

Post Design-Build Evaluation Report

**Project Description: I-24 at SR 299 Bridge Replacement
(Accelerated Bridge Construction)**

**P.I. Number: 0011682
County: Dade
GDOT District: District 6**

Date Conducted: August 1, 2017

I-24 at SR 299 Bridge under construction during 56 hour move



1. **Project Description:** The proposed project [P.I. No. 0011682] replaced the existing, structurally deficient State Route (SR) 299 bridge over Interstate 24 (I-24) in Dade County, Georgia. This overpass is approximately 0.6 miles south of the Georgia/Tennessee state line at the I-24 Exit 169 interchange. The bridge was replaced on the existing alignment using Accelerated Bridge Construction (ABC) techniques.

2. **Design-Build delivery goal(s):** Expedite delivery and, as the first ABC project leverage the DB process and the industry to provide a solution which met the project goals. ABC will allow the existing bridge removal and new bridge installation to occur within a time period of 56 hours, minimizing the project’s impact to the traveling public. The project will be delivered using Design-Build.

3. **Project stakeholders:**
 - GDOT – Innovative Delivery, District 6, Environmental Services, Bridge Design, State Utilities
 - Wright Brothers Construction Company – Prime Contractor
 - Parsons Brinckerhoff, Inc. – Prime Designer/ Engineer of Record
 - TN DOT
 - EPD
 - FHWA
 - Dade County

4. **Project Summary:**

	Project Milestone	Date
Pre-Let	Public Notice Advertisement (PNA)	04/24/2015
	Request for Qualifications (RFQ)	05/26/2015
	Letter of Interest (LOI)/Statement of Qualifications (SOQ)	06/26/2015
	Notice to Finalists	07/14/2015
	Request for Proposals (RFP)	07/27/2015
	Administrative Package Due	11/06/2015
	Technical Package Due	11/06/2015
	Price Proposal / Project Letting	11/20/2015
Post-Let	Project Award	12/07/2015
	NTP1 – Preliminary Design	01/27/2016
	NTP2 – Final Design Activities	06/01/2016
	NEPA (EER) Post-Award Re-Evaluation	09/23/2016
	NTP 3 – Construction Phase	01/05/2017
	Milestone Deadline – New Bridge Open to Traffic	05/16/2017
	Contract Completion Date	12/13/2017
	Substantial Project Completion	06/16/2017

5. Design-Build Proposers:

	Contractor	Designer	Total Bid
1	Wright Brothers Construction Co. Inc.	Parsons Brinckerhoff, Inc.	\$7,274,656.32
2	Kiewit Infrastructure South Company	Heath & Lineback Engineers, Inc.	\$11,205,716.00
3	Bell & Associates Construction., L.P.	STV/ Ralph Whitehead	\$16,303,000.00

6. Stipend

a. Was a stipend (stipulated fee) offered to proposing Design-Build Teams? Yes No

If yes, how much per firm: \$40,000

7. Design-Build Request for Proposals (RFP)

a. Type of procurement: One Phase/Low Bid Two Phase/Low Bid Best Value

Note: Three Design-Build Teams submitted LOI/SOQ packages in response to the RFQ and three were notified to be finalists. On November 6, 2015 the Department received three price proposals and corresponding technical proposals.

b. Advertisement duration: 30 days 60 days 90 days 90 days +

Note: Based on Procurement summary provided to FHWA Advertisement duration was 105 days.

c. Was a draft RFP released for this project? Yes No

If yes # of releases: - Note

Note: Draft RFP was issued to FHWA on 07/16/2015

Was a Q&A format provided? Yes No

d. Were One-on-One meetings held with proposers? Yes No

e. List GDOT offices involved in the RFP development: Design Policy & Support, Engineering Services, Environmental Services, Innovative Delivery, Utilities, Construction, Bridge, District 6, Traffic Operations

8. Design-Build RFP Package

a. List items included in the RFP package:

Item	Yes	No	Notes
Approved Traffic Study	X		Provided on GDOT's FTP site
Bridge layouts	X		Provided on GDOT's FTP site
Approved Survey Files	X		Provided on GDOT's FTP site
Approved Concept Report	X		Provided on GDOT's FTP site
Microstation Design files	X		Provided on GDOT's FTP site
Approved Design Exceptions/Variations		X	DE for sight distance was approved after RFP was issued and was included in technical scoring. Document was not included but issue was known.
Original Bridge Foundation Investigation	X		Provided on GDOT's FTP site
Approved Pavement Design	X		
Approved Overhead/Subsurface Utility	X		Existing utility information provided.

