I-270/US 33 Interchange Improvements, Phase 1
PRESENTATION

• Project background
• Alternative selection
• Project review/challenges
• Construction
PROJECT BACKGROUND

• Operates as a service interchange to the east approaching the Frantz Road/Post Road intersection
• Operates as a system interchange to the west
• Several adjacent developments
PROJECT BACKGROUND

• Goals
  – Improve safety
  – Address traffic congestion
  – Resolve obsolete geometric designs
  – Fiscal responsibility
    • Develop phased plan to meet funding constraints

• Eight alternatives were developed in total
• Three alternatives further studied
  – Alternatives 4, 7, and 8
ALTERNATIVE SELECTION

• Alternatives evaluated based on Purpose & Need and project goals
  – Use Highway Safety Manual for safety performance
  – Provide acceptable operations on I-270 and US 33
  – Eliminate weaving areas
  – Minimize ROW impacts
  – Meet changing fiscal constraints

• Alternative 8 selected
ALTERNATIVE 8 - PHASE 1

REMOVES CONFLICT AREAS ALONG I-270

REMOVES CONFLICT AREAS ALONG US 33

REMOVE LOOP RAMP

REMOVE LOOP RAMP
ALTERNATIVE 8 - PHASE 2

Phase 2 Construction (in 10-15 years)

Remove Loop Ramp
ALTERNATIVE 8
PROJECT DELIVERY

• Beginning of 2013 significant funding obtained
• May 2013 - Selection of preferred alternative
• June 2013 – Begin Stage 1 design
  – Structure type studies
  – Geotechnical investigations
  – Environmental studies
  – IMS
  – ROW plans
• July 2014 – Submit Final Tracings
• December 2014 targeted construction award
ACCELERATED DESIGN

• Bridges
  – 6 New builds
  – 5 Reconstructed/widened

• Retaining walls
  – 2 Soil nail walls with micropiles underpinning Post Rd. abutment
  – 3 Soldier pile and lagging walls
  – 2 MSE walls

• Roadway
  – US 33 widened for 2 miles
  – I-270 includes ramp accel./decel. lanes and merge/diverge areas
  – 7 Ramps realigned

• Drainage

• MOT

• Aesthetic/Landscape enhancements/coordination
SOLVE SCHEDULE CHALLENGES

Develop a plan to meet the schedule

MOVE FORWARD! NO STEPS BACK!

• Incorporate aspects of Design-Build approach
• Share project files with entire design team in real time
  – Projectwise
  – Sharepoint
SOLVE SCHEDULE CHALLENGES

- “Geometry Lock” submission
- Submit Stage 1 in packages
  - Individual assets
  - Stagger submittals
- Weekly Task Force meetings
- Electronic submissions
- 10 working day review period
SOLVE SCHEDULE CHALLENGES

• Conceptual ROW submittal
• Structure submittals
  – Structure type kick-off meeting
  – Interim (superstructure & shape of substructure)
  – Final (substructure)
• Work-in-progress Stage 2 submittal
• Combined Stage 2/3 submittal
• Maintenance of Traffic
  – Minimize disruption to events in Dublin (i.e. Memorial Golf Tournament)
    • Two new bridges on US 33
      – Part-Width construction would add 8-12 months and increase construction costs
SOLVE DESIGN CHALLENGES

• Maintenance of Traffic
  – Close US 33 to through traffic between interchange and Frantz Road
    • Two new bridges constructed in one phase
    • 133 day closure period permitted
    • $15,000/day incentive/disincentive
    • Begin closure the Monday after the Memorial Tournament
AESTHETICS COORDINATION

• City of Dublin led aesthetic efforts
  – Public involved in selection of theme
  – Approval from ODOT
  – Retaining walls and bridges (CDR)
  – Landscaping and free standing walls (CT/EDGE)
AESTHETICS COORDINATION
AESTHETICS COORDINATION
• During final design the bid award date was shifted to Spring 2015
  – Impacted tree removal/clearing and grubbing because of Indiana Bat and Northern Long-Eared Bat
  – Hundreds of trees to be removed by April 1st.
  – ODOT developed separate tree removal plans
    • Awarded October 30th, 2014
• During final design the bid award date was shifted to Spring 2015
  – Restricted US 33 closure duration required ‘outside-the-box’ approach to bridge construction
    • ODOT procurement of structural steel for 4 bridges to meet schedule
    • Separate bid packages developed for steel fabricators
PROJECT AWARD

