EAST END CROSSING
OHIO RIVER BRIDGES PROJECT

WVB East End Partners

Submitted to:
Indiana Finance Authority
c/o Indiana Government Center South
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October 26, 2012
3:00 PM EST

TECHNICAL PROPOSAL – VOLUME 2

REDACTED VERSION - ELECTRONIC

Exhibit E

SUMMARY AND ORDER OF PROPOSAL CONTENTS

Technical Proposal Component	Form (if any)	ITP Section Cross-Reference
A. Executive Summary		
Executive Summary **(Exclude price information)**	No forms are provided	Exhibit B, Section 3.1
B. Proposer Information, Certifications & Documents		
Proposal Letter	Form A	Exhibit B, Section 3.2.1
Authorization Documents	No forms are provided	Exhibit B, Section 3.2.1
Identification of Proposer and Equity Members	Form B-1	Exhibit B, Section 3.2.2
Information About Proposer Organization	Form B-2	Exhibit B, Section 3.2.2
Information About Major Participants, and Identified Contractors	Form B-3	Exhibit B, Section 3.2.2
Letter accepting joint and several liability, if applicable	No forms are provided	Exhibit B, Section 3.2.2
Responsible Proposer and Major Participant Questionnaire	Form C	Exhibit B, Section 3.2.3
Industrial Safety Record for Proposer and Major Participants	Form D (as applicable)	Exhibit B, Section 3.2.4
Personnel Work Assignment Form and Commitment of Availability	Form E	Exhibit B, Section 3.2.5
Letter(s) Regarding Pre-Proposal Submittals	No forms are provided	Exhibit B, Section 3.2.6
Non-Collusion Affidavit	Form F	Exhibit B, Section 3.2.7
Buy America Certification	Form G	Exhibit B, Section 3.2.8

Technical Proposal Component	Form (if any)	ITP Section Cross-Reference
DBE Certification	Form H No forms are provided for the DBE Performance Plan or Job Training Plan	Exhibit B, Section 3.2.9
Surety/Financial Institution Information	No forms are provided	Exhibit B, Section 3.2.10
Conflict of Interest Disclosure Statement	Form I	Exhibit B, Section 3.2.11
Equal Opportunity Employment Certification	Form Q	Exhibit B, Section 3.2.12
Lobbying Certification	Form R	Exhibit B, Section 3.2.13
Debarment and Suspension Certification	Form S	Exhibit B, Section 3.2.14
Insurance	No forms are provided	Exhibit B, Section 3.2.15
Confidential Contents Index	No forms are provided	Exhibit B, Section 3.2.16
C. Proposer Election of Termination for Convenience Calculation Method		
Election of Termination for Convenience Calculation Method	Form V	Exhibit B, Section 3.4
D. Volume 1 Appendices		
Copies of Organizational Documents	No forms are provided	Exhibit B, Section 3.2.2
Proposer Teaming Agreement or Key Terms	No forms are provided	Exhibit B, Section 3.2.2
Executed Contracts or Term Sheets/Heads of Terms	No forms are provided	Exhibit B, Section 3.2.2
E. Proposal Security (Proposal Bond or Proposal Letter of Credit)		
Proposal Bond	Form K-1	Exhibit B, Section 3.3.1
Proposal Letter of Credit	Form K-2	Exhibit B, Section 3.3.2

Technical Proposal Component	Form (if any)	ITP Section Cross-Reference
F. Escrow Agreement		
Escrow Agreement	Form L	Exhibit B, Section 3.5
G. Preliminary Performance Plans		
Preliminary Project Management Plan	No forms are provided	Exhibit B, Section 4.1
Preliminary Project Baseline Schedule for Design and Construction	No forms are provided	Exhibit B, Section 4.1.4
Completion Deadlines	Form N	Exhibit B, Section 4.1.4
Design-Build Plan	No forms are provided	Exhibit B, Section 4.2
Operations and Maintenance Plan	No forms are provided	Exhibit B, Section 4.3
H. Volume 2 Appendices		
Key Personnel Resumes	No forms are provided	Exhibit B, Section 3.2.5
Technical Drawings, Graphs and Data	No forms are provided	Exhibit B, Section 4.2

Financial Proposal
Proposers shall follow the order of the Financial Checklist in their submissions. A referenced copy of this document shall be submitted with the Financial Proposal.

	Financial Proposal Component	Location of information within submission documentation	
		Document Reference	Financial Model Sheet Reference
A.	**Updated financial information** Proposer must provide the corporate and financial information identified in Section 2.0 of Exhibit C, for the Proposer and Equity Members	Financial Proposal Volume 1 of 2 Separated by Entity	
A1	Audited Fiscal Financial Statements for all periods subsequent to SOQ and unaudited interim financial statements (Exhibit C, Section 2.0)	Financial Proposal Volume 1 of 2 Section A1 for each Entity	
A2	Financially Responsible Party letters of support (as required) (Exhibit C, Section 2.0)	Financial Proposal Volume 1 of 2 Section A2 for each Entity	
A3	For publicly held companies, most recent SEC 10-K and 10-Q reports and any 8-Ks filed since the SOQs (Exhibit C, Section 2.0)	Financial Proposal Volume 1 of 2 Section A3 for each Entity	
A4	Credit Ratings (Exhibit C, Section 2.0)	Financial Proposal Volume 1 of 2 Section A4 for each Entity	
A5	Letter regarding material change in financial condition since submission of the SOQ and for next reporting period (Exhibit C, Section 2.0)	Financial Proposal Volume 1 of 2 Section A5 for each Entity	
A6	Letter disclosing all material off balance sheet liabilities (Exhibit	Financial Proposal Volume 1 of 2 Section A6	

	Financial Proposal Component	Location of information within submission documentation	
		Document Reference	Financial Model Sheet Reference
	C, Section 2.0)	for each Entity	
B	**Financial Plan** (Exhibit C, Section 3.0)	Financial Proposal Volume 2 of 2 Section B	
B1	Financial Plan Executive Summary (Exhibit C, Section 3.1)	Financial Proposal Volume 2 of 2 Section B1	
B1	Identity of Financial Institution (Exhibit C, Section 3.2)	Financial Proposal Volume 2 of 2 Section B1	
B2	Range of Financing Sources (Exhibit C, Section 3.3)	Financial Proposal Volume 2 of 2 Section B2	
B3	Details for Core Lender(s) and Lead Underwriter(s) Commitment Letters (Exhibit C, Section 3.4)	Financial Proposal Volume 2 of 2 Section B3	
B4	[Reserved]		
B5	Details of Equity Source and letters from Equity Members (Exhibit C, Section 3.5)	Financial Proposal Volume 2 of 2 Section B5	
B6	Financial Advisor letter (Exhibit C, Section 3.6)	Financial Proposal Volume 2 of 2 Section B6	
B7	Schedule for Commercial and Financial Close (Exhibit C, Section 3.7)	Financial Proposal Volume 2 of 2 Section B7	
B8	Summary Cost Table and Financial Plan Summary Forms (Forms O and P, Exhibit C, Section 3.8)	Financial Proposal Volume 2 of 2 Section B8	Tab Form O Tab Form P
C	**MAP Proposal (Form J)** (Exhibit C, Section 4.0)	Financial Model Section C	Tab Form J
D	**Financial Model** (Exhibit C,	Financial Model	

	Financial Proposal Component	Location of information within submission documentation	
		Document Reference	**Financial Model Sheet Reference**
	Section 5.0)	Section D	
D1	Financial Model (Exhibit C, Section 5.1 to 5.2)	Financial Model Section D1	Tab Output – Project Tab Output – Sources & Uses Tab Output – Accounts
D2	Financial Model Assumptions Book (Exhibit C, Section 5.3)	Financial Model Section D2	Tab Assumptions Book
D3	Instructions on operations of the Financial Model (Exhibit C, Section 5.4)	Financial Model Section D3	
E	**Cost and Pricing Data** (Exhibit C, Section 6.0) (to be submitted to escrow)	Escrow	
F	**Independent Insurance Broker/Consultant Letter** (Exhibit C, Section 7.0)	Financial Proposal Volume 2 of 2 Section F	

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G. 4.0 Preliminary Performance Plans

4.0 PRELIMINARY PERFORMANCE PLANS

WVB East End Partners (WVB) appreciates the opportunity to make a long-standing commitment to IFA and the local community with the East End Crossing (Project). Walsh Investors, VINCI Concessions, and Bilfinger Berger strategically formed WVB (a Special Purpose Vehicle, or SPV) to merge international resources and expertise in finance, design, construction, and operations and maintenance (O&M) projects of this caliber, with the experience and understanding of local Indiana and Kentucky firms.

WVB East End Partners

WALSH INVESTORS

- Partnership owned by the Walsh family
- First long-term equity investment in a PPP transaction demonstrates financial commitment to the Project and IFA

VINCI CONCESSIONS

- Completed 47 PPP concessions, most still owned and operated
- Raised $7.5 billion in financing for PPP projects over the last five years

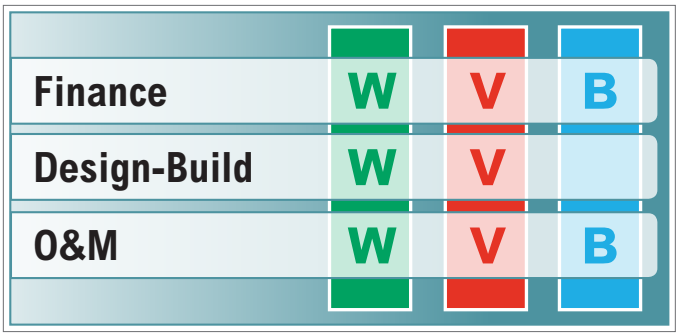
BILFINGER BERGER

- Completed 39 PPP concessions (15 transportation projects, 10 availability-style payment)
- Global leader in availability-style payment transactions for civil projects including six closed in North America

In all facets of the Project, WVB leverages our local knowledge and international experience to give IFA the best economic value possible, while continuing to be stalwarts within the community. Through all stages of finance, design, construction, and the Operating Period, WVB provides a vertically-integrated team that is committed to meet the needs of every Project component and whole life asset management (**Figure 4.0-1**).

Members of the WVB team have worked extensively for the State of Indiana for more than 20 years, and understand the desires of the State. Our vertically-integrated team knows how to provide a world-class, high-quality product.

FIGURE 4.0-1 PROJECT MANAGEMENT STRUCTURE



WVB's Integrated Management System (IMS) unifies all levels of Project delivery. Our preliminary Project Management Plan (4.1) establishes the organization structure, Key Personnel, and work requirements to successfully complete the Project and meet all IFA goals. The technical solutions provided in WVB's Design-Build Plan (4.2) creates a safe, quality Project for the best use of the community. WVB's O&M Plan (4.3) ensures a well-maintained and managed long-term asset optimizing traffic flow in the region. These Performance Plans culminate in a sustainable finished product that blends into the surrounding landscape.

By combining WVB's proven experience and expertise with integrated Performance Plans, **WVB will open the Project to revenue-generating traffic by October 31, 2016, eight months ahead of the IFA's mid-2017 target.** This schedule minimizes construction impacts on the environment, local residents, and the traveling public.

WVB is committed to exceeding the goals and aspirations of IFA, summarized in **Table 4.0-1**, by adhering to the basic principles used to create the Project's underlying mission statement:

WVB'S MISSION STATEMENT

Work together *to deliver, within* **time and budget,** *a* **quality long-term asset** *that is* **safe and sustainable in construction and during operation** *while making a* **positive impact on the area and community.**

TABLE 4.0-1 IFA/WVB PROJECT GOALS AND MISSION STATEMENT

Shared Project Goals	How WVB Will Deliver These Goals	WVB Approach Key Features	WVB Mission Statement
• Use public-private partnerships where acceptance of an offer from the private sector is in the public interest	• Vertically-integrated team with international and local expertise from Walsh Group, VINCI SA, Bilfinger Berger, and Jacobs Engineering. • Proven, consistent, and Integrated Management System used throughout development, design, construction, and O&M. • Informative, proactive project controls included optimal allocation of risks to the parties who can best manage such risks to avoid redundant contingencies.	• Collaborative project management approach based on joint goals aligned with IFA aims	**WORK TOGETHER** *to deliver,*
• Minimize cost and funds required • Open to revenue-generating traffic by mid-2017 or sooner • Expedite delivery of Project improvements, and timely facility management to maintain adequate service levels	• O&M involvement in the design at bid stage to optimize the life-cycle costs and minimize the funds required over the life of the Project; integrated full-life asset management. • Tailor-made project financing solution which is sculpted in accordance with the profile of availability payments and maintenance costs (including life-cycle costs) and optimized for the Term of the Project. • Funding competition between different financing solutions to achieve the lowest cost of funding and cost effective financing.	• Reduced construction time to allow opening by October 31, 2016 • Customized financing solutions	*within* **TIME AND BUDGET,**
• Innovate solutions resulting in delivery of a high quality, durable, maintainable, and aesthetic facility • Optimize life-cycle costs and efficiencies through obtaining cost-effective financing • Design solutions that respond to concerns and commitments	• Design enhancement at Kentucky approach bridge to reduce impact in wellhead protection area. • Tunnel shortened by 14%, reducing cost, schedule, and maintenance. • Aesthetically superior towers on the East End Bridge. • Concrete pavement and weathering steel used to reduce long-term maintenance needs and improve life-cycle costs. • Optimized design for more efficient end product while reducing construction impacts (e.g., Section 6 profile grade optimized to reduce cut/fill). • Main Span Bridge use of structural health monitoring throughout life of the contract for intimate knowledge of the bridge and its evolutions. • Proactive maintenance strategy with a comprehensive inspection program to identify problems early and implement corrective maintenance activities.	• Design enhancements and innovations to optimize construction and O&M • Material selection for performance, quality life-cycle, and visual appeal • Construction methodologies	*a* **QUALITY LONG-TERM ASSET** *that is* **SAFE AND SUSTAINABLE IN CONSTRUCTION AND DURING OPERATION** *while*
• Provide a safe project for workers and traveling public • Minimize environmental impacts	• Safety prioritized throughout (e.g., temporary pier provides safer access to construct bridge towers) (Tunnels, utilities, radio, ventilation). • Environmental Control Management Sustainable material use. • Reduced off-site hauling from optimized profile and material re-use into final product. • Environmental and safety risk analysis carried out during work preparation for each activity.	• Safety and environment present throughout our Integrated Management System	
• Optimize life-cycle costs and efficiencies • Ensure high-quality O&M; meet or exceed IFA's technical requirements and assess conditions for handover	• East End Bridge 2-inch thick latex modified concrete overlay with precast deck panels for increased maintainability. • Cables enclosed in a polyethylene sheath filled with corrosion-inhibiting blocking compound. • Enhanced SR 265/SR 62/Port Road interchange design for reduction of 44,000 square yards of pavement and over 23,000 square feet of bridge deck. • Specialized concrete pavement design for prolonged residual life and reduced long-term maintenance and rehabilitation disruptions. • Rolling program for activities to maintain roadway in a safe, high-quality condition while minimizing traffic disruption.	• Material selection (e.g., weathering steel to reduce maintenance) • O&M team involvement in design development • Documentation compiled during design and build	
• Provide comprehensive plan for promoting, managing, and monitoring opportunities for disadvantaged, minority, and women owned business enterprises	• Provide programs and personnel with extensive experience in delivering ambitious DBE targets. • Proactive approach to engage with DBE/SBEs to exceed goal. • Proven experience and commitment with Indiana On-the-Job Training Program.	• Performance reporting on local spending, employment and supply chain targets	*making a* **POSITIVE IMPACT ON THE AREA AND COMMUNITY**
• Minimize disruptions to existing traffic, local businesses, and communities • Proactive public relations, satisfy stakeholders, maintain public trust and integrity • Cooperate and coordinate with stakeholders in development of design, construction, operation, and maintenance • Allow mobility during construction while minimizing community impact • Minimize impact on navigable traffic on Ohio River • Provide customer service for traveling public	• Efficient sequencing with fewer disruptions and improved road safety (e.g., bridge construction reduced to one stage). • Road and river traffic impacts reduced through construction staging refinements to reduce number of stages. • Advance warning of potential impacts provided on websites, signs, and community boards. • Provide customer service for traveling public. • A maintenance strategy accounting for the availability of the roadway to minimize disruption of traffic. • An optimized life-cycle plan integrated during preliminary design to minimize lane closures. • Safely manage traffic during maintenance activities. • Incident response with the dispatch of O&M staff on site within one hour of the incident occurrence.	• On-going two-way communication throughout delivery to rapidly address any issues • Outreach activities already commenced • Traffic Management to protect the traveling public in case of any kind of incident	

EXPANDED VIEW **CONDENSED VIEW**

4.1 Preliminary Project Management Plan

4.1 PRELIMINARY PROJECT MANAGEMENT PLAN

WVB's preliminary Project Management Plan (PMP) forms the core of the Integrated Management System (IMS) we implement to control delivery throughout the Project, including Quality, Safety, and Sustainable Management Plans. Combined, these plans ensure WVB delivers the Project efficiently, cost-effectively, and safely with minimal impacts on road users, local stakeholders, and the environment, in line with IFA's goals. The PMP accomplishes many goals:

- Outlines WVB's management approach, philosophies, systems, processes, and procedures.
- Presents organization and resources to achieve all Project objectives.
- Outlines interfaces with IFA, stakeholders, and the public to establish clear lines of communication.
- Encourages DBE and workforce diversity outreach for ultimate involvement of the community.
- Provides specific, interactive plans to pave the way for Project delivery.

The WVB management team is responsible for delivering efficient and effective systems while continually improving daily operations. The management plan is

One Team, One Project, One Community
This symbol highlights items that show WVB's value added throughout the document.

based on proven processes from each of the member organizations, which are combined into a unique project management plan that is ISO compliant.


Certificat
VINCI CONSTRUCTION GRANDS PROJETS
ISO 9001 (2008) + ISO 14001(2004) + ILO-OSH (2001)

LONG TERM ASSET

WVB member, VINCI Construction Grands Projets' ISO certification resonates throughout WVB's IMS at all Project stages.

Vertical integration is the foundation to the management philosophy for the WVB team; each member has a stake in every component of the Project. To successfully coordinate delivery of these components, WVB has integrated all management processes and procedures into a single IMS, which serves as the keystone of the WVB organization. WVB uses the IMS during the planning, delivery and monitoring of all activities to ensure the safe, sustainable, on-time and in-budget delivery of a high quality product.

4.1.1 PROJECT MANAGEMENT APPROACH

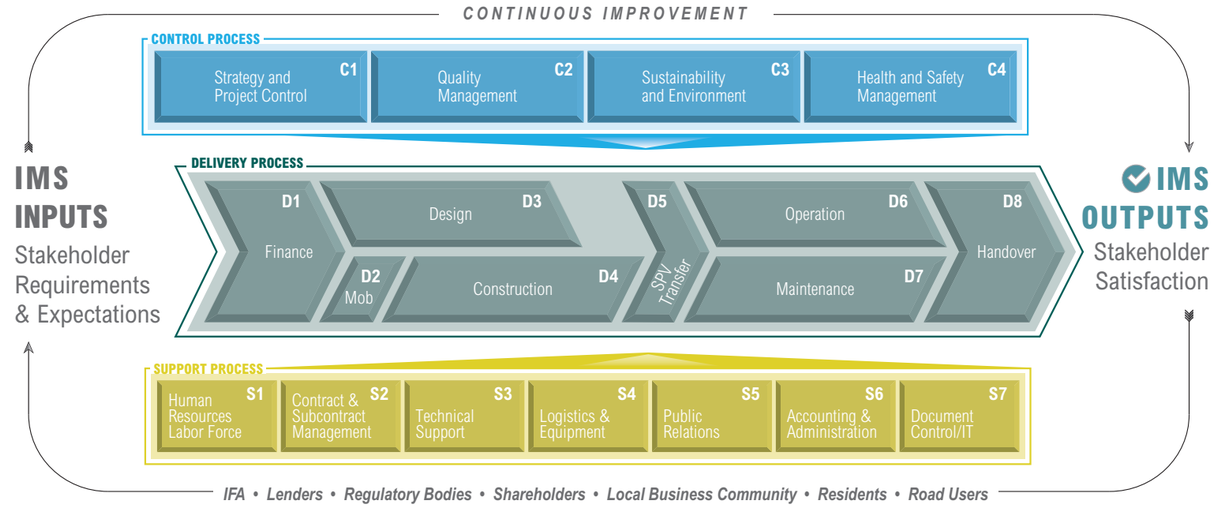
The IMS provides the framework for the management approach in all Project stages; WVB requires all WVB employees, subcontractors, and suppliers to comply with it. The inputs that enable the development and implementation of the IMS include stakeholder, client and WVB partner requirements and expectations and JV parent companies' existing management systems, best practice and lessons learned. The principal output is full stakeholder satisfaction.

IMS STRUCTURE: Fundamentally, the IMS identifies all Strategic Processes necessary for WVB to manage Project development and delivery, as well as their interactions. Each strategic process within this top level view is underpinned by a series of Management Processes. These are discussed in the relevant parts of our proposal as well as the Project Management Plan (PMP) in the Volume 2 Appendices. WVB's IMS is further explained in **Figure 4.1-1**.

All processes are documented through process charts. For each process, WVB produces associated documentation, including management plans, operational procedures, monitoring and reporting requirements, and work instructions. These are made available to authorized personnel (including subcontractors) via an interactive online version of the IMS (see Section 4.1.7).

FIGURE 4.1-1 WVB INTEGRATED MANAGEMENT STRUCTURE

The East End Crossing requires full project coordination to deliver in a manner that exceeds stakeholder expectations and ensures satisfaction. To streamline the development, planning, and implementation of all work, WVB has developed an Integrated Management System (IMS) that provides consistency and continuous improvement throughout all phases of the Project. All work from finance through O&M will conform to the principles and practices of WVB's IMS which is broken down into three types of processes: Control, Delivery, and Support. Our IMS consolidates all information into one unified platform to ensure WVB's "One Team, One Project, One Community" approach.



CONTROL PROCESS

These processes ensure WVB controls every aspect of the works to achieve the Project objectives. They include processes to establish our business strategy; communication and decision making procedures; schedule, cost and QSHE control methodologies; and organization and resource management approach.

DELIVERY PROCESS

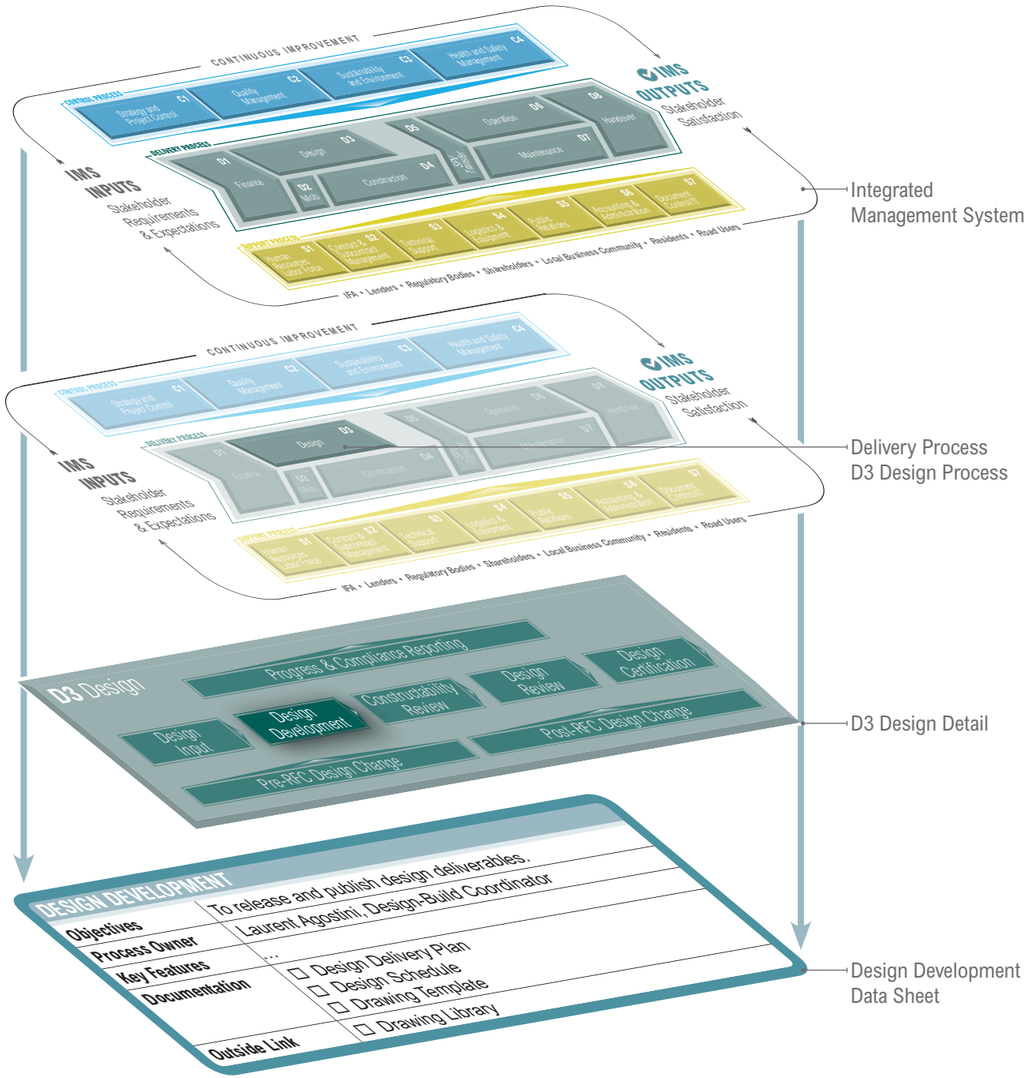
Core WVB processes that will contribute directly to the achievement of client satisfaction and the fulfillment of stakeholder objectives. They include the management procedures that apply at each stage of the works; for example, our planning and mobilization activities, change management processes, reporting requirements, and sign off procedures.

SUPPORT PROCESS

These processes ensure the proper implementation of WVB's delivery processes and provision of all necessary resources. This includes how we will manage: supply of qualified and experienced people; our supply chain; the input of technical experts; plant and equipment; public relations; financial support; and all project documentation and IT.

SUCCESSFUL IMPLEMENTATION: The interactive IMS was developed in 2007 and successfully implemented in the United Kingdom on the M1 Project (15 miles Highway, 45 bridges), as well as the Lee Tunnel Project (265-foot-deep shafts up to 100 feet in diameter with a 4.38 mile tunnel) where it was successfully used by designers, contractors, and clients.

WVB's Integrated Management Structure (IMS) is incorporated into WVB's computer software system, DyMaDoc, to allow users to point and click to drill down multiple levels to focus on specific task details within the processes.



As the IMS is driven down from the overall structure to process subsets, it reaches the detail level where WVB's proven Task Managers develop the work following the details from each task within the process. Task Managers utilize the IMS software interface to control and coordinate works within each detailed task and report to their process owner. WVB's IMS user interface merged with DyMaDoc, allows for clear and efficient flow of information and communication between Key Personnel, Task Managers, team members, and IFA.

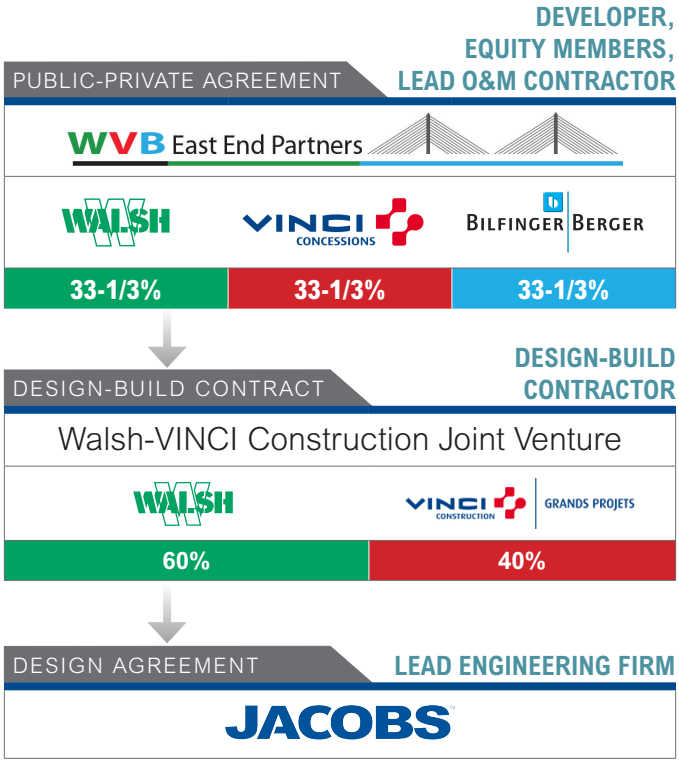
4.1.1.A MANAGEMENT STRUCTURE & PERSONNEL

The WVB Team includes local and global leaders of the industry and is structured to show WVB's long-term commitment for the life of the asset and community. Key Personnel and Task Managers control the IMS. They were drawn from WVB members and have demonstrated experience and capability of their roles. In every process, the key members are reinforced by competent support personnel pulled from WVB's abundant resources to deliver the Project efficiently, safely, on time and within budget.

4.1.1.a.i Organizational Structure

WVB has a design-build contract with the Walsh-VINCI Construction Joint Venture (Walsh-VINCI CJV) comprising Walsh Construction Company (Walsh Construction) and VINCI Construction Grands Projets (VINCI CGP). Walsh-VINCI CJV has a design agreement with Jacobs Engineering (**Figure 4.1-2**). WVB's team is solidified with local advisors, subcontractors, and consultants, such as Milestone, James H. Drew, Guthrie/Mayes, and Third Rock Consulting. WVB's full organizational structure is illustrated in **Figure 4.1-4**, showing the relation between Project partners. Partners are grouped by their roles and assigned responsibilities based on the firms' proven abilities.

FIGURE 4.1-2 WVB MANAGEMENT TEAM



WORK TOGETHER

Brian Hoppel, WVB's Construction Manager, has led major INDOT projects, including the Milton-Madison Bridge and Accelerate 465.

4.1.1.a.ii Key Personnel

Each process identified within the IMS has an owner appointed by the WVB Steering Committee. Process owners are senior managers with direct responsibility for the delivery of that process. They have complete authority, competence and resources to:

- Disseminate procedures and objectives across the entire WVB team to achieve IFA goals.
- Collect, review, and report the process operation information to ensure satisfactory performance.
- Implement improvements and measure success against key performance indicators (KPIs).

The allocation of responsibility for each process generates the following benefits:

- An accessible single point of contact, accountable for performance.
- A clear focus on maintaining flexible processes and continuously improving WVB's approach.

The WVB project delivery structure continually evolves to maintain flexibility and response to changing Project needs. **Figure 4.1-5** illustrates Key Personnel within the WVB organization throughout all Project phases.

Process owners are "flagged" in the organization charts as shown in **Figure 4.1-3**. Some processes have a unique owner for the whole Project (such as D1 Finance Delivery Process); some have an owner in the SPV and one in the CJV (such as C1 Strategy and Project Controls). Each Key Person's function and responsibilities are described in **Table 4.1-1**.

FIGURE 4.1-3 PROCESS OWNERS

Brian Hoppel, is the owner of the C1, D2, and D5 processes and will be committed 100% during design and construction.

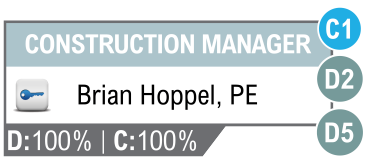


FIGURE 4.1-4 WVB's ORGANIZATIONAL STRUCTURE

INDIANA FINANCE AUTHORITY

Developers/Equity Members/Special Purpose Vehicle (SPV)

WVB East End Partners — WALSH | VINCI CONCESSIONS | BILFINGER BERGER

33.3% | 33.3% | 33.3%

- IFA Single Point of Contact
- Finance, Insurance
- Project Management
- Environmental Management, Safety, and Public Liaison
- Quality Assurance and Quality Control Management
- Reporting to IFA and Lenders

Lead Operations & Maintenance Contractor

- Operation and Routine Maintenance
- Lifecycle Maintenance and Major Rehabilitation
- Traffic Management during Operations and Maintenance

WVB EAST END PARTNERS (SPV SELF-PERFORM)

Safety | DBE/EEO | Environment

WALSH | VINCI CONCESSIONS | BILFINGER BERGER

- Project Quality Assurance and Quality Control
- Project Safety and Training
- Project DBE SBE Coordination
- Project Workforce Diversity and On the Job Training Management

Guthrie/Mayes	Project-Wide Public Information and Public Involvement Coordination
Third Rock Consulting	Project-Wide Environmental Compliance
United Construction & Design Group	Project-Wide DBE Consulting Services

External Legal, & Financial Advisors

Scotiabank	Financial Advisor
Operis	Model Auditor
Mayer Brown	Lead Legal Advisor
Latham & Watkins	Lender's Legal Advisor
Granherne	Lender's Technical Advisor
Bingham Greenebaum Doll	Local Legal Advisor
Ernst & Young	Tax/Accounting Advisor
Willis	Insurance Advisor
Moore McNeil	Lender's Insurance Advisor

Lead Engineering Firm

JACOBS

- Permanent Works Design
- Design Coordination and Review with INDOT/KYTC
- Innovative Design Solutions
- Agency Permit Review and Processing
- Independent Design Check
- Aesthetic and Landscape Design and Management

Design Agreement

Design-Build Contract

Design-Build Contractor/Construction Joint Venture (CJV)

WALSH | VINCI CONSTRUCTION GRANDS PROJETS

60% | 40%

- Report to WVB East End Partners
- Construction of East End Crossing
- Design-Build Coordination
- Design Coordination between design firms and subcontractors/suppliers
- Construction Management and Coordination
- Traffic Management during Construction
- Construction Risk Analysis and Management
- Schedule Management
- Project Sustainability
- Construction Impact Mitigation
- Safety Management
- Utility Agreement and Management
- Cost Control
- Electronic Data Management

Design Subconsultants

American Structurepoint	Section 6: Earthworks, Roadway, Structures, and Utilities
International Bridge Tech.	Section 5: Cable Stay Bridge
VINCI DITS/DIMT	Section 4/5: Internal Constructability Analysis
Stantec	Section 4/5: Geotechnical
Buckland & Taylor	Section 5: Independent Design Check
RWDI	Section 5: Wind Analysis
Donald MacDonald Architects	Sect. 5: Bridge Architect; Sect. 4/6: Aesthetic Architect
Earth Exploration	Section 6: Geotechnical
Carman & Associates	Section 4/5/6: Landscape Architect

Potential Subcontractors

Milestone	Section 6: Earthworks, Structures and Roadway
Bizzack	Section 4: Rock Excavation
Haydon Bridge Company	Section 4: Structures
Advitam	Section 5: Structural Health Monitoring
James H. Drew	Project-Wide Electrical and ITS
C.Lee Construction (DBE)	Section 6: Trucking and Utilities
Messier & Associates (DBE)	Section 6: Trucking, Concrete, Flatwork, and Demolition
Vibra-Tech	Project-Wide: Vibration Monitoring
PCSI	Section 4: Tunnel Consultant
Lachel & Associates	Section 4: Tunnel Geologist
Frakes	Section 4: Tunnel Control System Integration
Heritage Group	Section 4/6: Pavement Design

*Additional DBE Contractors as stated in Table 4.1-6 in 4.1.2

FIGURE 4.1-5 WVB INTEGRATED ORGANIZATION

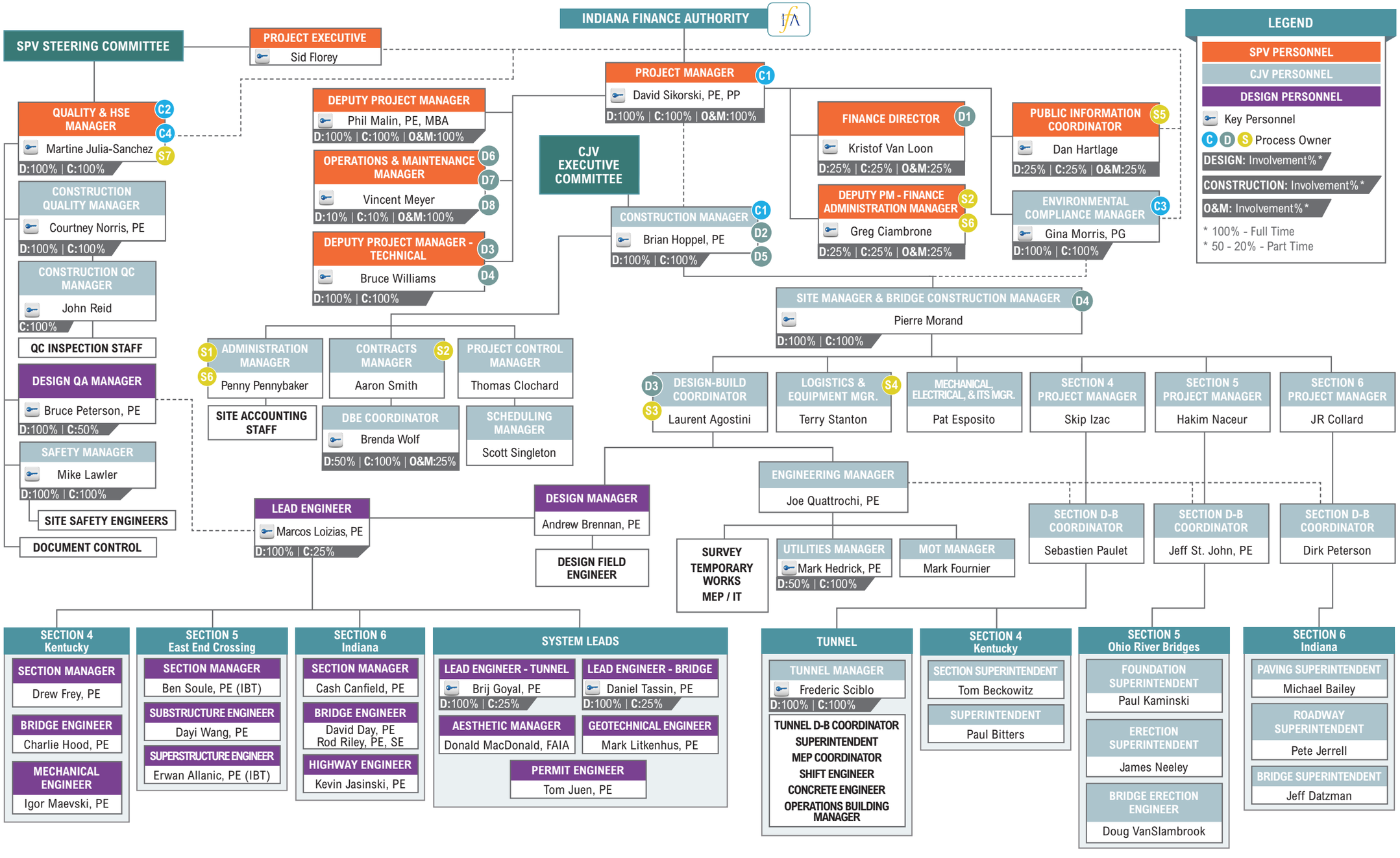


TABLE 4.1-1 WVB KEY PERSONNEL ROLES AND RESPONSIBILITIES

SPV PERSONNEL

NAME	KEY RESPONSIBILITIES
Sid Florey PROJECT EXECUTIVE	• Lead PPA negotiations • Coordinate transfer from construction to O&M phase
David Sikorski, PE, PP PROJECT MANAGER	• Accountable for fulfillment of the PPA contract; manage Project, direct entire team, and act as **single point of contact for IFA** • Lead integration of finance, construction, and operations and coordinate management of all resources • Define, deploy, review and maintain the business vision, values and strategy • Report Project progress and performance to IFA and Lenders
Phil Malin, PE, MBA DEPUTY PROJECT MANAGER	• Whole life asset management • Integrate O&M into construction • QMSE Manager during O&M period
Bruce Williams DEPUTY PROJECT MANAGER	• Oversee design and construction • Ensuring construction strategy, quality, safety and environmental policy align with PPA requirements • Ensure stakeholder requirements are accommodated within design and construction • Monitor performance to achieve target performance objectives and continuous improvement
Kristof Van Loon FINANCE DIRECTOR	• Lead the Finance Process to obtain Financial Close; manage lenders expectations and reporting • Manage financial model and update it with changes in forecast assumptions
Vincent Meyer OPERATION AND MAINTENANCE MANAGER	• Lead the operation and maintenance, lifecycle and rehabilitation and handover processes during the O&M period • Liaise with design and construction team during design-build period to ensure maintenance and whole life considerations are met in design • Monitor performance to achieve objectives; develop and drive continuous improvement
Greg Ciambrone DEPUTY PROJECT MANAGER - FINANCE ADMINISTRATION MANAGER	• Coordinate and manage financial accounting and reporting: implement robust systems and processes as appropriate, coordinate and manage statutory accounts preparation, audit clearance, and cash/treasury management
Martine Julia-Sanchez QUALITY & HEALTH, SAFETY, AND ENVIRONMENT MANAGER	• Develop, review, maintain, and report the IMS for effective performance; champion continuous improvement • Coordinate quality/process improvement activities; liaise with IFA and third parties QHSE participation • Assess, monitor, and report compliance with relevant law, WVB policies, project objectives; lead audit program • Manage quality control team, quality assurance reporting, and safety