Engineering (SUE) Quality Level "B"		
Utility Memorandum of Understanding (MOU)	X	MOUs included in contract
NEPA Categorical Exclusion	X	Provided on GDOT's FTP site

b. General observations of the RFP contents and/or procurement process:

- o Geotechnical information was inadequate for design.

c. Were conflicts in project scope identified: Yes No

If yes, what sections should be revised for future RFPs:

- o In the communications Section 3 of Vol 2 of the RFP need to clearly define the requirements for Time-Lapse Cameras during construction.
- o Geotechnical investigation for MSE Wall 3 could have been more clearly defined. Specifically providing strength data for foundation soils, and rock strength for drilled shafts.
- o Need to clearly define the role of the Engineer of Record in Exhibit 1 of Vol 1 of the DB Contract.
- o The DB Teams role in construction Quality Management in Sec 2.3 of Vol 2 & 3. The contract needs to clearly identify the deliverables the Department wants.
- o Need to provide more project specific requirement in Public Information and Communications Sec 3 of Vol 2.

9. Environmental

a. Type of document: NEPA: Level: PCE CE EA/FONSI EIS/ROD
 GEPA: Level: Type A Type B EER/NOD

b. Was the environmental document approved prior to the RFP advertisement? Yes No
 If no, when was the NEPA/GEPA document approved?

c. Was a re-evaluation performed post-let? Yes No
 If yes, describe scenario why a re-evaluation was required:

d. General observations of the pre-let or post-let environmental process:
 o ABC method eliminated the need for environmental coordination in this project.

10. Environmental Permitting

a. Type of 404 permit required: NWP IP Other None

b. Was mitigation required as part of the permit? Yes No
 If yes, did the Design-Build Team perform mitigation and/or acquire credits? Yes No

c. Was a Stream Buffer Variance (SBV) required? Yes No

d. List any other permits required by the project (not counting NPDES Permit): None

e. General observations of the environmental permitting process: None

11. NPDES Permit

a. Did the Design-Build Team prepare the Notice of Intent (NOI)? Yes No NA

b. Did the Design-Build Team pay the NPDES permitting fee? Yes No NA

c. Were the ESPCP regularly redlined? Yes No NA

d. Did any self-report actions occur? Yes No

e. Was a consent order filed? Yes No

i. Additional comments:

12. Right of Way (R/W)

a. Was R/W required? Yes No

If yes, who was responsible for R/W? GDOT Locals Design-Build Team

If yes, was it acquired prior to award of the Design-Build contract? Yes No

If yes, did R/W acquisition activities impact the project schedule? Yes No

b. How were R/W commitments or cost-to-cure elements handled on this project:

c. List any special circumstances, conditions, or property owner commitments of R/W acquisition:

d. General observations of the R/W acquisition process:

- o ABC eliminated the need for ROW impacts.

13. Utilities

a. Was SUE performed pre-let and included in the RFP package? Yes No

If yes, what level? QL-D QL-C QL-B QL-A

If No, what was the mitigating activity (e.g. white lining specification, "no-conflict" letters, first submission plans):

b. Were Design-Build Utility MOU's executed? Yes No

c. List the utility owners, if any, which were included in the Design-Build contract: AT&T, Georgia Power Distribution, Dade County Water Authority, AGL & Charter.

d. Generally describe observations with respect to Design-Build utility coordination:

- o There were existing telecommunications attached to the bridge. Due to the minimal timeframe for utility relocations during construction, AT&T relocation occurred prior to NTP3. AT&T's amenities were not relocated as directed by GDOT which created issues.

e. Generally describe any areas of improvement with respect to Design-Build utility coordination:

- o If utilities are on the bridge it can make the ABC method difficult.

f. What was the frequency of utility coordination meetings?

- o Monthly during design.

