



Jane Byrne
INTERCHANGE
Formerly known as Circle Interchange



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The Jane Byrne (Circle) Interchange: Milestone Overview & Highlights

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February 27, 2018



Illinois Department
of Transportation

Presentation Overview



- *Project Background & History*
- *Design Features & Challenges*
- *Project Status*
- *Upcoming Contracts*
- *Construction Features & Challenges - ER*
- *Current Construction Activities - ER*
- *Questions & Answers*

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History & Overview



*Late 1950's
early
1960's*

*The facility is
in need of
major repair
and
reconstruction*





The Jane Byrne interchange is located in the heart of Chicago connecting I-290 to I-90/94. The Kennedy Expressway is located to the north of the interchange, Congress Parkway to the east, Dan Ryan Expressway to the south, and Eisenhower Expressway to the west.

History & Overview

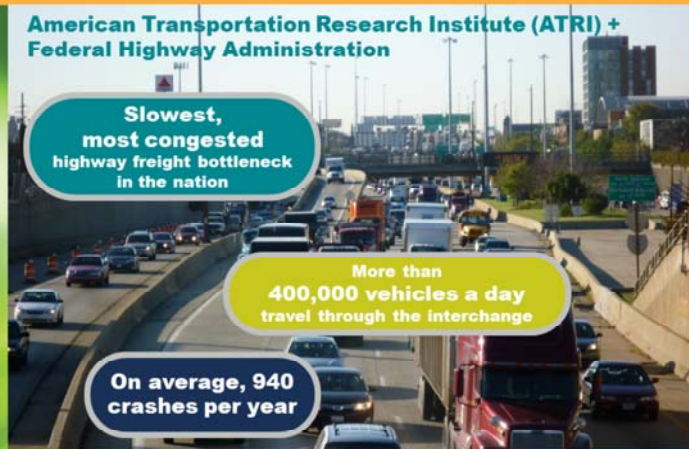


**American Transportation Research Institute (ATRI) +
Federal Highway Administration**

**Slowest,
most congested**
highway freight bottleneck
in the nation

More than
400,000 vehicles a day
travel through the interchange

On average, **940**
crashes per year



Proposed Improvements

Jane Byrne INTERCHANGE
Interchange to Drive Mobility

- Improve the safety and mobility
- Improve the bridges, roadway, & drainage system
- Minimizes environmental impacts
- Enhances community connectivity on the local street network

The image is an aerial map of the Jane Byrne Interchange, showing the intersection of Interstate 290 (I-290) and Interstate 90/94 (I-90/94). The map is overlaid with various colored lines and shapes representing proposed improvements. I-290 runs vertically through the center, while I-90/94 runs horizontally across the bottom. A network of colorful lines (orange, yellow, green, blue, purple) shows proposed roadway and drainage system changes. Blue rectangular shapes indicate proposed bridge structures. A north arrow is located in the upper right quadrant. Street names labeled on the map include S. Peoria St., S. Mass St., S. Hubbard St., S. Harrison St., S. Jefferson St., S. Lawrence St., and S. Green St. The project is titled 'Jane Byrne INTERCHANGE' with the tagline 'Interchange to Drive Mobility'.

Project Key Features

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TRANSFORMING THE WAY WE DRIVE

- Cross Road Bridges
- Flyover Ramps
- Other Bridges

Morgan Street

Peoria Street

Halsted Street

Taylor Street

Harrison Street

Van Buren Street

Jackson Blvd.

