, SPRINGFIELD, IL 62711 PHONE: (217)-679-2928 FAX: (217)-679-2736 PROFESSIONAL DESIGN FIRM CORPORATION LICENSE NUMBER 184-0081		ILLINOIS STATE TOLL HIGHWAY AUTHORITY ONE AUTHORITY DRIVE DOWNERS GROVE, ILLINOIS 60515	REVISIONS		PARCEL PLAT JANE ADDAMS MEMORIAL TOLLWAY (I-90) STA. 2907+84.90 TO STA. 2908+84.90 PART OF THE NE 1/4 SEC 1-41-8 & PART OF THE SW 1/4 SEC 35-42-8, 3RD PM KANE COUNTY	SECTION: EA SCALE: 1" = 30'	PLAT NO. 1-13-4144 1 OF 2	
DRAWN BY:	DAS					NO.	DATE				DESCRIPTION
CHECKED BY:	GLW					1	08/2013				FIRST REVIEW CORRECTIONS
						2	09/23/2013	FINAL CORRECTIONS			

LEGAL DESCRIPTION IS ON SHEET 2 OF 2 AND MADE A PART HEREOF.

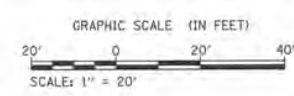
PART OF SECTION 1, T. 41 N., R. 8 E. OF THE THIRD PRINCIPAL MERIDIAN IN KANE COUNTY, ILLINOIS

## PARCEL PLAT THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

### LEGEND



BASIS OF BEARING IS THE ILLINOIS STATE PLANE COORDINATE SYSTEM EAST ZONE (NAD 83) 2007 ADJ.



STATE OF ILLINOIS )  
                          ) SS  
COUNTY OF SANGAMON )

THIS IS TO CERTIFY THAT I, GEORGE L. WOODS, AN ILLINOIS PROFESSIONAL LAND SURVEYOR, HAVE SURVEYED OR DIRECTED THE SURVEY OF THE PLAT SHOWN HEREON IN SECTION 1, TOWNSHIP 41 NORTH, RANGE 8 EAST OF THE THIRD PRINCIPAL MERIDIAN, KANE COUNTY, THAT THE SURVEY IS TRUE AND COMPLETE AS SHOWN TO THE BEST OF MY KNOWLEDGE AND BELIEF, THAT THE PLAT CORRECTLY REPRESENTS SAID SURVEY, THAT ALL MONUMENTS FOUND AND ESTABLISHED ARE OF PERMANENT QUALITY AND OCCUPY THE POSITIONS SHOWN THEREON AND THAT THE MONUMENTS ARE SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED, MADE FOR THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY.

DATED AT SPRINGFIELD, ILLINOIS THIS 26TH DAY OF AUGUST 2013 A.D.

*George L. Woods*  
GEORGE L. WOODS - ILLINOIS PROFESSIONAL LAND SURVEYOR NUMBER 35-003015  
LICENSE EXPIRATION DATE: 11-30-2014

THIS PROFESSIONAL SERVICE CONFORMS TO THE CURRENT ILLINOIS MINIMUM STANDARDS FOR A BOUNDARY SURVEY.

**ROW-9**



NOTE: BEARINGS AND COORDINATES ARE BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM, EAST ZONE, NAD83 (2007 ADJ.). COORDINATES ARE GRID. ALL AREAS AND DESCRIPTION DISTANCES ARE GROUND. ALL DISTANCES ARE MEASURED, UNLESS OTHERWISE SPECIFIED. TO CONVERT DISTANCES TO GROUND, DIVIDE BY A GRID FACTOR OF 0.999945622.