14. Geotechnical

a. Was an approved Soils Report included in the RFP package? Yes No

If no, was a Soils Report required for the project? Yes No

b. Was an approved BFI included in the RFP package? Yes No

If no, was a BFI required for this project? Yes No

c. Was an approved WFI included in the RFP package? Yes No

If no, was a WFI required for this project? Yes No

d. Was an approved High Mast Foundation Investigation report included in the RFP package? Yes No

If no, was a HMFI required for this project? Yes No

e. Were there any geotechnical issues encountered on construction? Yes No

If yes, describe issues and outcome:

- There was wall slope failure at existing Bent 5 prior to the ABC Period but it did not compromise the stability of the abutment. A soil-nail wall was installed to quickly stabilize the location.

15. Design and Construction Phases

- a. Did the Design-Build Team advance portions of the project to the construction phase while other portions of the project continued to be designed and/or permits obtained? Yes No

If yes, describe: Temporary bridge work including drilled rock cores for drilled shafts, and drilled temporary caissons prior to bridge plan approval. Conditional NTP 3a (for phased construction activities) initially included language to allow erosion control installation, clearing and grubbing and maintenance of traffic. NTP 3 for all remaining construction activities was issued on January 5, 2017.

- b. Describe the typical frequency for progress meetings? During the Design phase the meetings were monthly. During construction Phase the meetings were 2 times a month.

- c. Were the Design-Build Team plans/submittals of acceptable quality? Yes No

Plans were acceptable, however the following issues were documented: -

- Bridge plans lacked the necessary details for Bent Caps Reinforcing.
- The utility openings at the end walls were detailed to the wrong depth/elevation on the plans
- Deck reinforcing steel clearance was installed incorrectly due to misinterpretation of the RFC plans which resulted in raising the profile grade of deck one inch.
- Median cross over paving thickness at tie-ins was not adequate towards the end of the ABC period. For future projects extend the asphalt further along the existing alignment to provide a smoother transition onto the new pavement.

- d. Were GDOT's review times adequate? Yes No

If no, describe: Design review times were fine.

General observations of review times: None

- e. Was the Asphalt Index specification included in this project? Yes No

- f. Was the Fuel Index specification included in this project? Yes No

- g. Was construction of the Maintenance of Traffic (MOT) acceptable? Yes No

MOT was acceptable, however the following observations were provided:

- DOT should consider in-filling the rumble strips within the limits of the cross-over to minimize motorists shifting into adjacent lanes.
- Consider allowing daytime closures of SR 299 or other low impact roads.
- Overall traffic shifts & maintenance of traffic were a success on the project.

- h. Was the Schedule of Values adequate? Yes No

If no, describe:

- i. Was the pay voucher and overall payment process acceptable? Yes No

If no, describe:

- j. Was the Critical Path Method (CPM) schedule specification used on this project? Yes No

If yes, describe general experiences (pro or con) using the CPM specification:

- The WBS schedule specification requirements were too stringent.
- The hour by hour break down for the ABC Period was helpful. Excel spreadsheet including resources was as beneficial as the actual P6 ABC schedule.

If yes, any suggested improvements to the use of CPM schedule: None

- k. Were there any unique issues (to Design-Build) that occurred? Yes No

If yes, describe:

- o The demolition of the existing bridge was more challenging than anticipated. There was not forensic information provided to the DB Team during the proposal stage.
- o For future projects consider providing 3-D Lidar of existing bridge.

- l. Were sound barriers required on this project? Yes No

If yes, describe the material/color:

If yes, was the sound barrier material/color specified in the contract? Yes No

If yes, was the sound barrier height/location specified in the contract? Yes No

- m. Were there lane closure restrictions on this project? Yes No

If yes, were they adequate or could they have been modified for efficiency:

- o Restrictions were adequate. For future projects provide more flexibility for daytime closures, especially on low volume roadways.

- n. Were there ITS outage restrictions on this project? Yes No NA

If yes, were they adequate or could they have been modified for efficiency:

- o. Were there new or existing Traffic Signal modifications required? Yes No

If yes, were the traffic signal permits obtained by GDOT: Yes No

- p. Were As-built plans prepared by the Design-Build Team? Yes No Pending

16. Design-Build Innovations

- a. Were there innovative designs, solutions or materials used on this project? Yes No

If yes, describe:

- o Self-Propelled Modular Transport for Bridge Move during 56 hour weekend
- o Pre-Cast Approach Slabs and Pedestals
- o Use of #57 Crushed Stone to backfill approaches prior to the move as opposed to dirt.
- o Only known project in the country to move two spans over live traffic in one-weekend, which may have been overly aggressive.
- o Maintaining traffic flow on interstate I-24 went very smoothly.

