VTCA Spring Transportation Construction Conference
April 11, 2019

I-64 Hampton Roads Bridge-Tunnel (HRBT) Expansion Project

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Virginia Department of Transportation

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Project Executive
Hampton Roads Connector Partners
Settlers Landing in Hampton to I-564 Norfolk (10 Miles)

I-64 improvements include 6 lanes of highway plus drivable shoulder lane and construction of 4 lane bridge/tunnel facility

New HRBT tunnels will serve Eastbound traffic

2 existing HRBT tunnels will serve Westbound traffic
<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplemental EIS (SEIS) Process Initiated</td>
<td>June 2015</td>
</tr>
<tr>
<td>Draft SEIS Issued</td>
<td>August 2016</td>
</tr>
<tr>
<td>HRTPO Endorsement of Preferred Alternative</td>
<td>October 2016</td>
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<tr>
<td>CTB Endorsement of Preferred Alternative</td>
<td>December 2016</td>
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<tr>
<td>Request for Information &amp; Industry Meetings</td>
<td>April 2017</td>
</tr>
<tr>
<td>Final SEIS Issued</td>
<td>April 2017</td>
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<tr>
<td>FHWA Record of Decision</td>
<td>June 2017</td>
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## Procurement Timeline

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>DATE</th>
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<tbody>
<tr>
<td>PPTA Steering Committee</td>
<td>Dec 12, 2017</td>
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<tr>
<td>Request for Qualifications (RFQ) Issuance</td>
<td>Dec 15, 2017</td>
</tr>
<tr>
<td>Shortlist Announcement</td>
<td>Apr 26, 2018</td>
</tr>
<tr>
<td>PPTA Steering Committee</td>
<td>May 9, 2018</td>
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<tr>
<td>Draft request for Proposals (RFP) Release</td>
<td>May 22, 2018</td>
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<tr>
<td>Proprietary/ATC Meetings (6 rounds)</td>
<td>Jun-Oct, 2018</td>
</tr>
<tr>
<td>Final RFP Release</td>
<td>Sept 27, 2018</td>
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<tr>
<td>Addenda 1 to Final RFP</td>
<td>Nov 28, 2018</td>
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<tr>
<td>Addenda 2 to Final RFP</td>
<td>Dec 14, 2018</td>
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<tr>
<td>Addenda 3 to Final RFP</td>
<td>Dec 19, 2018</td>
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<tr>
<td>Technical Proposal Submission</td>
<td>Jan 15, 2019</td>
</tr>
<tr>
<td>Technical Proposal Evaluation</td>
<td>Feb 5, 2019</td>
</tr>
<tr>
<td>Price Proposal Submission</td>
<td>Feb 8, 2019</td>
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<tr>
<td>Price Proposal Evaluation</td>
<td>Feb 11, 2019</td>
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</tbody>
</table>
Best Value Determination

- Two proposals were received

- Both technical proposals were deemed to be responsive
  - They met minimum requirements
  - They passed all pass/fail criteria

- The determination of the Best Value Proposal was based on the following formula:

  \[
  \text{Total Proposal Score (max. 100 points)} = \frac{\text{Technical Proposal Score (max. 40 points)} + \text{Price Proposal Score (max. 60 points)}}{1}
  \]
Hampton Roads Connector Partners

- **Lead Contractors:**
  - Dragados USA
  - Vinci Construction Grands Projets
  - Flatiron Constructors
  - Dodin Campenon Bernard

- **Lead Designers:**
  - HDR
  - Mott MacDonald

- Met all required qualification and experience requirements

- Highest Technical Score and Financial Score (best technical proposal and lowest bid price)

- Design-Build Contract Value: $3.3B
• Introduction to HRCP Team
• General Project Timeline
• Main Scopes of Work
  • Subcontracted Work
  • Main Supplies
• TBM Technology
• Technical Challenges:
  • Environmental
  • Roadway
  • Tunnel
• Resources & Partnering
A World-Class Team
GENERAL PROJECT TIMELINE
Anticipated JPA Approval Date
= NTP
540 days (18 months) after LNTP1
= October 2020

Contract Execution + LNTP1
04/15/19

LNTP2 + LNTP3
9 months after LNTP 1
= January 2020

Permanent Works over 55 months
- Launch & Receiving pit ready for TBM
- TBM Assembly and Mining
- Interior Works Tunnels
- Commissioning and Testing
- North & South Marine Trestles
- Land Works I-64 Widening

Substantial Completion
06/30/25

Contractual - Substantial Completion Deadline
09/01/25

Contractual - Final Completion Deadline
11/01/25

LNTP 1
Design and Investigation Works for Environmental Permitting

6 MONTH OF SCOPE VALIDATION

LNTP 2
LNTP2 : Authorization for TBM Procurement

LNTP 3
LNTP3 : Launching Pit Construction to start

2019  |  2020  |  2021  |  2022  |  2023  |  2024  |  2025
MAIN SCOPES OF WORK
Main Scopes of Work (Subcontracts – $1.2B)