Adams Street

Monroe Street

290

90/94

N

Project Key Features



- 4 Lanes I-90/94
- New 2 Lane ramps
 - East to North (EN)
 - North to West (NW)

Unique Features/Challenges



- Only Drilled Shaft (Caissons) as Foundation option - No Steel Piles due to Vibration Concerns
- Poor Soils
- Existing and Future CTA tunnels
- Contractors' Overlaps within Constrained Project Site
- Complex Staging while maintaining large ADT's



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Unique Features/Challenges

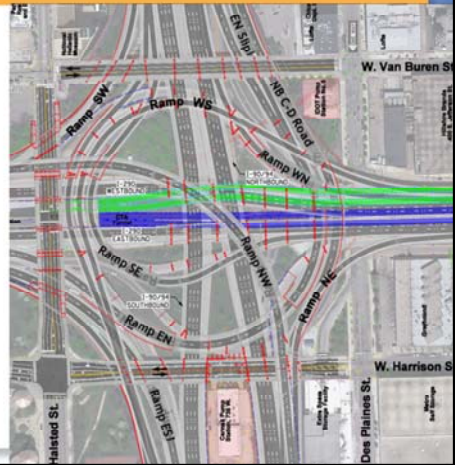
- Existing Piers and Foundations



Unique Features/Challenges



- Existing Piers and Foundations
- Existing and Future CTA Tunnels



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Unique Features/Challenges



- Existing Piers and Foundations
- Existing and Future CTA Tunnels
- Existing and Proposed Main Drain Sewers

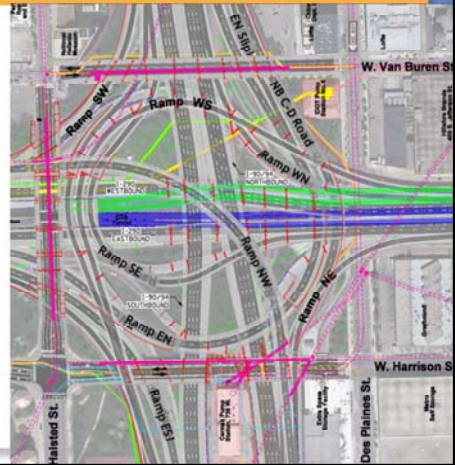


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Unique Features/Challenges



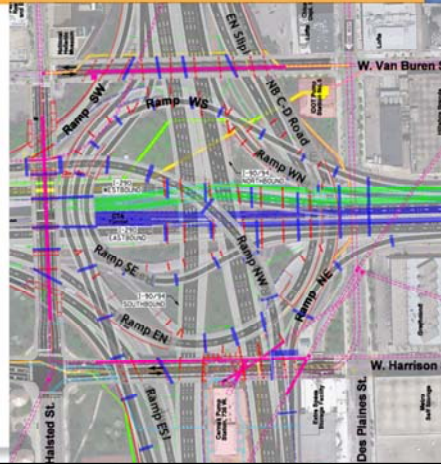
- Existing Piers and Foundations
- Existing and Future CTA Tunnels
- Existing and Proposed Main Drain Sewers
- **Watermain Tunnel Bulkheading**



Unique Features/Challenges



- Existing Piers and Foundations
- Existing and Future CTA Tunnels
- Existing and Proposed Main Drain Sewers
- Watermain Tunnel Bulkheading
- Proposed Bridge Piers and Foundations



Project Status



- Total Construction Cost: \$585 Million
- **14** Contracts "Substantially" Complete (\$199 M)
- **10** Contracts Under Construction (\$154 M)
- **11** Contracts Remain (\$232 M)
- Design > 60% Complete
- Construction > 55% Complete