- b. Were any Value Engineering Proposals (VEP) submitted? Yes No

If yes, fill out the below information:

No.	VECP Description	Total Savings	Approved
1		\$	N/A

- e. List other benefits that are not reflected in the cost savings:

17. Supplemental Agreement Summary- Pending liquidated damages final determination.

SA No.	Amount	Description

18. DBE

- a. What was the project's DBE goal? 8%

- b. Was it or will it be met? Yes No

If yes, generally describe utilization:

- o Multiple disciplines within construction phase.

19. Summary of observations from Office of Innovative Delivery (OID), Construction, DB Team, and FHWA

- a. Overall project was successful considering project goals and I-24 Maintenance of Traffic.
- b. Lessons were learned on ABC period. (See attached)
- c. Coordination and Communication between DB Team and GDOT during ABC period was absolutely critical to project success.
- d. FHWA praised GDOT and the Contractor for completing the project. The parameters specified and learned in this project will help guide future accelerated bridge construction projects in Georgia.

20. Recommendations

- a. Consider ABC period timeframe based on complexity of the project.
- b. Overestimate the closure times prior to and during the ABC period when performing public outreach.
- c. Consider complex bridge geometry (horizontal & vertical) when choosing ABC candidates.
- d. Keeping I-24 open during the ABC Period increased the complexity of the project greatly. Many of the other ABC projects were able to shut down the surrounding roadway network.
- e. RFP was somewhat restrictive requiring the use of either SPMT or slide-in. Allowing more flexibility by contractor could allow significant savings.
- f. Consider providing additional Geotechnical information to DB Team.
- g. Consider adding language in the specification requiring the EOR to perform biweekly on-site inspection during the construction.

21. Notable achievements by early interaction of design and contractor

- a. By working closely with the contractor the engineer of record was able to improve the design.

22. Post Design-Build Evaluation participants:

SIGN IN SHEET

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Post Design-Build Evaluation

PI No. 0011682

Page 10

Attachment: PI 0011682 56-Hour Period ABC Method Lessons Learned Overview

56-Hour Period ABC Method Lessons Learned Overview

SR 299/I-24 ABC Bridge Replacement Project – PI 0011682

The Georgia Department of Transportation (GDOT) Office of Innovative Delivery (OID) in partnership with The Federal Highway Administration (FHWA) developed a pilot project using the Accelerated Bridge Construction (ABC) process and Design Build (DB) Delivery Method. The project replaces the existing two-lane State Route 299 (SR 299) bridge over Interstate 24 (I-24) in Dade County, Georgia, North of the City of Trenton. The new bridge was replaced on the existing alignment and includes two 12-foot travel lanes and two 8-foot shoulders. The Design-Build contract dictated that the bridge be replaced using Accelerated Bridge Construction Methods which would enable the existing bridge removal and new bridge installation to be completed within a 56-hour period starting Friday, at 9:00 PM and ending on Monday at 5:00 AM.

The contract required the DB Team to prepare submittals outlining the processes to be used during the 56-hour period. These submittals included:

1. 56-hour schedule of activities, detailed by the hour.
2. Safety of stakeholders, DB Team, and Construction Engineering Inspection (CEI)/Construction Management (CM) employees.
3. Demolition Plan.
4. ABC Method.
5. Traffic Control Plan for the 56-hour period.
6. Bridge Monitoring Plan for the move.
7. Time lapse video for the entire 56-hour period.

The contract required acceptance of the 56-hour schedule 90 days before the proposed start of the move and meetings be held 30 days and 10 days before the move to discuss the approach. This was accomplished. The meetings were held on site with the DB Team and CEI/CM staff.

The schedule of activities started on Friday, May 12, 2017, at 9:00 PM and completed on Tuesday, May 16, 2017, at 6:00 AM. The completion time was 81 hours after the start time or 25 hours beyond the 56-hour period. The following outlines the schedule for the weekend. The process included utilizing a median crossover installed by the Design-Build Team to manage traffic on I-24.

1. Demolition of the existing bridge.
2. Installing precast pedestals.
3. Utilization of the self-propelled modular transport (SPMT) to move the bridge into place.
4. Monitoring the bridge spans during the move for twist.
5. Completing approaches to the bridge.

On June 1, 2017, a Lessons Learned Meeting was held at the GDOT general office. The major challenges encountered, which brought about delays during the ABC period, included the following:

1. The deterioration of the existing bridge was worse than expected, especially with regards to the existing deck and the deck's connection to the steel beams.