DESIGN PERSONNEL

NAME	KEY RESPONSIBILITIES
Gina Morris, PG ENVIRONMENTAL COMPLIANCE MANAGER	• Develop, deploy and review and maintain environment protection and sustainability activities for WVB, and liaise with IFA • Deliver environmental standards that meet and exceed expectations of the IFA, stakeholder and environmental bodies • Improve the environment and reduce impacts • Provide advice, training, and guidance on environment and sustainability issues during design and construction
Dan Hartlage PUBLIC INFORMATION COORDINATOR	• Develop, review, and implement Public Involvement Plan • Proactively communicate and contribute to community stakeholders • Manage public relations after liaise with IFA
Marcos Loizias, PE LEAD ENGINEER	• Oversee the development of the design and compliance with PPA and technical requirements • Verify design accounts for temporary load cases during construction • Ensure timely flow of design information • Coordinate CJV input through Design Manager • Approve final design
Brij Goyal, PE LEAD ENGINEER TUNNEL (Responsible Engineer)	• Design the Tunnel in compliance with the PPA and Technical requirements • Coordinate additional geotechnical investigation • Serve as Technical Leader for Design Team • Coordinate construction input through Lead Engineer
Daniel Tassin, PE LEAD ENGINEER BRIDGE	• Design the East End Bridge in compliance with the PPA and technical requirements • Serve as Technical Leader for Design Team • Coordinate construction input through Lead Engineer
Bruce Peterson, PE DESIGN QA MANAGER	• Manage design quality compliance • Coordinate design quality with construction team • Conduct Project audits for design quality compliance
Frederic Sciblo TUNNEL MANAGER	• Lead and direct Tunnel construction, ensure worker safety • Ensure all IFA and stakeholder Tunnel requirements are exceeded • Achieve performance objectives and drive continuous improvement
Mark Hedrick, PE UTILITIES MANAGER	• Manage permanent service (gas, electricity, water) identification and protection • Liaise with authorities and service providers to ensure they are informed and unaffected • Coordinate construction requirements through CJV Engineering Manager

CJV PERSONNEL

NAME	KEY RESPONSIBILITIES
Brian Hoppel, PE CONSTRUCTION MANAGER	• Accountable for delivery of the design-build contract, project management and team direction, single point of contact for the SPV • Define, deploy, review and maintain the WVB CJV Business vision, values and strategy • Deliver WVB objectives, satisfy IFA and stakeholder requirements, take responsibility for Project safety • Report Project progress and performance to SPV and parent companies and drives continuous improvement
Pierre Morand SITE MANAGER & BRIDGE CONSTRUCTION MANAGER	• Lead design and construction; implement field construction strategy, quality, safety, environmental processes • Ensure stakeholder design and construction requirements are met • Manage and achieve performance objectives; develop and drive continuous improvement • Responsible for al construction operations
Brenda Wolf DBE COORDINATOR	• Lead liaison with Disadvantaged Business Enterprises (DBEs) • Ensuring national goals are exceeded and coordinate progress payments to DBE firms • Lead liaison to coordinate diversity and SBE issues with IFA and the community • Maintain all reporting requirements, provide training, and coordinate Mentor-Protege efforts • Ensures CJV coordination and compliance through Contracts Manager
Courtney Norris, PE CONSTRUCTION QUALITY MANAGER	• Lead the quality assurance, surveillance and auditing, and continuously improve quality management • Manage IFA QA feedback • Assess, monitor and report compliance with relevant law and WVB policies and objectives • Manage and coordinate the QA reporting process
John Reid CONSTRUCTION QUALITY CONTROL MANAGER	• Lead the quality control, inspection, sampling and testing • Ensure compliance with PPA requirements, and IFA and State quality regulations • Stop work authority in case of noncompliance • Manage QC team, on-site and external independent laboratories according to program requirements
Mike Lawler SAFETY MANAGER	• Develop, maintain, and manage health and safety activities • Ensure safety exceeds expectations of IFA and WVB partners • Audit, inspect, train, manage, and continuously improve in all aspects of safety

4.1.1.a.iii Task Manager Qualifications & Experience

WVB staffs the Project with only suitably qualified and experienced personnel (SQEP). For all positions, a SQEP form establishes responsibilities, required experience, and qualifications. These qualifications are specific to each position, but include general training such as OSHA 30, cost control, quality, and leadership training.

Candidates are selected, tested, and appointed based on the criteria in the SQEP form. WVB used this process (see **Figure 4.1-6**) to select competent Project leaders, Key Personnel, and Task Managers from our member's current staff (see **Table 4.1-2**).

Project-specific training is provided to ensure Task Managers exceed SQEP standards and continuously improve. Regular performance reviews are conducted and reviewed with the SQEP forms to maintain Task Manager quality and identify potential growth opportunities. Potential Task Managers are trained as part of their personal development plan so they become SQEP.

WORK TOGETHER

Many of WVB's Task Managers come from Walsh Construction's Indiana office and have experience working with and exceeding INDOT's expectations.

FIGURE 4.1-6 WVB'S SQEP PROCESS

SQEP ensures the Project is staffed with highly-competent Task Managers who are regularly trained and reviewed.

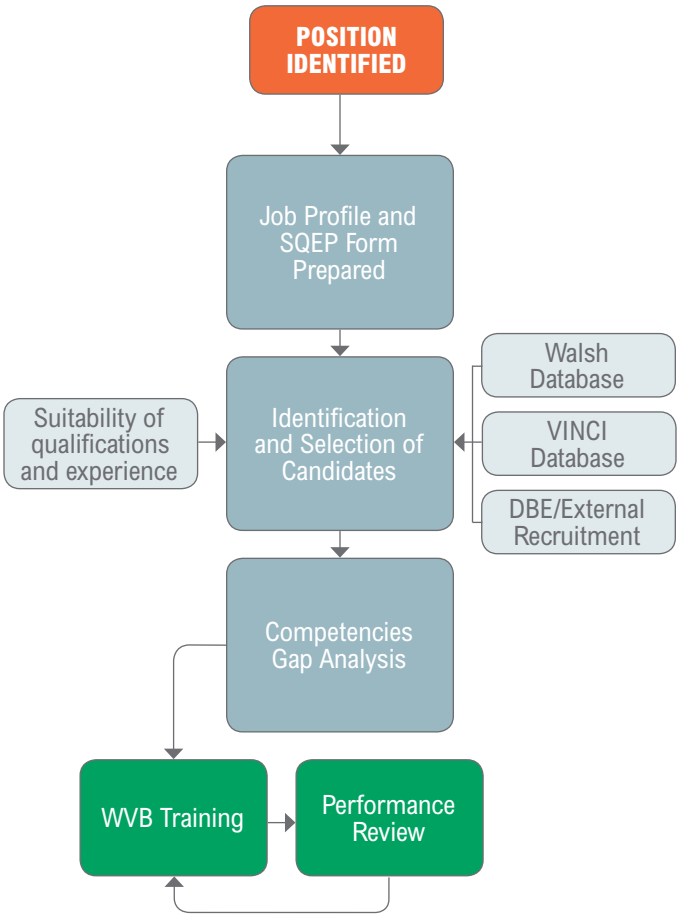


TABLE 4.1-2 PROPOSED TASK MANAGER QUALIFICATION REQUIREMENTS

Position	Qualifications	Experience	Selected Personnel
Section Project Managers	Construction Engineering degree/MBA or equivalent experience	15-25 years in major construction projects (including design-build) and worked in a JV	Skip Izac, JR Collard, Hakim Naceur
Superintendents	Adequate experience and training	15-25 years in construction 5-10 years in their area of responsibility (Tunnel/cable stays/bridge/roadways)	Pete Jerrell, Paul Kaminski, Jeff Datzman, Paul Bitters
Field Engineers	Construction Engineering/ Management Degree or equivalent	3-10 years in construction	Doug VanSlambrook
Design-Build Coordinators/Engineers	Civil Engineering degree or equivalent	8-15 years in construction/engineering including design-build	Laurent Agostini Joe Quattrochi, Dirk Peterson, Sebastien Paulet, Jeff St. John
Safety Managers	Safety Management degree/equivalent experience	10-15 years in safety management	Mike Lawler
Design Section Managers	Registered Professional Engineer in Indiana/ Kentucky	15-25 years in construction/engineering in relation to specific area of activity	Ben Soule, Cash Canfield, Andrew Frey

4.1.1.a.iv Current & Projected Workload

Although a significant Project, IFA can be confident that WVB is fully resourced for safe, on-time delivery of the Project through our vast financial, staff, and equipment resources available locally and internationally. WVB's workload and backlog is detailed in **Table 4.1-3**.

WVB draws from over 250,000 employees of VINCI's and Jacobs' worldwide operations and Walsh's North American operations. The workforce requirement for this job is less than 1% of our current workforce.

Of particular benefit to IFA is WVB's local presence; we draw on an experienced workforce familiar with local conditions and standards. WVB partner Walsh Construction has averaged over one million trade hours per year over the past three years in Kentucky and Indiana and is on pace to use 1.4 million trade hours by the end of 2012. This equates to approximately 650 trade employees in Indiana and Kentucky. In addition to our own local experience, we expect major participation from local subcontractors such as Milestone, Haydon Bridges and James H. Drew.

WORK TOGETHER

WVB's assigned Project resources benefit from recent experience with INDOT on Milton-Madison Bridge, I-465, I-69, and US 31.

WVB's locally-available equipment and facility resources are supported by additional global resources. WVB Team Partners' local equipment (**Figure 4.1-7**) includes:

- +$400 million of owned equipment
- Over 7,500 pieces of equipment
- 210 marine pieces including 2 ringer cranes
- 119 cranes including 9 tower cranes
- 500+ earth moving and paving pieces of machinery

The East End Crossing Team is independent from any other project including the Downtown Crossing and U.S. 31. Key personnel and Task Managers are selected and have been involved and committed to this Project.

FIGURE 4.1-7 LOCAL EQUIPMENT

WVB team member's equipment is available and ready to mobilize.

TABLE 4.1-3 WVB MEMBER WORKLOAD AND BACKLOG

Participant	Equity under Investment	Reserved Equity	Available Equity
Walsh Investors	[redacted]	[redacted]	[redacted]
VINCI Concessions	[redacted]	[redacted]	[redacted]
Bilfinger Berger	[redacted]	[redacted]	[redacted]

Participant	Current Workload	Projected Workload (2013)	Current Backlog
Walsh Construction	[redacted]	[redacted]	[redacted]
VINCI Construction Grands Projets	[redacted]	[redacted]	[redacted]
Jacobs Engineering	[redacted]	[redacted]	[redacted]

4.1.1.B INTERNAL ORGANIZATION SYSTEMS

Successful delivery of the Project in line with all IFA and WVB shared goals requires an effective working partnership. The foundations of our collaborative "One Team, One Project, One Community" approach include:

- Clear governance structure and procedures to support timely, informed decision making.
- Building trust and maintaining open and honest two-way internal communications.
- External communications to ensure local stakeholder and community engagement and support.

4.1.1.b.i Decision-Making Process

All partners commit to resolve internal disputes according to the terms of the respective agreements. For key decisions each partner has a vote equal to their share in the partnership. WVB's aim is for consensus decision making. Where this cannot be achieved, issues are elevated to the senior officer of each party involved. WVB's priority in the event of a dispute is for the Project to continue as planned.

David Sikorski, Project Manager, implements strategy, leads delivery, sets objectives, and makes key decisions for all aspects of project delivery. Where matters need escalation, he seeks support and authority from the SPV Steering Committee. This committee includes representatives from Walsh Investors, VINCI Concessions, and Bilfinger Berger, and has the authority to make the best decisions for the Project as a whole.

Brian Hoppel, Construction Manager, is responsible for decision making for the Project design and construction. In the same manner as David, Brian escalates issues to the Walsh-VINCI CJV Executive Committee, which includes representatives from Walsh Construction and VINCI CGP.

WVB managers at every level are aware of their autonomy to make decisions. Decisions are made and issues are resolved quickly at the lowest possible level where implications of the issue are best recognized. Only if these concerns cannot be resolved are they escalated to the next level. This ensures issues are addressed correctly and quickly, minimizing the risk of adverse impacts on cost, schedule and quality. We use a formal, Project-specific issue escalation process based on a matrix of the potential impacts that could occur across disciplines including safety, cost and schedule. This matrix clarifies the exact escalation and reporting mechanism.

The decision making and internal communications hierarchy is illustrated in **Figure 4.1-8**.

FIGURE 4.1-8 DECISION MAKING AND INTERNAL COMMUNICATIONS HIERARCHY

Decisions are made at the lowest possible level and escalated only when concerns cannot be resolved.

WVB has organized our structure to minimize disputes and associated impacts. WVB corporate partners are involved in all facets of design, construction and O&M, so that the interests of the Walsh-VINCI CJV align with the SPV. This vertical integration encourages the Walsh-VINCI CJV, including Executive Committee, and SPV, including Steering Committee, to make decisions based on the best interests of the entire Project. Our vertical integration thereby promotes our unified "One Team, One Project, One Community" approach to decision making.

WORK TOGETHER

WVB's unified "one team" approach, with corporate members involved in all phases of the Project, supports a strong, clear internal structure and decision-making process.

4.1.1.b.ii Internal Communication

WVB uses multiple formal and informal communication channels to provide clear, concise, and comprehensive communications, to maximize collaboration and trust in the Project team.

MEETINGS: **Table 4.1-4** outlines proposed meetings that provide project controls, support effective communication, and facilitate decision making. Because of the integration of WVB's team, the SPV, Walsh-VINCI CJV, and WVB O&M Teams are a part of all meetings and internal communications.

DOCUMENTATION AND DATA: Project documentation and data are stored electronically and shared via a common document management platform called DyMaDoc. Access to this in-house application is provided to all authorized members of the team and supply chain. In accordance with our IMS structure, DyMaDoc provides a centralized information source for accurate communication between parties (**Figure 4.1-9**).

REPORTING: At all levels of WVB's organization each individual has defined reporting responsibilities that are clearly communicated to the team and documented on the organizational chart. Report templates are agreed upon with IFA to provide pertinent information in a form that facilitates interpretation of results. To support continuous improvement, senior managers use progress reports and key performance indicators (KPIs) consolidated by the Quality Management team.

FIGURE 4.1-9 DYMADOC SUCCESS

WVB member VINCI CGP has used DyMaDoc successfully on 80 projects, including EKPPT Motorway Tunnel.

COMMUNICATION WITH THE CONSTRUCTION WORKFORCE: WVB maintains continuous two-way communication with the workforce and subcontractors through one-on-one communication, meetings, written reports, posters, and suggestion boxes. Managers at all levels have an "open door" policy to encourage communication. We hold daily and weekly task force, safety, schedule, and progress meetings to provide regularly scheduled opportunities for two-way communication.

TABLE 4.1-4 PROPOSED MEETINGS

Meeting	Composition	Focus	Frequency
Team/Workforce Briefings	Management staff/workforce	Requirements of works ahead; particular safety precautions; progress/performance review	Daily (separate)
Toolbox/ Brownbag Talks	Task managers, workforce, major subcontractors	Focus on particular project issues, such as safety, sustainability, environmental, quality, etc.	Weekly/as needed (separate)
Schedule Review	Field engineers and superintendents	Project progress and performance against the schedule	Every two weeks
Section Progress Review	Section delivery teams; major subcontractors	Monitor progress of a particular section against schedule and targets; address or escalate issues; three week schedule reviews	Weekly
Specialist Team Meetings	Teams of relevant WVB and supply chain personnel	Monitor progress and make key decisions in specific areas including: design, engineering, quality, logistics, scheduling, safety and sustainability	Monthly
CJV Executive Committee Meetings	Representatives from each Walsh-Vinci CJV partner	Direct, manage and supervise design-build works at a strategic level. Monitor progress and risk analysis to agree on actions to resolve issues and improve performance.	Monthly
Progress Review	Project Manager, Senior Managers, and SPV	Monitor overall progress versus schedule, project objectives and targets; address/escalate any issues as necessary	Every two weeks
SPV Steering Committee Meetings	Representatives from each of the WVB partners	Direct, manage, and supervise the business at a strategic level, covering design-build, finance and O&M.	At least every two months

4.1.1.b.iii External Communication

WVB maintains transparency through ongoing communication with all external partners during every Project stage. Shortly after Project award, WVB sponsors a Project partnering meeting to establish lines of communication, goals, and meeting schedules as appropriate for stakeholder groups. WVB continues this partnering collaboration throughout Project execution with quarterly functions. To clarify communication with external parties, WVB establishes single points of contact for each key interface, as described in **Table 4.1-5**. David Sikorski, Project Manager, is the single point of contact for IFA.

Through experience on recent Indiana and Kentucky projects, WVB's local team members Walsh Construction, Jacobs Engineering, American Structurepoint, Guthrie/Mayes, and Third Rock Consulting have established relationships with many shareholders and agencies. These initial relationships improve coordination as many of the protocols and practices are known and understood.

WORK TOGETHER

To support optimal external communication, local team members have established relationships with many Project stakeholders.

For efficient Project delivery, WVB co-locates with IFA in Utica, Indiana. Executing a project of this size from a co-located office allows for daily face-to-face interaction between design, construction, and IFA personnel and improves communication, cooperation, and expedited decision-making.

TABLE 4.1-5 KEY RESPONSIBILITIES AND METHODS FOR COMMUNICATION

Groups	Key Contact	External Communication Methods
IFA	Project Manager, David Sikorski	WVB provides a written report on progress and performance at least every two months, and meetings with the IFA to gain feedback.
IFA consultants: INDOT/KYTC/Parsons	Construction Manager, Brian Hoppel	Consultants are included in relevant design review and workshops to ensure an over-the-shoulder and closely coordinated review process.
Applicable third parties	Public Information Coordinator, Dan Hartlage	Consultation activities, regular meetings, third-party contact details, and inform public of upcoming service disruption.
Utilities	Utilities Manager, Mark Hedrick	Identify and manage all interfaces and eliminate risk of impact on utilities. Communication is particularly important where any services are relocated.
Community and stakeholder (aesthetic review)	Public Information Coordinator, Dan Hartlage	Consultation meetings and surveys are conducted to communicate design proposals and obtain stakeholder feedback and input into design development.
Transportation agencies	MOT Manager, Mark Fournier	WVB uses ongoing communication through informal contact and weekly meetings to mitigate impacts on the traveling public, and ensure safety.
Emergency services; e.g. police and fire departments	Safety Manager, Mike Lawler	Establish key points and methods of contact; develop and obtain approval for all project emergency plans. Monthly updates communicate potential risks.
Residents near the construction site	Public Information Coordinator, Dan Hartlage	Early consultation meetings to ensure potentially affected parties are identified and aware of the risks. Advanced warnings provided via the Project Website, local media and on site notice boards. A phone number and email address is provided to which queries, concerns or complaints can be addressed.
Environmental agencies	Gina Morris, Environmental Compliance Manager	Interface with environmental agencies to ensure all requirements, including testing and permanent approvals are met.

4.1.1.b.iv Public Information & Community Outreach Staff

As WVB's Public Information Coordinator (PIC), Dan Hartlage of public relations firm Guthrie/Mayes, develops and implements WVB's Public Involvement Plan (PIP). As WVB's single point of contact with IFA's PIP Manager, Dan supports IFA on all communication and public involvement issues.

Dan, and his supporting staff from Guthrie/Mayes, have more than 35 years of experience creating and implementing successful public relations programs for local and national businesses and associations. Supporting Dan in the public information effort are key management members of the WVB team who fully support and cooperate with Guthrie/Mayes to form WVB's Public Information (PI) Team. The PI Team interact with the community, attend events as requested, and communicate Project details and schedules. These key managers include:

- David Sikorski, Project Manager
- Brian Hoppel, Construction Manager
- Donald MacDonald, Aesthetics Manager
- Mark Fournier, MOT Manager
- Mike Lawler, Safety Manager
- Brenda Wolf, DBE/Diversity Coordinator

Guthrie/Mayes provides guidance to these personnel, who have extensive knowledge of the Project and have years of leadership and technical expertise.

POSITIVE IMPACT ON THE AREA AND COMMUNITY

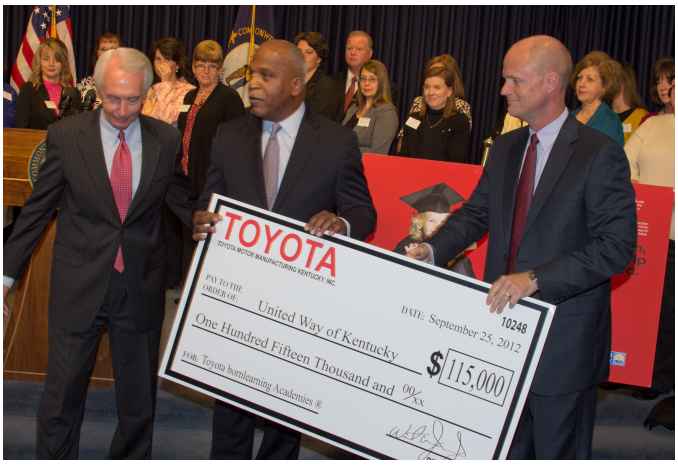
For more than 20 years, Dan has provided expert communications counsel and support for clients involved in high-profile community issues. His professional experience includes serving as a key communications consultant for the Louisville International Airport rebuild and expansion — the largest economic development construction project in the history of the Commonwealth of Kentucky.

4.1.1b.v Preliminary Public Information Plan

WVB's PIP supports IFA in their goal of proactive public information measures and prompt concern resolution to maintain public trust and integrity. All activities defined in the PIP support engagement and open dialogue amongst the Project team, IFA, and all sectors of the community.

EXPERT LOCAL PUBLIC RELATIONS

Dan Hartlage (right) joins Kentucky Governor Steve Beshear (left) and Toyota Motor Manufacturing Kentucky president Will James in a check presentation at the Kentucky State Capitol. The news conference and check presentation was organized and implemented by Dan and Guthrie/Mayes Public Relations staff.



To achieve the public involvement and communication goals for this high-profile Project, WVB works with IFA and the community to:

- Maximize positive public involvement throughout all phases of the Project through participation in general outreach, special focus committees, Project tours, and special events.
- Minimize inconvenience to the public through comprehensive, inclusive communication efforts that inform and prepare those directly affected by construction activities.
- Comply with consultation commitments in the First Amended MOA.
- Assist IFA in educating the public on the Project's importance to the region's mobility and economy.
- Provide the IFA PI Team high-quality support, including written and illustrative materials that are ready to publish.

WVB provides significant notifications to IFA's PIP Manager regarding lane closures, utility shutoffs, weekly construction updates, hazardous conditions, and traffic emergencies. WVB directs all requests for information received from the public to IFA and assist IFA in preparing the appropriate responses. The public involvement and communication efforts on this Project require an integrated, collaborative approach

with seamless interaction between IFA and WVB. As the guide for this combined IFA/WVB effort, WVB develops a Community Outreach Plan (COP) that identifies communication strategies and actions to deliver a consistent message in all public involvement, public outreach, and communication activities. The COP addresses the following:

- Roles and responsibilities
- Communication plan, procedures, and goals
- Public involvement and outreach approach
- Historic preservation outreach approach
- Significant public relations risks and benefits
- Performance-monitoring processes and tools

The COP focuses on obtaining feedback from residents and ensure local participation in the design and construction process. Neighborhood organizations and historic preservation groups are consulted regularly to provide expertise on locally sensitive areas. Donald MacDonald, Aesthetic Manager, collaborates with these groups to ensure their concerns are heard.

It is WVB's intent to share the Project's success with the community. To do so, WVB anticipates and plans around the many local events that take place in and around the greater Louisville area throughout the year. Mark Fournier, MOT Manager, and Mark Hedrick, Utility Manager prioritizes minimizing impacts to the event holders, attendees, and surrounding businesses and residents with thorough traffic staging plans and advance notifications.

SOCIAL MEDIA: WVB will incorporate the use of social media, like Facebook or Twitter, to rapidly notify the public of incident alerts and for two-way communication concerning road conditions, Project progress, and suggestions for getting around any closures. We can develop and distribute smartphone apps to make information access even easier. WVB will assist with the essential tasks of monitoring pages and comment threads, providing prompt responses and encouraging respectful and productive information exchange through the social media outlets.

Mike Lawler, Safety Manager, serves as the liaison between the Project Team and emergency services. Mike has developed a preliminary Project Safety Plan with input from Dan and Mark to ensure compatibility with public relations and traffic management. The Safety Plan is finalized through coordination with local fire and police departments to establish lines of communication for emergency response management. A crisis communications plan is established to ensure immediate stakeholder notification in the event of an on-site/project crisis or the development of a significant community issue.

WVB provides comprehensive and useful design and construction information using a variety of communication tools to reach the widest-possible audience. As needed by IFA, WVB writes content, provides graphics (as applicable), and helps facilitate the following:

- Project website
- Social media
- Quarterly newsletters
- Direct mailings
- Collateral materials
- Advertising
- Press releases
- Public postings
- Email and other correspondence

A Project website is established with a live-feed web cam for residents to stay up-to-date with construction progress.

WVB COMMUNITY EVENTS

WVB plans to hold community events similar to the bike/run event Walsh Construction held prior to opening the I-355 Des Plaines River Bridge.

4.1.2 PRELIMINARY DBE PERFORMANCE PLAN

DBE management, as well as all other subcontract management, is controlled by Support Process S2 within our Project IMS. WVB's preliminary DBE Performance Plan is summarized in this section and explained in further detail in the Volume 2 Appendices.

4.1.2.A ACHIEVING DBE GOALS

WVB is committed to exceeding the 9% Disadvantaged Business Enterprise (DBE) goal established for the Project with an anticipated 9.23% participation. We accomplish this through an aggressive approach that includes:

1. A DEDICATED DBE TEAM: The DBE effort is led and delivered by Brenda Wolf, WVB's dedicated DBE/EEO Coordinator for the Project. Brenda has seven years of experience as Walsh Construction's Indiana Regional DBE/EEO Coordinator. Brenda has built positive relationships with INDOT, understands the INDOT DBE process, and has a history of supporting local projects to reach and exceed DBE goals. Brenda led DBE efforts on the I-70 "Super 70" Design-Build which achieved 7.3 percent DBE participation, exceeding the 3.0 percent DBE goal. Brenda has supported other local projects including the Milton-Madison Bridge, Cannelton Hydroelectric Plant, and I-69 White River to CSX.

Brenda is supported by our experienced in-house DBE team, including Doug Cunningham and Marvin Jackson. This team has previously exceeded DBE goals on other projects, including:

OUTREACH MEETINGS

WVB's DBE/EEO Manager, Brenda Wolf, and Martine Julia-Sanchez, QHSE Manager, greet potential and established DBEs at the WVB-sponsored outreach event held at Simmons College.

POSITIVE IMPACT ON THE AREA AND COMMUNITY

WVB's DBE Coordinator, Brenda Wolf, has established positive relationships with INDOT personnel through years of working collaboratively with INDOT DBE/EEO officers during training and reviews. Procedures Brenda has established are often held by INDOT to be best practices.

- **Dan Ryan Expressway Reconstruction Project:** Achieved 28.7 percent DBE participation, exceeding the goal of 19 percent.
- **Marquette Interchange Project:** Achieved 22 percent DBE participation, exceeding the goal of 12 percent.
- **DART Green Line Expansion Project:** Achieved 42 percent DBE participation, exceeding the goal of 39 percent.

2. PROACTIVE OUTREACH AND COMMUNITY ENGAGEMENT: In addition to attracting, retaining, and assisting subcontractors and material suppliers already certified and prequalified, WVB's objective is to identify companies not currently certified or prequalified that have potential to perform work on this Project and on future projects.

3. SPECIALIZED DBE ATTENTION: WVB partners with community agencies and organizations to provide resources and assistance with items such as material purchasing, bonding, bid preparation, and insurance, among others. WVB also provides technical assistance and training to all DBEs and offers a mentor-protégé program to emerging DBE firms.

4. PACKAGED WORK SCOPES: WVB has identified many subcontracting opportunities for construction and design, as well as opportunities for material supply. We have estimated DBE participation for the Project on the values of subcontracting packages intended for award to DBEs. Anticipated DBE participation is expressed as percentage of the total amount of the Project (design and construction). **Table 4.1-6** lists these anticipated procurements by scope package, interested DBEs, and potential percentage, showing our anticipated participation of 9.23 percent.

TABLE 4.1-6 WVB ANTICIPATED DBE PARTICIPATION

Scope Package	Potential DBEs	Potential %
Aggregate Haul	Messier & Associates	0.07%
Clearing	King's Trucking & Excavation	0.01%
Bridge Builders	Cherokee Construction and Excavation, LLC	0.01%
	Free Contracting, Inc.	
	Jones and Bourland, Inc.	
	NWK Construction Inc.	
	PBTHNOJJ Construction Company, Inc.	
	Vic Enterprises	
Concrete and Flatwork - Miscellaneous	Pioneer Associates, Inc.	0.04%
	Eaton Construction Co., Inc.	
	DC Concrete, LLC	
	Martin Asphalt and Concrete Construction	
	Seven Seas Construction	
DBE Consultants	Engaging Solutions	0.01%
	Indiana Strategic Resource Group	
	United Construction & Design Group	
	Vick Strategic	
Design Consultants	Corn Island Archaeology	0.01%
	K&S Engineers	
	Khafra Engineering	
	Rangaswamy & Associates	
	Shrewsberry & Associates	
	Third Rock Consultants	
Drainage	Spartan Construction Inc.	0.01%
	Corbitt & Sons	
	Seven Seas Construction	
	Leong Enterprises	
	C & L General & Mechanical Maintenance	
	Reyes Group, Ltd.	
Electrical	T.E.M. Electric Company	1.01%
Excavation and Embankment Construction	HTA Enterprises	1.16%
	C Lee Construction	
	Central Engineering & Construction Assoc.	
Fuel and Petroleum Supplier	Big Meadow Oil, Inc.	0.01%
	Jacobi Oil Services	
General Conditions	Mezzetta Construction	0.01%
Guardrail, Attenuators, Fence, Signals	NWK Construction Inc.	0.16%
	Contractors Corporation	
	C-Tech Corporation	
	Dallas Dean, Inc.	
	JAG, Inc.	
	CLS Industries	
	Professional Fence Co.	
Highway Lighting, Traffic Signals, Fiber Optic Cables, ITS	Bansal Construction Inc.	0.01%
	The Hoosier Company	
Landscaping	B&B Contracting	0.31%
	C.A. Fulkerson	
	Cedar Valley	
	Earth Images	
	Environmental Landscape	
	NWK Construction Inc.	
Precast Beams - Furnish/Install	Choice Construction	0.53%
	Javier Steel Corporation	
	Amelie Construction & Supply, LLC	
Quality Control and Materials Testing	Barr & Provost	0.01%
	Resource International,Inc.	
Reinforcing Steel - Furnish	Circle City Rebar, Inc.	0.76%
Reinforcing Steel - Install	J & B Steel Erectors	0.01%
	D.T. Read Steel Company	
	Bar-Tie Reinforcing, Inc.	
	Javier Steel Corporation	
SIP Forms - Furnish and Install	J & B Steel Erectors	0.30%
	Javier Steel Corporation	
Structural Removal and Demolition	Cherokee Construction and Excavation, LLC	0.01%
	CINCO, Inc	
	L.L. Brown Construction	
	HCL, Inc.	
Structural Steel - Furnish and Install	Choice Construction	0.01%
	Amelie Construction & Supply, LLC	
	Javier Steel Corporation; Louisville	
Structural Steel - Painting and Coating	Atlantic Painting	0.01%
	Central Painting	
	Antoine Adams Painting, Inc.	
Survey	Barr & Provost, Inc	0.01%
	Classicle, Inc.	
	Jacobi, Toombs and Lanz	
	Structure Designs	
	United Construction & Design Group	
	Vision Engineering;	
Sealing and Masonry Coating	Cardinal Indiana, Inc.	0.01%
	Eaton Construction Co., Inc.	
Ready-Mix Concrete	Advanced Ready Mix	2.89%
	AR Concrete & Supplies, LLC	
	American Ready Mix	
	Bancroft Group	
Traffic Maintenance	K.V.W.V. Traffic Control Holdings, Inc.	0.01%
	M.A.S. Markers, Inc.	
	S&T Partners, LLC d/b/a Traffic Control Services	
	B&B Contracting	
Trucking	King's Trucking & Excavation	1.84%
	C Lee Construction	
	Hoosier Bulk Transport, Inc.	
	K&A Trucking, Inc.	
	LRP Trucking	
	Messier & Associates	
	Nubian Transport Management, Inc.	
	Oatts Trucking	
	MU Trucking	
ANTICIPATED TOTAL DBE PARTICIPATION		**9.23%**

5. REQUIRED DBE PARTICIPATION FROM MAJOR SUBCONTRACTORS: WVB requires, and assists, any subcontractor awarded work on the Project to meet the DBE goal for their individual scope of work whenever it is reasonably achievable.

6. PROGRESS REPORTING: WVB provides monthly DBE status reports to IFA and the WVB Steering Committee. This report summarizes recruitment strategies and results to show our ownership and accountability for DBE participation. Each month's report provides the details of current DBE participation, discussions of program status and progress, and outline future strategies to achieve or exceed our stated goals.

7. DBE CAPACITY-BUILDING PROGRAM: WVB shares IFA's commitment to building a long-term legacy of expanded capability for local firms. WVB's mentor-protege program and other training opportunities help build capacity and provide for growth of local DBE business partners.

4.1.2.B ENCOURAGING DBE PARTICIPATION

WVB's DBE Team initiated personal contact with DBEs early in the Project pursuit process. The initial meetings, beginning in early March, have progressed over the last seven months.

An important part of the WVB DBE Plan includes personal contact with local community organizations and agencies. From these contacts, we received information concerning local certified DBE firms, mentoring opportunities, and local DBE capacity. WVB has identified 2,033 DBE firms using published lists from INDOT and KYTC, and the database resources of the following agencies and local organizations:

- Louisville Metro Human Relations Commission
- Women Business Center of Kentucky
- Ohio River Valley Women's Business Council
- Louisville Hispanic/Latino Coalition
- Lexington Minority & Women Contractor Training Program
- Kentucky Minority Business Council
- National Association of Women Business Owners (NAWBO)
- Kentucky Procurement Assistance Program
- Tri-State Minority Diversity Supply Coalition
- Minority Enterprise Development of Western Kentucky

WVB recognizes the agreement between INDOT and KYTC allowing for DBE certification reciprocity on the Ohio River Bridges Project. We take advantage of this Project-specific agreement allowing Kentucky DBEs to be counted as certified in Indiana for the Project, using it to provide additional opportunities for DBEs in the area.

4.1.2.C OUTREACH AND ASSISTANCE FOR POTENTIAL DBE FIRMS

In addition to meeting with certified and prequalified DBE firms, WVB's DBE team has focused on outreach to DBE firms that are not yet prequalified or who meet the criteria for a DBE firm, but is not yet certified. WVB hosted several community outreach events (**Table 4.1-7**) to identify such firms and to guide them to certification and prequalification through toolkits we created and distributed at the events.

OUTREACH AT SIMMONS COLLEGE

The WVB DBE outreach at Simmons College hosted over 56 DBE companies and 95 individuals.

TABLE 4.1-7 WVB-HOSTED DBE OUTREACH

Date	Location	Event Notes
03/13/12	Louisville, KY	WVB DBE Outreach Meeting held at the Muhammad Ali Center was attended by 35 DBEs
03/14/12	Jeffersonville, IN	WVB DBE Outreach Meeting held at the Sheraton Hotel was attended by 31 DBEs
08/06/12	Lousiville, KY	WVB DBE Outreach Meeting held at Simmons College was attended by 55 DBEs

WVB recognizes that this outreach effort requires multiple layers of support (e.g., community, faith-based, public school, chambers of commerce, etc.) to identify and assist these firms. Key support comes from Maurice Sweeney from United Construction and Design Group. Maurice is the Diversity and Inclusion Advisor for our DBE Team. Maurice brings with him an impressive résumé in community involvement and DBE participation in the Southern Indiana/Greater Louisville Area, including as KYTC's Executive Director for the Office of Minority Affairs.

Additionally, the DBE team has met with DBE consultants from the Southern Indiana/Louisville area to assist with diversity and inclusion for the Project. Organizations met to date include the NAACP, Vick Strategic, Engaging Solutions, and Indiana Strategic Resource Group.

4.1.2.D EXPANDING DBE FIRM CAPABILITIES

WVB meets the differing needs of DBE firms with a true sense of cooperation and partnership to elevate and expand technical, management and business capabilities of DBE firms through mentoring, training, and other specialized assistance.