STA. / OFF	COORDINATE DATA FOR EXISTING & PROPOSED I-90	
	NORTH	EAST
POT STA. 2890+00.00	1,966,814.6585	999,704.5592
POT STA. 2920+00.00	1,966,822.8324	1,002,704.5481

PARCEL NUMBER	OWNER	TOTAL HOLDING ACRES	AREA TAKEN		AREA IN EXISTING R.O.W. ACRES	REMAINDER AREA ACRES	EASEMENT AREA		EASEMENT PURPOSE	PERMANENT INDEX NUMBER	PROPERTY ACQUIRED BY
			ACRES	SO. FT.			ACRES	SO. FT.			
NW-6A-12-006.T	CITY OF ELGIN	0.775	0.00	0.00	0.628	0.775	0.147	6.413	CONSTRUCTION ACCESS	06-01-200-002	

FIELDWORK COMPLETED: 07/2013  
DRAWN BY: DAS 07/2013  
CHECKED BY: GLW 07/2013

**LIN ENGINEERING, LTD. CONSULTING ENGINEERS**  
3261 S. MEADOWBROOK RD. SUITE 500, SPRINGFIELD, IL 62711  
PHONE: (217)-679-2928 FAX: (217)-679-2736  
PROFESSIONAL DESIGN FIRM CORPORATION  
LICENSE NUMBER 184-00181

**ILLINOIS STATE TOLL HIGHWAY AUTHORITY**  
ONE AUTHORITY DRIVE  
DOWNERS GROVE, ILLINOIS 60515

REVISIONS			PARCEL PLAT	SECTION: 6A	PLAT NO.
NO.	DATE	DESCRIPTION	JANE ADDAMS MEMORIAL TOLLWAY (I-90)	SCALE: 1" = 20'	
1	05/2013	FIRST REVIEW CORRECTIONS	STA. 2906+45.52 TO STA. 2908+01.28	CONTRACT NO. 1-13-4144	1 OF 2
2	07/2013	SECOND REVIEW CORRECTIONS	PART OF THE NE 1/4 SEC 1-41-B		
3	08/26/2013	FINAL CORRECTIONS	3RD PM KANE COUNTY		

# THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

## ACCELERATED BRIDGE CONSTRUCTION (ABC) - DECISION MATRIX TOOL (DMT)

Prepared By	Tollway	Prepared On	08 Dec, 2016
Checked By	Tollway	Checked On	08 Dec, 2016
Bridge No.	549/550	Mile Post	55.7
Location	I-90 over Fox River		



### ABC Rating Procedure

December 2016

Note to User: Refer to Structure Design Manual Article 27.3.1 for general guidance on using this tool.

<b>Average Daily Traffic</b> (Combined over and under)	4	0	No traffic during construction
		1	Less than 20,000
		2	20,000 to 50,000
		3	50,001 to 100,000
		4	100,001 to 150,000
		5	More than 150,000
<b>Traffic Impact</b> (Based on Severity Index )	3	0	Least severe traffic impact
		1	More severe traffic impact than 0
		2	More severe traffic impact than 1
		3	More severe traffic impact than 2
		4	More severe traffic impact than 3
		5	Most severe traffic impact
<b>Maintenance of Traffic</b>	5	0	No impact
		1	Short duration with simple MOT
		2	Short duration with multiple staging
		3	Normal duration
		4	Long duration with simple MOT
		5	Long duration with multiple staging
<b>Economic Impact</b>	3	0	Low business impact
		3	Medium business impact
		5	High business impact
<b>Bridge Classification</b>	0	0	Typical bridge
		3	Essential bridge
		5	Critical bridge
<b>Railroad/Waterway Impact</b>	3	0	No railroad or minor railroad spur or no waterway
		3	One mainline railroad track or waterway
		5	Multiple mainline railroad tracks or waterway with commercial traffic
<b>Environmental Impact</b>	5	0	No impact
		1	Minimum impact
		3	Medium impact
		5	Maximum impact
<b>Economy of Scale</b> (Total number of spans)	5	0	1 span
		1	2 or 3 spans
		3	4 or 5 spans
		5	More than 5 spans
<b>Use of Typical Details</b>	5	0	Complex or unsymmetrical geometry
		3	Some complexity
		5	Simple, symmetrical geometry
<b>Accessibility</b>	3	0	Unfavorable site with no ROW available
		3	Favorable site with some ROW available
		5	Favorable site with plenty of ROW available



# THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

## ACCELERATED BRIDGE CONSTRUCTION (ABC) - DECISION MATRIX TOOL (DMT)

Prepared By	Tollway	Prepared On	08 Dec, 2016
Checked By	Tollway	Checked On	08 Dec, 2016
Bridge No.	549/550	Mile Post	55.7
Location	I-90 over Fox River		



### ABC Rating Procedure

December 2016

Note to User: Refer to Structure Design Manual Article 27.3.1 for general guidance on using this tool.