2. The bridge's complex geometry was more challenging than anticipated.
3. Ensuring the safety of the traveling public and workers was the highest priority during the move.
4. The requirement to move two spans over live traffic in a 56-hour period under the conditions was very aggressive.

The originally scheduled 56-hour ABC period extended to 81 hours (or an overrun of 25 hours.) This can be attributed to the demolition of Spans 1, 2, 3, and 4 not being completed as scheduled due to the deteriorated condition of the deck and beams. This resulted in an overrun of 13 hours. The setting of the pedestals resulted in an overrun of four hours. The moving of the spans into final position resulted in an overrun of 8 hours.

Demolition Plan Schedule

The existing bridge was a four-span unit. Span 2 and 3 over the I-24 travel way was a continuous unit. As such Demolition of span 3 over the east bound portion of I-24 would affect span 2 over the west bound portion of I-24, which remained open to traffic. Since the span was a continuous unit, there was a public safety concern of how span 2 over the westbound side of I-24 would react during demolition of the existing span 3.

The DB Team's original demolition plan was to use hoe rams on the bridge to remove the concrete deck and then remove the steel beams. During the demolition plan review process, the DB Team became aware that the existing bridge would not support the hoe rams on the deck, and as a result, they revised the demolition plan due to safety considerations. The revised plans included saw cutting the deck and lifting the deck and beams together. Their demolition schedule called for the removal of the existing Spans 3 and 4 on the eastside of I-24 in eight hours. It took 19 hours to remove the deck and beams at Spans 3 and 4. The increased time included the necessary time to regroup due to the deteriorated state of the existing bridge deck and develop another approach and implement that revised approach to maintain safety on site and for the traveling public. The original demolition schedule called for removing Spans 1 and 2 on the west side of I-24 in eight hours. Using the revised demolition plan developed during the Spans 3 and 4 periods, it took 12 hours. The revision to the demolition plan approach resulted in a seven-hour reduction for removing Spans 1 and 2.

Lessons Learned

1. On future projects, provide the DB teams with more forensic details (e.g., detailed bridge inspection reports) about the existing bridge.
2. Scan the whole bridge and provide a three-dimensional mock-up to help determine the existing conditions of the bridge.
3. In hindsight, the DB Team suggested that having two cranes instead of one large crane for lifting purposes during the demolition process would help by providing stability when removing existing beams.

- 4. It appeared that cutting of the structural steel cross bracing was a slow process. The DB Team recommended utilizing different cutting torches and only cut enough of the cross brace required to lift out the section of deck being lifted.
- 5. It was stated that the calculations of the weight of the pick on the end beams was under-estimated due to the overhang. It was suggested that GDOT stipulate in the contract that 150% capacity for critical crane picks be required.

Demolition and Abandonment Pictures



Saw-cutting Span-4



Removal of Beam 1 on Span 4 (Looking towards Chattanooga)