MENTOR-PROTÉGÉ PROGRAM: The mission of the Mentor-Protégé Program is to cultivate an established DBE firm ready to grow to the next level, promote growth in the Southern Indiana/Louisville economy, and leave a positive benchmark on the community. As a seasoned mentor, WVB provides formalized mentoring that includes:

- Working together in monthly meetings
- Developing and implementing the protégé business plan to obtain the desired results
- 24 module classroom training provided by Mentor
- Providing guidance to allow these firms to be successful in the short and long term.

WVB has mentor-protégé commitments with the following DBE firms on this Project:

- **C. Lee Construction Services,** Griffith, IN
  Owner: Frederick "Chip" Lee
- **Messier & Associates Inc.,** Jeffersonville, IN
  Owners: Fernando and Juan Messier

TRAINING: WVB offers the following in-house training classes to DBE firms at no cost:

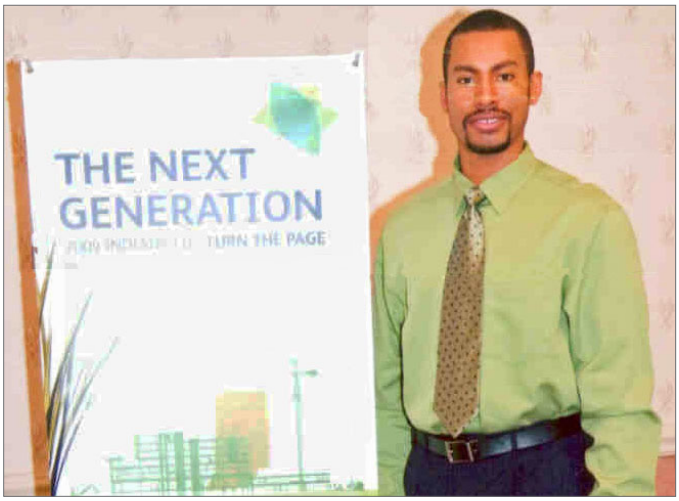
- Safety Training (e.g. OSHA 10-hour and 30-hour)
- Superintendent and Foreman Training
- Project Engineer Training
- Crane Awareness
- Profit/Loss Statement Training

SPECIALIZED ASSISTANCE: WVB offers assistance to DBE firms regarding contract compliance, goals and standards, cash flow management, and material purchasing. Specialized assistance also includes financial assistance:

- **Insurance and Bonding:** WVB provides assistance in overcoming limitations such as inability to obtain bonding or financing. This can be completed by simplifying the bonding process, reducing the requirements, eliminating the impact of surety costs from bids, and providing services to help DBEs and other small businesses obtain bonding and financing.
- **Invoicing and Payment:** DBE firms may face unique financial challenges affecting their ability to respond to projects of this size and complexity. WVB realizes these challenges exist and commits to expediting the payment process to DBEs.

PROTÉGÉ CHIP LEE OF C. LEE CONSTRUCTION

C. Lee Construction, founded by Frederick 'Chip' Lee, is an established excavation, demolition and trucking company based in Griffith, Indiana. C. Lee Construction, founded in 2005, has been working with Walsh Construction on various projects in Northern Indiana for several years. C. Lee is a certified Indiana DBE/MBE firm selected by Walsh Construction to participate in the Mentor-Protégé Program.



4.1.3 PRELIMINARY WORKFORCE DIVERSITY & SMALL BUSINESS PERFORMANCE PLAN

A diverse, well-trained workforce is crucial to project success — both to improve delivery and support achievement of IFA and WVB sustainable development goals. With the commitment of its leadership and management, WVB plans to exceed Project targets of 15 percent minority and 10 percent female workforce. We have described our approach to achieve this commitment in our Preliminary Workforce Diversity and Small Business Performance Plan, attached in the Volume 2 Appendices.

Brenda Wolf, DBE/EEO Coordinator, is responsible for plan delivery. Related management procedures are implemented under Support Processes S1 and S2 in the IMS.

Brenda is supported by our experienced WVB Workforce Team which includes Doug Cunningham. Doug led the workforce team on Walsh's award-winning Dan Ryan Expressway project.

POSITIVE IMPACT ON THE AREA AND COMMUNITY

Doug Cunningham led the DBE/EEO program on the $724 million Dan Ryan Expressway projects. Walsh achieved 48 percent—nearly 2.5 times the goal. As a result, the Illinois Road and Transportation Builders awarded Walsh their first-ever "Workforce Diversity Award."

4.1.3.A ON-THE-JOB TRAINING PROGRAM

WVB is committed to participating in INDOT's Equal Employment Opportunity Trainee Program and On-the-Job Training (OJT) program and meeting its requirements throughout the Project.

Walsh Construction, lead contractor of the Walsh-VINCI CJV, is very familiar with INDOT's requirements from involvement in federal aid contracts. Walsh Construction is currently signatory to the 2012 OJT Training Program and Partnership Agreement and have 11 trainees enrolled in approved training programs on four INDOT projects.

WVB's DBE and workforce team has already begun to consider OJT requirements for this Project and addresses these through the following avenues:

COLLEGE AND HIGH SCHOOL CONSTRUCTION CO-OPS: Through Walsh Construction's existing, time-tested internship/co-op program, WVB delivers a successful Project white-collar OJT program, including a minimum of ten minority and female interns and trainees. WVB has targeted these educational facilities for participation:

- Iroquois High School
- Fairdale High School
- University of Kentucky
- University of Western Kentucky
- University of Louisville
- Ball State University
- Rose Hulman Institute of Technology
- Purdue University

PROVISION OF PROFESSIONAL OJT: WVB's design partner, Jacobs Engineering, and its subconsultants employ a minimum of four design trainees. These trainees gain experience in a number design functions including bridge and highway design, CAD drawing, and shop drawing reviews.

For design and construction, WVB and our subcontractors employ 14 professional trainees, for a minimum of 800 hours per trainee.

WORKFORCE DIVERSITY AWARD

Dan Ryan Expressway, Walsh Construction.

TRADE-SPECIFIC OJT: WVB uses existing relationships to work with local labor unions to recruit trade trainees and apprentices. The WVB Workforce Team recruits through public and private channels likely to yield minority and women trainees. We focus efforts on recruiting trainees from the local area and encourage our supply chain partners to do so as well. The primary objective of the OJT Program is to bring minorities, women, and disadvantaged persons from apprentice status to a fully-experienced employee.

WVB estimates that trades OJT begins at the start of construction in 2013 and continues throughout the Project. The total number of trade trainees to be employed by WVB and subcontractors is estimated to be no less than 65 (**Table 4.1-8**). The number of trainees per work classification is based on contractor/subcontractor needs. The Walsh-VINCI CJV retains the primary responsibility for meeting training requirements. Training provisions are included in all applicable subcontracts.

WVB has already contacted local unions to discuss OJT needs. On August 8, 2012, the Workforce Team met Joe Wise of the Construction Trades Council, and Tim Murphy, Job Placement Direction for the Construction Pipeline, to agree on a plan to increase the number of individuals entering construction trades training programs in anticipation of the Ohio River Bridge projects.

Graduates from the Louisville Urban League's Pre-Apprentice Program and the Construction Pipeline are offered "fast-tracking" through union-sponsored boot camps to prepare them for formal entry into the established trade union apprentice programs. WVB furnishes workforce requirements to aid in the timely scheduling of these programs. During construction, apprentices then attend pre-established offsite training in addition to the Project OJT. As part of OJT, they attend training sessions away from their normal duties (usually for one week) .

4.1.3.B EDUCATING & TRAINING EMPLOYEES

WVB's commitment to invest in and train the individuals working on the Project both improves performance on this Project and strengthens the Southern Indiana/Louisville workforce.

WVB assesses all recruits and uses the results of this assessment to identify educational and training needs.

TABLE 4.1-8 TRADES TRAINING PROGRAMS

Trade	Number
Pile Drivers	5
Iron Workers	10
Carpenters	13
Operating Engineers	12
Laborers	25
TOTAL	**65**

This training is both induction training and ongoing training as further outlined in Section 4.1.3.G below. Environmental issues and site-specific issues are covered through this training.

4.1.3.C ENCOURAGING PARTICIPATION

WVB's approach to encouraging participation in the Workforce Diversity and Small Business Performance Plan begins with an understanding of the area demographics and existing collaborations with local community organizations to identify interested minority and female applicants.

As included in the preliminary Workforce Plan in the Volume 2 Appendices, WVB has participated in local career/resource events and met with 13 community-based organizations.

WVB's intent is to capitalize on established community organization programs as a source of local qualified applicants for the union apprentice and OJT programs. We met with the Louisville Urban League and discussed the benefits of its Kentuckiana Works Construction Pipeline Pre-Apprenticeship Training Program. WVB has discussed similar plans with others:

- Kentuckiana Power of Work Program (Elvin Stampley)
- Lexington Minority & Women Contractor Training Program (Marilyn Clark)
- Hispanic/Latino Coalition (Emily Dyer)
- Canaan Community Development Corporation (Terra Leavell)
- Women's Business Center of Kentucky (Sharron Johnson)

Working directly with local organizations with established training programs is an important first step to building participation. WVB proactively set the job readiness plan into action: WVB team member, Walsh Construction, has employed a recent Construction Pipeline Training Program graduate, Nacee Sarver. Nacee is a laborer on Walsh's Milton-Madison Bridge project. His employment stands as a testimonial to the success of this local job-readiness training program (**Figure 4.1-10**).

4.1.3.D GOALS & MENTORING APPROACH

Principle goals of the Project mentoring program are to:

- Support small businesses in delivering an exceptional end product for IFA.
- Equip small businesses with skills and experience to their capacity to undertake larger projects in the future.

WVB's mentorship program covers both small, minority-owned, and female-owned companies and minority and female employees. At a company level, support is primarily conducted through educational workshops, training events, and meetings where participants learn new skills and build on existing knowledge. Further details are in **Table 4.1-9**. Participants are assigned a mentor to answer questions and provide support as they work on the Project.

TABLE 4.1-9 MENTORING AND TRAINING WORKSHOPS

Workshop	Purpose
Kickoff Meeting (within first 90 days)	Identify a broad range of goals, objectives and strategies.
Training and Mentoring (held quarterly)	Content includes project management, financial management, marketing, estimating, risk management, scheduling, billing, safety, sustainability and quality control.
Networking Meeting (held quarterly)	Attended by WVB personnel and mentees to provide opportunities for them to improve networking skills
Wrap-Up Meeting (held at Project conclusion)	To review performance and progress and discuss future steps

FIGURE 4.1-10 JOB-READINESS PLAN IN ACTION

WVB has proactively set the Job Readiness Plan in action through the Louisville Urban League's Construction Pipeline Training Program. Graduate Nacee Sarver is now working on Walsh Construction's Milton-Madison Bridge project.

4.1.3.E METHODOLOGY FOR DIVIDING WORK

In dividing the work required to deliver the Project into procurement packages, Brenda Wolf has worked with WVB's procurement team to ensure opportunities for smaller businesses and female- and minority-owned firms. An outline of the packages we intend to procure is provided in **Table 4.1-6** in Section 4.1.2. Where feasible, we break these down further into smaller packages for individual sections of the Project to give DBEs or SBEs the ability to compete when bidding for these packages. Examples of potential packages include:

- Landscaping – Section 4 only
- Bridge Builders – Wolf Pen Branch Road only
- Precast Beams – furnish/install
- Trucking – Section 4 only

4.1.3.F EVALUATING PLAN EFFECTIVENESS

WVB reviews the results of our Workforce Diversity and Small Business Performance Plan throughout the Project to ensure we exceed our targets. By measuring performance regularly and reporting to IFA, using up-to-date utilization statistics, we can make adjustments needed to ensure satisfaction of WVB and IFA goals.

The Plan identifies key performance indicators, including:

- Number of minority and female recruits/trainees/apprentices as a percentage of the total
- Number of training hours provided as a percentage of hours worked

WVB measures success in attaining OJT goals by reviewing:

- All trainee introduction and completion forms
- Monthly trainee reports
- Monthly total workforce reports
- Quarterly trainee evaluations
- Annual reports
- Monthly subcontractor reports – including Federal EEO compliance

4.1.3.G TRAINING PROGRAMS

INDUCTION TRAINING: All team members and relevant supply chain members complete induction training before commencing work. This covers the Project purpose, scope and objectives; basic safety and environmental risks and requirements; "Right First Time' quality; and site-specific issues.

ONGOING TRAINING: Role- and task-specific training as well as more general training for all team members is provided. This training includes: supervisor training, technical training, environmental, safety and quality training, human resources training, project management training, insurance, and legal training.

4.1.3.H ELIGIBILITY CRITERIA

WVB follows all INDOT and KYTC EEO and SBE eligibility requirements for training program participants. We target minority and females for participation.

Union member personnel are eligible to participate through training programs provided by their trade union. WVB sponsors entry to the appropriate union for personnel when necessary.

4.1.3.I TRAINING & MENTORING WORKSHOPS

Ongoing technical training supports individual professional development and keeps skills and qualifications up-to-date. Workshops to provide training and mentoring support in civil engineering, surveying and maintenance of traffic are targeted as potential topics.

Workshops provide support for specific audiences, allowing WVB to address questions and concerns. We have identified two DBE firms for individual mentorship: C. Lee Construction and Messier & Associates. Each firm is presently DBE certified and performing general construction activities and trucking.

Another aim is to assist companies with the development of short- and long-term business plans, identifying potential growth areas, and providing training and support. For the short term, we concentrate mentoring for individuals on topics that enable them to improve their firms' prequalification limits or work classifications. Longer-term, we mentor individuals from qualifying small businesses to help their firms become DBE certified and INDOT prequalified. Many firms that would benefit from this support have been identified at WVB DBE outreach events. Workshop subjects include:

- Equipment
- Insurance
- Human Resources
- Legal
- Project Management
- Bonding and Insurance
- Safety

WVB maintains a schedule of workshops to be held and records attendance at each to monitor participation. Through involvement in this Project and training they receive, these firms grow and build financial strength and confidence to perform on larger projects.

MESSIER LETTER TO WVB

"In addition, we are extremely excited that you and your team have offered us the opportunity to participate in your Mentorship program." - Fernando Messier, CEO

Messier & Associates, Inc.
Certified MBE, DBE & SBA 8(a)

P.O. Box 21293
Louisville, KY 40221
Phone (502) 515 2451
Cel (502) 240 9181
Fax (502) 213 9040
www.messainc.com

August 13th, 2012

Max Rowland
Project Manager
Walsh Construction
1260 East Summit Street
Crown Point, IN 46307

Dear Mr. Rowland,

I would like to express our gratitude to you and the Walsh Construction Group for the interest you have shown in our company and the services we can provide for your team regarding the Ohio River Bridges Project. Moreover, we are very pleased that you are committed to working with us on this project as part of your DBE participation.

In addition, we are extremely excited that you and your team have offered us the opportunity to participate in your Mentorship program. I feel very strongly that this invitation in particular will be the most beneficial to our company and its future. The knowledge and experience we will gain from this endeavor will serve as a benchmark to springboard our company to the next level.

We are truly very grateful and look forward to working with you in the near future.

Sincerely,

Fernando Messier
CEO

Some of our Certifications
SBA 8A Certified
KENTUCKY TRANSPORTATION CABINET
MSD

8/24 26

Preliminary Project Baseline Schedule for Design and Construction

4.1.4 PRELIMINARY BASELINE SCHEDULES

WVB is committed to reaching Project substantial completion by October 31, 2016. This commitment is driven by:

- **Our past portfolio of successful projects,** coupled with the scheduling plan we have in place, provides assurance the construction is safely completed eight months ahead of IFA's requirement.
- **Increased investor confidence** that results from a shorter construction schedule, as reflected in the negotiated financing rates, offer better value for IFA.
- **Opportunity for IFA** to generate toll revenue eight months earlier than anticipated.

TIME AND BUDGET

WVB will open the East End Crossing to revenue-generating traffic by October 31, 2016 — eight months early.

GETTING STARTED: WVB has developed and implemented the preliminary PMP including IMS and Key Personnel and Task Managers during preliminary design. This allows WVB to hit the ground running upon commercial close and award of NTP 1. Key to WVB's efforts to coordinate the Project startup is issuing subcontracts, purchase orders, and utility agreements; performing field geotechnical analysis; and distributing updated designs to the key Project stakeholders.

WVB has gone through an iterative process to develop a list of proposed design units specifically created to expedite early construction activities. Critical design units identified:

- Section 4 Erosion and Sediment Control and Stormwater Pollution Prevention Plan
- Tunnel South Portal
- Section 5 Tower Foundations
- Section 4 Phase 1A MOT
- Ramp A Bridge and Roadway
- North River Road Drainage
- Harrods Creek Bridge Foundation

WVB is ready for close engagement with IFA, local stakeholders, emergency services, environmental agencies, and the general public to get the feedback required to generate and approve these early design units.

CRITICAL PATH: Tunnel construction is the Project's critical path. WVB's early design efforts to reduce the Tunnel length and optimize section properties supports our commitment to achieve substantial completion by October 31, 2016. The early design units for the Erosion and Sediment Control and the Tunnel South Portal are critical design activities to starting Tunnel excavation. Main span bridge work is near-critical and WVB's proposed early design units are planned to expedite foundation construction by fall of 2013.

SETTING MILESTONES: The milestones outlined in **Table 4.1-10** are those listed in Exhibit 4 of the PPA. These dates are included as milestone activities in the Preliminary Project Baseline Schedule and reflect the logic and durations carefully developed throughout the proposal and bid process.

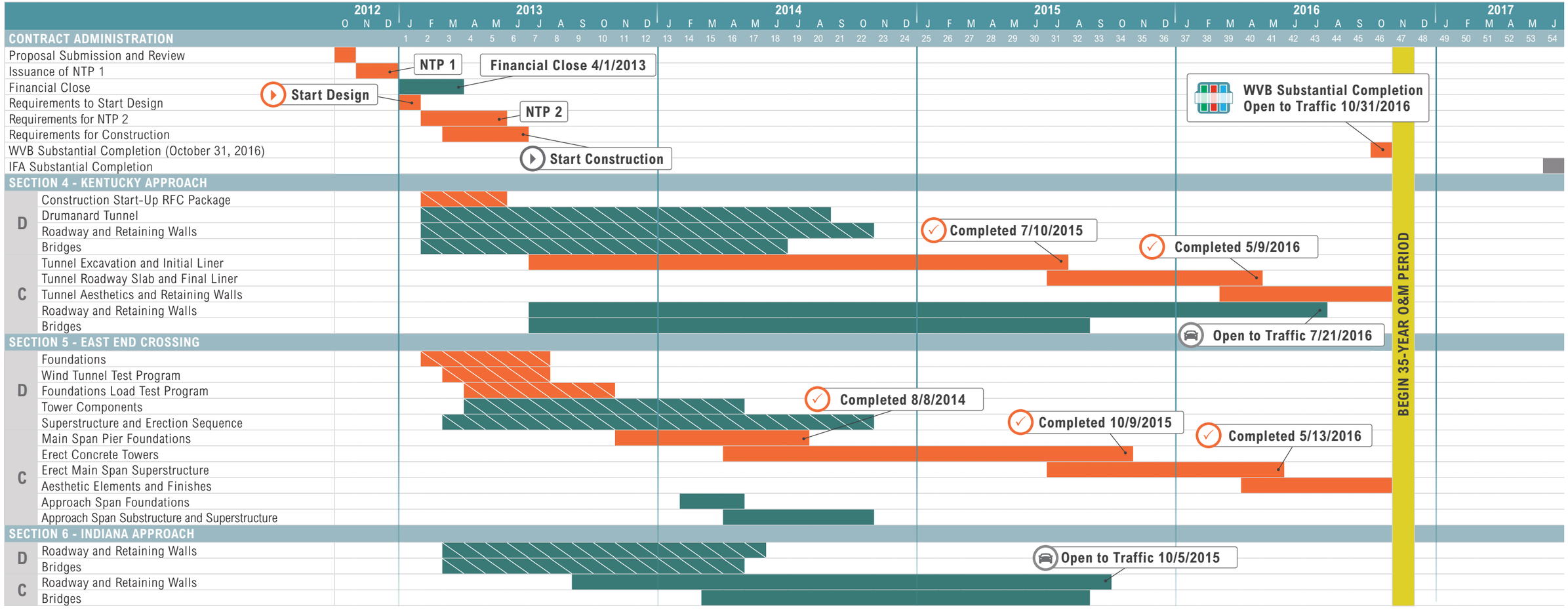
Roadway Sections 4 up to US 42 and Section 6 up to Salem Road is available for opening at the milestone dates of July 21, 2016, and October 5, 2015, respectively. **Opening areas of the Project a combined 31 months ahead of IFA's substantial completion requirement** increases public access to Salem Road and reduces traffic impacts, therefore enhancing public perception.

Table 4.1-11 is a summary schedule indicating the milestones and WVB's overall approach to scheduling the Project. Further details of our approach, including O&M details, are provided within Section 4.2.2.2 and 4.3.2.2 along with the schedule narrative and full preliminary P6 schedule provided in the Volume 2 Appendices.

TABLE 4.1-10 WVB'S TARGET MILESTONE DATES

Milestone	Description	Date
1	Complete Main Span Pier Foundations	8/8/14
2	Complete Tunnel Excavation & Initial Liner	7/10/15
3	Complete Main Span Towers	10/9/15
4	Complete Western Limits of Section 6 Roadway	10/5/15
5	Complete Eastern Limits of Section 4 Roadway	7/21/16
6	Complete Final Tunnel Liner	5/9/16
7	Complete Main Span Superstructure Erection	5/13/16
8	Substantial Completion	10/31/16

TABLE 4.1-11 SUMMARY PRELIMINARY BASELINE SCHEDULE (FULL PRELIMINARY BASELINE SCHEDULE PROVIDED IN VOLUME 2 APPENDICES)



Highlights to Getting Started

NTP 1 12/20/2012

- Submit DBE Performance Plan with Executive Agreement
- Submit Workforce Diversity and SBE Performance Plan with Executive Agreement
- Submit Insurance Policies

Start Design 1/19/2013

- Approve DBE Performance Plan
- Approve Project Management Plan (A)
- Host Design Workshop
- Identify Design Units
- Conduct Environmental Compliance and Mitigation Training
- Approved Design Review Plan and Schedule

NTP 2 5/8/2013

- Reach Financial Close
- Submit Payment Bond and Performance Security
- Establish Project Office
- Host Utility Owner Meetings
- Approve Project Baseline Schedule
- Approve WD and SBE Performance Plan

Start Construction 6/3/2013

- Approve Project Management Plan (B)
- Host MOT Meeting
- Submit Temporary Traffic Control Plan
- Approve Access and Mobility Plan
- Approve Environmental/Stormwater Pollution Prevention Plans

Critical and Near Critical Activities | Non-Critical Activities | Design | Milestone Date | Start Design | Start Construction | Completed | Open to Traffic

4.1.5 QUALITY MANAGEMENT

WVB's quality program is based on the premise that quality for all design and construction activities is best achieved by those responsible for performing the work, including subconsultants and subcontractors, and starts before design or construction begins. All WVB personnel participate in and contribute to the commitment to "Right First Time" delivery and are guided by implementation of the quality management process. The documented Quality Management Plan (QMP) provides guidance to the design professionals, workforce, project management, and quality assurance/quality control personnel in designing, planning, constructing, confirming, verifying through comprehensive inspection and test plans, and documenting project outcomes.

Quality management, as one of the key processes within WVB's IMS (Control Process C2), is the responsibility of Quality Manager, Martine Julia-Sanchez. The IMS includes all phases of this Project; WVB maintains a consistent approach to quality management throughout the Project lifecycle, from design and construction through the Operating Period.

The QMP is endorsed by WVB Steering Committee and is promoted throughout the WVB organization. The QMP and the entire Quality effort are continuously improved through comprehensive management audits that include input from IFA and stakeholders. Performance is measured against defined goals and related objectives. In **Table 4.1-12**, WVB's approach to elements of the quality management process is described.

SAFE AND SUSTAINABLE

WVB member, VINCI Construction Grands Projets' ISO certification resonates throughout WVB's IMS at all Project stages.

afaq AFNOR CERTIFICATION

Certificat
Certificate

N° 2008/33053a

AFNOR Certification certifie que le système de management mis en place par :
AFNOR Certification certifies that the management system implemented by:

VINCI CONSTRUCTION GRANDS PROJETS

pour les activités suivantes :
for the following activities:

CONCEPTION ET REALISATION DE GRANDS PROJETS D'INFRASTRUCTURES ET D'EQUIPEMENTS CLE EN MAIN.

DESIGN AND EXECUTION OF MAJOR INFRASTRUCTURE PROJECTS AND TURN-KEY EQUIPMENT.

DISEÑO Y EJECUCIÓN DE GRANDES PROYECTOS DE INFRAESTRUCTURAS Y DE EQUIPAMIENTOS LLAVE EN MANO.

ΜΕΛΕΤΗ ΚΑΙ ΚΑΤΑΣΚΕΥΗ ΜΕΓΑΛΩΝ ΕΡΓΩΝ ΥΠΟΔΟΜΗΣ ΚΑΙ ΕΞΟΠΛΙΣΜΟΥ ΕΤΟΙΜΩΝ ΠΡΟΣ ΛΕΙΤΟΥΡΓΙΑ.

a été évalué et jugé conforme aux exigences requises par :
has been assessed and found to meet the requirements of:

ISO 9001 (2008) + ISO 14001(2004) + ILO-OSH (2001)

et est déployé sur les sites suivants :
and is developed on the following locations:

5, cours Ferdinand de Lesseps FR-92851 RUEIL-MALMAISON
(Listes des filiales en annexes n° 1 et n° 2)
(List of subsidiaries on appendices n° 1 and n° 2)

Le détail des activités et sites certifiés par norme est mentionné sur les certificats suivants :
The description of certified activities and locations per standard is mentioned on the following certificates:

Certificat ISO 9001 n° 5440 délivré sous accréditation n° 4-0001.
Certificat ISO 14001 n° 22353 délivré sous accréditation n° 4-0001.
Certificat ILO-OSH n° 26495.

Ce certificat est valable à compter du (année/mois/jour) *This certificate is valid from (year/month/day)* 2012-02-21 Jusqu'au *Until* 2015-02-20

Directrice Générale d'AFNOR Certification
Managing Director of AFNOR Certification

F. MEAUX

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SAS au capital de 18 187 000 € - 479 076 002 RCS Bobigny - www.afnor.org

afnor CERTIFICATION

TABLE 4.1-12 IMS PROCESS C2 – QUALITY MANAGEMENT

Process	Approach
Key Performance Indicators (KPIs)	Performance benchmarked, measured and monitored using Project-specific KPIs. Use leading indicators to assess current situation and plan ahead. Use lagging indicators to monitor progress for continuous improvement.
Major Events	Empower team members to decide at a local level. Exception reporting to ensure team members recognize issues that must be escalated for swift resolution. Develop root cause analysis to ensure effective corrective/preventive actions.
IFA Feedback	Establish clear procedures and responsibilities within team to seek, address and respond to IFA feedback. Conduct regular surveys to collect feedback on schedule/plan information
Employee Feedback	Define processes that enable formal and informal communication with employees. Perform regular employee surveys.
Process Reviews	Establish a structured approach to ensure that each process in the IMS has regular reviews for effectiveness, relevance and currency for the process owner.
Management Review	Capture and analyze all available data to ensure IMS remains relevant and effective (e.g. audit results; IFA feedback; process performance). Identify improvement opportunities, resources, and training needs.
Improvement Plans	Incorporate outputs from the Management Review into improvement plans which identify the person responsible for implementing improvements and the schedule in which to achieve this.
See **Section 4.2.3** for detailed approaches relating to the other C2 Quality Management processes.	

RESPONSIBILITIES FOR DELIVERING OUR QUALITY MANAGEMENT PLAN: The key responsibilities for the WVB quality management approach are shown in the approach summarized in **Figure 4.1-12** and detailed in WVB's preliminary Project Management Plan in Volume 2 Appendices. The chart shows how, as part of our approach to "Right First Time" (RFT) delivery, we operate comprehensive inspection, testing and commissioning procedures during the design, construction and the Operating Period for both on- and off-site items.

WVB's inspection, test and commissioning procedures are incorporated into our IMS. Construction Quality Control Manager, John Reid, is responsible for the implementation of these procedures. John reports directly to Construction Quality Manager, Courtney Norris. WVB's organization includes an independent inspection team which is completely separate from production responsibility. All inspections are performed by qualified and experienced personnel under John's direction. To ensure WVB's quality management approach specific responsibilities are given to the key members of the quality team. Specific quality management responsibilities are shown in more detail in **Figure 4.1-11**.

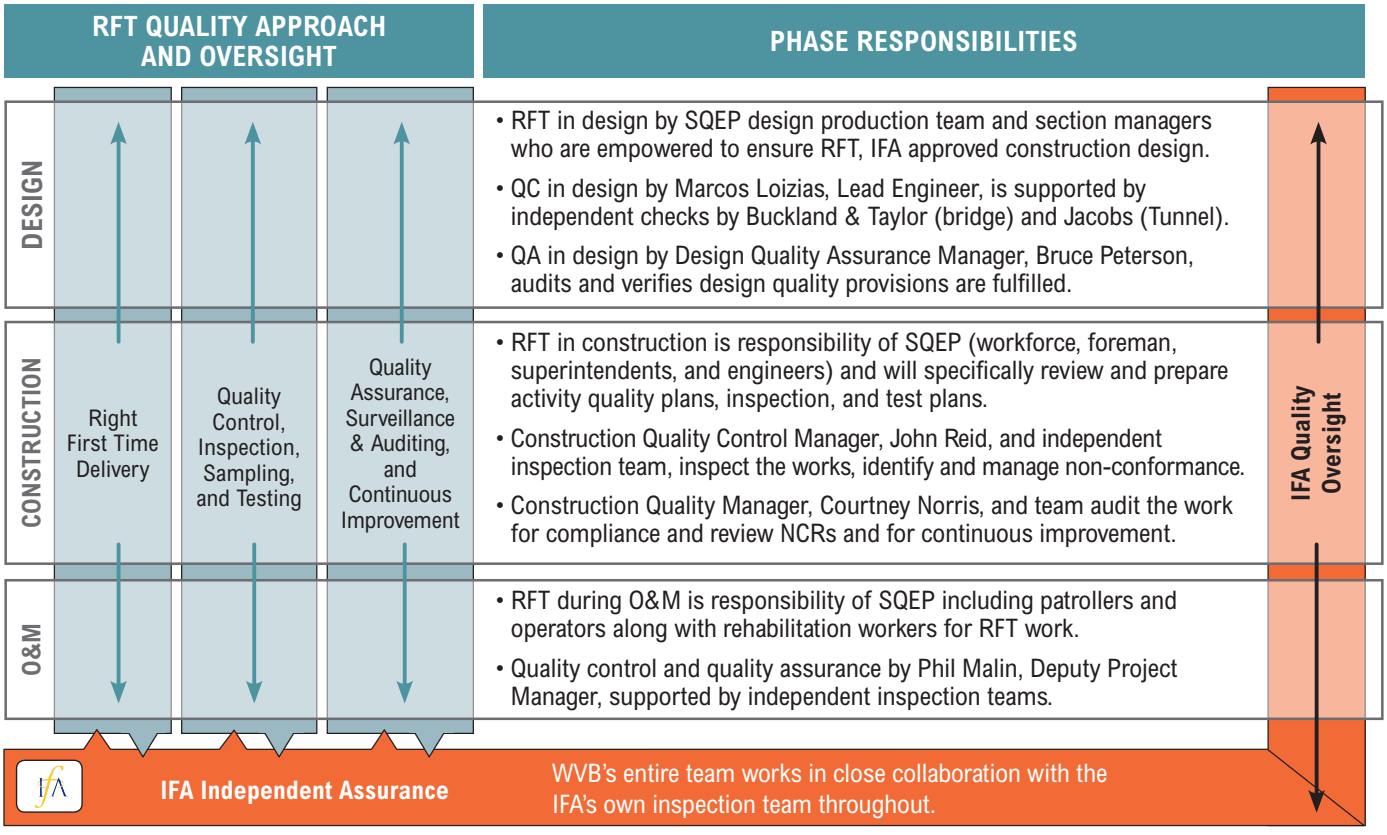
As part of WVB's IMS, everyone on site has responsibility in the delivery of the QMP; all team members are qualified for their role and responsible for compliance of their tasks with requirements.

DUPLEX A86 HIGHWAY TUNNEL

WVB partners have proven experience constructing products of the highest quality including VINCI CGP's construction of the Duplex A86 Highway Tunnel in France, which received the "Best Result for Safety" by the European Tunnel Assessment Program.

FIGURE 4.1-11 QUALITY MANAGEMENT APPROACH

Management approach with RFT delivery and IFA oversight, expanded details provided in preliminary PMP in Volume 2 Appendices.



4.1.6 COST CONTROL, SAFETY, ENVIRONMENT & RISK MANAGEMENT

Vertical integration and consistent application of WVB's Project IMS ensures the safe, sustainable delivery and operation of a quality Project.

4.1.6.A COST CONTROL

WVB's project management approach implements proven cost controls that enable us to measure and report on performance against targets for key areas, maximizing visibility and predictability for IFA at every stage.

The comprehensive control and assurance procedures WVB has implemented, as well as our information technology (IT) systems for document and project controls, are incorporated within our IMS. These procedures and systems build on the best practice, proven project controls, and key performance indicators (KPIs) already in use by the WVB partners. The management systems used to control, review, and coordinate costs and schedule consistently during the design, construction, and O&M phases are:

- **Document Control:** All documentation is stored and controlled online in WVB's electronic Dynamic Management of Documents systems (DyMaDoc). See Section 4.1.7 for more detail.
- **Cost:** WVB's commercial organization has been designed to manage and control cost effectively, calculating Earned Value Analysis (EVA), Cost Performance Index (CPI), and Schedule Performance Index (SPI) data to support predictive trend analysis. Cost is managed at both the SPV and Walsh-VINCI CJV levels using current in-house systems, CMiC and Pegase systems.
- **Schedule:** Past production rates from local and global projects were input for each construction activity to schedule the Project. The resulting schedule, developed in Primavera P6, is based on a realistic assessment of outputs, resources, site access, and other Project constraints.

TIME AND BUDGET

Because WVB partners are involved throughout the Project, we can use consistent controls and processes, like DyMaDoc to ensure costs are coordinated and controlled in all phases of design, construction, and O&M.

DESIGN AND CONSTRUCTION: WVB's three Section Design Managers direct the scope, schedule, and budget for design work, monitor related design unit development, and report progress to Andrew Brennan, Design Manager. The Section Design Managers develop three-week look-ahead schedules and establish plans to accelerate the design schedule if needed. WVB's construction Section Project Managers are owners of their budgets and cost reports. These monthly cost reports compare actual costs to original estimates for each Project section. Scott Singleton, Scheduling Manager, oversees schedule management efforts including weekly reviews of man-hour based production, monthly Critical Path Method (CPM) schedule updates, and weekly updates to detailed three-week look-ahead schedules.

OPERATIONS AND MAINTENANCE: WVB uses IFA's asset management system to define and monitor the schedule of routine inspection and maintenance. WVB has extensive experience in using a range of Computerized Maintenance Management Systems (CMMS) for this purpose.

INFORMATION FLOW: The fully integrated project controls system WVB has implemented is tailored to suit the specific Project requirements. For all stages of the Project, the project controls system serves as a single source of accurate information for the project partners, capturing and sharing accurate and meaningful data recorded against KPIs. This allows WVB to anticipate and resolve issues before they impact the Project, and enables continuous Project improvement by supporting the effective analysis of to-date performance in all areas.

A19 MOTORWAY

WVB's IMS, DyMaDoc and cost control measures were successfully used on WVB partner's construction of many projects including the $1.1 billion A19 Motorway in France.

4.1.6.B SAFETY

WVB's philosophy regarding safety is "No One Gets Hurt." We believe this can be achieved on the Project when all personnel are actively engaged in a safety culture. To achieve a safe environment, WVB implements a comprehensive Project Safety Plan, covered under IMS Process C4, developed to deliver the principles of our Safety Strategy (**Figure 4.1-12**).

WVB's core safety components include competent people, engineered temporary works, and reliable equipment and tools. WVB's Safety Strategy is reinforced by six areas of activity:

- **Leading:** Strong, proactive leadership by all managers and supervisors to instill a positive culture and safe behaviors.
- **Anticipating:** Designing out risks in all stages, using lessons learned from previous jobs, challenging existing practices and simplifying processes to ensure understanding.
- **Engaging:** Communicating risks and controls internally to our design, construction, and O&M teams. Communicating risks externally to third parties. Inviting feedback for improvement and to achieve team buy-in to WVB's safety approach.
- **Implementing:** Mike Lawler and his site safety team are responsible for the implementation of the Safety Plan including all training and on-site instruction. All WVB personnel are responsible to meet our goal that "No One Gets Hurt".
- **Tracking:** Proactive and systematic monitoring and reporting of WVB's actions and performance to control delivery and achieve continuous improvement.
- **Improving:** All identified potential improvements are captured in a Safety Management Action Plan, and monitored continuously by WVB's Safety Manager, Mike Lawler.

SAFE AND SUSTAINABLE

WVB implements successful safety programs like a "Blue Hard Hat" program to identify and supervise new employees, toolbox talks, and daily task-hazard analysis.

FIGURE 4.1-12 WVB'S SAFETY STRATEGY

WVB's project Safety Plan describes actions required in each of these key areas for each stage of project delivery, the related management processes, systems and controls and all reporting requirements. Related responsibilities are clearly assigned to team members. Training and on-site instruction overseen by safety professionals includes site inspection and toolbox talks to ensure all team members are aware of site rules, risks, safety measures and emergency procedures. Subcontractors and suppliers are included and expected to comply with the Safety Plan at all times.

NO ONE GETS HURT

WVB member Walsh Construction's proven safety culture contributed to 680,000 man-hours with no lost time accidents in 39 months of work on the Accelerate I-465 program.

The Walsh-VINCI CJV uses a blue hard hat program, successfully used on the Milton-Madison Bridge and Cannelton Hydroelectric projects, to identify all new employees to ensure that they are being watched out for by the experienced personnel on the staff.

Specific safety risks and controls for particular activities, including working in the Tunnel, working near or over water, and road safety, are included in related method statements, and the teams involved in the work receive focused training. Specialized safety equipment and personal protective equipment are provided for particular tasks.

The safety of the traveling public is a key priority and WVB's Safety Plan establishes how WVB ensures the traveling public's safety through the use of advanced warning, appropriate signage and the use of safety barriers to create physical separation of personnel and equipment and the traveling public.

4.1.6.C ENVIRONMENTAL MANAGEMENT

WVB commits fully to achieving all of IFA's goals for the Project. This includes innovative and efficient design, construction and O&M solutions to minimize environmental impacts. The PMP ensures that all environmental requirements, permits and commitments are complied with, and provide evidence to demonstrate this. This includes the requirements of the 2012 Record of Decision (ROD), 2003 Final Environmental Impact Statement (FEIS) and 2012 Supplemental Final Environmental Impact Statement (SFEIS), and all other environmental approvals and laws. These procedures are defined in Control Process C3 in our IMS.