- Slurry Wall Construction
- Ground Improvements
- Rebar supply and assembly
- Roadway Construction
- Marine Works
- Asphalt Paving
- Sound walls
- MOT Devices
- Mechanical
- Electrical
- Plumbing
- Fire Protection
- ITS & Scada
- Building Construction
- Bridge Repairs
- Utility Relocations
• Main Scopes of Work (Material Supplies – $0.6B)
  • Ready mix Concrete
  • Rebar supply
  • Precast Girders
  • Precast Concrete Piles
  • Steel piles
  • Quarry materials
  • Sound walls
  • MOT Devices
  • Bridge Consumables
  • RCP Pipes & Manholes
  • Cement
  • Tunnel Supplies & Consumables
TBM ASSEMBLING

TBM CUTTERHEAD: rotate to dig and excavate the ground

SHIELD: Waterproof space of work to erect the rings of the tunnel

GANTRY: Power Supply and Muck excavation through slurry
TUNNEL BORING ACTIVITIES

RING ERECTION: Thrust Rams retract to install segments one by one

CUTTERHEAD: rotation of cutterhead allows to cut the soil – the slurry mix in the head allows to keep the pressure of earth ground balanced

EXCAVATION: Once Ring is completed, TBM excavated by pushing on the rings

See TBM operation video
TBM U-TURN

EXIT SHAFT : TBM through headwall at the exit

U-TURN : Rotation of TBM on the North Island to bore the second tube
**SOUTH ISLAND INSTALLATION**

- **Jobsite Installation on South Island**
- **Tight Space Configuration**
- Will rely on **Marine Work** to supply and evacuate from the island
BACK VIEW OF TBM: final liner (before civil work in the tunnel)
TECHNICAL CHALLENGES
• Technical Challenges – Roadway and Bridges
  • Marine environment
    • Wave Forces
    • Scour
    • Corrosion
• Technical Challenges – Roadway and Bridges
  • Maintenance of Traffic
    • Existing exit and entrance ramps
    • Interchange operations
    • Existing tunnel operations
• Technical Challenges – Roadway and Bridges
  • Limited ROW
    • Drainage
    • Bridges
  • Key Stakeholders
    • Navy
    • Utilities
Technical Challenges – Tunnel

Tunnel Alignment & Subsurface Conditions
Bored Tunnel - Tunnel Spaceproofing

- Two Lanes & Shoulders
- Dedicated Egress Corridor
- Tunnel Ventilation & Fire Life Safety
- Tunnel Lighting
- SCADA & ITS
- Tunnel Drainage & Pump Stations

Bored Tunnel = 41’-6” Internal Diameter
Bored Tunnel Lining:
- Precast Concrete Segments
- Gaskets for watertightness

Designed for:
- Temporary loads
- Permanent loads
Marine Works - Islands:

- South Island
  - Limited expansion to allow for roadway trestle interface
  - Temporary docking facilities
- North Island
  - Expansion to allow for Tunnel Approach Structure construction
  - Temporary docking facilities
Tunnel Approach Structures:
• Westbound Entrance Portal – North Island
• Westbound Exit Portal – South Island

Also used for:
• TBM launch & recovery

Designed for:
• Temporary loads
• Permanent loads

Construction Methodology
• Slurry Walls & Ground Improvement
• Reinforced Concrete Structures
Facilities & Support Buildings:

- Ventilation Buildings
- Flood Gates
- Traffic Operations Center & Secondary Control Room
- Facility Maintenance Building Expansion
- Garage & Crash House Buildings
- Electrical Substations
- Inspection Booths
Early Design Activities

Subsurface Geotechnical Investigation:
- Marine Drilling
- Landside Drilling
- Conventional SPT & CPT
- Environmental

Environmental Permitting:
- Joint Permit Application
- Nationwide Permit #6

Scope Validation:
- Survey & Mapping
- Utility location
- Preconstruction Surveys
Environmental Permits
• Joint Permit Application & Nationwide Permit #6
  Nationwide Permit #6 for Supplemental Geotechnical Investigation

Compensatory Mitigation
• Habitat Condition Analysis
• Avoidance, Minimization and Mitigation Plan
DESIGN RESOURCES

- I-64 Design Joint Venture

Key Components:
- Landside Works
- Tunnel Works
- Environmental/Permitting
- Geotechnical
- Quality
• **Resources needed**
  - Peak Management Team: 300
  - Temporary Design Consultants
    - Structural Engineering
    - I&M
    - BIM Modelling
  - Equipment:
    - Cranes Peak: 30+
    - Barges Peak: 20+
    - Tug Boats: 5+
    - Craft Labor peak: 1,200-1,500
  - Average Monthly Revenue: $50M

• **Partnering**
  - Need of Subcontractor Support
  - Need realistic resource allocation
  - Do **NOT** over commit – Time is of the essence
  - Potential for breakdown scopes