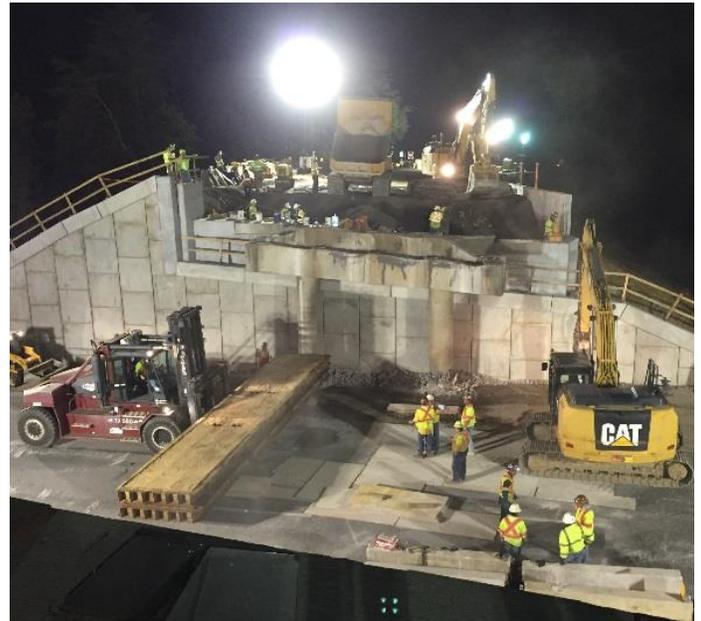
East side approach Slab demolishing



Beam-1 Span-3 Removal



Rigging of Beam-2 on Span-2



Removal of Bent 4

Pedestal Placement on New Bents

It was necessary to build the new substructure under the existing bridge. In order to do this, the new substructure could only be built to a certain elevation. Once the existing bridge was removed, the new substructure was raised to the correct elevation for placing the new spans by utilizing precast pedestals. These pedestals were placed after the existing spans were removed. There are six pedestals per bent. The 56-hour schedule for placing the pedestals at Bents 2 and 3 was seven hours. The actual time to set the pedestals at bents 2 and 3 was thirteen hours. The pedestals were required to be in place to start the Span 2 move. The schedule for placing the pedestals at Bent 1 was three hours. The actual time was four hours. The pedestals took an extended period due to the need to cut some of them multiple times to make them fit on the individual bent.

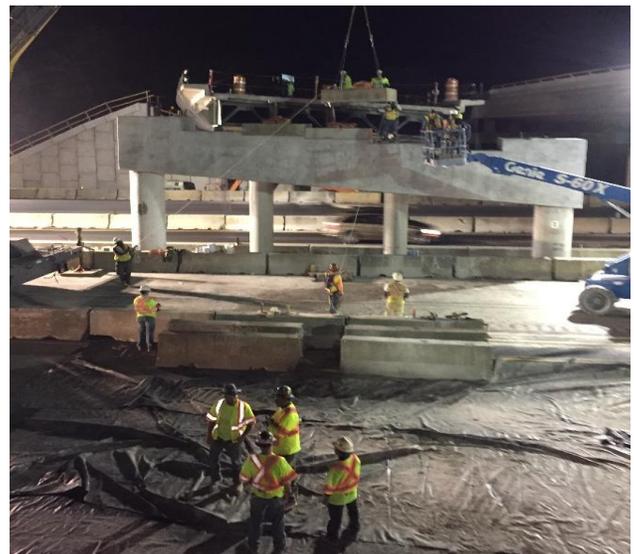
Lessons Learned

1. The contract required the DB Team to prepare an as-built of each bent to correctly pour the pedestals for each bent. This requirement was to be accomplished while the existing bridge was in place. This requirement was discussed during bi-weekly meetings. Due to schedule constraints on available weekends remaining, the DB Team decided to pour the pedestals in accordance with the RFC Plans. On Bent 1, one pedestal was set, removed, and cut once before resetting. On Bent 2, two pedestals were set, removed, and cut once before resetting. On Bent 3, two pedestals were set, removed, and cut twice before achieving final setting.
2. The schedule had Bent 1 pedestals set in three hours, although the actual time was four hours. The Bent 2 pedestals were scheduled to be set in four hours, while the actual time was 6.5 hours. The Bent 3 pedestals were schedule to be set in three hours, while the actual time was 6.5 hours.
3. The pedestal installation was scheduled to take ten hours total. It took approximately 17 hours due to re-measuring and cutting the pedestals to fit the bents. The adage of “measure twice and cut once” was not followed and valuable time was wasted.
4. The decision to pour the pedestals in accordance with the RFC plans instead of getting as-builts resulted in pedestals which did not fit properly on the bents.

Setting of Pedestals



Setting of Pre-Cast Pedestals at Bent 3



Setting of Pre-cast Pedestals at Bent 2

Move Spans into Place

The Contract Special Provision Section 299 Accelerated Bridge Construction provided the specifications to move the bridge by the Lateral Slide Method or the Self-Propelled Modular Transporter Method (SPMT).

The Design Build Team chose the SPMT to move the new bridge into place. They provided a submittal to move each of the two spans into place. The steps were preparation and setup of the Goldhofer trailers, travel of the span into position, and fine-tune the placement of the span over the anchor bolts. The procedure was to set Span 2 over the eastbound lanes of I-24 and then set Span 1 over the westbound lanes of I-24. The schedule for Span 2 included a preparation time of ten hours versus an actual time of 24 hours. This delay was due to the demolition of the existing bridge Spans 3 and 4 taking more time than anticipated. The Span 2 move time schedule was two hours versus the actual move time of 0.67 hours. The Span 2 schedule for fine-tuned placement was one hour versus an actual duration of five hours.