4.1.6.c.i Environmental Compliance Manager and Environmental Team

WVB has selected Gina Morris with Third Rock Consultants as the Environmental Compliance Manager (ECM), Gina is the single point of contact for all environmental matters throughout the Project. Third Rock Consultants is a strong Kentucky-based environmental DBE consulting firm with prequalifications in both Indiana and Kentucky. Gina has over 35 years of experience in NEPA documentation, environmental assessment, permitting and mitigation.

Prior to joining Third Rock, Gina was Assistant Director of the KYTC Division of Environmental Analysis,

SAFE AND SUSTAINABLE

Gina Morris, Environmental Compliance Manager, has over 35 years of experience including environmental compliance for KYTC.

and is a Professional Wetland Specialist as well as Professional Geologist. For many years she was responsible for ensuring environmental compliance for all KYTC projects. While at KYTC, she reviewed and commented on all environmental base studies and the Draft and Final EIS for the Louisville-Southern Indiana Ohio River Bridges project. As a result, she has a thorough understanding of the specific environmental commitments for the Project. Supervisors throughout the WVB team support Gina with environmental management. Many of WVB's task managers have proven experience with environmental management, such as permit applications, erosion control, noise abatement, and vibration monitoring.

ENVIRONMENTAL MANAGEMENT

WVB's experience includes relocating wildlife, such as this Peregrine Falcon at the Milton-Madison Bridge.

4.1.6.c.ii Environmental Compliance Management Plan (ECMP) Component Parts

Gina Morris, ECM, in collaboration with WVB's supervisors, oversees the completion of the ECMP and its submission for IFA approval in line with PPA requirements and in time for design work to begin.

ACHIEVING COMPLIANCE WITH ENVIRONMENTAL COMMITMENTS AND REQUIREMENTS: WVB has reviewed the Project environmental commitments and has incorporated them throughout preliminary design. As decisions made at design stage influence sustainability in all later project stages, Gina works closely with Laurent Agostini, Design-Build Coordinator, and Pierre Morand, Site Manager, to ensure all commitments and related controls, mitigations and monitoring measures are integrated effectively into our designs and construction approach.

All commitments and requirements are recorded in a Project Environmental Commitment Matrix, with owners assigned for each item. This is used to track achievement of each commitment and requirement. An associated schedule is developed to ensure permits are obtained, commitments satisfied, and reports submitted on time to allow design and construction to progress as planned. Gina also inputs to the ongoing development of the overall Project schedule, identifying upcoming environmental activities that require WVB team member involvement.

AVOIDING AND MINIMIZING ENVIRONMENTAL IMPACTS: The WVB Environmental Team has worked with our design, construction, and O&M staff to develop a Project Environmental Risk and Opportunity Register to identify potential impacts, suitable mitigation measures, and assign responsibility to appropriate team members. This includes potential impacts to woodlands, 4(f) resources, parks, historical properties, threatened or endangered species, and wetlands and waters of the United States.

NOISE/VIBRATION ABATEMENT

Walsh Construction's means and methods for the Wacker Drive Reconstruction project in downtown Chicago took into account the 57 high-rise buildings adjacent to the project site, requiring noise and blasting/vibration abatement plans.

ENVIRONMENTAL STEWARDSHIP

US 90 Bridge over Bay St. Louis included environmental management measures for construction around sensitive marine environment and endangered species.

Gina is directly involved in decisions in specific management plans and the approved Project environmental documents. She coordinates with Pierre Morand during activities adjacent to or within sensitive environmental resources to ensure appropriate environmental mitigation and control measures are implemented.

DOCUMENTATION: The ECMP includes a list of all related documentation, including applicable laws, regulations and industry best practice. This list is updated as necessary to ensure WVB remains compliant with the latest requirements. Environmental documentation is managed by our administrative team, according to IMS support process S7. It is made available to all team members online via our electronic document management system.

COMMUNICATION: The ECMP also describes WVB's procedures for environmental communication and reporting. This includes our organizational structure and reporting lines as well as contacts with IFA, stakeholders, and other third party organizations.

Environmental training requirements are finalized in a Project Environmental Compliance and Mitigation Training Program appended to the ECMP and includes the following:

- Design team training to ensure awareness of environmental requirements and constraints.

- Induction training to communicate key environmental concerns and controls.
- Brown bag talks to address specific issues in construction.
- Environmental progress and performance indicators communicated via progress review meetings and on-site posters.

WVB implements a reporting protocol describing the format for individual activities oversight reports and monthly environmental progress summaries. This information is used for progress reports required by the IFA and the end-of-Project documentation communicating steps taken to respond to changes during construction.

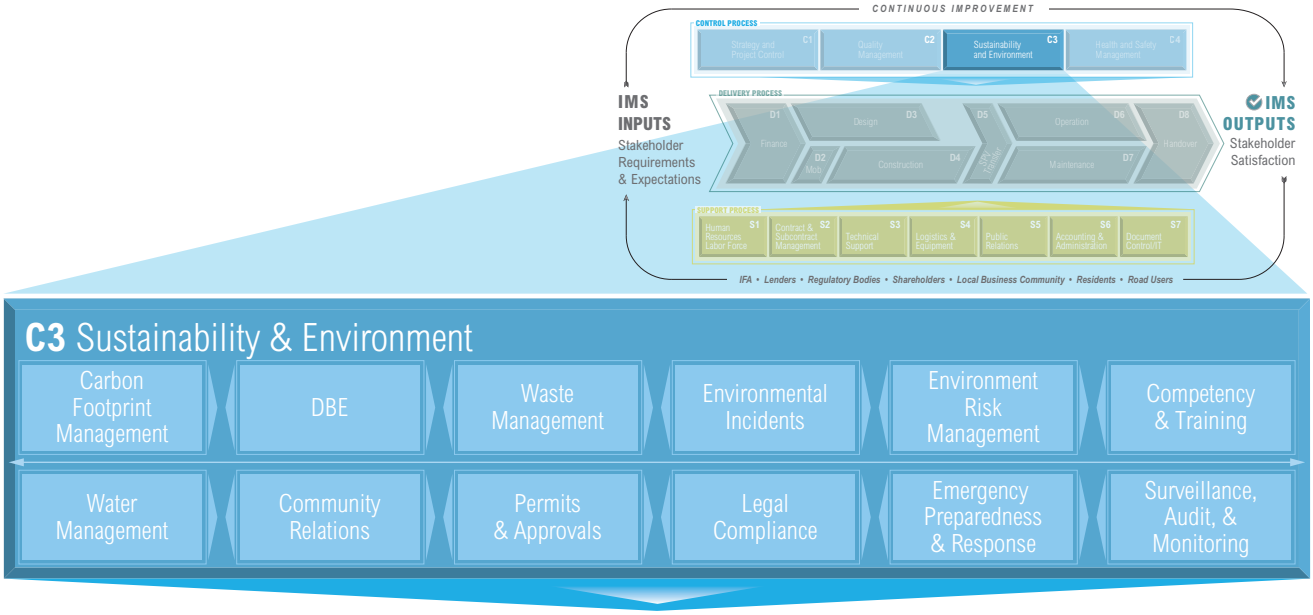
QUALITY CONTROL AND ASSURANCE: WVB conducts weekly and unannounced site inspections to confirm the correct implementation of all environmental controls. Martine Julia-Sanchez, our Quality and HSE Manager, owner of Control Process C3 (**Figure 4.1-13**), and the Project quality controls and assurance team lead bi-annual audits of the IMS including the Environmental Management System. All monitoring, testing, inspection, and audit results are recorded in templates appended to the ECMP to provide consistency in reporting. Results are analyzed by Gina and her team to enable trend analysis and the identification of any areas of non-compliance.

TAKING CORRECTIVE ACTION: Where monitoring, inspection or audit activity reveals potential or actual non-compliance. Gina evaluates the extent of damage, assesses the root causes and engages those members of her team with the appropriate expertise to determine additional plans, actions or approvals required before work can proceed. A corrective action plan is prepared and submitted for IFA approval and implementation. This plan is then monitored for effectiveness and tracked to completion. An agreed upon matrix of potential issues and their solutions with IFA and any relevant third party is implemented to minimize schedule impacts.

4.1.6.c.iii Integrating Permits, Issues, & Commitments into O&M

The IMS and WVB's sustainability policy apply through all stages of Project delivery, including the Operating Period. Project Manager, David Sikorski, owns the sustainability policy during design and construction; it then becomes the responsibility of Vincent Meyer, O&M Manager, once the new facilities become operational. Our O&M Team is involved throughout the design development process to maximize their awareness of, and input into, all decisions made at this time, including environmental matters.

FIGURE 4.1-13 CONTROL PROCESS C3 IS OWNED BY THE QUALITY AND HSE MANAGER



WVB's Environmental Commitment Matrix and Environmental Risk and Opportunity Register are reviewed and updated throughout design and construction stages for a clear record to use in the Operating Period. Vincent reviews these documents in advance of construction substantial completion to ensure any permits required to allow the Operating Period to commence are obtained. He then continues to update the matrix and register to provide ongoing assurance of our environmental compliance during the Operating Period.

During the final punch list stage of construction, WVB coordinates the workshop with IFA/INDOT to confirm the sustainability principles to be implemented during the Operating Period.

4.1.6.c.iv Mitigating, Eliminating & Reducing Risk

WVB applies a structured risk management approach to identify all Project environmental risks, assess potential consequences and calculate likelihood. This allows us to identify and implement appropriate measures to either eliminate a risk, or reduce and mitigate potential impacts (**Table 4.1-13**).

To ensure WVB's proposal incorporates necessary mitigation measures, our team has already begun to identify potential environmental risks. This continues through the design development and construction stages to ensure the Project remains compliant with any changes to legal or corporate requirements. Throughout this process, the WVB O&M Team is involved to ensure

TABLE 4.1-13 PROJECT-SPECIFIC ENVIRONMENTAL MITIGATION MEASURES

Area of Concern	Risks	Mitigation Measures
Groundwater and well head protection areas, surface water, wetlands and waters of the United States	Contamination of ground or surface water, by pollutant spills/ dust/run-off. Sediment damage to water quality and aquatic habitats.	All permanent roadway/structures in the WHPA designed so water is collected, filtered and disposed of at Harrods Creek. Haul roads constructed with liners and drainage for run-off water in the WHPA. Construction vehicles not to access wetlands and floodplains. Silt fences constructed where needed.
Riverbed (erosion)	Permanent loss of riverbed. Temporary loss of water quality.	Design uses a precast cofferdam tub footing, eliminating construction on the riverbed and removing this risk.
Restricted work zones	Non-compliance leading to e.g. damage to historical assets	Erect fencing and signage to demarcate restricted work zones. Cover restrictions in personnel training.
Reforestation	Permanent/temporary loss of vegetation	Develop designs to limit impacts and minimize footprint. Develop, implement and monitor project-specific Reforestation Plan. Use restrictive fencing and signage to prevent access/ damage by construction vehicles.
Terrestrial & aquatic wildlife, including endangered, threatened, rare species, and invasive species (zebra mussels)	Temporary or permanent loss of habitat/mobility. Noise/light/ vibration disturbance – incl. in breeding/nesting season.	Provide wildlife crossings for use in construction and operation. Develop construction access routes to limit temporary crossings of habitats. Schedule construction around breeding/nesting seasons. Methodology to limit requirement for construction activities in water. Training and awareness.
Cultural Resources due to blasting operations and construction vibration – Archaeological sites – Historic estates	Direct/indirect damage to/ destruction of archaeological or historic assets – identified and unidentified	Design works to avoid impacts. Fence off areas identified to prevent access and damage. Develop, implement and monitor a project-specific Noise and Vibration Plan. Train operatives in related issues and controls. Monitor to ensure noise/vibration stays within agreed limits.
Noise and viewshed	Disturbance of local residents. View disturbance. Wildlife disturbance	Construct temporary and permanent noise barriers; screening measures such as earth walls, noise walls, trees/shrubs and fencing.
Local residents and surrounding road	Blocking of access to local properties. Increased local congestion/noise/air pollution.	Implement design optimizations at Wolf Pen, Port Rd, SR 62, US 42 to limit staging timeline and off-site trucking. Route trucks onto major arteries. Brief drivers.
Hazardous materials	Increased waste disposal costs. Air, water and soil contamination. Safety risk.	Develop designs to limit potential for disturbance. Carry out ground surveys & develop Hazardous Materials Management Plan to control in line with best practice.

potential impacts on the Operating Period made during design and construction are considered and addressed.

4.1.6.c.v Compliance with the Environmental Management System

WVB uses the IMS to control project management through all stages of delivery. This system incorporates the best practice and proven management systems and controls in use throughout the WVB parent companies. It uses VINCI CGP's corporate ISO14001:2004-certified Environmental Management System (EMS) as a baseline.

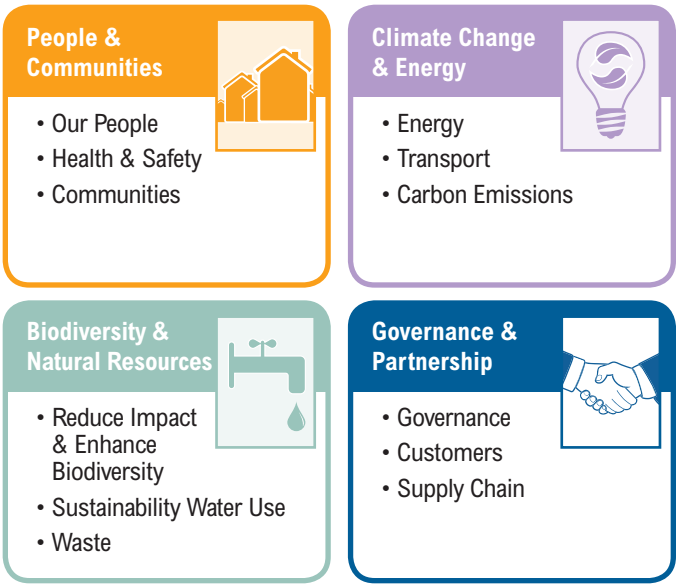
It is the overall responsibility of ECM, Gina Morris, to ensure compliance with the EMS at all times. Gina attends all relevant design-stage meetings to ensure WVB Design Team is fully aware of EMS requirements and incorporates these into designs and construction methodologies. She leads environmental risk identification and mitigation activity, trains other team members in their associated responsibilities, and maintains all required records during delivery.

Regular audits to ensure compliance are carried out at all Project stages. Compliance with the WVB EMS is audited and confirmed annually. Audits continue throughout the Operating Period to ensure continued effectiveness and application of the EMS.

ENVIRONMENTAL & SUSTAINABILITY ACHIEVEMENT

Constructed by VINCI CGP under ISO compliance and maintained by VINCI Concessions, Confederation Bridge won an Environmental Achievement Award and National Canadian Gold Award for Leadership.

FIGURE 4.1-14 SUSTAINABLE DELIVERY



4.1.6.c.vi Sustainability Management Plan

WVB's draft Sustainability Management Plan (SMP) is included in the Volume 2 Appendices. The SMP addresses each element of our sustainability strategy (**Figure 4.1-14**). It identifies Project-specific targets, key performance indicators, management procedures and responsibilities, as well as monitoring and reporting mechanisms. This ensures all aspects of sustainable development — environmental, economic and social — are considered throughout project delivery.

WVB's compliance with IFA/INDOT's requirements for a sustainable project throughout design, construction and operation:

- Is safe and secure
- Provides long term security
- Improves cross-river accessibility and mobility
- Optimizes life-cycle costs
- Provides economic opportunity
- Protects and conserves environmental resources
- Provides for proactive engagement with the public

The SMP is reviewed and updated at all monthly specialist sustainability team meetings to ensure it remains relevant, meets regulatory requirements and delivers IFA/INDOT expectations.

4.1.6.D RISK MANAGEMENT

WVB's risk management plan and risk register addresses each of IFA's concerns, including:

- 4.1.6.d.i Identification of Risk
- 4.1.6.d.ii Potential Consequences
- 4.1.6.d.iii Probability of Identified Risks
- 4.1.6.d.iv Risk Sensitivity Analysis
- 4.1.6.d.v Risk Mitigation Strategies

The following plan summarizes WVB's six-step project risk management approach. We identify and assess the potential probability of consequences of all significant risks on the Project. This approach allows us to identify and implement appropriate measures to either eliminate a risk entirely or reduce and mitigate the potential impacts of the risk. Applying this approach during the proposal period has contributed to the development of the project risk register, an extract from which is shown in **Table 4.1-14**.

1. Risk Management Planning: Engages key stakeholders (including IFA, INDOT, engineering, construction and health/safety/quality/environmental (HSQE) operations) to collaborate to manage risk.

2. Risk Event Identification: Identifies potential risk events and, for each, the affected process area, category, action owner, potential effects if no action is taken, and potential cause of failure.

3. Qualitative Risk Analysis: Prioritizes risks by analyzing the probability of occurrence, categorized in five levels across a range of 0-100% certainty, and impacts, categorized in five levels to determine potential impact on schedule, cost and resource.

4. Quantitative Risk Analysis: Assigns a risk relating to the potential impact on overall Project objectives. This analysis serves to place risk events on a heat map according to the total quantitative risk calculated as (Risk Probability) x (Risk Severity).

5. Risk Response Strategy: Determines options and action plans to mitigate events and enhance opportunities. This begins with all red (high level) risk events, then continues to yellow (medium) and green (low) risk events. Further priority can be established according to the risk level number. WVB uses Monte Carlo sensitivity analysis to ensure we prioritize risks correctly. Each risk is assigned an owner who is the most appropriate person to address that risk.

SAFE AND SUSTAINABLE

WVB uses a risk register that is constantly evolving throughout the life of the Project to ensure changing risks are accurately reflected. We use Monte Carlo sensitivity analysis to properly prioritize and address these risks.

6. Risk Monitoring and Control: An ongoing process overseeing the effectiveness of risk responses, monitoring residual risks at a predetermined frequency, recording action status, identifying and documenting new risks and assuring risk management processes are followed. This process is monitored and controlled using the project risk register.

The risk register remains an evolving document throughout Project delivery to ensure WVB can adapt its delivery approach to changing conditions. Relevant parts of the register are discussed and updated at all project review meetings, with the most significant risks reviewed at monthly senior management team meetings.

RISK MANAGEMENT IN PPP

WVB partners use proven risk assessment measures throughout all phases of finance, design, construction, and O&M learned from major PPP projects such as the Rion-Antirion Bridge.

TABLE 4.1-14 WVB RISK REGISTER WITH BEFORE AND AFTER MITIGATION RISK RATINGS

		BEFORE MITIGATION					AFTER MITIGATION				
Category	Description	Probability (P)	Severity (S)	Risk Rating	Mitigation Actions/Comments		Probability (P)	Severity (S)	Risk Rating	Potential Cost Impacts	Potential Schedule Impacts
Access & ROW	Right-of-way not available when needed	3	3	9	WVB has reviewed IFA expected ROW Access dates and has adjusted schedule of work to provide float between when parcels are required. Critical path activities are outside of unsecured parcels. No need to buy new parcels.		2	2	4	None	Medium
Geological	Tunnel geological site discrepancies	4	4	16	WVB has reviewed IFA provided GDR and GBR. WVB has completed 4 internal and independent reviews of data and all parties have agreed on correct Tunnel work plan. WVB has based schedule and cost of GBR information to remove risk. Additional measures are included for temporary support and excavation as required for each rock classification.		2	4	8	Medium	Medium
Design	Main span drilled shaft foundations; final design and geological considerations	4	4	16	Design risks for foundations include geological conditions, seismic loading, vessel impact and wind loading. Foundation design based on assumptions from IFA provided boring information and technical provisions. WVB has done preliminary wind/seismic/vessel studies and included info into design. Osterberg test to be completed to confirm assumptions prior to design completion.		3	3	9	Medium	Medium
Gov't Approvals	Delays from permitting and government approvals	2	4	8	IFA is providing major government approvals and providing preliminary permits. WVB has kept all major bridges within same footprints of permitted bridges to remove risk of requiring revised permits.		1	3	3	None	None
Earthquake	Damage and delays due to seismic events	1	5	5	Design performance criteria such as strain limits in reinforcing steel and concrete for primary and secondary bridge elements to minimize levels of damage.		1	3	3	Low	Medium
Flooding	River flooding causing delays to construction	4	5	20	Design innovation includes precast tub footing to limit required timeline for foundation work. This limits time susceptible to flooding risk during foundation work. Temporary causeways and tower crane are designed to be able to continue work through minor flooding.		2	4	8	Low	Medium
Hazardous Material	Delays due to encountering hazardous waste	2	3	6	Majority of construction is through greenfield, residential and farmland. The probability for finding hazardous materials is unlikely. Hazardous material spills from third parties is unlikely during construction since existing roadway is not hazardous material route. WVB will have all field personnel trained on our Hazardous Material Plan, including how to spot hazardous material and steps to take once hazardous material is found including communication to IFA and mitigation of spreading.		1	3	3	Low	None
Construction Completion	Schedule completion delay	4	5	20	WVB has completed detailed schedule of early events (administrative, financing and design) to ensure early construction start. Early design packages allow for early RFC drawings and earlier construction throughout. Bridge design removes bridge from critical path work and provides float. Tunnel work is on critical path from start to finish. Tunnel schedule is based on 5 days per week. This allows for schedule recovery on weekends during excavation work. All other Tunnel work could be accomplished with second and third shifts to reduce time frame.		3	3	9	High	High
Operations	Traveling public complaints	3	3	9	WVB will have the appropriate organization structure, with staff available 24/7 and an on-call duty for managers, to adequately respond to emergencies, incidents and any user complaint rapidly		1	2	2	None	None
Maintenance	Unexpected maintenance required	3	4	12	WVB has put in place a proactive maintenance strategy with daily visual inspections and frequent detailed inspections to rapidly identify and rectify smaller defects before they become big problems. Durability of construction materials are engineered at design stage.		3	2	6	Low	None
Demand	Lack of personnel/materials/ equipment to complete Project	3	4	12	WVB is pulling from team members local work force and is subcontracting with many local subcontractors to utilize existing workforce, management and equipment that is already within the region. Material vendors and additional subcontractors have already been communicated with and are aware of schedule constraints and have confirmed ability to meet demands.		2	2	4	None	None
Inflation	Inflation during construction and O&M	4	2	8	WVB has designed reliable and long-lasting elements, such as concrete pavement that decrease the amount of maintenance and frequency of replacements, minimizing risk from exposure to future cost escalation. Early stage procurement during construction and equipment purchasing		2	2	4	Low	None
Financing	Difficulties obtaining funds required to pay for work	2	4	8	WVB has created a finance plan taking into account both financing costs and the financial needs throughout the design and construction phase.		1	4	4	Low	Low
Legislative Policy	Changes in design and construction requirements due to new safety regulations	2	3	6	WVB has a strong safety plan that exceeds, when possible, current standards and enables WVB to react to and incorporate quickly new legislation.		2	2	4	Medium	Low
Technology	New technology makes current systems obsolete	4	2	8	WVB uses up-to-date technology for its ITS and bridge monitoring systems.		3	2	6	Low	None
Residual Value	Anticipation of rehabilitation works if needed before end of O&M period	3	3	9	WVB will create a plan six years before handback and, through the three inspections leading up to handback, identify and take care of issues. Design has incorporated added residual life for items such as concrete pavement and existing structure deck replacements.		2	2	4	Medium	None

	1	2	3	4	5
Probability (P)	1	2	3	4	5
Severity (S)	1	2	3	4	5
Risk Rating (P x S)	1	4	9	16	25

4.1.7 ELECTRONIC DATA MANAGEMENT SYSTEM (EDMS)

A significant volume of data is generated, processed and shared within WVB's Team and with the IFA on a daily basis over the life of the Project. The documents and records to be controlled are summarized in **Figure 4.1-15**. WVB's approach and Electronic Document Management System (EDMS), called DyMaDoc, address each of the IFA's concerns:

- 4.1.7.a Maintaining Documents
- 4.1.7.b Format
- 4.1.7.c Project Documentation Security and Backup Approach

All documentation is securely stored and controlled digitally in DyMaDoc. This process controls the evolution of a document during all stages of its life, from preliminary to as-built status, regarding all comments, review status (stamps obtained from designated authorities), and distribution. It provides intuitive access to all applicable documentation via a simple web-based interface. At all stages of construction, records are available to the IFA.

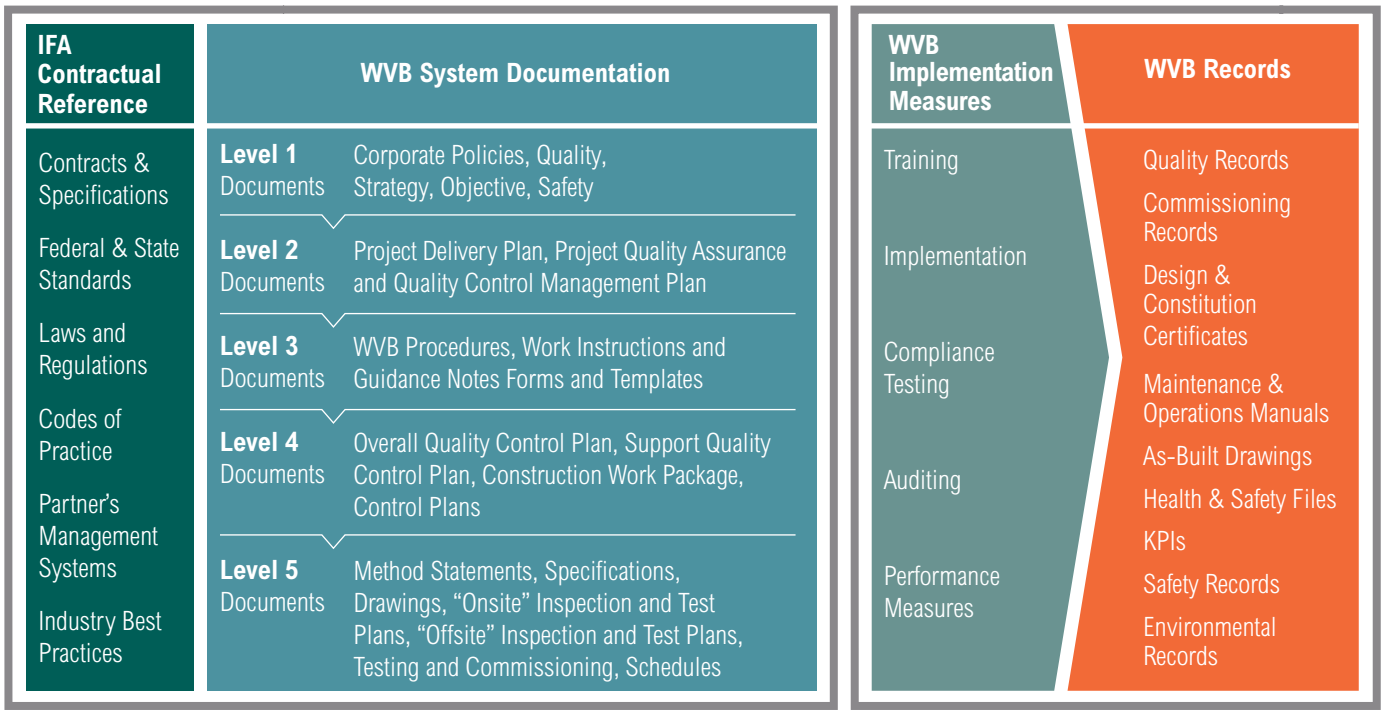
Secure access to the dedicated documentation, procedures and forms for each project management process is provided online via a fully interactive version of the IMS, linked to DyMaDoc. Users click on a particular strategic process within DyMaDoc, which shows the user the related management process. Selecting a part of this process provides the user with an associated management process profile sheet that lists and provides links to all related documentation (such as, descriptions of procedures, template forms and applicable permits. Upon the start of the Operating Period, documents are transferred to the WVB O&M Team.

Documents to be distributed for information and review only are stored as PDF files, preventing unauthorized changes. Original, editable versions of documents are accessible only by authorized personnel. Documents are stored in the most relevant format; Microsoft Office, Primavera P6 or AutoCAD files, as appropriate.

Access to project documentation is available only to authorized personnel. Access is granted, accounts created and passwords provided for individuals according to their status on the project. Access is controlled via standard Windows Access Control Lists based on group memberships defined within an active directory.

Data is backed up to a secure cloud provider, where it is encrypted with a key known only to WVB personnel.

FIGURE 4.1-15 DOCUMENT CONTROL SUMMARY



Form N - Completion Dates

FORM N

COMPLETION DEADLINES

Milestone Schedule
For East End Crossing

IFA Last Allowable Dates:

Milestone	Deadline
Baseline Substantial Completion	**June 30, 2017**
Financial Close Deadline	the date established by the Developer for Financial Close in its proposal, as such date may be extended by IFA as provided in the PPA, but in no event earlier than February 15, 2013
Long Stop Date	12 months after Baseline Substantial Completion
Final Acceptance Deadline	120 days after Substantial Completion Date

Proposal Commitment Dates (cannot exceed the above table):

Milestone	Deadline
Satisfaction of NTP1 Conditions	**0** calendar days after the execution of the PPA
Satisfaction of NTP2 Conditions	**139** calendar days after the date IFA issues NTP1
Financial Close Deadline	**4/1/13**
Commencement of Construction	**6/3/13**
Baseline Substantial Completion	**10/31/16**
Long Stop Date	**10/31/17**
Final Acceptance Deadline	**2/28/17**

4.2 Design-Build Plan

4.2 DESIGN-BUILD PLAN

WVB East End Partners (WVB) has developed a Design-Build Plan (DBP) for the East End Crossing (Project) that is tailored precisely for IFA with the "End Goal in Mind." Led by the Walsh-VINCI Construction Joint Venture (Walsh-VINCI CJV), WVB's DBP provides IFA with innovative design, construction, and permitting solutions, which will result in the delivery of a high-quality, durable, maintainable, and aesthetic facility.

WVB's approach incorporates technical solutions with innovative features that exceed the contract requirements to provide IFA and the local community a world-class Project. WVB's integrated team combines Walsh's local and national knowledge with VINCI's technical and global experience, supported by qualified local subcontractors and designers.

Walsh-VINCI CJV's DBP is built on the principles of quality and safety in all elements. Both CJV partners being a part of the Concession and Operations and Maintenance (O&M) Teams strengthens the developmental processes through vertical integration and proves WVB's long-term commitment to IFA.

One Team, One Project, One Community
This symbol highlights items that show WVB's value added throughout the document.

This combined teamwork ensures a quality result and approach throughout the entire delivery process, guaranteeing a successful Project for all parties.

The Walsh-VINCI CJV is led by our Construction Manager, Brian Hoppel. Brian has managed many successful projects for the State of Indiana and has the proven skills for incorporating innovation and quality into design and construction. These qualities can be substantiated through his most recent success, the Milton-Madison Bridge project.

Walsh-VINCI CJV understands the established Project expectations and goals. WVB's DBP has been developed to exceed the needs and expectations of IFA and the public. With the proven processes and experienced personnel in place, WVB will hit the ground running with creative and sensible technical solutions.

4.2.1 DESIGN-BUILD TECHNICAL SOLUTIONS

Development of the Project provides the unique challenge of meeting the needs and requirements of two states while uniting them for a prosperous future with the East End Bridge serving as the connecting inspiration.

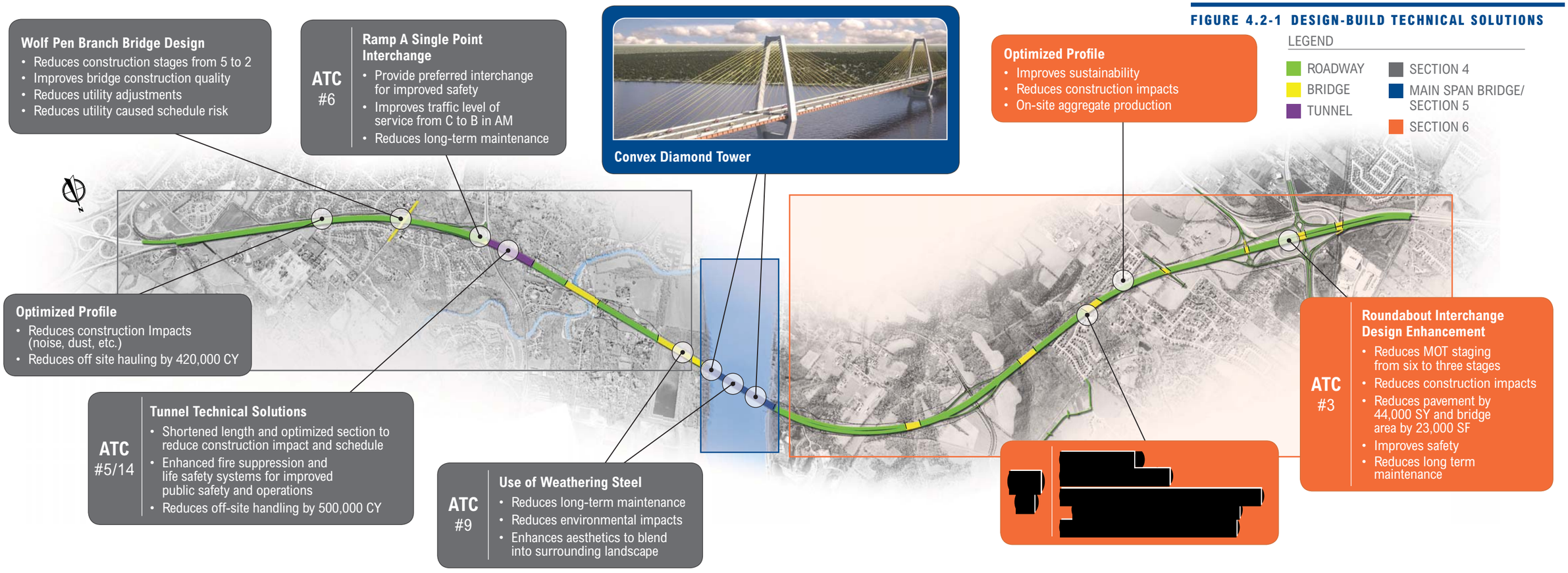
With IFA's provided Reference Information Documents (RID), the Walsh-VINCI CJV has analyzed the preliminary design and local community goals to develop innovative design and construction solutions. Involving the local community and other stakeholders in the development of the solution ensures the end product is a source of pride for the entire community.

Walsh-VINCI CJV developed solutions that meet all Project objectives and minimize environmental and construction impacts. Included in these solutions are seven ATCs that enhance design, provide long-term benefits to safety and maintainability, and provide IFA a net present value savings. Originally presented as WVB ATC #3, the enhanced SR 265/SR 62/Port Road interchange improves construction efficiency for this element of the Project by 40 percent compared to the original concept, significantly minimizing associated construction impacts, improving safety, and reducing long-term maintenance. Walsh-VINCI CJV provides a summary of incorporated technical solutions and associated benefits in **Figure 4.2-1**.

LONG-TERM ASSET

WVB's creative and context-sensitive technical solutions, including the enhanced SR 265/SR 62/Port Road interchange, provide IFA with a higher quality long-term asset with reduced maintenance.

FIGURE 4.2-1 DESIGN-BUILD TECHNICAL SOLUTIONS



Walsh - VINCI CJV Design-Build Innovative and Technical Solutions

Section 4 - East End Kentucky Approach		Section 5 - East End Bridge		Section 6 - East End Indiana Approach	
Challenge	**Technical Solution**	**Challenge**	**Technical Solution**	**Challenge**	**Technical Solution**
• Tunnel geotechnical excavation and support	• Four Internal analyses to optimize excavation and support measures; optimal cross-section and shape, ATC #14	• River flooding	• Precast floating tub foundation to mitigate river fluctuations and provide shortened construction schedule	• Interchange maintenance of traffic	• Enhanced interchange design with reduce traffic stages and improved safety
• Tunnel construction schedule	• Shorten Tunnel length by 14% and 24hr/day (3-shift) excavation schedule	• Bridge height 300' restriction and other commitments	• Convex diamond tower provides most efficient cable/superstructure design	• Earthwork balancing	• Optimized mainline and local road profiles
• Constructing highway through historical character area	• Minimize construction activities to reduce impact to historic area and design portals to blend with surrounding landscape	• Bridge aesthetics	• Reduced overall section for streamline design with blended limestone color and convex diamond tower	• Existing bridge maintenance and handback	• Replaced existing bridge decks for enhanced useful life and reduced long-term maintenance
Construction Impact	**Mitigation**	**Construction Impact**	**Mitigation**	**Construction Impact**	**Mitigation**
• Wolf Pen local residence and maintenance of traffic	• Adjusted bridge location for single stage bridge construction and reduced utility conflicts	• Marine traffic and safety	• Optimized design and construction staging to reduce schedule and time in water	• [redacted]	• [redacted]
• Dust, noise, and, vibration	• Optimized profile to reduce rock blasting and reduced haul-off by 920,000 CY equating to over 2,024,000 truck miles	• Louisville Water Company wellhead protection	• Utilizing off site tug/barge yard; designed liner system for access road	• Environmental footprint	• Roundabout design reduced area footprint by 15 acres, reduced environmental impacts and improved public safety
• Constructing within historical districts	• Restricted work zones, temporary and permanent viewshed barriers, fencing and landscaping	• Long term maintenance/ environmental	• Weathering steel for reduced maintenance and environmental impacts, ATC #9	• Traveling public disruptions	• Reduce traffic disruptions and adds residual life at handback by utilizing a long-term concrete pavement design that minimizes maintenance and rehabilitation work.

4.2.1.1 EAST END BRIDGE STRUCTURE

WVB envisions a unique, innovative bridge structure fitting seamlessly with the historic characteristics of the region. To meet this vision, WVB used the Bridge Type Selection Process (BTSP) information along with state-of-the-art engineering and construction techniques to provide the most efficient, durable, long-lasting and aesthetically-pleasing structure. WVB selected and designed a bridge structure exemplifying local historic characteristics, including slenderness and visual transparency, that are a source of pride for the community.

WVB experts, including Marcos Loizias and Donald MacDonald (Lead Engineer and Aesthetic Manager, respectively) evaluated each available structure type on the criteria shown on **Table 4.2-1**. WVB selected the most effective solution that meets all requirements and commitments: a cable-stayed bridge with convex diamond towers, Bridge Alternative A-3.

TABLE 4.2-1 BRIDGE TYPES COMPARISON MATRIX

Bridge Type (Per TP Section 15.4.1)	Aesthetics	Construction Cost	Life-Cycle Costs	Construction Time	Constructability	Engineering Performance	Maintenance	Security / Protection
A-1: Steel Tied Arch	●	●	●	●	●	●	●	●
A-2: Concave Diamond Tower Cable Stayed	●	●	●	●	●	●	●	●
A-3: Convex Diamond Tower Cable Stayed	●	●	●	●	●	●	●	●
A-4: Median Tower Cable Stayed (Outside Cables)	●	●	●	●	●	●	●	●
A-5: Median Tower Cable Stayed (Median Cables)	●	●	●	●	●	●	●	●
A-6: Median Tower Cable Stayed with Suspension Cables	●	●	●	●	●	●	●	●

● Low ● Medium ● High

4.2.1.1.a Preliminary Bridge Schematic

The 2,280-foot-long convex diamond tower steel composite cable-stayed design provides an aesthetically pleasing and structurally efficient design. The bridge is flanked at each end by 115-foot-long steel plate girder simple spans for a total main span structure length of 2,510 feet.