• Project awarded February 2015
• 1.25% under the State Estimate
• Two years for substantial completion (third year aesthetics and landscaping)
Interchange Improvements
OTEC 2016

Drew Griesdorn, P.E. District 6 Construction
I-270/US 33
Interchange Improvements

- Contractor: Complete General Construction
- Partnership: ODOT & City of Dublin
- Project Awarded: February 18, 2015
- Work Started: March 24, 2015
- Construction Cost: $68 million
Existing Interchange
2015 Construction
US 33 Median Widening

2015 US 33

FRA-33-0257L/R

FRA-33-0271L/R

RW-3

RW-4
2015
Ramp EN
33WB to 270NB
2015 Ramp WS 33EB to 270NB

6’x4’ Culvert

10’x7’ Culvert Cosgray Ditch

FRA-270-1619L Cramer Ditch
2016 Construction
US 33 EB & WB Closure

ROAD CLOSED
US 33 EB & WB Closure

- **A+B Closure**
  - Minimum 90 days
  - Maximum 133 days

- **Incentive/Disincentive**
  - $15,000 per day
  - Maximum Incentive = $450,000

- **Start:** June 8, 2015
- **End:** October 19, 2015

- **Ramp Closures**
  - US 33 WB to I-270SB
  - I-270SB to US 33 EB
US 33 EB & WB Closure

Advantages
- Eliminated part-width construction
- Reduced construction cost
- Access to the work

Disadvantage – cutoff direct access
- Into Old Dublin from US 33 EB and I-270 SB
- Out of Old Dublin to US 33 WB and I-270 SB

Public Impact Mitigation
- Higher volume ramps maintained
- Local detour routes
- Public outreach
33W thru Detoured to Sawmll Rd.

270N to 33E

33E to 270N

270S to 33E Detoured to Tuttle Crossing Blvd

33W to 270S Detoured to Sawmll Rd.

33E thru Detoured to Tuttle Crossing Blvd
The “HOLE”

Timeline of Construction

FRA-33-0271L/R
US 33 over Ramps WN & ES
Curse of Chief Leatherlips?

RAIN, RAIN GO AWAY!

June 2015: 16 weather days

July 2015: 16 weather days

IMAPCT: Pushed opening date to early December 2015
November 2, 2015
Purchased structural steel for 4 bridges prior to project award.

Two purchasing contracts

- **ITB 427-15 - $1.58 million**
  - FRA-33-0257L
  - FRA-33-0257R
- **ITB 428-15 - $850k**
  - FRA-33-0271L
  - FRA-270-1763

Fabrication & delivery lead time required purchase to keep US 33 closure timeframe on schedule.
Structural Steel Procurement
Structural Steel Procurement

- Contract Management
- Storage Fees
- Delays – weather & construction progress
- Delivery Coordination
- Get it right – thorough design review
Concrete Aesthetics

- Bridges
  - Abutment walls
  - Pier columns & caps
  - Outside face of parapets

- Walls
  - MSE Panels
  - Soldier pile & lagging facing
  - Noise wall panels

- 31 unique liners for CIP concrete
- 17 unique liners panels for MSE panels
- Linear liners for piers & parapets
Clay Patterns
Concrete Form Liners
Mock Up – QC-1 Concrete
Mock Up – QC-1 Concrete
Mock Up – SCC Concrete
Mock Up – SCC Concrete
Concrete Aesthetics
Lessons Learned

- Clear specifications
- Utilize mock ups
- Consider SCC for intricate form liner detail – specify SCC as option in the plans
- Form systems need to accommodate high slump
- Consider concrete pour rates when bidding & scheduling
- Surface finishing & treatments – stain/sealer
Construction Challenges

- Cobbles & Boulders in Cut Subgrade
- Accelerated Design
  - D/B aspects of a D/B/B project
  - Design services during construction
2017 Remaining Work

- Landscaping & Irrigation
- Surface Asphalt & Final Striping
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