Construction Completed



2018 Ongoing Construction Work

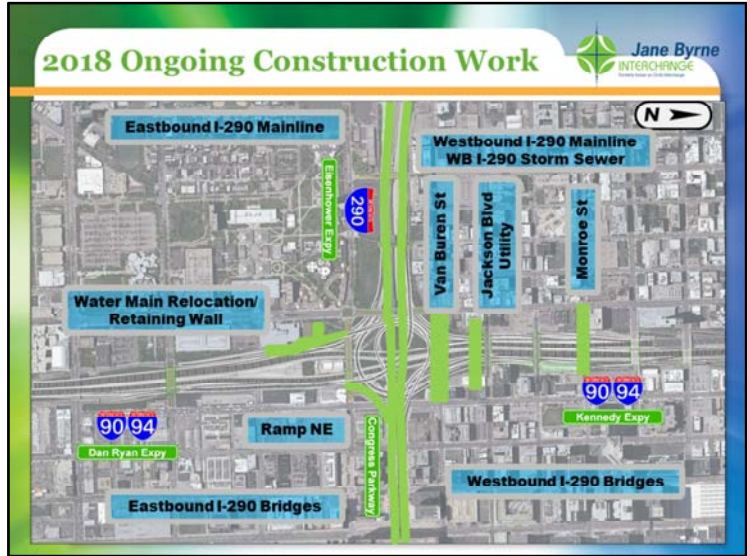


1. WB I-290 78" Storm Sewer (62D78) (Completion 5/18)
2. WB Congress Parkway Viaduct (60X78) (Completion 8/18)
3. WB I-290 Mainline (60X77) (Completion 8/18)
4. Jackson Boulevard Utility Relocation (62A75) (Completion 9/18)
5. Ramp NE (62B76) (Completion 10/18)
6. Water Main Relocation/Rehabilitation at Cermak Pumping Station (62A74) (Completion 11/18)
7. Van Buren Street Bridge (60X99) (Completion 6/19)
8. Monroe Street Bridge & Peoria Street Siphon Lining (60X95) (Completion 6/19)
9. EB I-290/Congress Parkway Bridges (60X75) (Completion 6/19)
10. EB I-290 Mainline Reconstruction (60X76) (Completion 11/19)



(Completion Dates are based on Contract Drawings)

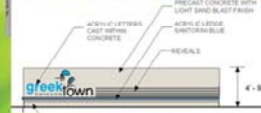
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Van Buren Street – Elysian Field



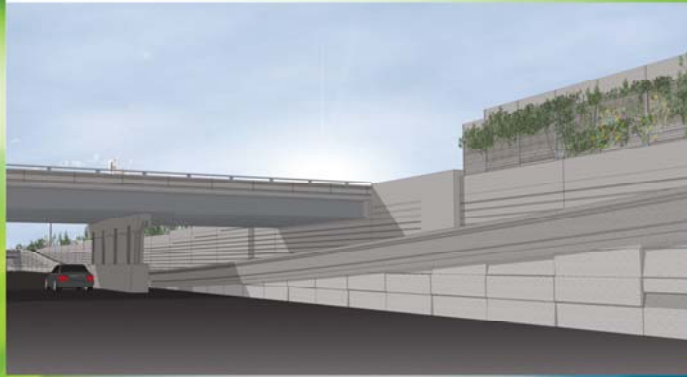
- Southeast corner of Halsted Street and Van Buren Street
- Coordinated Design with Greektown Branding and Signage
- Relocated Greektown Monument and Artificial Turf Green Space



Flyover Pier



Retaining Walls



Halsted Street Bridge Reconstruction  Jane Byrne
Existing View Looking South INTERCHANGE
TRANSFORMING THE CITY OF CHICAGO

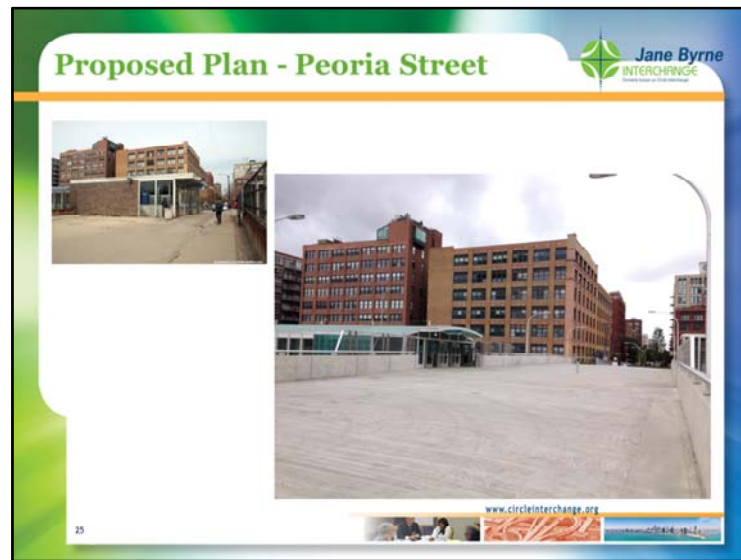


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Old and new looking north



Upcoming Contracts



Fiscal Year 2019

- *Tree Planting #4 - Letting 11/18*
- *Ramp EN - Letting 11/18*
- *Interchange Ramp Completion- Letting 11/18*
- *Congress Parkway Bridge Painting- Letting 6/19*