Note: Do not adjust weight factors without prior approval from the Illinois Tollway.

ABC RATING SCORE: VARIABLES AND WEIGHTS					
Variable	Score	Weight Factor	Adjusted Score	Maximum Score	Adjusted Score
Average Daily Traffic	4	10	40	5	50
Traffic Impact	3	15	45	5	75
Maintenance of Traffic	5	10	50	5	50
Economic Impact	3	5	15	5	25
Bridge Classification	0	3	0	5	15
Railroad/Waterway Impact	3	5	15	5	25
Environmental Impact	5	3	15	5	15
Economy of Scale	5	3	15	5	15
Use of Typical Details	5	3	15	5	15
Accessibility	3	5	15	5	25
Total Score			225	Max. Score	310

**ABC Rating Score: 73**

ABC Rating Score = [(Total Score)/(Max. Score)]\*100

# THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

## ACCELERATED BRIDGE CONSTRUCTION (ABC) - DECISION MATRIX TOOL (DMT)

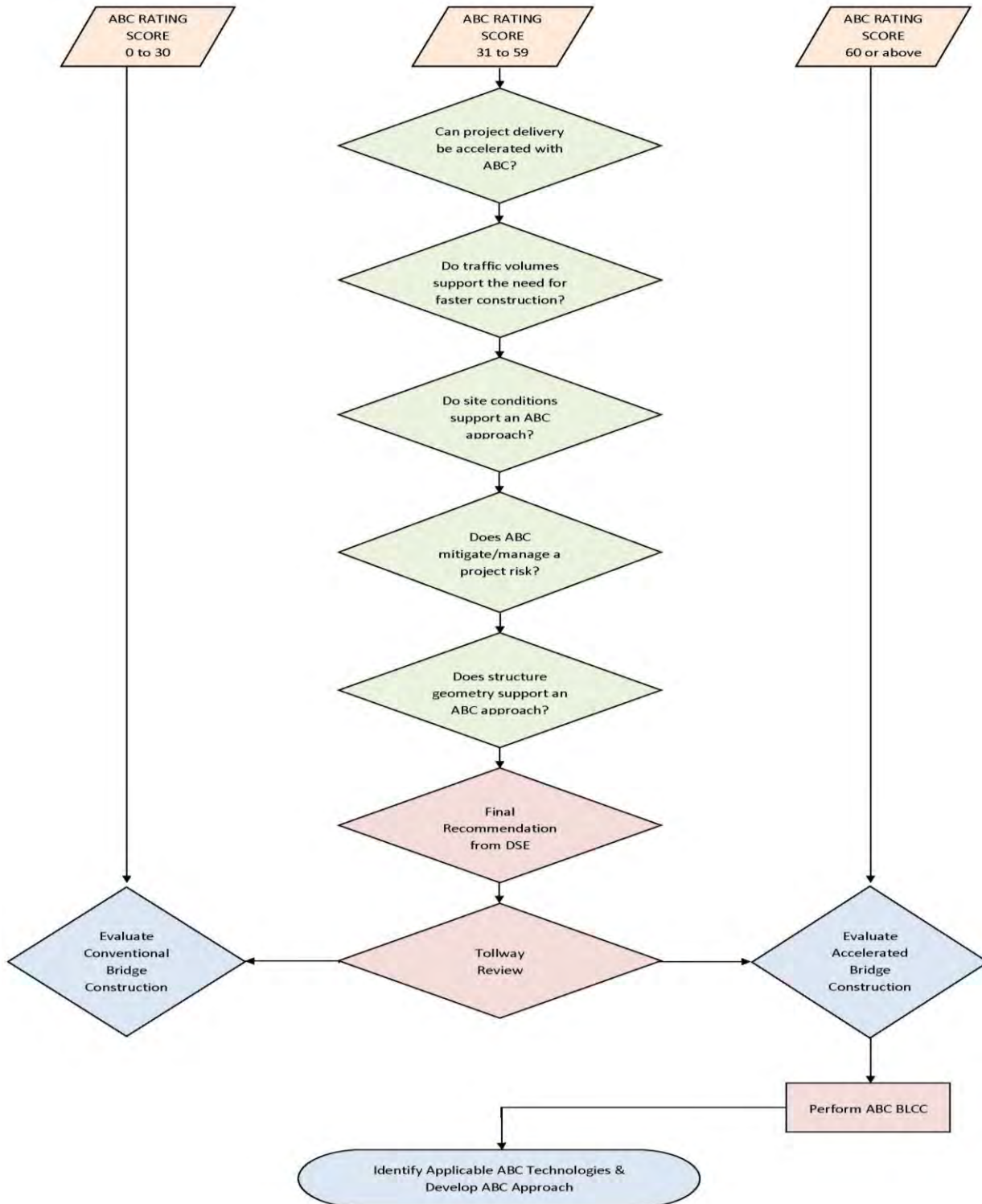
Prepared By	Tollway	Prepared On	08 Dec, 2016
Checked By	Tollway	Checked On	08 Dec, 2016
Bridge No.	549/550	Mile Post	55.7
Location	I-90 over Fox River		