While the overall length of the main span matches the RFP concept, WVB has reduced the length of the cable-stayed bridge by 230 feet, which provides several benefits including structural optimization, reduced construction and life-cycle costs, and improved constructability and safety. The Kentucky approach span is 1,966 feet long and features an eight-span continuous steel plate girder bridge. The full schematic of the East End Bridge is shown in provided roll plots and summary layout in **Figure 4.2-2**.

4.2.1.1.b Substructure Preliminary Design

The substructure for the main span structure consists of Anchor Pier 2, Tower 3, Tower 4, and Anchor Pier 5 to support the cable-stayed bridge; flanked by Kentucky Pier 1 and the Indiana Abutment.

The locations of Anchor Piers 2 and 5 have been optimized to 540 feet from the towers compared to 430 feet per the RFP concept. This arrangement:

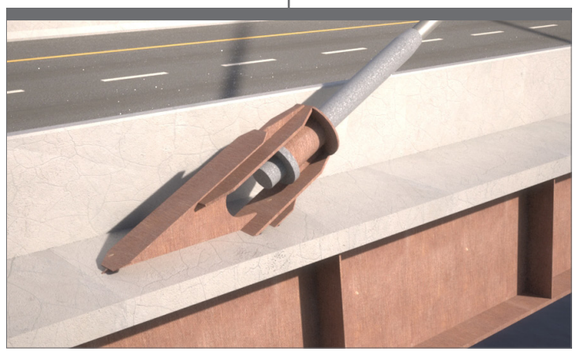
- Improves superstructure efficiency
- Reduces pier vulnerability to collision loads
- Reduces bank impacts during construction
- Enhances access for future bearing inspections

The anchor piers comprise three 8-foot-diameter, reinforced concrete columns extending from drilled shaft foundations. The Kentucky approach span piers are also three-column bents for aesthetic consistency but are founded on driven H piles.

The two convex diamond towers extend approximately 300 feet above normal pool elevation to become the dominant visual element of the bridge. The tower shape provides greater torsional and transverse stiffness to resist wind, seismic, and other load demands, and is a more redundant and robust structure than a single pylon structure.

Analysis of the provided geotechnical information concluded that the towers be supported by 8-foot-diameter drilled shafts socketed into bedrock at a depth of 110+ feet from normal pool. The drilled shafts are capped with a 16-foot-thick waterline footing and have a transverse shear wall between the tower legs for added strength to resist ship impacts. The waterline footings, constructed inside precast cofferdam tubs, minimize river flow disruptions, future riverbed scour, and navigation disruption during construction.

FIGURE 4.2-2 SUBSTRUCTURE AND SUPERSTRUCTURE COMPONENTS FOR THE EAST END BRIDGE STRUCTURE



STAY-CABLES *(Superstructure)*

- Stay cable system has a design service life of up to 75 years, 15 more than required.
- Bridge is supported by 104 parallel-strand stay cables arranged in a modified fan arrangement, which improves efficiency and reduces force demands on the edge girders.
- Stay cables are connected to edge girders using in-line, fin-shaped anchorages welded to the top flange of the edge girder, which provides a direct load path of the stay forces through the top flange into the girder webs.
- Parallel strand cables composed of multiple 0.60-inch diameter strands with multiple levels of corrosion protection.
  - Individual strands encased in a polyethylene sheath filled with a corrosion blocking compound entirely surrounding the wires of the strands. The blocking compound also reduces fretting between wires and increases the fatigue life of the strands.
  - Strands housed inside a two-layer, co-extruded HDPE sheath with double-helix fillets to mitigate rain and wind vibration.
- Engineered so that individual stay cable strands can be removed for inspection and testing, or replacement if necessary, while maintaining traffic on the bridge.

MAIN TOWERS *(Substructure)*

- Aesthetically pleasing and structurally efficient convex diamond stay towers extend approximately 300 feet above normal pool elevation to become the dominant visual element of the bridge.
- Inclined reinforced concrete tower legs, with a hollow box section, are stiffened by a roadway strut and a top strut, thereby reducing bending moment demands in the tower legs.
- Tower legs permit clear passage of the superstructure for ease of construction and simplicity of details. Fly-thru arrangement offers greater ease for stay cable force adjustments.
- Structural steel stay cable anchor boxes are cast into the upper tower legs to provide anchorage to the stay cables. These assemblies resist tensile forces and unbalanced cable loads.
- Anchor box sections in 12-foot long segments are easily lifted into place with a tower crane and connect to each other with bolted connections. The anchor boxes are shop fabricated as a unit to fully incorporate the geometry requirements for the stay cable anchors.
- The stay cables and anchorage boxes are offset from the centerline of the tower legs to provide easy access for anchorage inspection inside the towers. Access ladders and platforms are installed from deck level to tower top.

DECK CROSS-SECTION *(Superstructure)*

- Inclined stay cables support the bridge deck on each side, providing for out-to-out deck width of 123 feet 8 inches (reduced from 131 feet 6 inches per RID).
- Bridge deck is composed of 7-foot-deep longitudinal steel edge girders on each side connected by transverse floorbeams which support 10-inch-thick precast concrete deck panels and cast-in-place infills to create a composite roadway deck.
- Use of steel-concrete composite section minimizes the weight of the bridge and accelerates construction.
- 2-inch-thick latex modified concrete overlay is placed atop the precast panels, providing for greater durability and extended life of the deck.
- Stay cable anchorages are spaced 45 feet apart while the floorbeams are spaced at 15 feet intervals, providing optimum efficiency of structural steel framing and concrete deck.
- HPS 70W structural steel and high-performance concrete are used in the bridge superstructure, providing optimum design and reduced maintenance costs.
- A full-length inspection catwalk with access holes through the floorbeams is provided under the deck to allow inspectors to easily walk the bridge length below the deck.

FOUNDATIONS *(Substructure)*

- Each stay tower is supported by 8-foot diameter drilled shafts socketed into competent limestone at a depth of 110+ feet from normal pool elevation.
- Precast concrete cofferdam tubs are used as a template for installing the drilled shafts and to cast the waterline footings. Tubs are used as sacrificial forms and are not treated as structural members, mitigating maintenance of foundation concrete as related to local damage in the event of vessel collision.
- Cofferdam tubs allow for minimal use of marine equipment for drilled shaft installation, mitigating impacts to normal Ohio River barge traffic and recreational users.
- Drilled shafts are capped with a 16-foot thick waterline footing that, along with a transverse shear wall at the base of the stay tower legs, provides added strength to resist ship impacts.
- Waterline footings offer cost savings and easier construction while reducing environmental impacts, minimizing river flow disruptions, and preventing future riverbed scour.

Stay-cable connections at the towers consist of structural steel anchor boxes cast into the upper tower legs. The stay cables and anchorage boxes are offset from the centerline of the tower legs to provide easy access for anchorage inspection inside the towers. Construction sequence of the towers, substructure, and superstructure is detailed in **Figure 4.2-3**, with full sequencing details and schedule provided in Volume 2 Appendices.

4.2.1.1.c Superstructure Preliminary Design

The deck of the cable-stayed bridge is a composite steel section comprised of 7-foot-deep longitudinal steel I-shaped edge girders on each side, transverse floor beams, and 10-inch-thick precast concrete deck panels. High-performance concrete (HPC) is used in the precast deck panels and infills, while high-performance structural steel (HPS) 70W is used for efficient girder sizes that resist axial and load demands.

HPS 70W weathering characteristics provide a more durable design with low life-cycle costs that achieves the 100-year design service life while minimizing long-term maintenance costs. Stay cable anchorages are welded directly to the edge girder top flanges, providing a direct load path from the cable through the top flange and into the girder webs. This design enhances the aesthetics of the edge girders and optimizes structural performance.

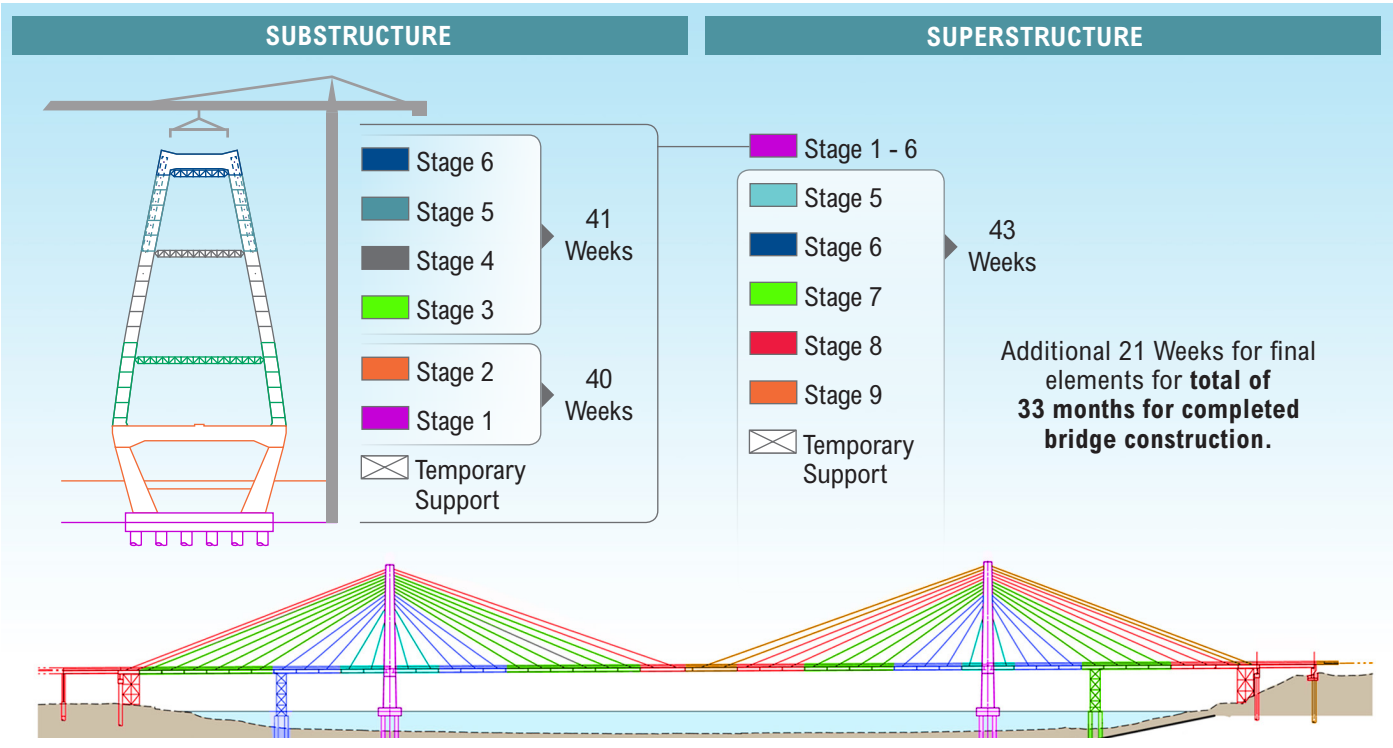
The superstructure is erected simultaneously at the two towers using the balanced cantilever method, as shown on **Figure 4.2-4**, to expedite schedule. Pre-assembled 45-foot-long segments consisting of two edge girders and three floor beams are erected with a pair of stay cables installed and stressed, followed by erection and connection of precast deck panels. The superstructure section is erected using barge-mounted and tower cranes. Our staggered

FIGURE 4.2-4 BALANCED CANTILEVER METHOD

WVB utilizes a fast-track, 7-day segmental erection cycle based on experience constructing Rion-Antirion Bridge in Greece.

FIGURE 4.2-3 EAST END BRIDGE ERECTION SEQUENCE AND SCHEDULE

WVB's construction sequencing and corresponding schedule are based on experience from other cable-stayed and river crossing structures, such as the Q-Bridge in Connecticut and the second Severn Crossing in the United Kingdom.



erection sequence accommodates uninterrupted river traffic by typically isolating the floating equipment to a single side of the channel.

The Indiana transition and Kentucky approach span consist of nine lines of steel composite girders to support a reinforced concrete deck slab. The steel girders of the Kentucky approach are erected using land-based cranes to erect pier (cantilever) segments followed by drop-in segments between inflection points.

4.2.1.1.d Requirements and Commitments

WVB's design meets the requirements of Government approvals, the NEPA documents and environmental commitments, and is sensitive to Louisville Water Company's (LWC) Wellhead Protection Area (WHPA) (**Table 4.2-2**).

4.2.1.1.e Architectural Argument

The BTSP produced four publicly-presented aesthetic recommendations that have been followed by the WVB Design Team. The convex diamond towers and other curved vertical elements, such as the roadway lighting and pedestrian walkway railings, give the bridge a curvilinear theme. Bridge coloring uses uncoated concrete elements, rust colored structural steel, warm grey metal bridge elements, and classic white aesthetic lighting on the bridge. The BTSP also produced a list of suggested refinements during the design phase. Many of these refinements, including towers detailed with reveals and the curved open diamond shape creating slender towers, are clearly reflected in WVB's proposal design. Our design adheres to the MOA commitments including minimizing light, noise, and sensitivity to the historic cultural context.

POSITIVE IMPACT ON THE AREA AND COMMUNITY

WVB's vision of the East End Bridge can be appreciated in the bridge animation in the Volume 2 Appendices.

WVB's design addresses all nine of the Technical Provisions' essential aesthetic design guidelines while creating a visually outstanding bridge (**Figure 4.2-5**). The bridge design honors the local historic and cultural context, borrows from local building traditions, and strikes a modern, efficient aesthetic tone to create an understated architectural symbol for the community that maximizes natural views of the river and surroundings.

TABLE 4.2-2 MEETING REQUIREMENTS AND COMMITMENTS

WVB's schematic design meets NEPA, governmental approvals, and environmental commitments.

Government Approval	Controlling Element	Comments	Meets Commitments
FAA Tall Structures Permit – for Crane	Crane Height	Crane height will be below height approved in FAA permit	✓
FAA Tall Structures Permit – for Bridge	Bridge Tower Height	Tower height will be below height approved in FAA permit	✓
USCG Section 9 Permit	Bridge Clearances	Provides full 900-ft permanent channel width and 600-ft channel during construction	✓
USACE Section 10 Bridge Permit	Construction in Navigable Waters and fill	Proposed temporary and permanent fill placement is within range shown in permit application and is within RID design	✓
USACE Section 404 Permit	Placement of fill in waters of the U.S.	Proposed temporary and permanent fill placement is within range shown in permit application and is within RID design	✓
IDEM Section 401 Water Quality Certification Permit	State Water Quality Standards	Proposed construction essentially the same as RID proposal in manner and extent	✓
LWC Filtration Tunnel	Construction near Tunnel	No pier construction within 40 ft of Tunnel	✓
LWC/WHPA	Discharge of bridge drainage	All bridge runoff will be collected and properly disposed	✓
LWC/WHPA	Use of polymer slurries	No bentonite or polymer slurries used for drilling within WHPA	✓
Zebra Mussels	Construction Equipment free of zebra mussels	All construction equipment used in the Ohio River and tributaries is free of zebra mussels	✓

FIGURE 4.2-5 WVB EAST END BRIDGE DESIGN EXCEEDS ALL AESTHETIC DESIGN GUIDELINES

Leveraging the historic, cultural, and environmental context of this unique Ohio River region, the WVB's design creates a safe, symbolic 21st century structure that addresses all nine of the essential aesthetic design guidelines.

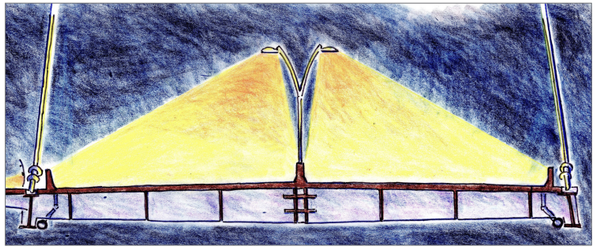
1 The bridge towers are modeled after the historic ground hog type lime kiln to create a **symbolic, memorable bridge for local residents**. Both the lime kiln and bridge towers possess a simple, utilitarian aesthetic that highlights their understated gently curved architectural flair. Drivers will experience the tower legs' stacked concrete gradually arching up and over them as they go through the tower openings reminiscent to lime workers passing through the historic lime kiln's arched doorway.

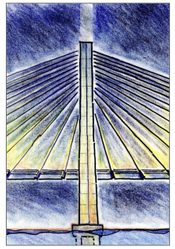
2 WVB's design utilizes modern efficiency to be as **visually transparent and unobtrusive** as possible. By splitting the superstructure into thinner members with an open diamond design, along with judiciously spacing the cables to spread out as they descend to eye-level, viewers can better see through the bridge to the landscape beyond. The number and thickness of elements are efficiently minimized and spread across the view to substantially lessen the effect of the bridge on the view shed.

3 The pedestrian path is designed to be the most enjoyable way to cross the bridge due to its being **user-friendly and maximizing the feeling of safety**. User-friendly elements include the pedestrian-scale size and spacing of barrier elements and the extra space provided at the towers to stop, rest, and take in the view. Pedestrians feel safer due to the physical and visual separation created by locating cables and barrier elements between the path and roadway all the way across the bridge.

4 **Natural views are preserved** by maximizing the use of horizontal design elements because they do not restrict as much of the viewer's range as vertical elements and thus appear less obtrusive. For example, barrier components are designed to be mostly horizontal. The roadway section depth is minimized, contributing to this horizontality to be viewed as a line in the horizon. Furthermore, the pedestrian path provides previously unseen views downstream enhancing the area's natural views.

5 By paying critical attention to detail, **the bridge becomes meaningful**. Tapering and properly proportioning the towers elements are critical large scale details. Smaller components are tailored at a scale appropriate for the various speeds of the bridge's different users, such as roadway lights for drivers and handrails for pedestrians. To create a coherent experience throughout, the understated simplicity of efficiency is used where detail without any meaning would visually clutter the bridge.





6 Safety, aesthetic, and environmental **lighting design features are implemented to be subtle and non-intrusive**. Towers and cables are up lit from the roadway to gradually diffuse higher up and disappear into the sky. Roadway lighting is mounted in the center of the roadway spaced at the maximum safe distance so the roadway edges will prevent light spilling over the bridge edge and intrusively flooding down onto the river or shoreline. Only highly efficient LED lights are used to further minimize any environmental impact.

7 The bridge **blends into the landscape by relating to local colors and finishes**. All concrete support structures are uncoated concrete with horizontal grooves to mimic local horizontally layered limestone cliffs. Supporting the layer of concrete roadway deck, a layer of weathering steel girders and beams creates a horizontal rust-colored datum similar to the rust-stained layers of iron oxide rich local limestone. Cable and other metal elements are a warm grey color found to be the most likely to blend in with the naturally occurring stone.

8 The bridge complements the surroundings by **relating to the local vegetation, landforms, and materials**. Bent roadway lighting poles and pedestrian barriers are modeled after organically bent mature native trees along the river. The horizontal nature of the roadway's form complements the area's numerous natural horizontal forms, such as the surface of the river, the layered limestone outcroppings, and the flat-topped bluffs overlooking the river.

9 The East End Bridge is **one part of an overall transportation project** that stretches through Indiana and Kentucky. A consistent palette of materials and building forms honoring the native landscape is used throughout to achieve cohesiveness, such as weathering steel, stacked limestone forms, and gently curved shapes. Efficient design enables a shorter construction period creating consistent aging throughout the whole project and further lending cohesiveness through historic consistency.

4.2.1.2 TUNNEL ELEMENTS

The portals and approaches for the Tunnel have been designed to blend with the existing surroundings and enhance the overall local landscape (**Figure 4.2-6**). Technical solutions incorporated into the plan minimize impacts during construction while providing the most efficient design to prolong asset life and increase public safety.

State-of-the-art life safety systems are used to provide an exceptional level of protection against a variety of fire types. A fire detection system is coupled with a foam/water sprinkler system and added drainage inlets to create a complete fire suppression system capable of controlling a flammable liquid fire. This system restricts the rapid spread of a Tunnel fire, allowing additional time for traditional fire-fighting techniques and emergency evacuation, improving safety for emergency responders. The Tunnel electrical system has been designed to fully withstand a fire event, further enhancing public safety. These design solutions, accompanied by an improved interior configuration, maximize safety egress and maintenance access, while providing a better long-term asset for KYTC.

Further, these solutions prolong the life of the structure and allow for an efficient O&M program when the Tunnel is completed. Consideration has been taken to shorten the construction schedule, reduce local impacts, and minimize maintenance requirements and cost.

With the Tunnel being the Project's critical path schedule activity, Walsh-VINCI CJV incorporates several innovations to complete Tunnel construction prior to IFA's deadline. This early completion allows opening of the Project to revenue-generating traffic by October 31, 2016, eight months ahead of IFA's goal of mid-2017.

LONG-TERM ASSET

The state-of-the-art life safety systems will maximize safety and egress while providing a better long-term asset for KYTC.

4.2.1.2.a Early Construction of Tunnel Elements

The excavation and support schedule for the Tunnel is based on the geotechnical conditions under the Drumanard Estate. A detailed review of the conditions led to the selected drill and blast process resulting in specific temporary support measures and excavation cycle times for each rock classification. The cycle-times were expanded to develop the overall schedule using an offset multiple heading excavation plan as shown on **Figure 4.2-7** and detailed in Volume 2 Appendices: Tunnel Construction Methods and Tunnel animation, showing the full Tunnel construction sequence. The temporary support system mitigates potential geotechnical risks and reduces the need to implement Tunnel contingency plans. Tunnel excavation and temporary support items are constructed on a 24-hour per day, five day a week schedule, with concrete liner work occurring around the clock.

Before commencing Tunnel construction, several preconstruction processes occur immediately after Project award and during the design phase. These include: community notifications, establishing a settlement and seismic monitoring system, and erosion mitigation measures.

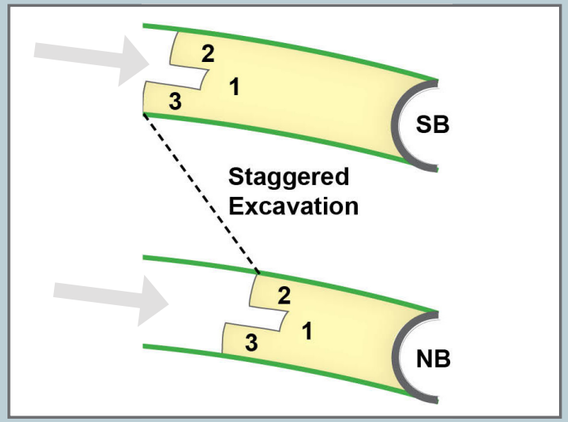
FIGURE 4.2-6 DRUMANARD TUNNEL NORTH PORTAL DESIGN

WVB's Tunnel design blends with the existing surroundings and enhances the overall landscape.

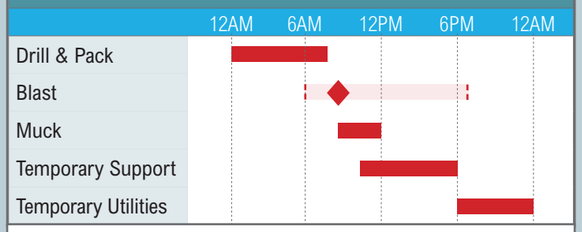
FIGURE 4.2-7 PROPOSED TUNNEL CONSTRUCTION METHODS AND SCHEDULE

A Excavation & Temporary Support

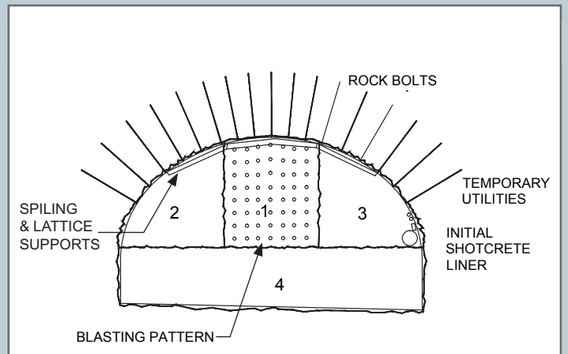
- NB tunnel to advance ahead of SB tunnel by approximately 200 ft.
- Top section split into three headings led with pilot heading (1)
- Side headings (2, 3) to stagger behind approximately 50 ft.
- Bench excavation (4) to follow up headings
- Drill and Blast method to be utilized for excavation with blasting patterns and delays to control noise and vibrations
- Daily cycles to be utilized for increased productivity, improved safety and reduced overall schedule and construction impacts
- Temporary support and daily blasting lengths to be based on actual rock geology
- Further details provided in Volume 2 Appendices



PRELIMINARY 24-HOUR EXCAVATION CYCLE



24-hour construction cycle accelerates the schedule, providing improved safety while minimizing impact to the local community.



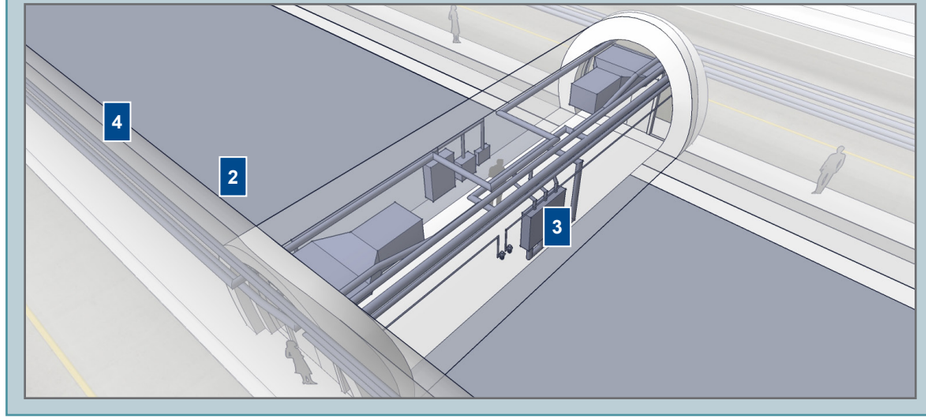
CONSTRUCTION GENERAL SEQUENCE

ACTIVITIES	2013				2014				2015				2016			
	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec
Design & Mobilization	◆															
A | Excavation & Temp Support																
B | Drainage & Waterproofing Systems																
Arch Lining & Invert Concrete																
Tunnel Finishes Including Tile																
C | Ventilation & Fire Suppression Systems																
D | Fire Life Safety, Lighting & Other Utilities																
E | Tunnel Control Systems & Start-Up																
F | Tunnel Training & Handover																

B Drainage & Waterproofing System | Arch Lining and Invert Concrete

- After excavation is completed, all drainage systems including waterproofing will be installed
- Leveling shotcrete layer to be placed prior to waterproofing membrane to ensure solid contact
- Waterproofing membrane to be installed using high quality proven material
- Reinforcement and inserts to be set in place for arch liner
- Arch liner to be poured in 40-48 ft. increments using a form traveler
- Drainage and structural sub-base to be placed along with reinforced concrete invert
- Barriers to be placed with slip form paver followed by conduit installation and walkways

C-F Ventilation, Fire Suppression, Lighting & Other Utilities | Tunnel Control Systems, Start-Up and Training | Tunnel Handover



1. Jet Exhaust Fans (6 in the SB; 12 in the NB Tunnel)
2. Foam Suppression System (3-inch line in both tunnels)
3. Deluge Valve Box
4. Fire Main & Sprinkler Systems (6-in. line in the SB Tunnel; 8-in. in the NB Tunnel)
5. Lighting
6. Ceramic Tile Finish

4.2.1.2.b Interfacing with Property Owners

Keeping nearby residents informed of potential construction impacts is a top priority throughout the duration of Tunnel construction. The WVB Public Involvement Plan contains specific procedures for interacting with local residents and property owners near the Tunnel, including the Harbor at Harrods Creek, Bridgepoint, Shadow Wood, and historic properties such as Allison Barrickman House and Drumanard Estates & Strater House. WVB holds preconstruction and construction update meetings along with weekly notifications of blasting. These measures are in addition to WVB's proactive public relations approach to maintain public trust and integrity. A pre-construction survey is conducted as the first step of a detailed blasting plan, which utilizes a system to monitor vibration levels and settlement at surrounding structures. **Table 4.2-3** summarizes this proactive approach.

TABLE 4.2-3 WALSH-VINCI CJV WILL PROVIDE A PROACTIVE PUBLIC RELATIONS APPROACH

Proactive Public Relations Measure
Sponsor Tunnel construction pre-work and update meetings.
Send weekly correspondence regarding blasting times (website, Twitter) as noted in our Public Involvement Plan.
Perform pre-blast vibration and noise analysis.
Perform pre-, during, and post-construction inspections of residences and local roadways.
Provide 24-hour emergency contact information.
Ensure local fire, police and emergency response dispatchers have updated information.
Use temporary information signs to inform traveling public of blasting and construction events.

4.2.1.2.c Limiting Dust, Noise and Vibrations

To reduce the impacts to the surrounding properties, Walsh-VINCI CJV minimizes the construction activities at the root of such impacts. The Walsh-VINCI CJV design shortens the overall Tunnel length, optimizes the Tunnel cross-section and raises the portal profile to significantly reduce the overall amount of rock excavation, resulting in less blasting, stockpiling, and haul-off. Additionally, the portal approaches have been designed to limit material haul-off and overall blasting. Technical solutions that remove impacts in addition to mitigation measures are summarized in **Table 4.2-4**.

TABLE 4.2-4 WALSH-VINCI CJV's MITIGATION MEASURES FOR TUNNEL CONSTRUCTION

Mitigation Measures	Dust	Noise	Vibration	Public Safety
DESIGN TECHNICAL SOLUTIONS				
Raised South Portal Approach profile decreases rock blasting quantity by 500,000 cubic yards, and associated haul-off of 1,100,000 truck miles	✓	✓	✓	✓
Shortened Tunnel length by 14%, reducing blasting timeline and overall construction schedule, minimizing construction impacts	✓	✓	✓	✓
Cross section optimized to reduce walkway width and minimize liner thickness to eliminate excessive excavation, haul-off, and blasting (ATC #14)	✓	✓	✓	✓
CONSTRUCTION MITIGATION SOLUTIONS				
Strategically identified haul routes minimize construction traffic	✓	✓		✓
Drilling and blasting operations to occur during daylight hours only	✓	✓	✓	
Utilize blast detonation delays and adjust drill patterns to reduce noise and vibration, while maximizing efficiency	✓	✓	✓	✓
Temporary or permanent noise barriers, including earthen berms, placed to limit disruption to surrounding neighbors; improving viewshed		✓		✓
Project-specific Blasting & Vibration Plan with associated training, noise/vibration monitoring and pre-blast analysis of surrounding structures	✓	✓	✓	✓
Implement best management practices to minimize impact to public; i.e., water trucks, equipment mufflers, OSHA training	✓	✓	✓	✓

These design innovations minimize construction activities and reduce the use of public travel ways for construction purposes, lessening the overall carbon footprint while improving safety for the traveling public.

As part of the mitigation measures, an open door policy is used with the surrounding communities to provide feedback if the initial mitigation measures are not sufficient. Walsh-VINCI CJV strives to mitigate all impacts promptly, while using community interaction to recognize and avoid potential complications.

4.2.1.2.d Access Plan and Haul Route Plan

Included as an impact mitigation measure of Section 4.2.1.2.c are the intended access plan and primary haul routes as shown in **Figure 4.2-8**. The Walsh-VINCI CJV has developed an access and haul strategy that decreases impacts to the environment, surrounding community, and traveling public. WVB's access plan allows early commencement of Tunnel excavation and continued progress throughout each traffic stage.

The original estimated 1.7 million cubic yards of haul off material would require a substantial amount of truck traffic through the local historic districts, drastically disrupting the everyday life of the local communities. Walsh-VINCI CJV has designed an optimized roadway profile that decreases the amount of rock excavation for the Tunnel south portal by 500,000 cubic yards. Additionally, the Walsh-VINCI CJV design improves sustainability by increasing the amount of fill material north of Harrods Creek, allowing for a overall haul-off decrease of 920,000 cubic yards, a 57 percent reduction.

LONG-TERM ASSET

Local roads and highways see a reduced traffic impact by 2.0 million truck miles with Walsh-VINCI CJV haul-off reductions versus RID.

Local quarries have agreed to process the excavated rock into a material suitable to be reused on the Project and other surrounding construction projects. The recycled rock is incorporated in natural berms for noise reduction and improve viewsheds for the historic districts such as the Rosewell House. Furthermore, a large quantity of material is transported to the north of Harrods Creek fill zone. Walsh-VINCI CJV identified primary haul routes along the KY 841 corridor that minimize construction traffic and reduce overall impacts to the surrounding communities.

4.2.1.3 ROADWAY ELEMENTS

Walsh-VINCI CJV has incorporated many technical solutions into the roadway elements to provide IFA a lasting, durable, and sustainable East End Crossing. During preliminary design of the roadway elements, Walsh-VINCI CJV coordinated with WVB's O&M Team to review and provide increased life-cycle solutions throughout.

FIGURE 4.2-8 PROPOSED ACCESS AND PRIMARY HAUL ROUTE PLAN

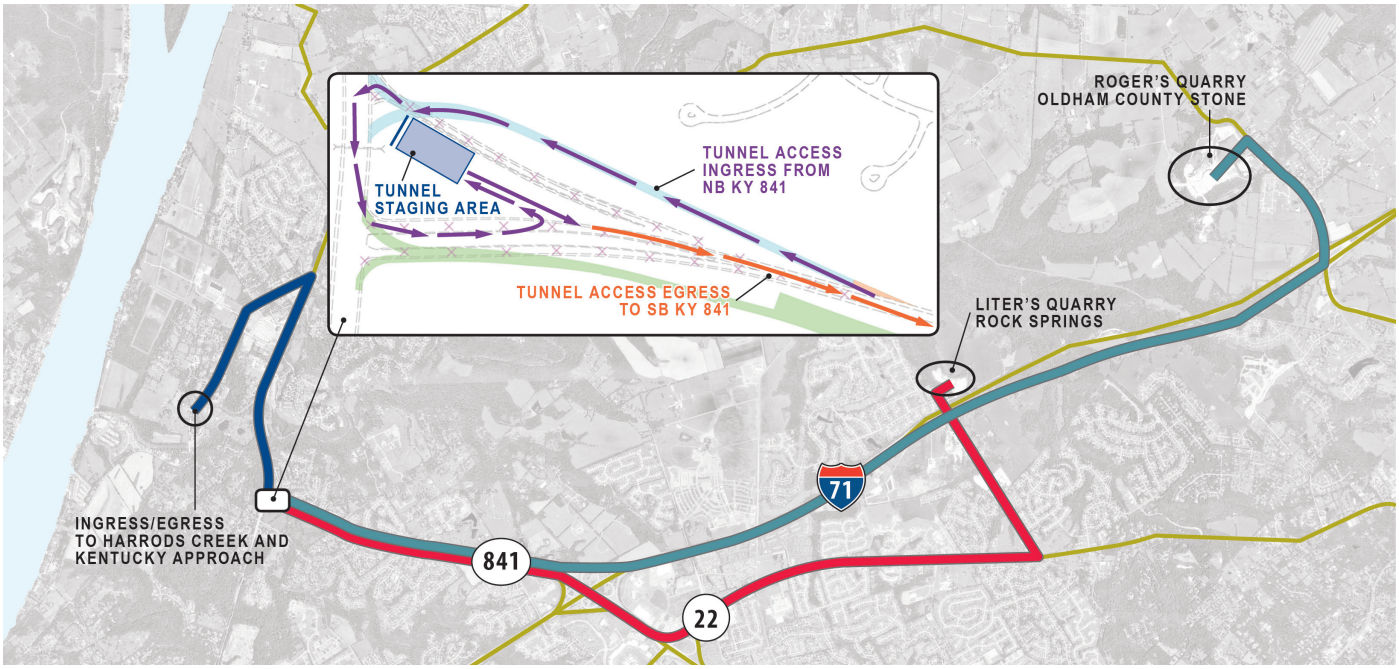
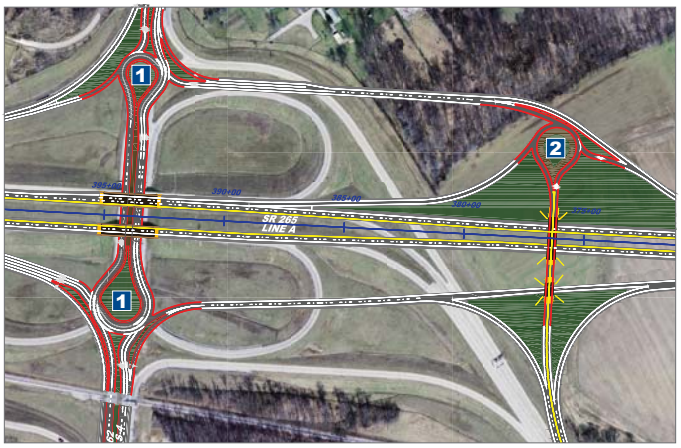


FIGURE 4.2-9 ROUNDABOUT INTERCHANGE

WVB enhanced roundabout interchange design (as presented in WVB ATC #3) uses 1 two multi-lane roundabouts (that replace the crossover diverging diamond and traffic signals) and 2 one single-lane roundabout (that replaces two loop ramps) that provide a safer and higher level of service.



Among the technical solutions is the roundabout interchange at SR 265/SR 62/Port Road (**Figure 4.2-9**). The redesigned interchange benefits include:

- Reducing long-term maintenance by eliminating two loop ramps and reducing 44,000 square yards of pavement and 23,000 square feet of bridge deck.
- Reducing traffic idle time and related carbon footprint by eliminating two traffic signals.
- Improving safety and reducing impacts to traveling public by reducing construction staging and removing 33 percent of traffic conflict points.
- Improving safety and increasing level of service by realigning ramps as shown in interchange traffic simulation (in the Volume 2 Appendices).
- Decreasing environmental impact from construction activities by reducing the overall Project footprint by 15 acres.

4.2.1.3.a Staging, Traffic Control, and Sequencing

During design development, Walsh-VINCI CJV sought out design solutions in construction staging and sequencing that limit impacts to the traveling public. Along with the reduced staging of the roundabout interchange, beneficial solutions were developed at three other locations:

Wolf Pen Branch Bridge redesign allows for single stage bridge construction (removes temporary bridge construction) and two stage MOT in lieu of five stages.

US 42 Single Point Interchange ATC #6 modifications provide improved level of service and reduced construction impacts to local roads and communities.

[redacted]

4.2.1.3.a.i. Traffic Management, Control, Sequencing

Walsh-VINCI CJV employs a proactive traffic management approach to reduce impacts on the surrounding area and traveling public. Walsh-VINCI CJV's Maintenance of Traffic (MOT) Manager, Mark Fournier, has developed a Traffic Management Plan (TMP) with this approach to ensure a safe, continuous operating roadway for the traveling public that leads to limited disruptions. The TMP includes elements listed in **Table 4.2-5**.