Fiscal Year 2020

- *Tree Planting #5 - Letting 6/19*
- *NB I-90/94 (Roosevelt to Lake St/Madison St) - Letting 4/20*
- *SB I-90/94 (Roosevelt to Lake St/Madison St) - Letting 4/20*
- *Interchange High Mast Lighting & ITS - Letting 4/20*

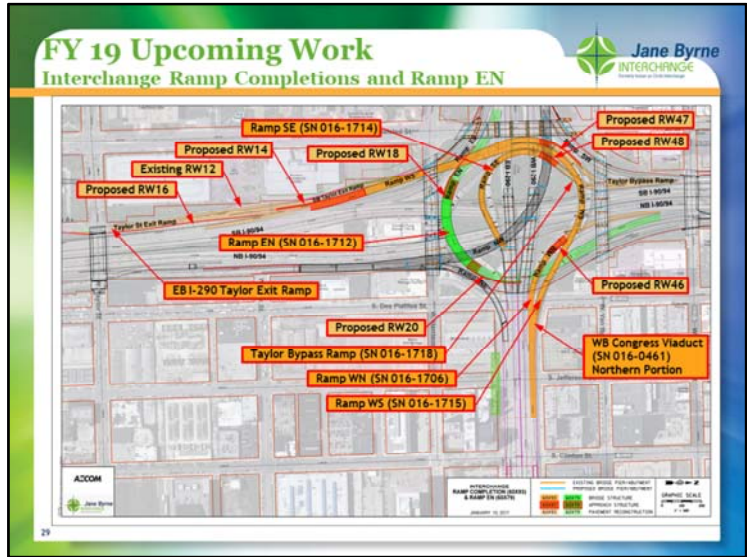
Fiscal Year 2021

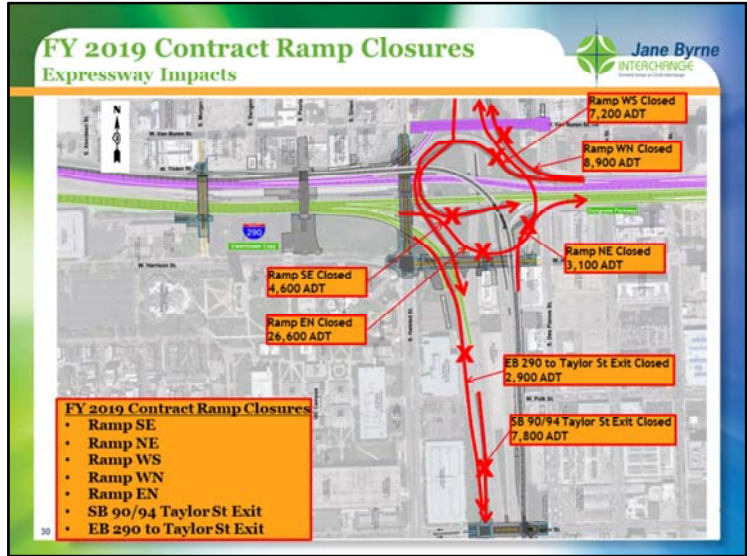
- *Adams Street - Letting 6/20*
- *Jackson Boulevard - Letting 6/20*
- *Green Space Contract - Letting 9/20*

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Following the East-West piece, the reconstruction of I-90/94 along with the cross road bridges of Van Buren Street, Jackson Boulevard, Adams Street and Monroe Street over I-90/94 will take place in the 2017 timeframe.





Project Benefits



The improvement will create a **safer environment for the motoring public** by reducing the predicted number of severe crashes by up to **25%**.