ABC Rating Procedure

December 2016

### ABC RATING SCORE - DECISION FLOW CHART



# THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

## ACCELERATED BRIDGE CONSTRUCTION (ABC) - BRIDGE LIFE CYCLE COMPARISON (BLCC) TOOL



Prepared By	Tollway	Prepared On	08 Dec, 2016
Checked By	Tollway	Checked On	08 Dec, 2016
Bridge No.	549/550	Mile Post	55.7
Location	I-90 over Fox River	Bridge Alternative #3	

ABC BLCC Tool December 2016

Note to User: Refer to Structure Design Manual Article 27.3.2 for general guidance on using this tool.

### TOTAL ABC BLCC RATING SCORE SUMMARY

Total ABC BLCC Rating Score = 0.33(IC)+ 0.34(TIC)+ 0.33(MC)

#### DIRECTIONS FOR USER:

User to Input values

User may elect to add additional bridge alternatives to the ABC BLCC Tool to accurately compare all options.

Construction Type = Enter the type of construction (Conventional or ABC)

Deck = Enter the type of deck material (CIP or Precast Panels)

Super = Enter the type of Superstructure (CIP, Precast or Steel)

Sub = Enter the type of substructure (CIP or PBES)

Method = Enter the type of construction method (Conventional, Lateral Slide, SPMT, Longitudinal Launch, Crane Based)

Bridge Alternates Investigated					
Name	Construction Type	Deck	Super	Sub	Method
Bridge Alternative #1	Conventional	CIP	Precast	CIP	Coventional
Bridge Alternative #2	ABC	CIP	Precast	CIP	Longitudinal Launch
Bridge Alternative #3	ABC	CIP	Precast	PBES	Coventional
Bridge Alternative #4	ABC	Precast Panels	Precast	PBES	Coventional
Bridge Alternative #5	ABC	CIP	Precast	CIP	Crane Based

Manually Input results for different Bridge Alternatives Investigated:

Total ABC BLCC Rating Score					
	Alt #1	Alt #2	Alt #3	Alt #4	Alt #5
Initial Costs (IC)	60	56	62	64	55
Traffic Impact Costs (TIC)	50	67	67	67	67
Maintenance Costs (MC)	59	60	62	57	60
<b>Total ABC BLCC Rating Score</b>	<b>56</b>	<b>61</b>	<b>63</b>	<b>63</b>	<b>61</b>

User may elect to add additional Recommended Bridge Alternatives to the ABC BLCC Tool to evaluate further in the Bridge Type Study and perform a cost comparison.

Recommended Bridge Alternatives				
Bridge Alternatives to Consider Based on Total ABC BLCC Rating Score:				
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

# THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

## ACCELERATED BRIDGE CONSTRUCTION (ABC) - BRIDGE LIFE CYCLE COMPARISON (BLCC) TOOL



Prepared By	Tollway	Prepared On	08 Dec, 2016
Checked By	Tollway	Checked On	08 Dec, 2016
Bridge No.	549/550	Mile Post	55.7
Location	I-90 over Fox River Bridge Alternative #3		

ABC BLCC Tool

December 2016

Note to User: Refer to Structure Design Manual Article 27.3.2 for general guidance on using this tool.