TABLE 4.2-5 TRAFFIC MAINTENANCE PLAN ELEMENTS

Temporary Traffic Control Plan with detailed MOT plans and traffic analysis
Temporary pavement design and unrestricted access details for all businesses and residents
MOT phase change procedures with clear responsibilities and processes for temporary signage markings that provide for safe traffic switches with limited disruptions
Work zone access, truck routes, and haul route maps to allow for safe ingress/egress for personnel and traveling public
Detour routes and project closures to be approved by IFA
Traffic Operations Plan describing key personnel and responsibilities
Emergency Plan and coordination with emergency services
Coordination meetings with adjacent projects, transit operators, utility owners, and local public agencies
Coordination with PIP and public communication implementation by Public Information Coordinator
Proactive communication measures such as public meetings, temporary signage, PCMS, and website notices

4.2.1.3.a.ii Conceptual Staging Plans

Walsh-VINCI CJV developed detailed construction staging and MOT plans to ensure all components of the design are coordinated. Revised traffic staging at US 42, Wolf Pen, and Roundabout Interchange provide added benefits to the traveling public including reduced impacts and improved public safety. The conceptual construction staging diagrams are summarized in **Figure 4.2-10** and **4.2-11** (and detailed in Volume 2 Appendices) for the following areas:

- KY 841 at US 42 and US 71
- Wolf Pen Branch Road
- SR 265/62/Port Road Interchange

During development of the traffic staging plans, Walsh-VINCI CJV reviewed and incorporated all requirements for ramp treatments and temporary or permanent drainage work. With enhanced designs and traffic staging, an added benefit is the limited amount of temporary drainage required. Local roads, including River Road, Utica-Charlestown Road, Brookhollow Drive, and Utica-Sellersburg Road, have minimal disruptions and all construction and staging activities adhere to the final TMP. Preliminary detour plan for Utica-Sellsburg Road is provided in the Volume 2 Appendices.

4.2.1.3.a.iii Business and Residential Access

Throughout the Project, Mark Fournier, MOT Manager, works with Dan Hartlage, Public Information Coordinator, to ensure safe unrestricted access for all residents. Details for temporary access driveways, detours, temporary closures and timelines are described in the TMP, approved by IFA and communicated to the public. Design solutions such as [redacted] Wolf Pen Bridge allow for reduced disruption to the local communities and unrestricted access.

The enhanced roundabout interchange staging provides unrestricted access to the Port of Indiana and River Ridge Development. The temporary traffic staging is designed to allow access for long-trailer vehicles including shipments of windmill blades or other long cargo. By way of the TMP, Walsh-VINCI CJV works closely with the Port of Indiana, other businesses, and local residents to ensure that construction impacts and disruptions are limited.

SAFE AND SUSTAINABLE

WVB's enhancement in design and staging provide improved public safety, higher quality, and reduced impacts to the traveling public, environment, and stakeholders.

4.2.1.3.a.iv Construction Schedule & Sequence to Minimize Impacts

Walsh-VINCI CJV has mitigated potential impacts and the overall construction timeline through design innovation and traffic sequencing, most notably for the SR 265/SR 62/Port Road interchange. The revised roundabout interchange allows for more natural traffic movement and a simpler construction sequencing plan. The entire interchange can be constructed in three main stages, with only two adjusting traffic configurations. This approach drastically reduces disruptions to the traveling public and overall impact to the environment.

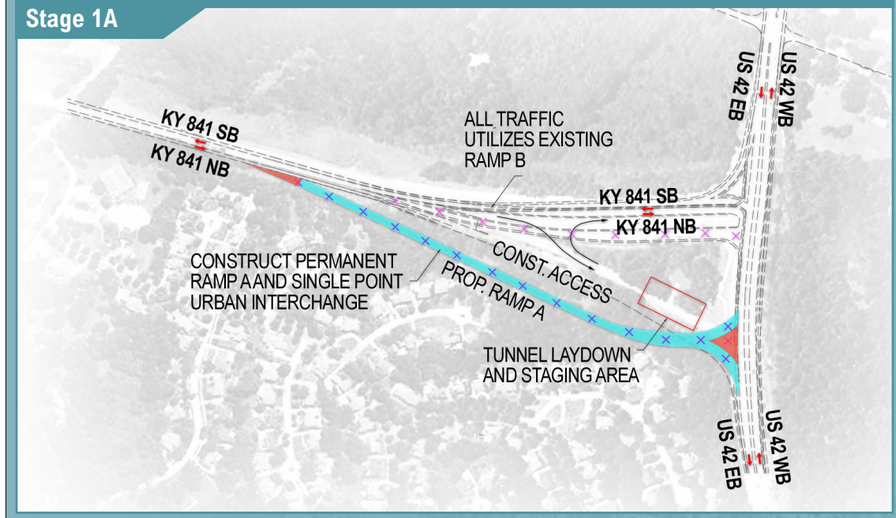
Along Wolf Pen Branch Road, Walsh-VINCI CJV developed a final bridge design that allows bridge construction in a single traffic stage with access within right-of-way, reducing traffic disruptions, and improving quality. Early in the development phase, public information meetings are held with subdivision residents to explain the traffic sequencing for Wolf Pen Branch Road and ensure community support.

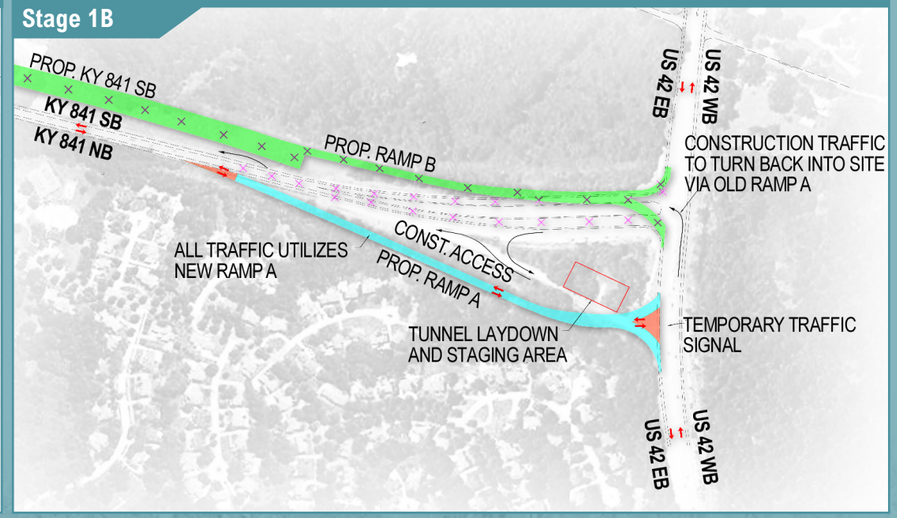
Walsh-VINCI CJV has incorporated environmental protection and mitigation into the overall design and development of the Project and will continue to further enhance mitigation measures throughout construction. These mitigation measures ensure that Walsh-VINCI CJV's construction efforts respect the existing landscape, ultimately providing a Project with minimal environmental impact.

4.2.1.3.a.v Laydown, Recycling, Staging, Disposal and Maintenance Locations

As part of the environmental training program, all employees are notified and trained on specific construction requirements around historic, restricted, and sensitive work zone areas, to help mitigate noise, dust, viewshed, and environmental impacts. Walsh-VINCI CJV has designated many construction staging, recycling, and laydown areas with these restrictions in mind as shown in **Figure 4.2-10** and **Figure 4.2-11**.

FIGURE 4.2-10 WVB's CONCEPTUAL STAGING SUMMARY AND POTENTIAL USE LOCATIONS FOR SECTIONS 4 AND 5



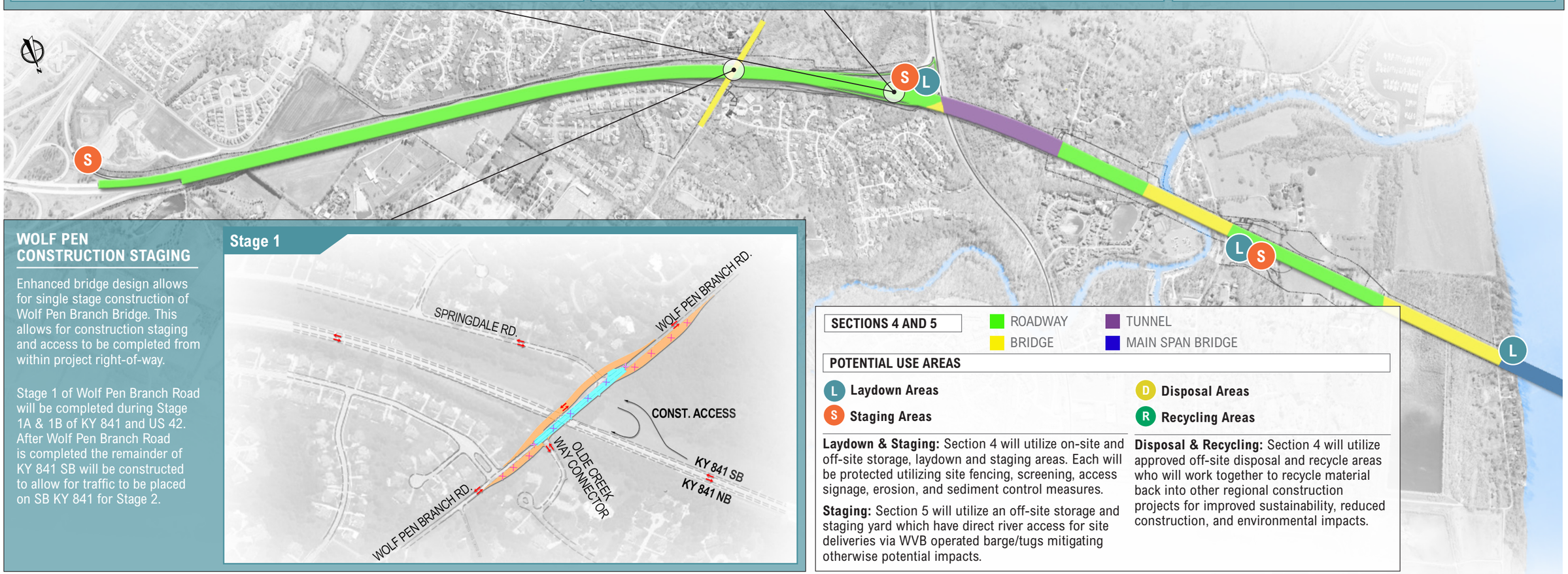


SOUTH PORTAL CONSTRUCTION STAGING

WVB's Single Point Urban Interchange (SPUI), ATC #6, provides IFA a superior interchange with a higher level of service and safety. During construction, the SPUI allows for uninterrupted traffic flow between KY 841 and US 42 that keeps the traveling public away from the construction works, improving safety for both workers and public. The staging allows for construction of all of Southbound KY 841 and Ramp B in two stages with traffic running along existing Ramp A in Stage 1A and permanent Ramp A in Stage 1B. In Stage 2, traffic will run on new Ramp B while Northbound KY 841 and Ramp A are constructed.

Staging Legend

- CONSTRUCTION AREA PHASE 1A
- CONSTRUCTION AREA PHASE 1B
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- TEMPORARY PAVEMENT



WOLF PEN CONSTRUCTION STAGING

Enhanced bridge design allows for single stage construction of Wolf Pen Branch Bridge. This allows for construction staging and access to be completed from within project right-of-way.

Stage 1 of Wolf Pen Branch Road will be completed during Stage 1A & 1B of KY 841 and US 42. After Wolf Pen Branch Road is completed the remainder of KY 841 SB will be constructed to allow for traffic to be placed on SB KY 841 for Stage 2.

SECTIONS 4 AND 5

- ROADWAY
- BRIDGE
- TUNNEL
- MAIN SPAN BRIDGE

POTENTIAL USE AREAS

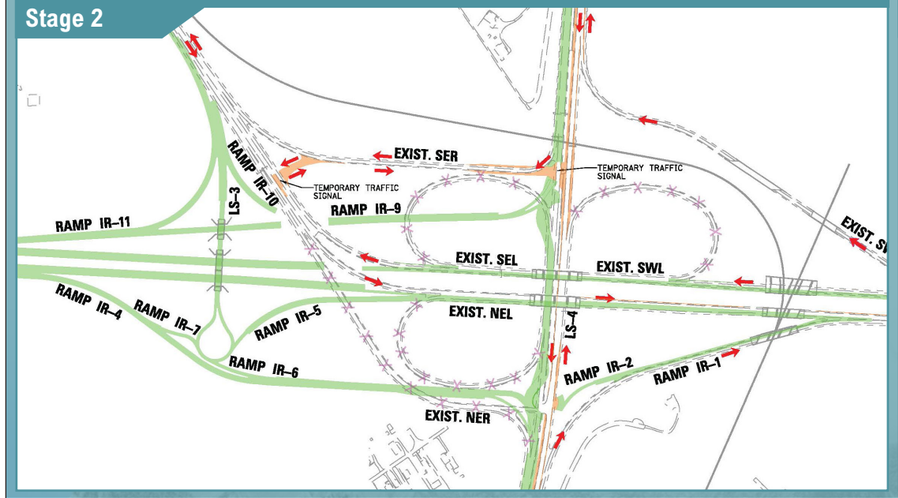
- L **Laydown Areas**
- S **Staging Areas**
- D **Disposal Areas**
- R **Recycling Areas**

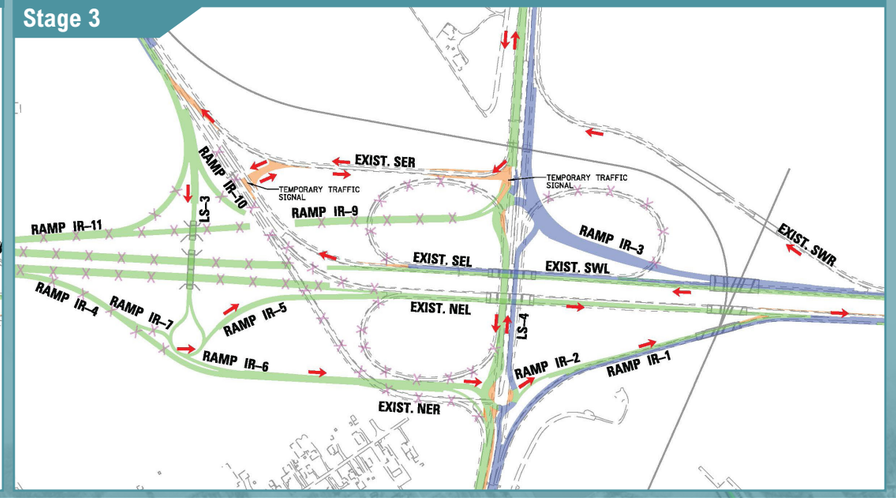
Laydown & Staging: Section 4 will utilize on-site and off-site storage, laydown and staging areas. Each will be protected utilizing site fencing, screening, access signage, erosion, and sediment control measures.

Staging: Section 5 will utilize an off-site storage and staging yard which have direct river access for site deliveries via WVB operated barge/tugs mitigating otherwise potential impacts.

Disposal & Recycling: Section 4 will utilize approved off-site disposal and recycle areas who will work together to recycle material back into other regional construction projects for improved sustainability, reduced construction, and environmental impacts.

FIGURE 4.2-11 WVB's CONCEPTUAL STAGING SUMMARY AND POTENTIAL USE LOCATIONS FOR SECTIONS 6



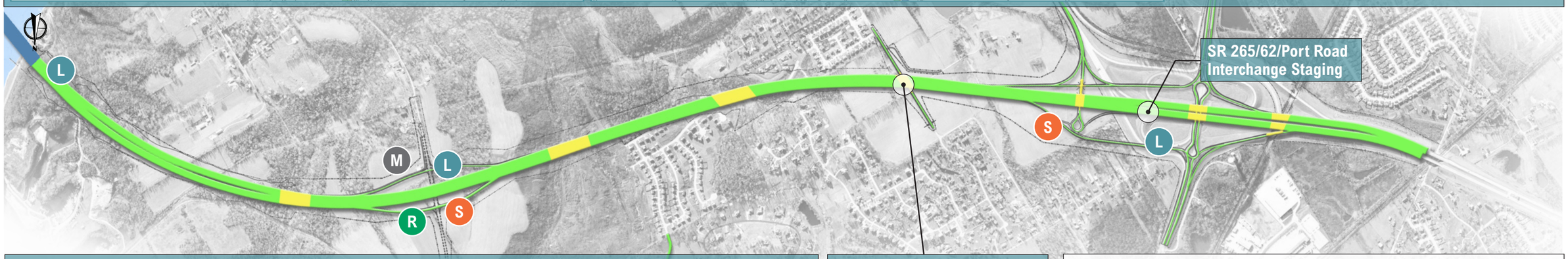


SR 265/62/PORT INTERCHANGE CONCEPTUAL STAGING DIAGRAMS

WVB's enhanced Roundabout Interchange design presented as ATC #3, provides many benefits as noted in Section 4.2.1.3 including reduction of six to three main MOT stages. Stage 1 is a prep stage to install temporary pavement along Port Road and SR 62 with no changes to traffic configuration.

Stage 2 allows for complete construction of the new Port Road bridges and ramps along with Northbound SR 62 and half of SR 265. This staging allows for minimal movement of the existing traffic lanes while allowing construction to be completed at one time allowing for greater benefit to the traveling public.

Stage 3 construction of the interchange puts traffic on the new Port Road construction and allows for construction completion of SR 62 and SR 265.

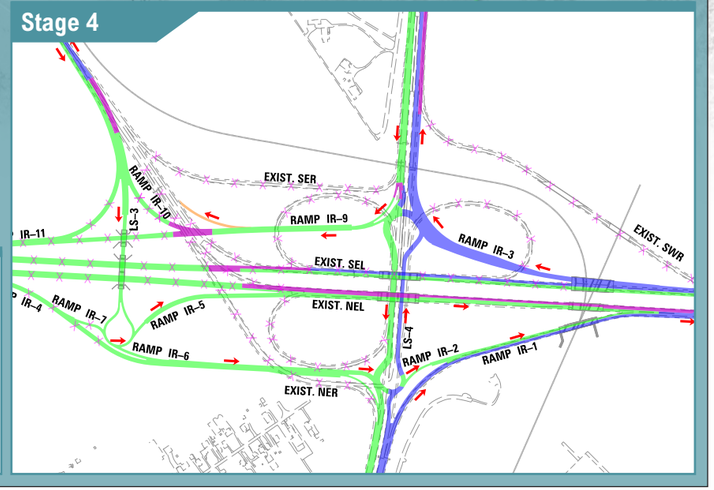


SR 265/62 PORT ROAD INTERCHANGE CONCEPTUAL STAGING DIAGRAMS

Stage 4 allows traffic to run with limited maintenance of traffic equipment for maximized traveling public safety. Altogether, the enhanced interchange design, along with Walsh-VINCI CJV's TMP, allows for improved safety during and after construction while further minimizing construction impacts to the environment and traveling public.

Staging Legend

- CONSTRUCTION AREA PHASE 2
- CONSTRUCTION AREA PHASE 3
- CONSTRUCTION AREA PHASE 4
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- CLOSED TO TRAFFIC



UTICA-SELLERSBURG OVERPASS

Essential to Walsh-VINCI CJV's construction staging is the early completion of the Utica-Sellersburg Overpass, which will be done under the six month allotted closure, see preliminary detour plan in Volume 2 Appendices. Returning this asset to the community early will drastically reduce construction impacts. During construction, Walsh-VINCI CJV will first construct permanent pavement underneath the overpass to create construction access without relying on local roads.

SECTIONS 5 AND 6

- ROADWAY
- BRIDGE
- TUNNEL
- MAIN SPAN BRIDGE

POTENTIAL USE AREAS

- **L** Laydown Areas
- **S** Staging Areas
- **D** Staging Areas
- **R** Recycling Areas

Laydown & Staging: Section 6 will utilize on-site storage, laydown, and staging areas. Each will be protected utilizing site fencing, screening, access signage, erosion and sediment control measures.

Disposal & Recycling: Section 6 will utilize on-site recycling and disposal areas which reduces off-site trucking, construction impacts to the environment and local residents, and improves Project sustainability.

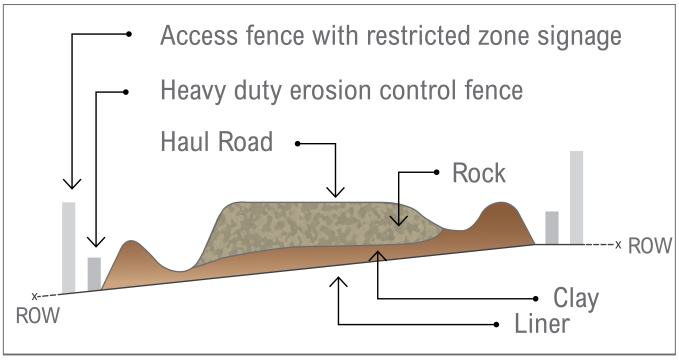
- **M** Operations & Maintenance Building

Operations & Maintenance Building Location: WVB will utilize IFA Parcel 25 for the O&M Building. Included in this location, as stated in 4.3.1.2.6, will be the O&M Building, storage facility, maintenance shed, and open to public parking for use of the Project pedestrian path.

Staging and stockpile areas are kept off and away from sensitive and restricted work zones. Stringent restrictions are placed on all activities within the wellhead protection area (WHPA), specifically in the area of the Transylvania Beach Kentucky Approach Bridge (**Figure 4.2-12**). Site-specific environmental training is provided to all workers who enter the WHPA including strict restrictions that must be adhered to for all work.

FIGURE 4.2-12 WHPA HAUL ROAD

Walsh-VINCI CJV developed a protective system, including impermeable liner and fencing, for haul road and laydown yard within the WHPA for the KY Approach and Main Span Bridges.



4.2.1.3.b Geotechnical Issues

To proactively deal with geotechnical concerns, additional borings are taken throughout the site. The exploratory drilling helps provide additional information on types of materials to be found, depth of rock strata, and possible existence of karst features.

Based on the provided information and for additional locations where poor ground conditions are encountered, the best-suited solution is implemented to remedy the situation (**Table 4.2-6**).

To improve Project sustainability, limestone material is recycled as embankment material and aggregate material. The reuse of rock increases stability in large embankment areas and improves poor soil conditions. Walsh-VINCI CJV has performed near site investigations and discussed potential risks with local quarries and contractors familiar with the surrounding geotechnical profile. Where shale is present within the final excavation limits, a protective membrane layer is applied within 24 hours of exposure to prevent deterioration of the shale face due to the elements. The portal walls have also been designed to minimize the shale exposure in the rock slopes, resulting in less maintenance for KYTC and improved traffic safety.

TABLE 4.2-6 TECHNICAL SOLUTIONS FOR SOIL IMPROVEMENT

Potential Soil Improvement Areas	Improvement Required	Technical Solution
North Portal Approach	Potential Swelling Shale; Fractured Rock	Shotcrete Membrane
Tunnel Approaches	Rock Face Stability	Rock Bolts
Port Road Structures over Mainline 25/26	Poor Soils, Settlement, Stability	Soil Undercuts with Added Geotextile Fabric and Granular Embankment
Mainline Bridge Structure 11/12	Poor Soils, Settlement, Stability	Aggregate Piers
River Road Fill Zone	Settlement	Pre-Loading
Throughout Mainline Fill Zones	Poor Soils, Stability	Rock Embankment and Limited use of Geogrid with rock/cohesive fill
Throughout Mainline Fill Zones	Poor Soils	Disk/Dry Soils for Reuse on Project
Throughout Mainline Fill Zones	Settlement	Staged Construction for Embankment
Additional soil improvement measures are not expected to be needed, but WVB has extensive knowledge with other improvement types such as low density fill material, cement or lime treated soil modification, geogrid, and wick drains.		

4.2.1.3.c Road and Property Maintenance & Protection

Walsh-VINCI CJV takes measures to reduce trucking impacts on local roads, maintain a clean site, and minimize construction activities that may significantly impact sensitive areas. These efforts are supported by continuous two-way communication with local stakeholders and residents and are managed and monitored through our project Public Involvement Plan. Measures to minimize impacts are summarized in **Table 4.2-7**.

Additionally, near historic and residential areas, temporary or permanent viewshed improvements are implemented to limit the viewshed impact from the construction activities. To further limit impacts to the surrounding communities and local roads, Walsh-VINCI CJV has incorporated material staging within the site limits whenever possible to improve sustainability, reduce off-site trucking, and reduce the overall carbon footprint of the Project.

LONG-TERM ASSET

Walsh-VINCI CJV's 50-year pavement design exemplifies WVB's commitment to minimizing traffic disruptions with a long-lasting asset.

4.2.1.3.d Preliminary Roadway Schematic

Walsh-VINCI CJV's technical solutions and roadway concept are shown on the roll plots. These solutions include:

- Enhanced SR 265/SR 62/Port Road Roundabout
- US 42 Single Point Urban Interchange
- [redacted]
- Mainline Profile Optimizations
- Other beneficial characteristic changes

Walsh-VINCI CJV team members, American Structurepoint, Heritage Group, and other pavement consultants have worked with VINCI Concessions to develop an innovative and easily maintainable pavement design that provides a long-lasting life-cycle. As discussed in Section 4.3.1.2.a, the pavement life-cycle analysis proved the designed concrete pavement structure, which follows INDOT pavement design guidelines including open drainage layer, provides the best long-term solution for IFA and stakeholders and provides additional residual life beyond the requirements.

4.2.1.3.e Characteristic Comparison

Table 4.2-8 highlights the characteristics of our schematic that differ from the RID Schematic.

TABLE 4.2-7 ROADWAY AND ENVIRONMENTAL MAINTENANCE PROTECTION MEASURES

Measures	Impacts Mitigated							
	Noise	Vibration	Erosion	Local Road Drainage	Viewshed	Public Safety	Local Community	Local Roads
Design improvements (profile optimization, raising Tunnel south portal, staging adjustment at Wolf Pen and interchange)	✓	✓			✓	✓	✓	✓
Limited night and after hours work activities including guidance near residential, historic and sensitive areas	✓	✓					✓	✓
Water control, street sweeping, and calcium chloride				✓		✓	✓	✓
Perimeter erosion control, ditch checks, diversion ditches, rock check dams, and sediment basins			✓	✓				
"No Access" fence and signage						✓	✓	
Temporary and permanent noisewalls, berms, and landscaping	✓	✓			✓		✓	
Pre-work plans	✓	✓	✓	✓	✓	✓	✓	✓

TABLE 4.2-8 CHARACTERISTIC COMPARISON

Walsh-VINCI CJV has incorporated these technical solutions including design refinements and ATCs that provide benefits to IFA, traveling public and local communities.

Schematic Element	Description of Changes from RID	Benefits to East End Crossing and IFA	Supporting Documentation
Optimized Profile and Sections of Entire Roadway System – Including East End Bridge	• Raised KY 841 profile from Wolf Pen Branch Road and through Tunnel to the north Tunnel portal and adjusted retaining walls • Raised overall profile of Tunnel • Lowered profile of East End Bridge, while maintaining all required vertical clearances • Raised roadway profile above 100-year storm elevation at the north portal of the Tunnel • Lowered the roadway profile through the fill area between the Harrods Creek and approach bridges • Adjusted cross-sections throughout Section 4 to match technical provisions • Adjusted profile throughout Section 6 including at Utica-Sellersburg Road, Brookhollow Road, and river approach	• Provides a better balance of cut and fill requirements reducing moving of material onto and away from site • Reduced off site hauling by 920,000 cy, which reduces truck trips and their impacts to local residents and roadways • Reduces noise and dust impacts associated with hauling • Reduces Impacts of local traffic during construction • Reduces construction duration, meaning reduced impacts to local residents, traffic and the environment associated with ongoing construction • Reduce total quantity of rock cut, thereby reducing blasting and its potential impacts to local residents • Reduces flooding risk to Tunnel, improving safety and reducing maintenance costs • Reduces bridge height minimizes visual impact of main span bridge and approaches	• Roll Plot Schematics • Section 4 – Sheets 1-4 of 4 • Section 5 – Sheet 1 • Section 6 – Sheets 1-10 of 10
Modified US 42 Interchange of KY 841 with US 42 (ATC #6)	• Eliminate "flyover" on Ramp A and replace with single point urban interchange style connection between NB KY 841 and US 42	• Reduces conflict between Tunnel construction and ramp construction • Improves safety during Tunnel excavation • Provides improved long term capacity to handle traffic growth and maintain acceptable level of service • Reduces traffic impacts to traveling public by achieving final configuration earlier	• ATC # 6 • Roll Plot Schematics – Section 4 – Sheet 2 of 4
[redacted]	[redacted]	[redacted]	[redacted]
SR 265/SR 62/Port Road Interchange Configuration	• Eliminated diverging diamond interchange at SR 265/SR 62/Port Road and replaced with roundabout interchange • Roundabout design adjusted ramp locations, bridge locations, profiles, bridge widenings and other associated items (lighting, drainage, signage) • Roundabout design reduced number of new bridges from 5 to 2	• Eliminates long term maintenance associated with traffic signals • Reduces long term inspection and maintenance by reduction in pavement of 44,000 sy and bridge deck of 23,000 sf • Continuous movements of roundabout reduce congestion and fuel consumption providing more sustainable solution • Allows improved MOT reducing phases, shortening construction and reducing impact to traveling public and residents	• Roll Plot Schematics – Section 6 – Sheet 3 of 10
East End Crossing – Main Cable-Stayed Bridge and Kentucky Approach	• Selected Bridge Type A-3, convex diamond, for East End Crossing • Eliminated center columns and moved roadway sections together into a single structure for Main Span Bridge and KY Approach Bridge • Adjusted roadway approaches cross-section to match bridge	• Reduces overall footprint and impact of the project on the adjacent environment and aesthetic viewshed • Allows Piers 2 and 5 to be moved to land reducing their impact on the river • Narrower width reduces impacts to LWC Wellhead Protection Area • Reduces the number of beam lines required to support the same number of traffic lanes	• Roll Plot Schematics – Section 5 – Sheet 1 of 1 • Roll Plot Schematics – Section 4 – Sheet 3 of 4
Revised Emergency Access Road in Section 4	• Shifted the emergency access road to the west side of KY 841 • Eliminated three retaining walls • Replaced artificial treatment structure with natural detention pond	• Eliminates operations and maintenance associated with stormwater treatment structure • Eliminates maintenance and any future repairs of three retaining walls that are no longer required • Reduce off site impacts of material hauling and disposal, overall reduction of environmental impact	• Roll Plot Schematics – Section 4 – Sheet 3 of 4
Wolf Pen Bridge – Revised Configuration	• Shifted Wolf Pen abutments • Construct Wolf Pen Bridge in single stage	• Eliminates need for temporary bridge and construction impacts to traffic • Allows for traffic control patterns that are easier to navigate providing safer conditions for motorists • Shortens construction duration reduces impact to traveling public and residents	• Roll Plot Schematics – Section 4 – Sheet 2 of 4
Optimized Tunnel Cross Section, Access Road, Reduced Pillar Width, and Tunnel Length	• Reduced Pillar Width at South Portal from 40 ft to 35 ft • Modified walkway widths and cross-passage locations within the Tunnel • Shortened both Tunnels by 270 ft • Optimized cross-section shape and all utility systems per technical provisions	• Reduces quantity of rock excavation for Tunnel which reduces impacts from blasting activities and hauling of spoil material off site • Reduces Tunnel maintenance costs associated with lighting, cleaning and drainage • Reduces construction timeline associated with Tunnel construction and overall Project schedule • Minimizes shale mitigation measures, as the Tunnel begins beyond the shale layer, reducing temporary support • Improves the efficiency of the Tunnel ventilation and fire suppression systems and reduces long-term maintenance • Improves Tunnel access and safety for emergency crews	• ATC #5 and 14 • Roll Plot Schematics – Section 4 – Sheet 2 of 4
SR 265 interchange with Utica-Sellersburg Road	• Shortened Structure 14 and reduced overall bridge deck area	• Reduces long-term maintenance of bridge elements; reduced long-term inspection requirements	• Roll Plot Schematics – Section 6 – Sheets 2 of 10
O&M Pavement Design Section	• WVB 50-year concrete pavement design • Optimal shoulder design	• Reduces long-term maintenance • Provides higher residual life • Reduces disruptions to traveling public	• Roll Plot Schematics – Section 4 – Sheet 3 of 4 • Roll Plot Schematics – Section 6 – Sheets 1-10 of 10

4.2.1.4 BRIDGE STRUCTURES, RETAINING WALLS, NOISE WALLS, & SURFACE STRUCTURES

Along the East End Corridor, vehicles travel over and past bridges, retaining walls, and other structures that are designed to harmonize with the natural landscape of the region (**Figure 4.2-13**). As part of the technical solutions incorporated by Walsh-VINCI CJV, weathering steel and prestressed concrete beams are used throughout for visual appeal and reduced maintenance. Wolf Pen Bridge was redesigned with adjusted abutment locations to allow for a single stage construction and improved quality.

Walsh-VINCI CJV's enhanced staging plan for the SR 265/SR 62/Port Road interchange minimizes bridge widening, provides improved quality, and reduces construction impacts. Through careful design, material selection, and construction quality, Walsh-VINCI CJV delivers structures that minimize long-term maintenance and provide self-sustainable, aesthetically pleasing structures that blend with the character of the region.

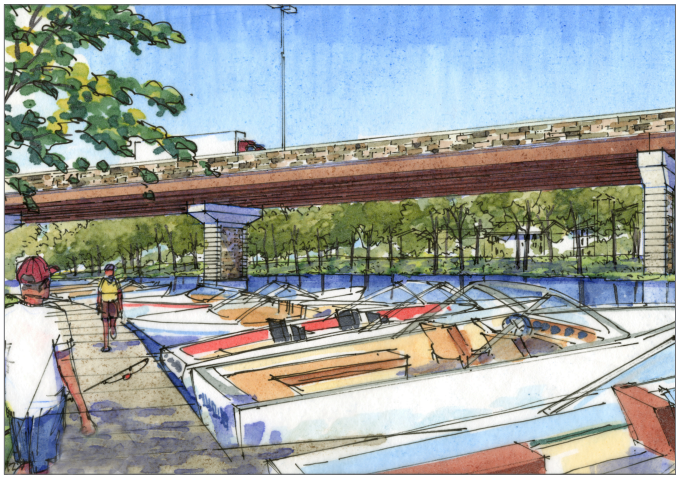
4.2.1.4.a Selection of Materials

To meet IFA's goals of Project quality, safety, sustainability, durability, and cost, the material selection process was completed by WVB's qualified architectural, construction, and procurement teams, with additional support from the Environmental and DBE teams. The choice of construction materials for each structure was based on the unique structure setting requirements and WVB's first-hand knowledge of material selection that works with Midwest features and climate. Walsh-VINCI CJV's goal is to utilize materials with:

- **Superior Quality and Proven Performance:** Use only structural steel, concrete beams, and MSE walls from suppliers with proven performance.
- **Durability, Reliability, and Sustainability:** Reuse limestone material on-site and locate a concrete plant to decrease environmental impacts and improve material quality.
- **Reduced Long-Term Maintenance:** Use weathering steel where applicable to reduce future painting expenses. Continuous structural units and integral bents remove unwanted joints at bridge decks.

FIGURE 4.2-13 HARRODS CREEK BRIDGE

Weathering steel, as seen here for Harrods Creek Bridge, used throughout for long life cycle, reduced maintenance and enhanced aesthetics.



- **Visual Appeal:** Subdued, unobtrusive materials that blend with their surroundings are selected. In Indiana, precast beams blend with the subdued landscape; in Kentucky, weathering steel blends with naturalistic stained limestone.

Walsh-VINCI CJV actively encourages local vendor/DBE participation to positively impact local business and community relations.

4.2.1.4.b WVB's Schematic

WVB has advanced the design of the RID documents for the bridges and walls with the following goals:

- Provide constructible/cost effective structures.
- Reduce impacts of construction on adjacent properties and traveling public.
- Provide opportunities for aesthetic enhancements consistent with the existing environment.
- Standardize structural elements to optimize both the design and construction processes.
- Implement structural details that promote durability and ease of maintenance.

The location, size, type and clearance information for all of the bridges and walls are shown on the provided roll plots and summarized in **Figure 4.2-14** and **4.2.15**.

FIGURE 4.2-14 WVB's SECTION 4 STRUCTURE SUMMARY SCHEMATIC

Bridge 1

WOLF PEN ROAD OVER KY 841

- 2 Spans
- Prestressed Concrete I-Beam - Type 4
- Concrete Abutment/Drilled Shaft/Single Pier
- Length: 188 ft.
- Minimum Vertical Clearance: 16 ft.

Wolf Pen Bridge has been reconfigured to reduce the overall bridge deck area and eliminate the need for construction of a temporary bridge. This expedites the construction schedule and significantly reduces the impact on adjacent properties and vehicular and pedestrian traffic during construction.

Bridge 2

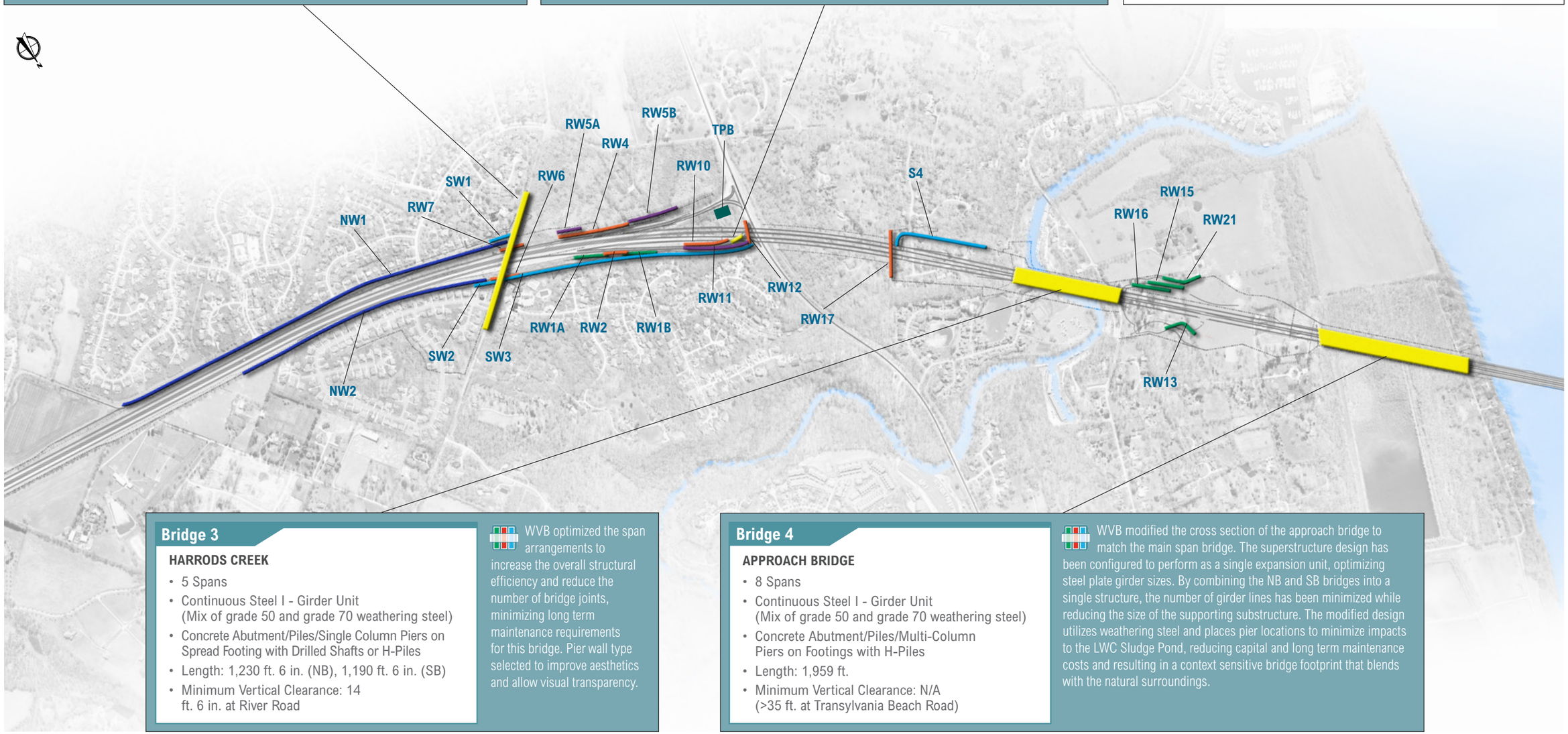
RAMP A AT KY-841

- 1 Span
- Continuous Steel I - Girder Unit (Mix of grade 50 and grade 70 weathering steel)
- Concrete Abutment/Spread Footing
- Length: 130 ft.
- Minimum Vertical Clearance: 27 ft. 4 in.