The schedule for Span 1 setup time was 4.5 hours versus an actual time of 12.25 hours. The schedule for Span 1 move was three hours versus an actual time of ten hours and the schedule for fine-tuned placement was one hour versus an actual time of 5.33 hours.

The difference in the scheduled fine-tuned time versus the actual time taken was due to the complexity of the bridge geometry. However, the difference in the scheduled versus actual move time for Span 1 was due to the trailers becoming out of alignment as they started to make the move. This delay was approximately seven hours.

Lessons Learned

1. The complexity of the bridge's geometry affected the amount of time that was required for the final setting of the bridge. SR 299 is in a tight horizontal curve and the roadway is Super elevated, so the north side of the bridge is significantly lower in elevation than the south side. Further complicating the move is that I-24 is in a significant vertical grade. The DB Team suggested that on future projects with similar bridge geometry that a custom horizontal jacking system be used to speed up the process.
2. The DB team also suggested that for future similar ABC projects, a 72-hour schedule would be more attainable than the 56-hour period.
3. The Span 1 move time took ten hours compared to the Span 2 move time of 0.67 hours. This was due to the trailers getting out of sync as they tried to move forward and adjust for the geometry conditions imposed by Span 2 already being in place. The recommendation for future projects would be to not operate the trailers in sync but operate them independently. Additionally, a back-up hard link between the two movers may be warranted.

ABC Move



ABC set-up Span-2



Verifying Shim Position Span-2



Preparing for the move - Span 1



Preparing for the move - Span 1

Site Work

The site work on the east side was scheduled to take 23 hours and it took 30.75 hours.
The site work on the west side was scheduled to take 15 hours and it took 7 hours.
Overall site work was scheduled to take 38 hours and it took 37.75 hours.

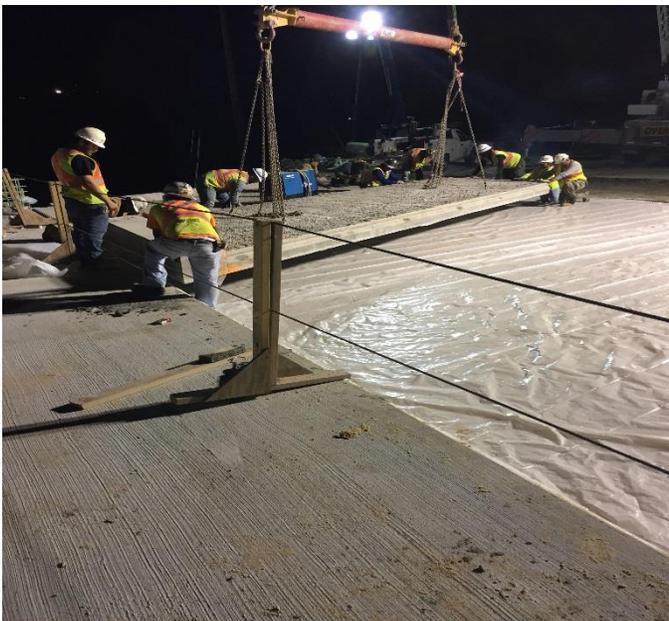
Pre-cast Approach slab



#57 Stone backfill at Bent 3



Setting of Precast Approach Slab - Bent 3



Setting of Precast Approach Slab - Bent 3



Approach Slab at Bent-3 after set-up

Traffic Control

The traffic flowed on I-24 uninterrupted and there were no known traffic accidents during the 56-hour period. The ABC Period included multiple shifts of I-24 EB and WB traffic to complete the two moves. All four lanes on I-24 remained open and flowing at speed limit throughout the weekend except for very intermittent lane closures to implement the shifts. Traffic control was a major success for the project.

Two issues were detected concerning traffic control during the ABC Period:

- 1) The median crossover started to develop potholes towards the end of the period. This was due to the pavement section design depth chosen by the DB Team and accepted by the Department. The pavement was not thick enough at the tie-in to the existing pavement. The suggestion for future projects is to design the pavement sections at the tie-in points using a more conservative approach by considering a thicker pavement section. Although it's worth noting that the pavement degradation occurred only after the initial 56-hr period.

