The Ohio River Bridge East End Crossing Tunnel

Wern-ping (Nick) Chen, Jacobs Engineering
Agenda

1. Introduction
2. Design
3. Construction
4. Summary
1. Introduction - Purpose

- Improve safety, alleviate traffic congestion and connect highways
- Stimulate the economy of the entire Louisville-Southern Indiana region
1. Introduction – Project Location Plan

Louisville, KY - 190 miles Southwest to Columbus, OH
ORBEE Crossing Tunnel Site
1. Introduction – Project Location Plan
1. Introduction – Project Location Plan
1. Introduction - Responsible Parties

- Indiana Financial Authority (IFA) – oversee the P3 project
- KYTC – maintain the tunnel
- Constructor – Wash Vinci CJV
- Engineer of Record – Jacobs Engineering
- Tunnel Engineer of Record – Nick chen
2. Design – Tunnel Plan

- \( L = 1,700 \text{ ft} \)
- Two cross passages
2. Design – Tunnel X-section at North Portal

- 53-feet wide and 26.5-feet high
- 40-ft wide roadway
- Three-lane traffic, one (1) 4-ft maintenance walkway.
2. Design – Schematic Geo. Profile

Excerpted from internal Communication with Benjamin LECOMTE of DITS, December 2013
2. Design – Final Lining Design

• Criteria:
  – Groundwater loading from GDM
  – Rock loads derived from GDM and numerical modeling:
    • 10-ft rock load for Type A Support (Ground Classes I and II)
    • 15-ft rock load for Type B Support (Ground Class III)
  – Rock load validation from field geological mapping interpretation, using Q rock mass classifications
2. Design – Final Lining Design

- Reinforcing Panel (40-ft) based on field mapping

<table>
<thead>
<tr>
<th>Support Type</th>
<th>Ground Class</th>
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<tbody>
<tr>
<td>A (unsymmetrical)</td>
<td>I, II</td>
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<tr>
<td>A (symmetrical)</td>
<td>I, II</td>
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<tr>
<td>B (unsymmetrical)</td>
<td>III</td>
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<tr>
<td>B (symmetrical)</td>
<td>III</td>
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<tr>
<td>C (South Portal)</td>
<td>I, II</td>
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<tr>
<td>D (South X-passage)</td>
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</tbody>
</table>
2. Design – Waterproofing and Drainage Designs
2. Design – Fire Proofing

• Criteria:
  – No explosive spalling during design fire events
2. Design – Fire Proofing

• Criteria:
  – Laboratory verification
2. Design – Fire Proofing

• Conclusion: No passive fireproofing is needed
2. Design – Ventilation
3. Construction – Drill and Blast
3. Construction – Initial Support
3. Construction – Initial Support
3. Construction – Invert
3. Construction – Tunnel Schematic
4. Summary

- Total east end crossing cost - $677M
- East end crossing tunnel cost - $338M
- $228M saving in construction costs
- Over 240 days ahead of schedule
- Design started on Dec. 2013
- Expect open traffic by the end of 2016
Q/A ？

Nick.Chen@Jacobs.com