WVB's single point interchange design provides multiple benefits including: an additional left turn lane from KY 841 to US 42 and an improved right turn lane from US 42 to KY 841; operation in the 2030 design year at a Level of Service B in the AM peak and Level of Service C in the PM peak; reduced delay at the intersection; and improved safety by reducing the likelihood of wrong way drivers.

SECTION 4

- BRIDGE
- CUT WALLS: SOIL NAILS (RW)
- CUT WALLS: SHOTCRETE W/ROCK BOLTS (RW)
- FILL WALLS: MSE (RW)
- NOISE WALLS (NW)
- SAFETY WALLS (NW)
- TUNNEL PORTAL BUILDING (TPB)
- VALUE ADDED TECHNICAL SOLUTION



Bridge 3

HARRODS CREEK

- 5 Spans
- Continuous Steel I - Girder Unit (Mix of grade 50 and grade 70 weathering steel)
- Concrete Abutment/Piles/Single Column Piers on Spread Footing with Drilled Shafts or H-Piles
- Length: 1,230 ft. 6 in. (NB), 1,190 ft. 6 in. (SB)
- Minimum Vertical Clearance: 14 ft. 6 in. at River Road

WVB optimized the span arrangements to increase the overall structural efficiency and reduce the number of bridge joints, minimizing long term maintenance requirements for this bridge. Pier wall type selected to improve aesthetics and allow visual transparency.

Bridge 4

APPROACH BRIDGE

- 8 Spans
- Continuous Steel I - Girder Unit (Mix of grade 50 and grade 70 weathering steel)
- Concrete Abutment/Piles/Multi-Column Piers on Footings with H-Piles
- Length: 1,959 ft.
- Minimum Vertical Clearance: N/A (>35 ft. at Transylvania Beach Road)

WVB modified the cross section of the approach bridge to match the main span bridge. The superstructure design has been configured to perform as a single expansion unit, optimizing steel plate girder sizes. By combining the NB and SB bridges into a single structure, the number of girder lines has been minimized while reducing the size of the supporting substructure. The modified design utilizes weathering steel and places pier locations to minimize impacts to the LWC Sludge Pond, reducing capital and long term maintenance costs and resulting in a context sensitive bridge footprint that blends with the natural surroundings.

FIGURE 4.2-15 WVB's SECTION 6 STRUCTURE SUMMARY SCHEMATIC

Bridge 6/7

SR 265 EB (6) / WB (7) OVER UTICA CHARLESTOWN ROAD AND LENTZIER CREEK TRIB.

- 3 Spans
- Continuous Composite Prestressed Concrete Bulb Tee Beams
- End-Integral End Bent Cap on H-Piles/Interior-Concrete Multiple Column Frame Bent on H-Piles
- Length: 414 ft. 6 in.
- Minimum Vertical Clearance: 14 ft. 6 in. over Utica Charlestown Road

Bridge 11/12

SR 265 EB (11) / WB (12)OVER LENTZIER CREEK AND BROOKHOLLOW DRIVE OVER LENTZIER CREEK

- 4 Spans
- Continuous Composite Prestressed Concrete Bulb Tee Beams
- End-Semi-Integral End Bent Cap on H-Piles with MSE Wall Abutment at Bent 1/Interior-Concrete Multiple Column Frame Bent on H-Piles
- Length: 541 ft. (11), 542 ft. (12)
- Minimum Vertical Clearance: N/A

[redacted] optimized the bridge 11/12 profile and abutment locations for improved structural efficiency and reduced maintenance.

Bridge 25

PORT ROAD OVER RAMP IR-9

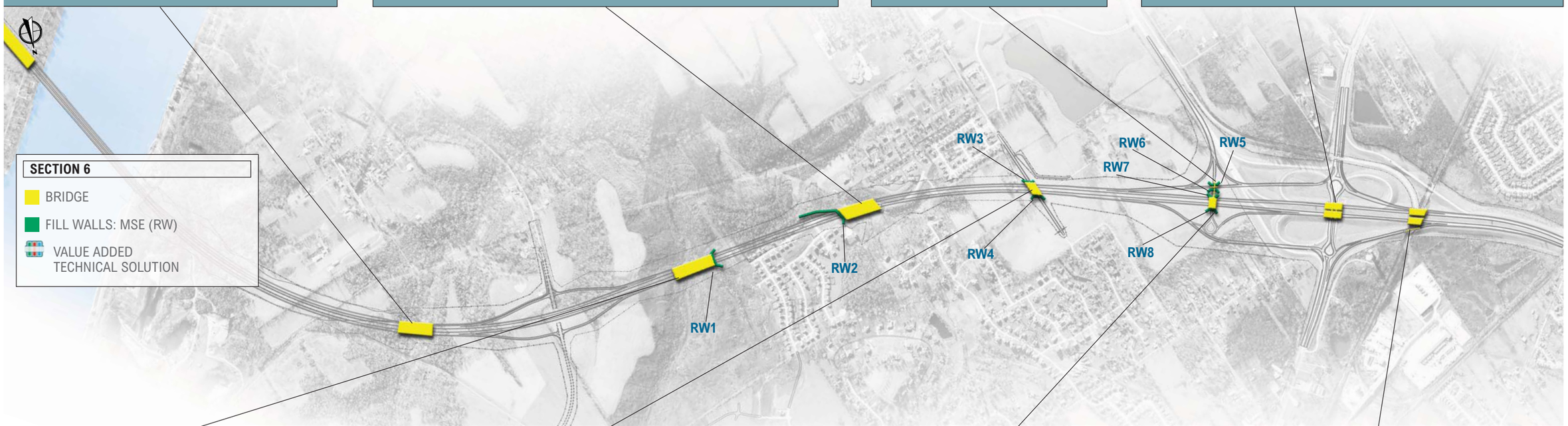
- 1 Span
- Composite Prestressed Concrete Bulb I Beams
- End-Integral End Bent Cap on H-Piles with MSE Wall Abutments
- Length: 59 ft.
- Minimum Vertical Clearance: 16 ft. 6 in.

Bridge 19/20

SR 265 WB (19) / EB (20) OVER SR 62

- 4 Spans
- Continuous Composite Prestressed Concrete Bulb Tee Beams
- End-Semi-Integral End Bent Cap on H-Piles with MSE Wall Abutment at Bent 1/Interior-Concrete Multiple Column Frame Bent on H-Piles
- Length: 217 ft. 9 in.
- Minimum Vertical Clearance: 16 ft. 6 in.

By introducing roundabouts at the SR 265/SR 62/ Port Road Interchange, the total number of bridges is reduced from 10 (RID Design) to 7 (WVB proposed) thereby reducing bridge deck area by 23,000 sf.



Bridge 9/10

SR 265 EB (9) / WB (10) OVER LENTZIER CREEK TRIB.

- 4 Spans
- Continuous Composite Prestressed Concrete Bulb Tee Beams
- End-Semi-Integral End Bent Cap on H-Piles with MSE Wall Abutment at Bent 1/Interior-Concrete Multiple Column Frame Bent on H-Piles
- Length: 598 ft. 9 in.
- Minimum Vertical Clearance: N/A

WVB optimized the span and pier locations to reduce the structure from 5 spans to 4 spans and reduce bridge deck area.

Bridge 14

UTICA SELLERSBURG ROAD OVER SR 265

- 2 Spans
- Continuous Composite Prestressed Concrete Bulb Tee Beams
- End-Integral End Bent Cap on H-Piles with MSE Wall Abutments/ Interior-Concrete Stem Wall on Single Row of H-Piles
- Length: 215 ft. 8 in.
- Minimum Vertical Clearance: N/A

With modification to the interchange, WVB optimized the structure length, reducing bridge deck area.

Bridge 26

PORT ROAD OVER SR 265 EB AND WB

- 2 Spans
- Continuous Composite Prestressed Concrete Bulb Tee Beams
- End-Integral End Bent Cap on H-Piles with MSE Wall Abutments/ Multiple Column Frame Bent with crashwall on H-Piles
- Length: 172 ft.
- Minimum Vertical Clearance: 16 ft. 6 in.

As part of the revised interchange design, Port Road was reconfigured to cross over SR 265 with a single bridge, rather than two bridges for the SR 265 mainline to cross Port Road as shown in the RID documents.

Bridge 15/16/17

RAMP IR-1 (15), SR 265 WB (16), AND SR 265 EB (17) OVER C&O AND CMC RRS

- 3 Spans (15 & 16), 4 Spans (17)
- Continuous Composite Prestressed Concrete Bulb Tee Beams
- End-Semi-Integral End Bent Cap on H-Piles/Multiple Column Frame Bent with Crashwall on H-Piles
- Length: 179 ft. 3 in. (15), 167 ft. 1 in. (16), 201 ft. 4.5 in. (17)
- Minimum Vertical Clearance: 23 ft. 4 in. (15), 25 ft. 1 in. (16 & 17)

4.2.1.5 ITS SYSTEMS

Because of the importance of design, selection and installation of an Intelligent Transport System (ITS), WVB has teamed with INDOT's major player in ITS construction, James H. Drew. Having successfully completed over $250 million of electrical work in Indiana during their 65 years of experience, James H. Drew successfully designed and installed more than $30 million of ITS work over the past 12 years (**Figure 4.2-16**). With an outstanding record and ITS pre-qualifications with INDOT and KYTC, James H. Drew solidifies the team's preliminary design and construction effort to formulate a detailed ITS design (including commissioning) and open to traffic plans that meet INDOT and KYTC expectations.

FIGURE 4.2-16 ELECTRICAL CONTRACTOR
James H. Drew has completed major electrical and ITS works throughout KYTC and INDOT including tower installations.

4.2.1.5.a ITS Equipment Placement

The system is extremely modular to allow for upgrades, and to interface the new systems with existing systems. IFA's ITS program requires advanced sensors, communication systems, and data processing to identify incidents quickly, and aid in response to minimize traffic effects. The proposed locations of ITS system elements are summarized in **Table 4.2-9** and are shown on the ITS Schematics in the Volume 2 Appendices.

The ITS design includes all communications, power and supporting infrastructure to provide a fully operational network. The system is fully integrated and controlled by the Department Traffic Management Center (TMC) for devices located in Indiana and by TRIMARC for devices located in Kentucky.

WORK TOGETHER

WVB's ITS work will be completed by James H. Drew who has completed over $30 million of ITS work on INDOT and KYTC projects.

TABLE 4.2-9 LOCATIONS OF ITS ELEMENTS

Vehicle Detection	Spaced every 0.25 to 0.30 miles
Roadway Weather System	Kentucky approach of the East End Bridge
Virtual Weigh Stations	Along each direction on Indiana river side
Reference Markers	Along all approaches of proposed highways
CCTV	Interchanges, on bridges, and inside the Tunnel
DMS	Kentucky approaches (4), Indiana approaches (2)
Lane Control Systems	Inside the Tunnel
Wrong Way Detection	Tunnel approaches
Intrusion Detection	Installed in maintenance access areas on East End Bridge
HAR & WIZARD System	Installed at the East End Bridge

4.2.1.5.b Preliminary ITS Test and Commissioning Plan

Before new systems go into operation, Walsh-VINCI CJV monitors and oversees formal documented testing. As part of the Definitive Design of Operations (DDO) document, Walsh-VINCI CJV developed a test plan to verify the functionality of the ITS components, devices, and communication networks. The test plan includes a test schedule, system acceptance criteria, procedures for troubleshooting and retesting failed equipment, and all test procedures. Test logs are developed to record results and are used to submit a formal test report to IFA that includes test-by-test results. Elements of this testing plan include:

- Factory acceptance testing with required access and advance notification to IFA.
- Post-delivery testing.
- Integration from third party integrators.
- Installation testing with confirmation of compatibility with TRIMARC, TMC and MetroSafe.
- Final acceptance testing with end-to-end, controlled environment integration tests of hardware and software in accordance with the test plan.

4.2.1.5.c Preliminary ITS Installation Plan

As part of the DDO document, Walsh-VINCI CJV develops a preliminary installation plan that includes:

- Installation management procedures
- Control of the work and record keeping
- Subcontractor activities
- Activities by worksite
- Subsystem and component installation sequence
- Completion schedules by phase.

All ITS design is reviewed by WVB's quality process including coordination with other civil and structural disciplines. The full design is integrated and installed with coordination from TMC and TRIMARC to ensure WVB provides the best system.

4.2.1.5.d Open to Traffic Plan

Walsh-VINCI CJV's Open to Traffic Plan (OTP) establishes our coordinated approach with TMC/TRIMARC in taking over and using the ITS to support the safe, successful opening to live traffic. The plan describes the measures taken prior to and following opening, including team member responsibilities and related performance monitoring steps. Prior to opening, WVB does the following:

- Develop a schedule to support handover
- Train personnel and provide O&M manuals
- Demonstrate full functionality prior to opening
- Plan handover activity to anticipate and resolve any potential issues in advance

Following opening, WVB continues to communicate with TMC and TRIMARC to ensure systems operate correctly and initially maintains day-to-day operations of the system. Walsh-VINCI CJV's OTP establishes our related communication procedures that commence with the identification of the sequence and schedule of construction works to be communicated to motorists. The OTP includes the development of messages to be used on the DMS at approaches and throughout the corridor, as well as advance signage required to alert the public to construction works and subsequent road changes.

To support communication with TMC and TRIMARC during construction, ITS devices (such as DMS, CCTV and HAR) are used to monitor work zones and advise TMC and TRIMARC of unexpected traffic conditions such as accidents and congestion.

4.2.1.6 CONTEXT-SENSITIVE SOLUTION ELEMENTS

Throughout WVB's preliminary design, special attention was devoted to developing the East End Crossing to fit the region's historic character. WVB has developed the plan from previous research, such as the 2007 Aesthetics and Landscape Architecture Guidelines (ALAG), Kentucky East End Approach Aesthetic Design Guidelines and the Bridge Type Selection Process (BTSP) documents. From these documents supported with site visits, photographs, and other research, WVB developed an Aesthetic and Landscape Concept Master Plan (ALCMP) as provided in Volume 2 Appendices.

The ALCMP provides design solutions for landscape and aesthetic enhancements along the corridor that are sensitive to geographic, natural, historic, and cultural context and responsive to expressed preferences and desires of the local community and stakeholders. The context sensitive design vision set forth by IFA provides information on the context, concepts, and design criteria envisioned by stakeholders, which WVB has integrated and translated into new proposed design solutions. WVB's intrinsic philosophy shown in the ALCMP addresses the needs and desires of the stakeholders to have an aesthetically pleasing environment along the new transportation corridor, while creating a context sensitive solution and preserving the integrity of historic landscapes and character areas (**Figure 4.2-17**).

FIGURE 4.2-17 STREETSCAPES ENHANCEMENTS
Streetscapes enhancements along Wolf Pen Branch Road provides visual aesthetics while improving safety.

Key principles to providing environmentally appropriate landscape and aesthetics design are as follows:

- Respect, restore, and emulate the character of the existing natural environments and cultural landscapes, both natural and man-made features, impacted by the new improvements.
- Select material and architectural framework for context sensitive solutions of the various historic properties and the surroundings.
- Reinterpret materials and architectural styles with modern materials and treatments for safety, durability, and efficiency.
- Leverage new improvements to provide new and restored habitat for native wildlife and provide connectivity for plant, wildlife, and communities.
- Sustainable planting palette that includes adapted, native, low water use and non-invasive species.

WVB's ALCMP, as summarized in **Figure 4.2-19** respects aesthetics created by historic landscapes designed by Fredrick Law Olmsted, Marian Cruger Coffin, and Arthur Westcott Cowell. The Master Plan design works within this cultural, historic framework to illustrate how context-sensitive architectural details, textures, finishes and colors can be consistently applied to a variety of elements throughout the Project. Care has been given to apply solutions that minimize the visual and auditory impact while maximizing the safety, durability, and maintainability of the project components. The aesthetics palette visually unifies the features with an approach that adheres to the naturalistic qualities of the local vernacular, while reinterpreting them in a modern way.

EAST END BRIDGE STRUCTURE: The aesthetics of the East End Bridge honor and reflect the local historic and cultural context while remaining as visually transparent and unobtrusive as possible. WVB's aesthetic concept utilizes simple, natural shapes and adjusts the scale, proportion, and repetition in which they appear throughout the bridge to create a cohesive, symbolic structure that has a light impact on the existing landscape. To complement, enhance, and coexist with its natural surroundings, WVB's design for the East End Bridge creates visual transparency through efficient engineering, enabling more slender bridge components which are optimally distributed. The design applies an aesthetic touch to the bridge elements to relate them to the natural landscape so they blend in (e.g., weathering steel, WVB ATC #9, blends with natural limestone).

POSITIVE IMPACT ON THE AREA AND COMMUNITY

WVB's landscape and aesthetics solutions are sensitive to geographic, natural, historic and cultural context, and responsive to the expressed preferences and desires of the local community and stakeholders.

As the largest scale elements of the bridge, the towers, are modeled in reference to an icon of the region: the historic ground hog type lime kiln with its Gothic arch opening. Similarly, the towers of the bridge efficiently serve their main structural function of supporting the roadway while also possessing an understated flair. A gentle convex curve above and below the roadway lends a local style to the diamond shaped towers. Reminiscent of workers entering the lime kiln, drivers on the bridge experience the stacked concrete sections of the towers gradually arching up and over them as they cross the river on their way to work.

The East End Bridge Structure is not just a physical connection between Indiana and Kentucky, but is also WVB's avenue for a seamless, aesthetic connection (**Figure 4.2-18**).

FIGURE 4.2-18 WVB's AESTHETIC RENDERING OF THE EAST END BRIDGE

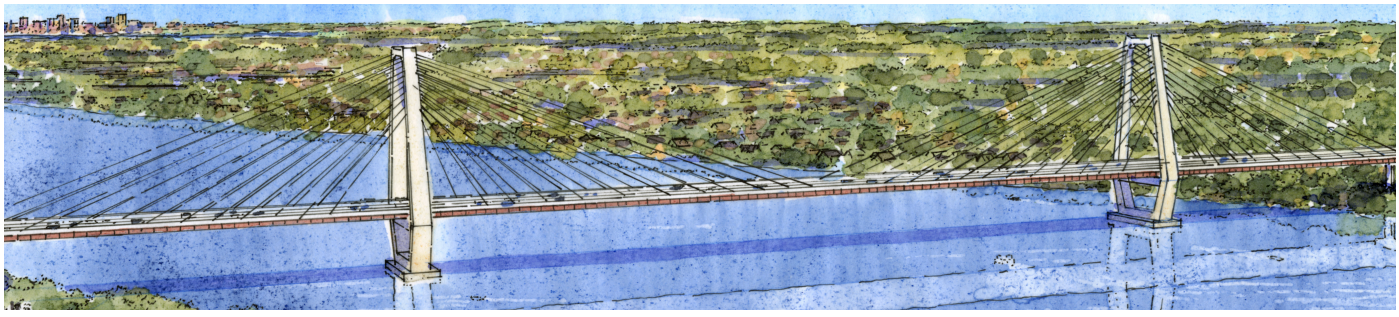
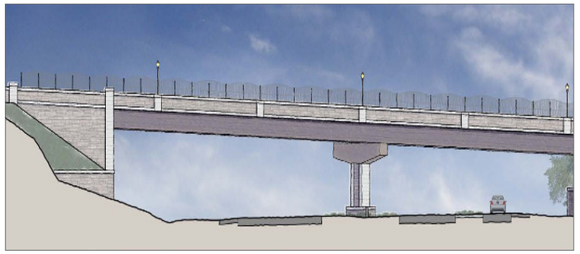


FIGURE 4.2-19 THE MAJOR AESTHETIC FEATURES OF THE ALCMP PROVIDE A CONTEXT-SENSITIVE SOLUTION THAT PRESERVES THE INTEGRITY OF HISTORIC LANDSCAPES AND CHARACTER AREAS.



1 BRIDGES: Concrete texturing and detailing creates a unifying aesthetic between bridges and references natural stone materials. Weathered steel is used per Stakeholders' preference. Pilaster articulation adds classic styling, masks joints, and accentuates the stone wall texturing. Decorative metal fencing references area historic estates and is a pedestrian-scale enhancement.

2 STREETSCAPE ENHANCEMENTS: Enhanced crosswalks provide traffic calming and pedestrian crossing articulation. Enhanced safety walls become gateway walls into the community. Traditional fence design ties the new intersection streetscape into the rural road character of the surrounding countryside, and help visually narrows the roadway to help calm traffic.

3 BICYCLE AND PEDESTRIAN FACILITIES: Connectivity between Wolf Pen Branch neighborhoods affected by the new highway alignment is improved. Trail head rest area along the shared use trail provides a staging point for both local recreational use and for pedestrians and bicyclists who continue across the East End Bridge.

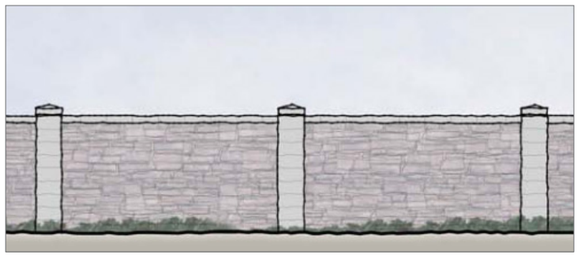
4 CONTOUR GRADING: Berming approach creates a more natural looking landform that matches the existing area character. The scale of the sloped fill condition can be broken up and views improved toward the highway from adjacent properties. Use of landform berms and plantings will effectively screen views from historic properties such as Rosewell and Belleview.

5 RETAINING STRUCTURES: Enhancements reflect the local vernacular forms, colors and textures which helps integrate new structures into the existing visual environment. Consistently applied concrete texture and detail using these materials creates a unifying visual aesthetic that provides visual linkage between wall and bridge structures along the corridor.

6 SLOPE PROTECTION & VEGETATION: Adjacent neighborhoods and historical properties are screened from highway views and roadway areas are softened (e.g., on top of Tunnel portals and rock slopes). The natural landscape is enhanced and impacted historic cultural landscapes are restored. Trees, shrubs and grasses on new fill slopes and berms provide a permanent solution to slope protection.

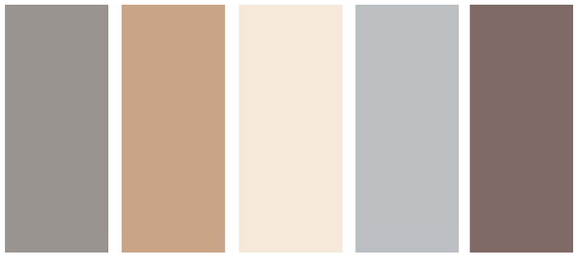
7 HISTORIC PRESERVATION: Berms break up the scale of the slopes and provide more natural-looking landforms that help screen views from historic properties. Plantings restored in this cultural landscape are a visually-pleasing amenity along the highway corridor. Landform and landscape screening helps preserve the character of historic properties impacted by new highway alignment.

8 STREET LIGHTING & TRAFFIC SIGNALS: Decorative light fixtures on Wolf Pen Branch Bridge provide a pedestrian-scale amenity for pedestrians crossing the bridge between neighborhoods bisected by the highway. Dark, natural-toned surface treatments for vertical light posts along the corridor help them blend into the natural color palette of the landscape.

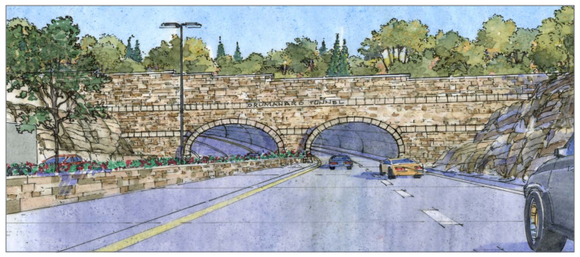


9 FENCING AND SCREENING: These structures use existing fencing types and wall texturing that incorporate the local stone wall vernacular. Landscape plantings enhance screening. Soundwalls along the corridor provide noise mitigation and a safety barrier. The architectural surface treatment will be the same creekstone texture and color used on the bridge structures.

10 ARCHITECTURAL CONCRETE TEXTURES: Enhancements reflect the local vernacular forms, colors and textures. Artisanal treatment to refine shotcrete-facing provides human scale and visual interest. Concrete texture and detail unifies visual aesthetic that provides visual linkage between wall and bridge structures along the corridor.



11 ARCHITECTURAL SURFACE FINISHES: A range of earth-toned stain colors recreate the color tones of the existing natural and built features in the landscape. Smooth textured concrete creates a refined visual aesthetic for built elements. Dark painted surfaces and elements, along with unpainted weathered steel, blend with the natural surroundings as favored by the community.



12 TUNNEL PORTAL TREATMENTS: Using an artisanal treatment to refine the shotcrete-facing material, the massive cut-rock face of the Tunnel portals will be transformed to a welcoming, human scale entrance into the Tunnel. The architectonic look of a constructed stone wall provides a natural transition from the sheer rock wall cuts to man-made Tunnel feature.

4.2.1.7 UTILITY RELOCATION & ADJUSTMENT WORK ELEMENTS

WVB has developed a Utility Master Plan (UMP) that encompasses WVB's approach for utility adjustment work. Mark Hedrick, Utility Manager, manages the UMP and all utility work. Included in this approach is WVB's overall goal to reduce utility relocation and protection work through innovative design and construction measures. We have addressed each of the IFA's concerns:

- 4.2.1.7.a Utility Adjustment and Interface
- 4.2.1.7.b Construction Staging for Utilities
- 4.2.1.7.c Proactive Utility Coordination

WVB has identified and been in constant communication with utility owners including AT&T, City of Jeffersonville Wastewater, Duke Energy, Insight, LG&E, LWC, MSD, and Watson Water Company, to understand the concerns and meet the expectations of the utility owners.

WVB has developed a Utility Matrix to track and review the known and potential utility adjustments and protection items. The matrix began with the IFA-provided list of the adjustments. During the design process, WVB noted additional utility conflicts and adjustments and has worked proactively with IFA and the utility owners to address. The Utility Matrix, a portion of which is included in **Figure 4.2-21**, is continuously updated throughout construction and Operating Period. Each month the Utility Matrix is provided to the utility owners and IFA as part of WVB's efforts to work with all parties to determine necessary relocations and adjustments.

Based on communication with utility owners, WVB has designed innovations into the Project to avoid utilities and reduce overall exposure to utility adjustments. Design enhancements at the Kentucky Approach Bridge with adjusted pier locations removes conflict with LWC's sludge lagoon. At Wolf Pen Bridge, WVB's design removes a transmission pole conflict, and associated material lead time, allowing early construction commencement. Additional utility technical solutions are included in the figure on the next page.

Restricted and protected zones, such as LWC's WHPA and 60-inch watermain, have been identified, reviewed and discussed with utility owners for proper protection

SAFE AND SUSTAINABLE

WVB has redesigned the Kentucky approach by adjusting pier spacing to mitigate the sludge lagoon adjustments.

measures. Within the WHPA, WVB installs erosion control fencing and earthen berms with liner for the haul roads and laydown yards. WVB has determined alternatives to reduce impacts and has developed a design to avoid the most impactful conflicts. WVB continuously reviews potential utility conflicts to avoid cost and schedule impacts, and negative effects to the public.

During construction, communication with utility owners, IFA and the Department allows WVB to locate utilities using vacuum excavation in order to mitigate relocations (**Figure 4.2-20**). Further, WVB uses its local experience on past projects to identify local utility firms that WVB has worked with successfully to assist in any utility work.

WVB's construction staging and sequencing approach accounts for utility work that is completed by WVB and by utility owners; we coordinate with the utility owners, IFA and the Department to ensure timely completion of this work, especially those adjustments that might affect our Critical Path Schedule. Our approach ensures that any utility work done by WVB is planned in conjunction with utility owners in order to relocate utilities just once during construction, mitigating cost. Proactive communication with utility owners and IFA allows anticipated completion of a majority of utility work by mid 2014.

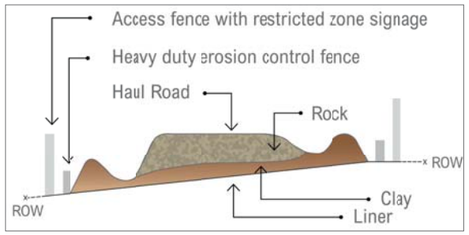
FIGURE 4.2-20 UTILITY PROTECTION

WVB has experience with local utility companies and subcontractors and with protection measures such as vacuum excavation and potholing.

FIGURE 4.2-21 UTILITY RELOCATION AND ADJUSTMENT WORK ELEMENTS

UTILITY AVOIDANCE TECHNICAL SOLUTIONS

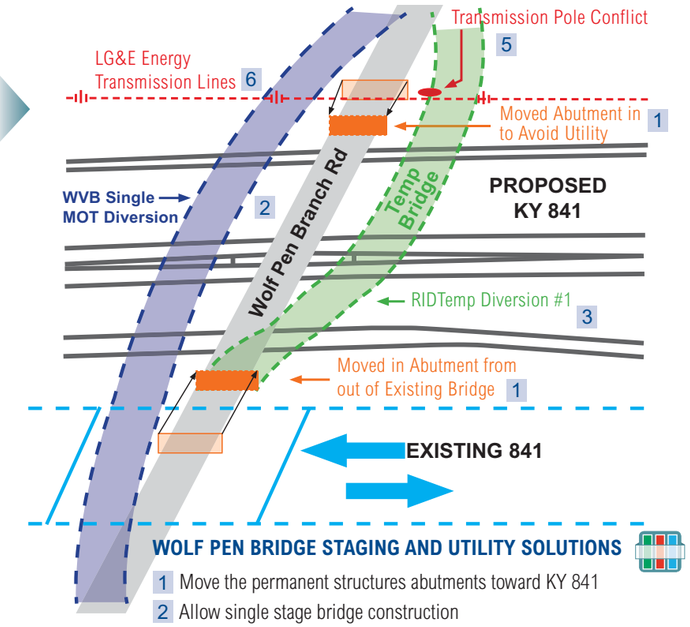
Area	Challenges	Innovations
Wolf Pen Utilities	• Design required relocation of a utility pole complicating construction, due to long lead time for pole, and traffic phasing	• Redesigned bridge avoids utility pole, allowing for a single stage construction and reduced impacts to residents
LWC Sludge Pond	• Design called for two pier foundations that impacted the sludge pond which lies in an environmentally sensitive Wellhead Protection Area	• Redesign of Kentucky Approach, bringing the NB and SB bridge structures together as a single bridge, and adjusted pier spacing removes the sludge pond adjustment.
Brookhollow	• Permanent Brookhollow Bridge under SR 265 caused sewer conflicts and environmental impacts (wetland / floodplain)	[redacted]
SR 265 / SR 62 / Port Road Interchange Utilities	• Multiple utility conflicts to be completed in multiple stages and multiple stage RR impacts	• Enhanced roundabout design reduces overall footprint and bridge widenings for reduced utility adjustments; design also reduces railroad impacts



Haul road and laydown yard protection measures for the LWC Wellhead Protection during construction of the Kentucky Approach Bridge and Main Span Bridge

UTILITY AWARENESS AND PROTECTION

Area	Challenges	Innovations
LWC 60" PCCP	• Existing main has at least three current fractures • Blasting activities for tunnel adjacent to main • Loss of watermain would create serious public inconvenience and harm	• Preconstruction video survey • Continuous monitoring during blasting • Post-construction video survey • Follow up video survey one year after construction
LWC Well Head Protection Area	• Material restrictions • Access restrictions • Contamination of well heads in major environmental impact area	• Construct berms, liners • Haul roads with shot rock and stone caps • Preconstruction meetings with LWC and IFA • Specific review of design for LWC impacts



WOLF PEN BRIDGE STAGING AND UTILITY SOLUTIONS

1. Move the permanent structures abutments toward KY 841
2. Allow single stage bridge construction
3. Reduce RID traffic stages from five to two
4. Eliminate temporary bridge structure
5. Avoid conflict with transmission pole and 24-month utility adjustment
6. Eliminate shutdown of the high demand transmission line

- Reduce impact to traveling public and utilities.

UTILITY MATRIX EXCERPT

Company: Utility Type/Material	Relocation Type (1, 2 or 3)	Conflict Location	Expected Agreement Date	Construction Commencement Date	Notes
SECTION 4					
LG&E: Electric 69 kV Transmission Line	Type 3	SB KY841 Springdale to US 42	02/2013	02/2014	WVB has had several discussions with LG&E concerning their preliminary designs at Wolf Pen. Preliminary design does not include lines that are in conflict with the noise wall on the left side of KY841 that will be directly under the lines. LG&E is trying to obtain approval to keep lines in place and move noise wall toward center line in the design. Preliminary design Includes self-supporting poles across Wolf Pen. LG&E took out 10.15.12 RID Volume 3.
MSD: 10-inch Gravity Sanitary Sewer	Type 2	Shadow Wood Sub	02/2013	06/2013	Preliminary design shows that after completion of the new gravity sanitary lines to pump station (estimated completion of September 2013), the existing gravity and effluent lines will be bulk headed and safe loaded. WVB has contacted MSD concerning preliminary work plan for new gravity line. WVB has preliminary redesign to relocate effluent lines and remove a portion of relocation.
ATT: Fiber Optic/Cabinets	Type 3	Wolf Pen	03/2013	07/2013	WVB has contacted AT&T in regards to the preliminary design that included temporary fiber optic cable relocate on the temporary bridge; WVB redesign of Wolf Pen eliminated temporary bridge and removes temporary relocate.
SECTION 6					
Duke: Aerial Distribution Line	Type 3	SR 62/SR 265/ Port Road	03/2013	03/2014	Communication has been opened up between WVB and Duke Energy. Relocation timeline incorporated into Project schedule. Enhanced roundabout interchange design reduces maintenance of traffic and construction issues with distribution line.
Vectren Gas:10-inch Transmission Line	Type 3	Station 244+50	01/2013	05/2013	WVB has contacted Vectren Gas to clarify relocation design. Preliminary design indicates to abandon gas main in place. Vectren will Install new 10-inch transmission line 25 feet offset from proposed SR 265.
Level 3: Fiber Optic	Type 2	Utica Sellersburg Road Thru SR62	02/2013	06/2013	After discussion with Level 3 Communication, it has been indicated existing facilities along Utica Sellersburg Road will be relocated underground in conduit bank along Utica Sellersburg Road through SR 62/SR 265 interchange.

4.2.2 DESIGN-BUILD MANAGEMENT APPROACH

The Walsh-VINCI CJV's approach to design-build management is based on full integration of design, construction, and O&M. This gives us greater control to ensure fulfillment of IFA and WVB goals.

WVB's "one team" approach shapes development of the project management organization and Integrated Management System (IMS) procedures. WVB's expertise provides a unified approach to design, construction, and quality control to enable efficient scheduling of design, construction, and review to ensure safe, timely Project delivery at all stages.

4.2.2.1 ORGANIZATION

The Walsh-VINCI CJV has an efficient organizational structure tailored for the Project, using our experience of safe, on-time delivery of similar projects and understanding of industry best practice. Our project management approach aligns our team structure with our IMS requirements to optimize delivery of all elements of design, construction, and quality control.

4.2.2.1.a Project Management Organization

Section 4.1.1(i) identifies the firms/organizations involved in the Project's design and construction. Brian Hoppel, Construction Manager, leads the Walsh-VINCI CJV and is the single point of contact to the SPV.

4.2.2.1.a.i Design Management

Laurent Agostini, Design-Build Coordinator, owns the design delivery process (D3) in the IMS. This process integrates directly with the construction delivery process (D4), as shown in **Figure 4.2-22** and described in **Table 4.2-10** on the next page. Laurent manages the interfaces between construction and design, working closely with engineering managers and Andrew Brennan, Design Manager. Andrew's responsibilities include:

- Coordinating with Design Section Managers to predict required staffing changes for their teams.
- Liaising with the design staffing coordinator regarding design team hiring/relocation issues.
- Overseeing corridor-wide coordination functions, including the global project CADD platform.
- Managing design subcontracts and allocates subcontractor resources to section teams as needed.

Design Section Managers manage scope, schedule, and budget for design work for their section. Each develop cost estimates for remaining design work for each unit; three-week look-ahead schedules; and accelerate the design schedule as needed.

FIGURE 4.2-22 DESIGN DELIVERY PROCESS (D3)

Utilizing WVB's IMS, Design-Build Coordinator, Laurent Agostini, will work closely with Construction Manager, Brian Hoppel, to deliver the Project.