### INDIVIDUAL ABC BLCC RATING SCORE INPUT

#### INITIAL COSTS (IC)

<b>Total Labor</b> (On-Site and Off-Site)	2	1	Estimated construction time >= 18 months
		2	13 months <= Estimated construction time < 18 months
		3	8 months <= Estimated construction time < 13 months
		4	3 months <= Estimated construction time < 8 months
		5	Estimated construction time < 3 months
<b>Deck Material</b>	1	1	Deck type is cast-in-place concrete
		2	Deck type is precast concrete panels
<b>Superstructure Material</b>	2	1	Superstructure type is cast-in-place concrete
		2	Superstructure type is precast concrete or steel
<b>Substructure Material</b>	2	1	Substructure type is cast-in-place concrete
		2	Substructure type is precast concrete
<b>Equipment</b>	4	1	Self-Propelled Modular Transport equipment required
		2	Bridge Slide-In equipment required
		3	Specialty Crane Based equipment required
		4	Prefabricated Bridge Element System or Longitudinal Launch required
		5	Typical cast-in-place concrete/steel construction equipment required
<b>Agency Costs</b>	2	1	Extensive agency coordination
		2	Moderate agency coordination
		3	Normal agency coordination
<b>Right-of-Way</b>	1	1	Required R.O.W. acquisition > 1 acre
		2	0.5 acres < Required R.O.W. acquisition <= 1 acre
		3	0.25 acres < Required R.O.W. acquisition <= 0.5 acres
		4	0 acres < Required R.O.W. acquisition <= 0.25 acres
		5	Required R.O.W. acquisition = 0 acres
<b>Environmental Impact Costs</b>	2	1	Maximum impact
		2	Medium impact
		3	Minimum impact
		4	No Impact

# THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

## ACCELERATED BRIDGE CONSTRUCTION (ABC) - BRIDGE LIFE CYCLE COMPARISON (BLCC) TOOL



Prepared By	Tollway	Prepared On	08 Dec, 2016
Checked By	Tollway	Checked On	08 Dec, 2016
Bridge No.	549/550	Mile Post	55.7
Location	I-90 over Fox River	Bridge Alternative #3	

ABC BLCC Tool

December 2016

Note to User: Refer to Structure Design Manual Article 27.3.2 for general guidance on using this tool.

### INDIVIDUAL ABC BLCC RATING SCORE INPUT

### TRAFFIC IMPACT COSTS (TIC)

<b>Maintenance of Traffic Costs</b>	2	1	Extended duration with multiple staging
		2	Extended duration with simple MOT
		3	Normal duration
		4	Short duration with multiple staging
		5	Short duration with simple MOT
<b>Economic Impacts</b>	3	1	High business impact
		2	Medium business impact
		3	Low business impact
<b>Railroad/ Waterway Impacts</b>	5	1	Complete closure
		2	Extended duration, disruption or closure
		3	Normal duration, disruption or closure
		4	Short duration, disruption or closure
		5	No disruption or closure of Railroads/Waterways

**Note:**  
Service disruptions (including traveler delay and revenue impacts) are not directly included in the ABC BLCC Tool. Additional analysis required if requested by the Illinois Tollway.

# THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

## ACCELERATED BRIDGE CONSTRUCTION (ABC) - BRIDGE LIFE CYCLE COMPARISON (BLCC) TOOL



Prepared By	Tollway	Prepared On	08 Dec, 2016
Checked By	Tollway	Checked On	08 Dec, 2016
Bridge No.	549/550	Mile Post	55.7
Location	I-90 over Fox River	Bridge Alternative #3	

ABC BLCC Tool

December 2016

Note to User: Refer to Structure Design Manual Article 27.3.2 for general guidance on using this tool.