After Project Completion,
A **50% reduction in delay** for all vehicles over the course of the day.

- Reduction of up to **5 million hours annually** of drivers sitting in congested traffic.
- Savings of **\$185 million annually** in lost production from delayed travelers.
- Reduction in idle time resulting in nearly **1.6 million gallons annually**.
- Reduce greenhouse gas emissions by **one-third**.



- The Illinois Department of Transportation (IDOT) and Federal Highway Administration (FHWA) will act as lead agencies for the Circle Interchange project. As such, FHWA (Division Administrator) and IDOT will be responsible for making final project recommendations and decisions.
- IDOT Project Management Consultant is Stanley Consultants
- Joint Venture Consultant team of AECOM and TranSystems
- The PST has primary responsibility for the project development process and will meet regularly as the project progresses to provide technical oversight and expertise in key areas including study process, agency procedures and standards, and technical approaches.
- Go around room and have everyone introduce themselves.

Construction Features & Challenges



Preconstruction

Rendering




In-Progress

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The 'Hood'

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Transforming Space to Create Opportunity

High density residential area



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The slide features a green and blue border. At the top left, the text 'The 'Hood'' is written in a green, sans-serif font. At the top right, the 'Jane Byrne INTERCHANGE' logo is displayed, consisting of a green leaf-like icon and the text 'Jane Byrne INTERCHANGE' in blue, with the tagline 'Transforming Space to Create Opportunity' in a smaller font below it. The main content area is white and contains the text 'High density residential area' in a black, sans-serif font. Below this text is a large, high-angle photograph of a city neighborhood. The image shows a dense cluster of multi-story buildings in various colors (brick, grey, blue) surrounding a complex, multi-level highway interchange with several overpasses and ramps. The sky is clear and blue. At the bottom of the slide, there is a small horizontal strip with the website address 'www.circleinterchange.org' in the center, and the number '34' in the bottom left corner.

The Jane Byrne Interchange project includes unique work zones. The interstate corridors are lined with high-rise condos. Many more are scattered throughout the neighborhood with new ones currently under construction.

The 'Hood'

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Transit Hub in Circle Interchange

University of Illinois at Chicago

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The UIC campus provides a steady supply of pedestrians, some with “wheels.” They come with skate boards, bikes, roller blades, motorized wheel chairs etc.

The 'Hood'



Highly congested business district



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Office buildings, stores, restaurants, parking garages, arenas, schools, churches, you name it!

The slide features a green and blue gradient header. The title 'The Hood' is in green. The logo for 'Jane Byrne INTERCHANGE' is in the top right. The main content is a bulleted list. The footer includes the website 'www.circleinterchange.org' and three small images: a group of people, a construction site, and a highway interchange.

The 'Hood'

- Main access for downtown Chicago
- Limited ROW
- Multiple overlapping work zones

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All of these things combine to make the contractor's job more difficult. He must perform his work while maintaining access to businesses and without impacting adjacent properties. Often times he has to share the work zone or wait to access portions of the work. Brian and the design team took care to add provisions in the contract to advise bidders of special work zone limitations or coordination requirements.

Contract Administration



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- Contractor coordination
- Traffic control coordination
- Special events
- Utilities
- CTA bus/rail
- City of Chicago
- Residents, businesses, stakeholders
- UIC

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Something that I want to stress is how interconnected these projects are. Think of these contracts as a series of dominoes being lined up. If one doesn't fall then it affects all of the dominoes down the line. So our challenge in Construction is to keep pushing those dominoes that won't fall over. These are some of those dominoes.

**WHAT WENT
WRONG?**



WHY DID IT HAPPEN?

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HOW DO WE FIX IT?