- 2) During one of the shifts, the I-24 Westbound traffic was forced to travel on the I-24 Eastbound rumble strips. This caused drivers to have to choose either hugging the median barrier wall, or straddling the rumble strips. This condition existing for a short period within the 56-hrs and no incidents were reported. However, mitigation for the rumble strips should be considered.

Traffic Control

Traffic Control - I-24 WB towards Nashville



Traffic Control- I -24 EB towards Chattanooga



Overall, the DB Team took ownership and reacted very well to the issues that occurred on the project. The communications between the DB Team and Department worked well throughout the period. The safety at the project site was managed very well. No injuries were reported during the ABC period.

Communications

1. The Public Detour Meeting was held on April 27, 2017, at 4:00 PM.
2. The following items worked well:
 - a. Coordination between DB Team, GDOT PM, and HNTB (serving as GDOT Owner's rep) Communications Team
 - b. DB Team's responsiveness to GDOT Team during the ABC period
3. The following could be improved:
 - a. DB Team and GDOT PM coordination/communication regarding the project detour map and turn-by-turn directions.
 - b. DB Team and GDOT PM coordination to provide ample lead time regarding the occurrence of public meetings.
 - c. Early coordination between HNTB Communications and DB Team regarding handling of construction camera parameters and issues.
 - d. Setup meeting between OID Delivery, HNTB PMC Team, and Communications Team to develop video camera specifications for future projects. The video camera deliverable should be better defined in the Contract Communications specification (i.e., time-stamped and dated video.)
4. Communications recommendations:
 - a. DB Team will need to provide more substantial specifications/expectations for deliverables to include filming durations with camera vendor. The Communications Team will be more involved in preparing the contract specification and review of the vendor submittal package when requested.
 - b. In future projects, if GDOT plans to use HNTB's Consultant Professional Service Contract to secure a construction camera vendor, HNTB's Consultant Professional Services will need to be involved in rewriting the Contract Communications Section.
 - c. In future projects, if GDOT plans to procure construction camera services directly with vendor, the camera requirements should remain in the DB Team Contract to provide technical specifications which meet the requirements of the Communication group.
 - d. Continue to refine the way we spotlight special projects for the public.

ABC Period Office of Innovative Delivery (OID) Personnel Assignments

The OID Team monitored the work during the ABC period by utilizing the DB Teams fifty-six (56) hour schedule as the starting point. A notebook was put together for each of the OID Team members. The notebook outlined the work to be completed and the RFC Plans to be used during the ABC period. The notebook included the following:

1. Emergency response plan
2. Project contact list
3. 56-hour inspection schedule
4. Site plans
5. Traffic control plan
6. Demolition and abandonment plan
7. Pedestals
8. ABC method
9. Monitoring Plan
10. 56-hour material testing
11. # Fifty-seven 57 stone installation
12. Approach slab installation

Utilizing the DB Team schedule for the ABC period we developed two inspection teams consisting of four people each. The shifts were twelve (12) hour shift, Arcadis (as lead CEI firm) led the night shift group and Luster (as Project Engineer) led the day shift group. Meeting was held on Thursday May 11, 2017 on site to go over the above referenced items of work in the morning. In the afternoon, a field meeting was held to become familiar with the areas of work to be accomplished during the 56-hour period. The process included meeting one (1) hour before each shift started to inform the next shift the status of the work performed. The schedule was updated to show the work started and completed during the previous shift. It also identified the work to be performed during the new shift. Each of the inspection team members were to identify on their schedule when activities started, note any items which may cause delay and identify when activities finished. In addition to the two (2) crews, GDOT OID staff were present as well as HNTB Construction Manager personnel acting as GDOT Representatives to float between the two shifts. Since communications between all parties was critical to keep track on the status of the project, the DB Team provided updates to one of the three (3) GDOT Representatives every two (2) hours to report on the progress and identify any problems which might arise.

The inspection teams were to take pictures of the activities and document the start and finish times of the activities on the schedule.

Lessons learned:

1. The recommendation is to better anticipate the possibility of the schedule not being met. Since there were only three (3) personnel to cover the 56-hour period; which turned into eighty-one (81) hours, they tended to be on site fourteen (14) to sixteen (16) hours or more during the ABC Period. Additionally, three (3) of the eight (8) inspection team members had to leave Sunday afternoon. This left the inspection teams and Department staff short of people from Sunday night through Tuesday morning. Plan for four (4) people to be committed to being on site for the entire duration to adequately cover for any overruns.