### INDIVIDUAL ABC BLCC RATING SCORE INPUT

### MAINTENANCE COSTS (MC)

<b>Maintenance / Rehabilitation Life Cycle Costs</b> (Frequency)	2	1	If No Precast element types are used (Highest Repair Frequency)
		2	If One Precast element type is used
		3	If Two Precast element types are used
		4	If Three or more Precast element types are used (Lowest Repair Frequency)
<b>Cost of Repair</b> (Material, Labor and Time)	3	1	If Three of the Listed Materials are used (Most Expensive Cost)
		2	If Two of the Listed Materials are used
		3	If One of the Listed Materials are used
		4	If None of the Listed Materials are used (Cheapest Cost)
<b>Note:</b> Listed Material: Precast Deck Panels, Steel Girders, PBES Substructure.			
<b>Total Replacement Costs</b> (Estimated Service Life)	2	1	If only super is precast or if only sub is precast or neither
		2	Precast Beams and Precast Substructure
<b>Note:</b> The decision to replace structure is based on superstructure and substructure condition. Excludes deck.			
<b>Future TIC for Routine Maintenance</b>	2	1	Weekday Peak shift or Extended MOT Duration or Major Impact
		2	Weekend or night time closure or Medium MOT Duration or Medium Impact
		3	Off peak closure or Shorter MOT Duration or Minimal Impact
		4	No Closure or Shortest MOT Duration or No Impact
<b>Future TIC for Rehabilitation and Replacement</b>	2	1	Weekday Peak shift or Extended MOT Duration or Major Impact
		2	Weekend or night time closure or Medium MOT Duration or Medium Impact
		3	Off peak closure or Shorter MOT Duration or Minimal Impact
		4	No Closure or Shortest MOT Duration or No Impact
<b>Joint Durability</b>	1	1	Additional joints between precast elements
		2	Typical Jointed Bridge
		3	Jointless Bridge
<b>Unforeseen Performance</b> (Risk)	2	1	High (More than one PBES element)
		2	Medium (Single PBES element)
		3	None or Low (Conventional Construction material)
<b>Salvage Value</b>	1	1	Precast Concrete Beam
		2	Steel Girders

# THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

## ACCELERATED BRIDGE CONSTRUCTION (ABC) - BRIDGE LIFE CYCLE COMPARISON (BLCC) TOOL



Prepared By	Tollway	Prepared On	08 Dec, 2016
Checked By	Tollway	Checked On	08 Dec, 2016
Bridge No.	549/550	Mile Post	55.7
Location	I-90 over Fox River	Bridge Alternative #3	

ABC BLCC Tool

December 2016

Note to User: Refer to Structure Design Manual Article 27.3.2 for general guidance on using this tool.

### INDIVIDUAL ABC BLCC RATING SCORE INPUT

Note: Do not adjust weight factors without prior approval from the Illinois Tollway.

Individual ABC BLCC Rating Score = (Total Score)/(Max. Score)\*100

Total ABC BLCC Rating Score = 0.33(IC) + 0.34(TIC) + 0.33(MC)

INITIAL COSTS (IC)					
Variable	Score	Weight Factor	Adjusted Score	Maximum Score	Max Adjusted Score
Total Labor	2	10	20	5	50
Deck Material	1	10	10	2	20
Superstructure Material	2	10	20	2	20
Substructure Material	2	10	20	2	20
Equipment	4	10	40	5	50
Agency Costs	2	5	10	3	15
Right-of-Way	1	5	5	5	25
Environmental Impact Costs	2	3	6	4	12
		<b>Total Score</b>	<b>131</b>		<b>212</b>

**IC ABC BLCC Rating Score: 62 (33% of Total Score)**

TRAFFIC IMPACT COSTS (TIC)					
Variable	Score	Weight Factor	Adjusted Score	Maximum Score	Max Adjusted Score
Maintenance of Traffic Costs	2	10	20	5	50
Economic Impacts	3	5	15	3	15
Railroad/Waterway Impacts	5	5	25	5	25
		<b>Total Score</b>	<b>60</b>		<b>90</b>

**TIC ABC BLCC Rating Score: 67 (34% of Total Score)**

MAINTENANCE COSTS (MC)					
Variable	Score	Weight Factor	Adjusted Score	Maximum Score	Max Adjusted Score
Maintenance / Rehabilitation Life Cycle Costs	2	10	20	4	40
Cost of Repair	3	10	30	4	40
Total Replacement Costs	2	10	20	2	20
Future TIC for Routine Maintenance	2	5	10	4	20
Future TIC for Rehabilitation and Replacement	2	3	6	4	12
Joint Durability	1	5	5	3	15
Unforeseen Performance	2	3	6	3	9
Salvage Value	1	3	3	2	6
		<b>Total Score</b>	<b>100</b>		<b>162</b>

**MC ABC BLCC Rating Score: 62 (33% of Total Score)**

**TOTAL ABC BLCC Rating Score: 63**