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Construction Issues

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Interchange to Interchange

Traffic Control Coordination delays

- Stage changes
- Special events
- Extended closures

Solutions:

- ✓ Interim completion dates/Liquidated damages
- ✓ Plan notes and special provisions
- ✓ Ongoing phase II and III coordination
- ✓ Weekly traffic coordination meetings

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Traffic control for each project usually impacts the adjacent projects. Also, stage changes must be coordinated between the contracts. Traffic staging conflicts in the JBI projects were very common. **Solution:** Brian included interim completion dates in some of the contracts with liquidated damages attached to make sure contractors are aware of the impact of delays to certain items. Construction and Design work together once work begins to find ways to eliminate delay impacts to other contracts.

For example, for contract 62A74, we have performed some additional exploratory work to figure out if we can shift the location of a water main tie-in away from ramp ES pavement. Based on the field data, it looks like we will be able to perform the water main work without requiring traffic staging that conflicts with an adjacent contract. This eliminates an interim stage on both contracts and thumb twiddling by both contractors while they wait for their chance to complete work.

Construction Issues

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Interchange to Interchange

City of Chicago Coordination

- Office of Underground Coordination (OUC)
- Department of Water Management (CDWM)
- Office of Emergency Management (OEMC)
- Bureau of Electrical Operations (BEO)
- Department of Transportation (CDOT)

Solutions:

- ✓ Phase II coordination
- ✓ Phase III submittals (OUC and CDWM)
- ✓ Frequent and timely communication

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A big portion of utility coordination is with City of Chicago agencies. Planned excavation is cleared through CDOT before a city permit is issued. Excavations deeper than 12 ft must go through OUC. **Solution:** Much of this coordination was initiated in Phase II and continued in Phase III. Timely submittals is critical. (Issue a list of required submittals to the contractor and hammer them to get submittals in.) Frequent and timely communication helps to preempt city coordination issues and delays.

Construction Issues

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Trade Association for Construction

Other Utilities

- Communications
- Natural Gas
- Electric
- Unknown/Abandoned Utilities?

Solutions:

- ✓ Phase II coordination (OUC and CDWM)
- ✓ Initial utility coordination meeting

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Unknown and abandoned utilities are always the most difficult to deal with. Solution: Nothing much can be done beyond the initial material coordination meeting. Deal with utility issues as they occur.

Construction Issues

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Trade Association for Interchange

- Noise
- Dust
- Vibration
- Settlement!!!

Solutions:

- ✓ Minimize night demolition
- ✓ Give advance notice
- ✓ Air quality monitoring program
- ✓ Vibration and settlement monitoring special provisions

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Due to the proximity of adjacent structures settlement/displacement monitoring became a critical issue. **Solution:** Be sure to address any settlement concerns whenever excavating near adjacent buildings!

Construction Issues

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Drilled shaft foundations

- Obstructions
- Differing soil conditions
- CSL testing anomalies
- Heat of Hydration Control

Solution:
?

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Unexpected obstructions and soils differing from the borings are common. Solution: None. However CSL test anomaly delays are difficult to reconcile. **Suggested solution:** IDOT is looking into alternate tests to determine the integrity of drilled shafts. Eliminate CSL testing altogether and focus on adherence to approved drilling procedure and construction inspection. Alternatively, install CSL test tubes in all shafts and only test if there is an observed problem. Cooling tubes were used in some large diameter shafts.

Construction Issues

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Contract 60W25 Value Engineering proposal




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The Morgan St. bridge project involved a VE to change from drilled shafts to micropiles. It would have been too difficult to maneuver a large drill rig within the braced excavation due to the system of struts and walers.

Construction Issues

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Trade Show & Conference



Damaged Comed cable encountered during electrical utility relocation (60W25)

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The original contract involved temporarily supporting a ComEd electrical duct package, demolishing the existing structure, reconstructing the new structure, then reattaching the duct package to the new structure. However, this cable arced while the contractor was working to temporarily support the duct package. One of the workers was injured and the plan to temporarily support the cables was scrapped.

Construction Issues

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Solutions:

- ✓ Change to staged construction
- ✓ Temporary pedestrian bridge

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IDOT committed to maintaining access for pedestrians to at least two of the three CTA station entrances for UIC.

Construction Issues

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- Contract 60W29 UIC-CUPPA Hall settlement
- Contract 60X61 Retaining Wall 6

Solutions:

- ✓ Anticipate settlement
- ✓ Increase settlement/displacement monitoring
- ✓ Stiffen retaining walls and TSRS

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The building adjacent to the braced excavation for the Peoria St. north abutment settled. The issue is being litigated.

Solution: Increase settlement monitoring of adjacent structures. Stiffen walls and TSRS near adjacent structures.

Construction Issues

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Contract 60W29 TSRS near CUPPA Hall



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Note the brown building in the upper right corner of the picture. There is approximately 10 feet from the temp soil retention system to the face of the building.

Contract 60X61 Retaining Wall 6



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This picture of Retaining Wall 6 shows the proximity of the construction to the buildings.

Contract 60X61 Retaining Wall 6



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The wall was designed with ground anchors at 9 to 15 degrees from vertical to reduce deflection.

Construction Issues

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THE WAY TO CONSTRUCTION

Contract 60W28 NW Flyover ramp

- Drilled shaft vs. abandoned tunnels
- Settlement prone soil under MSE wall
- Steel Erection

Solutions:

- ✓ Add permanent casings for abandoned tunnels
- ✓ Use LCCF for settlement prone soil
- ✓ Pre-erection meetings for steel

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We encountered steel fit-up issues while placing curved girders for the critical span over I-290. Curved girders typically require additional preparation. **Solution:** Pre-erection meetings are recommended to address contingencies for fit up issues. Initial girders experienced significant fit up and splicing problems and were unable to be set during allowable contract times. Subsequent beams were set despite indications of mis-alignment. The deck and remaining structure was adjusted to account for the mis-alignment.


Solution to abandoned tunnels: Added permanent casing

Solution to settlement prone soil: LCCF

Construction Issues

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Curved girder erection



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With curved girder construction, the first one or two beams are not stable. The second and third girder lines provide stability once the cross members are attached. A shoring tower was necessary to erect these girders. The shoring tower had to be modified on-the-fly due to the girder alignment issues. This work was performed over high-volume expressway lanes that were temporarily closed to traffic. This issue caused a significant overrun of the allowable lane closure time.

COOL CONSTRUCTION FEATURES!!!



Contract 60W29 Peoria St. Bridge precast deck panels



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Cool Construction Features



Contract 60W29 Peoria St. Bridge precast deck panels



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Note the shear studs arranged in pockets. Also, there is approximately 8 inches of rebar extending from the panel edges.

Cool Construction Features

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Contract 60W29 Peoria St. Bridge
UHPC concrete (21,000 PSI at 14 days)



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Ultra high strength concrete provides an alternative to rebar splices. This material provides 20 ksi. In contains metal fibers for tensile strength.

Cool Construction Features

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TRANSFORMING THE CHICAGO METRO AREA



Contract 60W29 Peoria St. Bridge CTA station under construction

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Another cool feature incorporated into the Peoria St. bridge project was the rehabilitation of the CTA station. This station was completely ADA compliant including the addition of an elevator. Here you can see the framing of the station.

Cool Construction Features

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TRANSFORMING THE CTA



Completed CTA station

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These pictures show the completed station.



These projects impacted huge water distribution and sewer systems.



And finally there were a few aesthetic features incorporated into many aspects of construction.

Aesthetics/Architectural Features



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Aesthetics/Architectural Features




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Phase III Team

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I-90/94 Interchange

IDOT Phase III engineers:


- Shearrisa Phillips-Hatcher
- Patrick Walsh
- Holly Wilson
- Oscar Jimenez
- Connie Venegas
- Eric Ray
- Roman Meropolski
- Ann Berube
- Paul Gregoire
- Ryan Sheley

Phase III engineering firms:

- Bowman Barrett & Associates
- Burns and McDonnell
- Gonzalez Companies
- Knight E/A
- Omega & Associates
- Teema Associates
- TranSystems

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These are just some members of the Phase III team. Also, IDOT BB&S, Traffic, Materials, and too many others to list.

Questions / Comments



Thank You

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