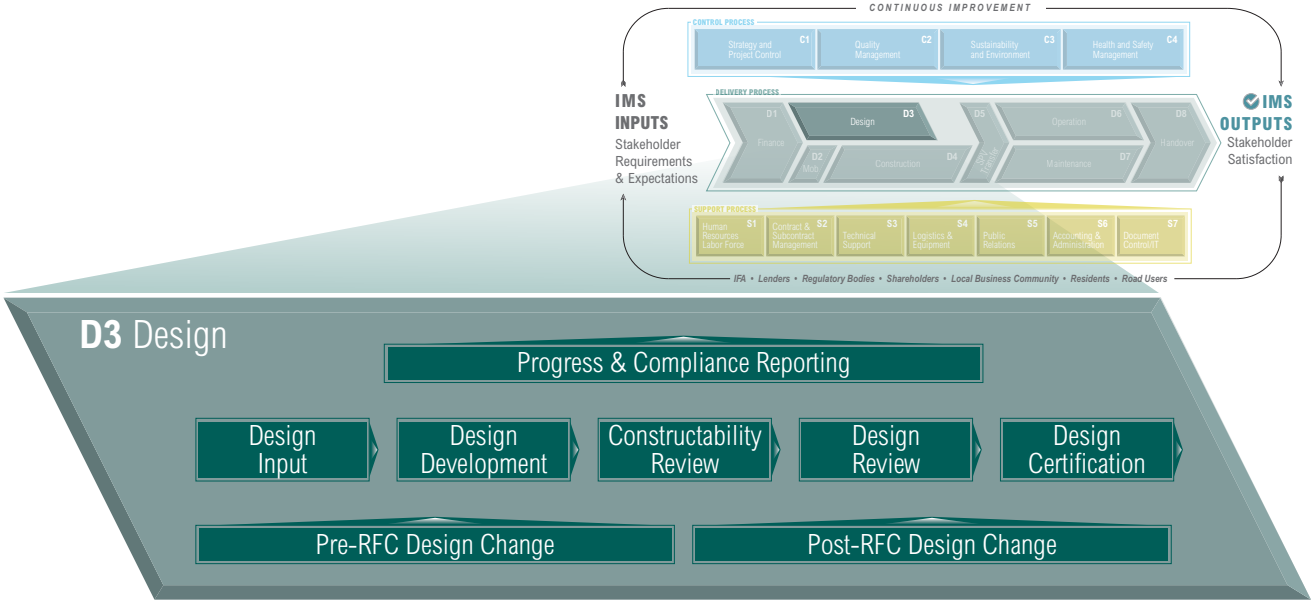


TABLE 4.2-10 PROCESSES COVERED BY THE DESIGN DELIVERY PROCESS (D3)

Phase	Description
Design Input	Design Team reviews preliminary designs and design brief to ensure specifications comply with contract and will deliver IFA and stakeholder requirements. Input data include temporary construction constraints.
Design Development & Construction Review	Design team processes and reviews design input data after interfacing with relevant others. Outputs design deliverables as per the schedule and plan. Engineering team reviews designs from a technical perspective to ensure quality and buildability, with specialist input (e.g., technical, geotechnical and environmental).
Design Review	DQAM leads WVB's review process to enable designs to be issued for Stage 1, 2 and RFC approval. Independent design checkers review and challenge bridge and Tunnel designs. IFA reviews phases.
Design Certification	DQAM confirms each design deliverable produces executed works that comply fully with project requirements/design inputs.
Pre-RFC Design Change	Design Manager oversees a structured change management process to ensure design changes needed (e.g., to improve buildability are recorded, managed, approved and costed appropriately).
Post-RFC Design Change	Engineering Manager ensures changes at this stage (to respond to non-conformances, environmental incidents, etc.) are recorded, managed, approved and cost appropriately.
Design Interface Management	Design-Build Coordinator ensures all interfaces are identified and continuous engagement conducted to keep stakeholders informed and take on board feedback. This will include the integrating issues discussed below.
Progress & Compliance Reporting	The Design Build Coordinator will report on design/engineering progress and performance as well as major issues to the CJV Executive Committee for decision making.

INTEGRATING RELATED ISSUES: WVB's Design Team receives input from several corridor-wide functions to ensure Project and stakeholder requirements integrate with:

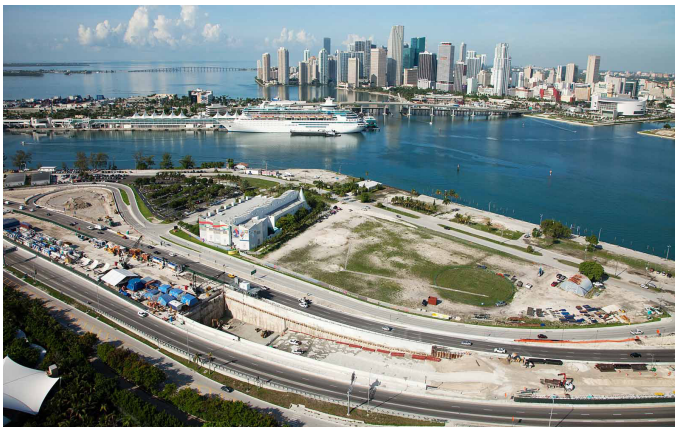
- **Right-of-Way Coordination:** Although not anticipated, the ROW Coordinator notifies the team of any right-of-way acquisition changes to the design process so schedule impacts can be mitigated.
- **Utilities:** Mark Hedrick, Project Utilities Manager, provides routine updates on the status of utility adjustments. Mark arranges utility agreements and liaises during the design development.
- **Survey:** WVB's survey team, led by our Chief Surveyor, liaise with the design and engineering teams to incorporate results into design development.
- **Community Relations:** Dan Hartlage, Public Information Coordinator, leads external consultation and communication. He and the design team consult stakeholders and ensure feedback is used in design development.
- **Environmental Permitting:** Gina Morris, Environmental Compliance Manager, supports a review of environmental permits, commitments, and requirements. Gina also assesses sustainability risks and ensures designs incorporate measures for compliance during construction and the Operating Period.

4.2.2.1.a.ii Design Delivery

DESIGN RESOURCES: WVB works with local and international design experts to deliver the Project safely, on-time, and in line with IFA quality requirements. Mobilization of the design team begins at Notice of Award. To identify design staff requirements, we integrated the design schedule into the overall schedule and developed a staffing curve. We estimate a peak design staff of 150 professionals six months after mobilization. To meet staffing requirements, Jacobs partners with disadvantaged businesses.

DESIGN COORDINATION

The WVB Design Team's has proven coordination experience from PPP project's like Golden Ears, Confederation Bridge and Port of Miami Tunnel.



DESIGN TEAM LOCATION: Andrew Brennan, Design Manager, leads the design team, and manages and coordinates subconsultants. WVB strategically selected local design team offices to:

TABLE 4.2-11 PROPOSED MAJOR DESIGN TEAM LOCATIONS

Location & Type	Primary Functions
Utica, IN **Project Office**	• Design-Build Coordination • Quality Assurance Management • Post-RFC Design Coordination • IFA Review Phase Coordination
St. Louis, MO Indianapolis, IN **Primary Design and Production Facility**	• Corridor Wide Integration • Segment 4 & 5 Production Centers • Segment 6 Production Center (Indiana) Design Team Cost and Schedule Controls • CADD Production Management • Design Document Management • Resource Support

- Provide the required design functions at the project office as per the technical specifications.
- Locate all project-wide coordination and production functions in a central primary facility.
- Create cost-effective major support centers where larger staffs are available.
- Harness specialty technical expertise from other contributing locations.

Table 4.2-11 describes proposed locations. To minimize travel, WVB utilizes tele-, web- and video- conferencing capabilities at all design locations.

INTEGRATING AND COORDINATING DESIGN TO ENSURE CONSISTENCY AND QUALITY: WVB first communicates our single, uniform approach to design management to ensure consistency throughout design development. We agree on: design schedule, required formats for drawings and data, design review and approval protocol, and key contacts. Details are agreed to at initial workshops and captured in the Project Management Plan, Project Criteria Document (setting the baseline design criteria) and Design Quality Management Plan.

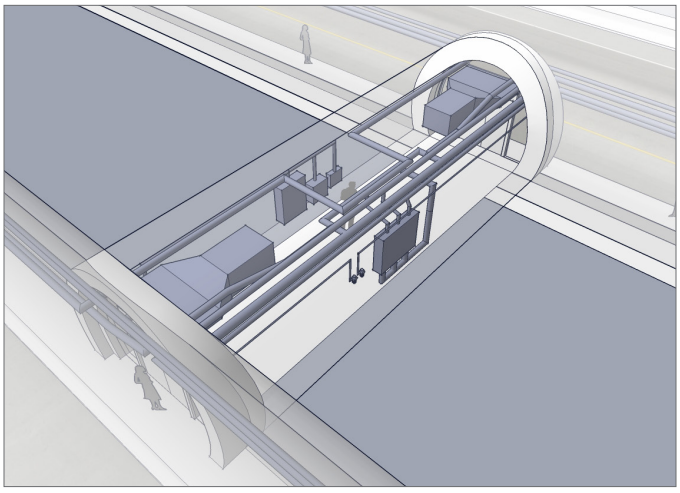
WVB requires all design team members to use common design and communication tools. DyMaDoc provides authorized parties access to Project documentation and drawings. Document change alerts are sent to relevant personnel to ensure the correct data is used. We use a Project-specific workspace environment in MicroStation to distribute to all offices, including subcontractors. This standardizes, for example, libraries, symbols, and colors for consistent plans.

IDENTIFICATION OF PHYSICAL INTERFACES & DESIGN INTEGRATION: A vital stage in the design process is the identification of critical physical interfaces between the various elements of the design. Once design team and subcontractors are appointed, WVB holds a workshop to identify all physical interfaces and prioritize associated areas. Early design has begun to identify areas of congestion within the schedules. Where this is more challenging or a serious risk to constructability, a more in-depth review is carried out.

For example, at the Tunnel utility cross passages WVB uses VINCI CGP's program, ARMA 3D©, to provide 3D/4D visualization of the complex utility placement from different disciplines within small cross-passage corridors: electrical, fire suppression, detection, and ventilation (**Figure 4.2-23**).

FIGURE 4.2-23 3D/4D VISUALIZATIONS

WVB Design Team has completed 3D/4D modeling of many key areas including Tunnel cross-passage to resolve utility interfaces.



4.2.2.1.B INTERNAL ORGANIZATION SYSTEMS

WVB's project organization systems enable full design and construction integration. We have an efficient management and delivery team that expedites communications and enhance the decision-making process to increase the value of the Project for IFA. Clear control lines and communication ensure the highest quality,

Construction Manager (CM), Brian Hoppel

Direct Reports: Project Controls Manager; Site Manager and Bridge Construction Manager; Administration Manager; Contracts Manager

Benefits of this Organization :

- Accurate reporting and informed decision making
- Integration of buildability, scheduling, economics and site constraints
- Admin. support and best use of staff/labor resources
- Can champion the contract with SPV and subcontractors

Site Manager & Bridge Construction Manager, Pierre Morand

Direct Reports: Design-Build Coordinator; Logistics & Equipment Manager; Section 4 Project Manager (PM); Section 5 PM; Section 6 PM; Mechanical, Electrical and ITS Manager

Benefits of this Organization:

- Integrates site engineering with main and subcontract designs for efficient management of post-RFC changes
- Central service function streamlines equipment use and PPM scheduling for optimal safety and productivity
- Focused ownership of construction, scheduling, design-build coordination, works preparation and execution
- Section PMs own budget, time, quality and safety
- Coordinates with O&M and utilities

DESIGN-BUILD COORDINATION

Pierre Morand successfully managed and coordinated with WVB design partners IBT and Buckland & Taylor the Confederation Bridge, an eight mile prestressed bridge.

efficient work, issue identification, and resolution throughout construction.

By dividing the works into three sections based on geography and construction activities, Section Project Managers have autonomy to control a particular area. This autonomy improves response to local and task-specific commitments, requirements and concerns. Although divided, all works are delivered consistently, in line with our single IMS.

4.2.2.1.b.i Construction Management and Integration

Brian Hoppel, Construction Manager, leads the entire design-build delivery of the Project. Site Manager and Bridge Construction Manager, Pierre Morand, reports to Brian and directs the Design-Build Coordinator and Section Project Managers.

As the Project is divided into three geographic areas, we organized the management team based on this division:

- Section 4 – Kentucky Approach
- Section 5 – East End Bridge
- Section 6 – Indiana Approach

A Section Project Manager controls each section and all aspects of design and construction for that section. Geographic division of works facilitates management of environmental requirements and constraints, local stakeholders and interfaces. For each part (Tunnel, bridge, and roadway in both Sections 4 and 6), there is a dedicated Design-Build Coordinator. Individual Design-Build Coordinators for each of these portions ensures knowledge sharing and minimizes duplication. Section Design-Build Coordinators report to the Design-Build Coordinator, Laurent Agostini, who coordinates communication between sections during design and construction.

Design-Build Coordinators work with the Engineering Manager to support Laurent with management of design efforts and schedule assessment, interface, and constructability constraints. Design-Build Coordinators work closely with area-wide managers, such as Mark Hedrick, Project Utilities Manager, and Mark Fournier, MOT Manager, to support design development and review. Design-Build Coordinators are involved in both design and construction, and ensure construction requirements are considered during design

and design is understood in construction. **Table 4.2-12** provides specific physical interfaces that require design coordination.

Within each section, crews report to a Foreman, who in turn reports to a Superintendent. Multiple Superintendents report to each Section Project Manager. Regular two-way communication is maintained between all supervisors and reporting personnel to provide clear instruction and promote quality, productivity, safety, and sustainability, and to receive feedback. Field Engineers support related engineering and project controls activity, including monitoring and measuring to support reporting of key performance indicators. WVB's reporting structure is illustrated in **Figure 4.1-5** in Section 4.1.1.a.ii.

4.2.2.1.b.ii Unified Design, Construction, & Quality Approach

WVB is committed to collaborating with IFA to deliver the Project safely and responsibly, on schedule and within budget. Our Project Management Plan (PMP) sets out the delivery approach applied through design, construction, and the Operating Period. The PMP describes the management systems and procedures in our IMS, which incorporates our quality management system. The IMS applies at all stages, and everyone working with WVB is required to comply.

WVB applies a single governance approach and a consistent decision making process. Decision making and quality assurance are supported by inspection, measuring and reporting by our independent quality team. The quality team independently ensures the objective review and approval of all aspects of delivery.

WVB trains to ensure team awareness of quality requirements. Common induction training is provided to employees and supply chain personnel on our project management approach, individual responsibilities, site rules and specific quality messages. Focused training is provided to design team for design quality and environmental requirements.

WORKING TOGETHER

As Walsh Construction has done with past INDOT partnerships, WVB will create and sign a charter reinforcing our vision, values, and objectives.

COLLABORATIVE PARTNERING APPROACH: Early on, WVB and client senior managers define the project vision, values and objectives. We create and sign a project charter based on our vision, values and objectives.

An initial design workshop introduces design team members to the Project charter. Initial launch workshops for construction and O&M workforces reinforce WVB's vision, values, and objectives. We ask team members to sign the Project charter. Project induction training and regular briefings further communicate our approach. Additionally, regular social events are held to celebrate achievements and build lasting relationships within our team.

PARTNERING

WVB partners are leaders in construction industry that believe in collaborative partnering with the owner and all team members as has been done across INDOT projects such as Accelerate I-465.

TABLE 4.2-12 PHYSICAL INTERFACES AND DESIGN INTEGRATION

Design Element	Parties	Interface Concerns
Cable Stay Anchorage Point	Bridge structural engineer, cable stay supplier for anchor heads, pylon anchor box, DB coordination	High density of reinforcement around anchorage point, requires suitable space for tensioning and inspection.
Tower Lower Strut	Bridge structural engineer, form work manufacturer, bridge superintendent, DB coordination	High density of reinforcement and coordinated form work design for constructability.
Tunnel Cross Passage Utilities	MEP coordinator, lead Tunnel engineer, mechanical engineer, component manufacturers, DB coordination	Multiple utility lines running through cross passage.

4.2.2.2 DESIGN-BUILD BASELINE SCHEDULE

In developing our Project design-build schedule, WVB considered all elements of the work, related requirements and constraints, resource availability, risks, and construction best practices to optimize safe and efficient delivery.

4.2.2.2.a Schedule Methodology

The Project CPM schedule incorporates thousands of activities, including many to be completed by subcontractors. The CPM accounts for and tracks all aspects of the Project including design, fabrication, and construction activities.

4.2.2.2.a.i Schedule Preparation, Control & Update

WVB's approach to preparing the design-build schedule, as presented in Section 4.1.4, is based on a refined design approvals process and proven construction output rates. The schedule narrative and preliminary P6 schedule is provided in Volume 2 Appendices.

WVB's design approval methodology, as shown in **Figure 4.2-24**, optimizes design progression by coordinating subsequent Stages during the IFA approval periods. This provides a streamlined approval process for effective construction progress. WVB collectively reviewed and agreed upon proposed methods, sequences, and proven production rates to provide a swift and efficient schedule that allows for substantial completion by October 31, 2016.

TIME AND BUDGET

WVB delivers the East End Crossing to revenue-generating traffic by October 31, 2016, eight months ahead of IFA's goal.

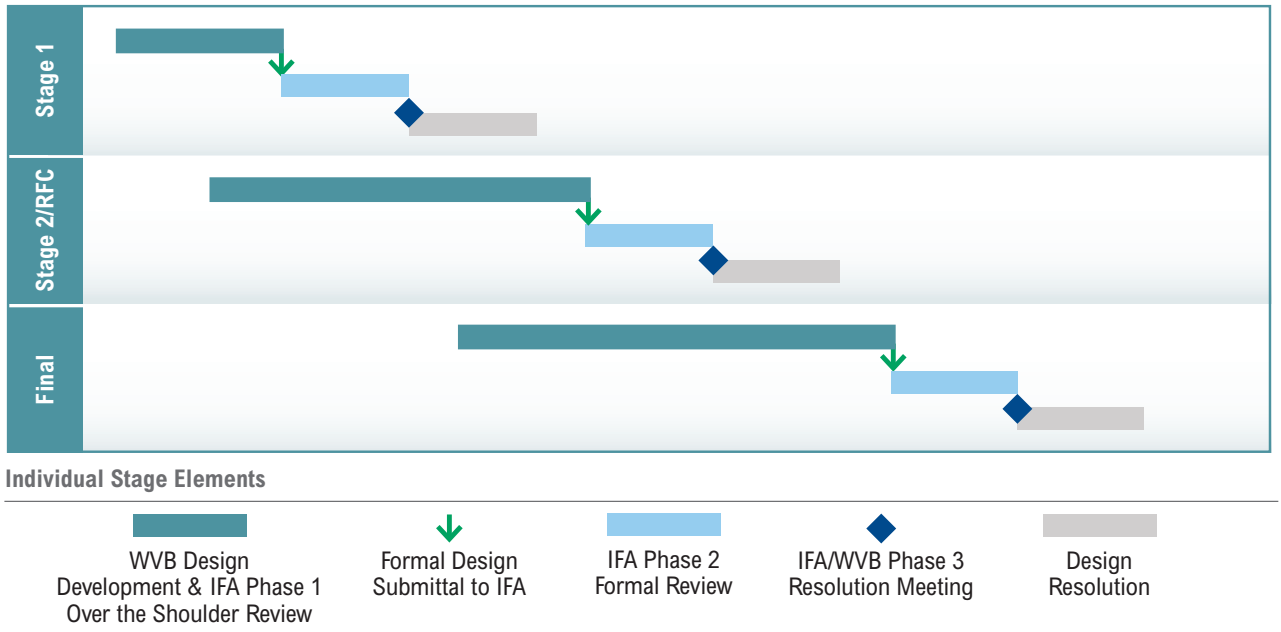
The WVB Design Team reviews progress on the design schedule on a monthly basis. This review identifies risk factors or opportunities previously unforeseen, and formulates solutions. Critical and near-critical activities are closely monitored throughout the design phase of the Project. Earned Value reports provide the design team leaders the information needed to manage their teams, and to brief the project management team on progress.

WVB's structured control and update system for scheduling this Project includes:

- Three-week look-ahead schedule produced weekly and reviewed by the design-build team.
- Project team meetings twice per month to compare the progress of the past two weeks against the previous schedule and update as necessary.

FIGURE 4.2-24 DESIGN APPROVAL PROCESS

WVB's design approval process summary schedule shows how IFA's three-phase review process will be incorporated into the three stages of the design process.



- Meeting minutes produced by the Project Scheduler and included as part of the encompassing monthly update provided to the IFA.

4.2.2.2.a.ii Work Breakdown Structure (WBS)

Iterations of alternative Work Breakdown Structures (WBS) were developed and reviewed to determine a fitting preliminary outline that accurately reflects the entire Project's scope and provides a sensible and accurate tool for planning through completion.

WVB Schedule Manager, Scott Singleton, has developed a detailed WBS in line with INDOT procedures for all activities including:

- **Contract Administration** (meeting financial close, satisfying NTP requirements, commencement of construction).
- **Section 4 – Kentucky Approach** (design and MOT phasing, Tunnel/roadway/bridge construction).
- **Section 5 – East End Bridge** (design, foundations, towers, superstructure, erection sequence, finishes).
- **Section 6 – Indiana Approach** (design and MOT phasing, roadway/bridge construction).

4.2.2.2.a.iii Integrating Subcontract Activities

WVB consults with key material providers and subcontractors to create and agree to the overall baseline schedule. The schedule includes a large collection of activities for Project procurement, including fabrication times for key items such as bridge bearings and beams, post-tensioning materials, Tunnel equipment, MSE walls, and overhead sign structures.

WVB works closely with all suppliers to ensure they have the capability and capacity to meet the requirements of the agreed construction schedule. WVB tracks supplier fabrication schedules and frequently visits fabrication shops. On-site subcontractors attend the twice-monthly Project team meetings and contribute to the schedule review to make modifications to the schedule where necessary. This is then applied to the development of our detailed three-week look-ahead schedules throughout the course of the Project to ensure all parties remain focused on predictability of Project delivery.

4.2.2.2.a.iv Managing Resources & Activities

WVB has based our schedule on productivity rates from our member's global portfolio of delivered projects. Once on site, we consider each element of construction separately to further optimize activities to reflect durations based on final quantities and demonstrated production rates.

WVB's project controls team, as part of WVB's C1 Strategy and Project Control Process, will drive our continuous improvement efforts. This effort focuses on optimizing our processes, identifying and implementing innovations, and adopting collaborative work practices to achieve improved delivery time.

WVB's approach ensures we meet and potentially improve our milestone dates. The following resource options for schedule recovery have also been considered:

- WVB's Tunnel excavation schedule is based upon three shifts working five days. Excavation on a sixth day provides a 17 percent production increase.
- The East End Bridge schedule is based upon one shift working five 10-hour days. Added shifts and extended hours offer multiple recovery options.

Every project introduces challenges that interrupt the planned schedule. Whether it requires alternative design solutions, additional equipment, extended labor shifts, or an increase in subcontracted activities, WVB has the local and global resources and experience to deliver the Project more effectively than any other team.

DESIGN-BUILD SCHEDULE SUCCESS

WVB uses design-build coordination to complete projects with aggressive schedules, such as the US 90 Bridge over Bay St. Louis, which won AASHTO schedule award in 2008.

4.2.3 DESIGN-BUILD QUALITY MANAGEMENT

WVB is committed to delivering a quality end product for IFA and providing assurance throughout all stages of Project delivery to confirm this commitment. Our Design-Build Quality Management approach is founded both on our use of knowledgeable personnel with relevant experience, and our commitment to achieving "Right First Time" delivery. As well as enabling us to exceed IFA quality expectations, our approach maximizes efficiency in delivery, bringing significant cost and schedule benefits.

In defining clear processes for the production and checking of design deliverables, WVB clarifies roles and responsibilities for team members and establishes all lines of communication and reporting from the Project outset to ensure smooth operations during delivery. High quality designs are produced efficiently, incorporating the full input of all relevant parties, and are approved in time for safe, responsible construction to begin on schedule.

QUALITY

"Right First Time" delivery to exceed IFA quality expectations, maximize efficiency, and provide cost and schedule benefits.

4.2.3.A DESIGN QUALITY

THE DESIGN DELIVERABLE PROCESS: The first step in this process is to identify all design deliverables required for the Project. Each is uniquely numbered and the relevant approval requirements and timings calculated so they can be incorporated into a Project design deliverables schedule. This aligns with the overall Project schedule to ensure designs are completed and approved in time for construction to begin as planned.

Design team members produce deliverables according to an agreed plan and common set of procedures. This determines the format in which drawings are to be produced and provides templates for related documents to ensure these record all necessary information. It also established the route each deliverable must take to ensure distribution and approval in line with WVB and IFA requirements.

OUR INTERNAL PROCESS FOR DESIGN REVIEWS: Throughout the design process, all calculations, analyses, models, and drawings are checked according to the procedure and requirements set out in our Design Quality Control Plan. This plan, developed by our Lead Engineer, Marcos Loizias, specifies the type and frequency of checks and assigns competent design checkers. Checks are performed by qualified engineers not involved in originating the work to ensure objectivity in checking and challenging the designs provided.

WVB performs independent design checks for the main span bridge and Tunnel items, using qualified engineers who are independent of the design team. These independent checks are in addition to the typical design quality control procedures. The WVB O&M Team is included in the design process to provide input for materials and details that optimize the durability and maintainability of the Project.

Initial designs go through a series of internal WVB reviews including constructability, safety, cost and schedule control, material selection, and sustainability concerns. Bruce Peterson, Design Quality Assurance Manager (DQAM), then reviews the package from both the design quality control checking process and internal reviews. He confirms compliance with our overall Project Quality Control Plan as well as the PPA requirements to ensure designs lead to client satisfaction in construction, operation, and maintenance of the end product.

THREE STAGE REVIEW PROCESS: The Technical Provisions specify a three stage design review process comprising Stage 1, Stage 2, and Final Stage reviews. Within each stage there are, in turn, three phases:

PHASE 1: Informal or 'over the shoulder' reviews, which we anticipate will be handled through the daily interaction of the WVB designers and IFA reviewers during regularly scheduled section or task force meetings.

PHASE 2: Formal submittal of the design to IFA for review. The durations for the formal IFA review process are defined in the PPA documents and will be agreed at the Design Kick-Off meeting.

PHASE 3: Design resolution meeting chaired by the DQAM Bruce Peterson, with the Responsible Engineer, the IFA's reviewers and other developer team members as appropriate. WVB will provide a written response to IFA's comments for review and resolution. If required, Bruce will obtain the revised designs and submit them as a revised Phase 2 submittal.

In order to meet the overall Project schedule requirements, certain construction activities need to start before the applicable design unit has completed the Final Stage of the design process. For these activities, including main bridge foundation and Tunnel south portal walls among others, specific early release RFP reviews are added to the review process. The DQAM submits these items for RFC approval with a certification that the design and quality process has been sufficient to enable the construction of the selected items of work identified in the relevant RFC package.

QUALITY ASSURANCE AND QUALITY CONTROL FUNCTIONS: WVB's Quality Assurance and Quality Control functions are described in Section 4.1.5 and detailed in preliminary PMP in the Volume 2 Appendices. WVB's DQAM, Bruce Peterson, is responsible for adherence to the design deliverable quality assurance processes, taking accurate input data into account, and maintaining all necessary records.

HOW THE IFA AND DEPARTMENT ARE INVOLVED: WVB engages IFA and Department via the Phase 1 over the shoulder reviews throughout the design development and approval process to ensure incorporation of all objectives and to provide status on the up-to-date progress on developing the designs ready for construction. IFA's participation in these reviews is vital to allow us to address any design-related issues proactively and expedite the formal review process. The IFA and Department are involved in approving and signing off designs as part of the Phase 2 and 3 reviews.

REPORTING RELATIONSHIPS AND RESPONSIBILITIES: The WVB Design Team structure, including reporting relationships, is shown in the organization chart in the Volume 2 Appendices PMP. As this illustrates, Bruce reports directly to our Project Quality Manager, Martine Julia-Sanchez. He focuses exclusively on the Design Quality Process independent of the Design Manager and the Lead Engineer.

IFA AND DEPARTMENT OVERSIGHT PROCEDURES TO BE IMPLEMENTED: WVB includes a Design Review Plan and Schedule in the Design Quality Plan to control and monitor compliance with oversight procedures. For each design unit, this Plan identifies related design documents to be prepared and submitted for review at each stage of development, including IFA design reviews. Completion of the Plan and associated schedule provides assurance that all required quality control activities have been delivered. The requirements set out in the Plan are discussed and communicated to all Design Team members via an initial design workshop, scheduled to take place within 30 days of NTP1.

DESIGN QUALITY PROCESS SUMMARY

CONFORMANCE WITH FEDERAL OVERSIGHT REQUIREMENTS: Walsh-VINCI CJV's design complies with FHWA guidelines and is not expected to require any additional design exceptions other than those previously noted by IFA. We continue to work with FHWA to ensure the final design meets all requirements and Federal safety standards. The current design meets all NEPA commitments and Walsh-VINCI CJV will coordinate with INDOT/KYTC to ensure the final design meets all requirements and commitments.

DOCUMENTING DESIGN QUALITY MANAGEMENT: After Bruce has verified that all internal reviews have been completed for a design package, he prepares a certification of the package for submission to the IFA. For each submission, a complete package is placed in the online

QUALITY

Design process incorporates best experiences of design, construction, operations, and maintenance for unparalleled sustainability.

DyMaDoc document control system, including all design quality control, internal review and quality assurance documentation.

MAKING CHANGES TO CORRECT DESIGN DEFICIENCIES: Design deficiencies identified are recorded by Bruce and communicated to the relevant members of the Design Team. Bruce creates a register of design deficiencies to review, track, and report on our progress of resolving these issues.

Any design changes are recorded and communicated to all relevant members of the Design Team to ensure incorporation in all drawings and future design development.

4.2.3.B CONSTRUCTION QUALITY

Implementation of Walsh-VINCI CJV's Design-Build Quality Management Plan ensures construction is in compliance with approved designs and specifications resulting in a high quality end product.

INTEGRATING WITH DESIGN: Throughout the design and specification of the Design Units (DUs), our experienced construction personnel interact with our design team to support development of material provisions, equipment installation requirements, construction tolerances, inspection and test standards, and acceptance criteria that meet or exceed IFA's specifications. Constructability reviews are carried out on each DU to ensure we achieve safe, efficient delivery of a high-quality end product.

WVB's Project IMS, incorporating our QMS, applies during design and construction. This includes common procedures for: document management; non-conformance/deficient design and build control; submittal and RFI; and communication and reporting. This facilitates quality control and ensures reporting consistency, making it easier to assess our ongoing quality performance.

DOCUMENTING THE CONTROL OF MATERIALS: The inspection of source materials is documented per IFA standards. Where possible, the selection of pre-qualified suppliers ensures materials are sourced from firms that have demonstrated their capacity and capability to uphold the Department's quality requirements. Records demonstrating the control of materials include Certified Material Test Reports and the results of physical material sample testing. Physical inspections and tests occur during in-process construction activities. All such records and results are managed via our secure online DyMaDoc document control system and also entered into IFA's requirement verification database application.

INSPECTIONS

ITPs provide details for inspectors use in field checks (rebar inspection at Cleveland Innerbelt, Walsh Construction).

REPORTING PROCEDURES AND METHODOLOGIES: WVB develops and implements a standard reporting discipline to ensure all results, records, and reports comply with common reporting parameters. This includes recording task-specific details, location, work element, workforce and supervision accountability; identification of incorporated material; major equipment use; inspection and test results; and the conditions under which construction was carried out. Quality performance is reported in IFA-approved formats and WVB provides report templates to ensure consistency and facilitate interpretation of results. Records provided include daily reports, schedules, work plans, ITPs (including mandatory hold points), witness points with signoffs, and quality results summaries.

All reporting is content driven, formatted, and approved by IFA authorities. This includes electronic meta data file structure and files. DyMaDoc is used for all document control and management including (but not limited to) quality records, drawings and specifications (see Section 4.1.7). WVB uses IFA's requirement verification database to review and respond to observations made during IFA quality oversight activities.

ACCEPTANCE TESTING, INSPECTION AND MONITORING OF CONSTRUCTION: Acceptance testing and inspection activities to be completed during construction are defined in inspection and test plans (ITPs) attached to method statements. ITPs typically include:

- Inspection type activity (hold point, witness point)
- Frequency of inspection
- Criteria of acceptance
- Responsibilities
- Records

Construction monitoring (**Table 4.2-13**) is primarily the responsibility of QC staff, but every member of our trained and empowered workforce is mindful of safe work practices and required quality standards.

TABLE 4.2-13 CONSTRUCTION MONITORING

Inspection and Confirmation of Work Plan Execution	Competent Project workforce responsible for Right First Time delivery
Inspection and testing of constructed components	Quality control professionals (directed by Construction Quality Control Manager, John Reid)
Affirmation of the results by split-sampling tests and surveillance inspections	Quality assurance personnel (directed by Construction Quality Manager, Courtney Norris)
Independent auditing	Independent personnel (directed by Quality and HSE Manager, Martine Julia-Sanchez)
IFA/Department oversight	IFA / Department personnel

CORRECTIVE ACTIONS: WVB is committed to right first time delivery and the use of quality planning, control and continuous improvement methodologies to achieve 'no surprises' during execution. This approach relies on our disciplined development of work plans; application of best practice quality control processes; and commitment to a philosophy of continuous improvement. Sustainable improvement is strengthened by quality assurance audits, management reviews of quality system results and the implementation of our strict non-conformance/corrective action (NCR/CA) procedure.

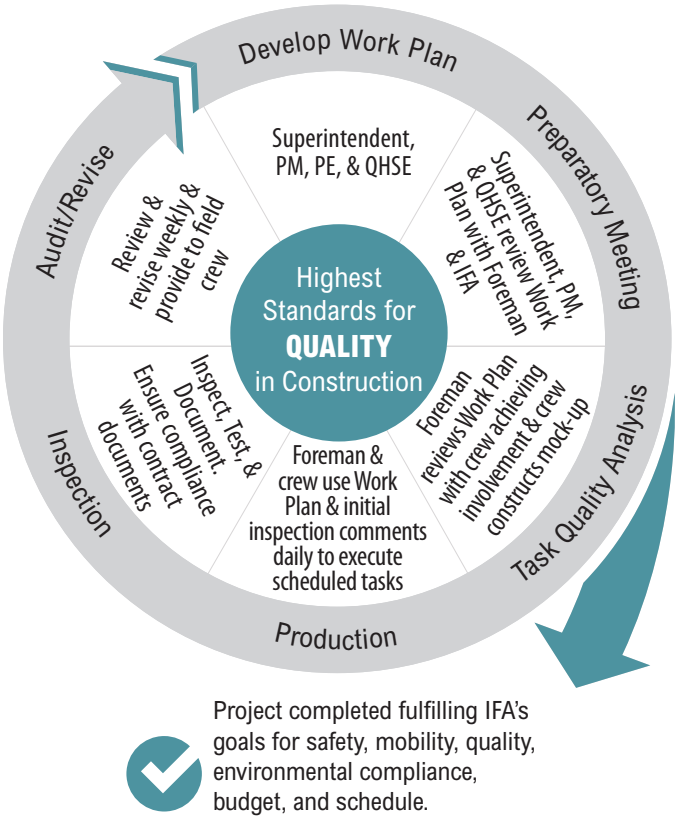
WVB's NCR/CA procedure requires anyone identifying non-conforming or deficient work or products to report this immediately for investigation and correction. A Corrective Action Plan is developed, implemented and monitored to ensure effectiveness in each case. NCRs are documented in CMiC and our EDMS. This allows our quality team to review results and identify any trends that warrant preventive actions to be introduced. Lessons learned are developed for sharing with IFA and throughout WVB supporting continuous improvement.

QUALITY

"Right First Time" delivery — disciplined work plan development, best practice application, and continuous improvement commitment.

IFA AND DEPARTMENT INVOLVEMENT: IFA and the Department are notified in advance of all proposed construction quality activities. We achieve this through regularly scheduled coordination meetings, look-ahead schedules, formal IFA-WVB quality meetings and direct communication with appropriate IFA personnel. IFA approval is obtained before any construction activity can proceed from a mandatory hold/witness point.

CONSTRUCTION QUALITY PROCESS SUMMARY



4.3 Operations and Maintenance Plan

4.3 OPERATIONS AND MAINTENANCE APPROACH

WVB's East End Partners' (WVB) Operations and Maintenance (O&M) main objective for the East End Crossing is to safely provide a high quality rapid response service and maintain the roadway with reduced disruption to the traveling public.

To achieve this objective, WVB commits to self-perform more than 30% of the O&M work of the East End Crossing Project (Project). Combining the know-how and experience of our equity owners, we have a vertically integrated approach to provide efficient and safe O&M.

WVB, led by Project Manager David Sikorski, brings extensive experience from the O&M of similar roadways and facilities around the world with shareholders currently operating over 3,300 miles of roadway systems including four cable stay bridges, summarized in **Table 4.3-1**. Vincent Meyer, our Team's O&M Manager served as maintenance manager of 620 miles of highway on the ASF Network, from 2008 to 2011.

WVB's international expertise is reinforced by our knowledge of the local area provided by Walsh Investors of Chicago. The integrated approach fosters project innovation and optimization to support efficient and safe O&M. WVB's approach utilizes local Indiana contractors, including Walsh Construction, to complete major maintenance and rehabilitation work.

One Team, One Project, One Community
This symbol highlights value added items throughout the document.

This experience and local knowledge, coupled with our vertical integration, gives WVB an in-depth understanding of the relationship between capital and operational expenditure for such facilities, as well as the importance of maintainability and access. The O&M Team has been involved throughout the bid in design development to ensure technical proposals for the Project include innovative O&M solutions, see **Figure 4.3-1**. Our solutions provide best value for money for IFA by reducing capital and rehabilitation costs, and further reducing costs beyond the Operating Period.

The WVB Team commits to provide excellent customer service for the traveling public throughout the operational life of the Project. WVB's O&M quality management procedure ensures that, by contract termination, we meet, and wherever possible exceed, all IFA Performance and Handback Requirements.

TABLE 4.3-1 SUMMARY OF SIMILAR PROJECTS UNDER WVB SHAREHOLDER OPERATIONS AND MAINTENANCE

DBFOM Projects	Description	Operations since
Cofiroute Network, France	750 miles of highway	1970
SR 91, California, USA	20 lane-miles of managed lanes	1995
ASF Network, France	620 miles of highway	1957
Tagus Bridge, Portugal	7.7 mile crossing with cable-stayed bridge	1998
Severn River Bridge, UK	3.1 mile crossing with cable-stayed bridge	1996
Rion-Antirion Bridge, Greece	1.8 mile crossing with cable-stayed bridge	2004
Confederation Bridge, Canada	8.1 miles with highway and bridge	1997
Kicking Horse Pass, Canada	16 miles with highway and bridge	2007
A1 Motorway, Germany	45.5 miles with highway and bridge	2012
North West Anthony Henday Drive, Canada	13 miles with highway and bridge	2001
Golden Ears Bridge, Canada	8 mile highway with 3,175 foot long cable-stayed bridge	2006

FIGURE 4.3-1 DESIGN TECHNICAL SOLUTIONS PROVIDED BY WVB TO OPTIMIZE FUTURE MAINTENANCE

SCOPE

For 35 years, starting at the end of the construction period, the WVB O&M Team will be responsible for all O&M activities within the Project O&M Limits. The WVB O&M Team will interface continuously with the Department and KYTC to ensure the flow of data between all parties is as smooth as possible.

WBV Responsibilities:
- Section 6 Mainline SR 265 and Ramps
- Section 4 Approach Bridge and Mainline North of Harrods Creek Bridge

INDOT Responsibilities:
- Section 6 Salem Road, Utica Sellersburg Road, and SR 62
- ITS
- Toll Collection

KYTC Responsibilities:
- Section 4 – South of Harrods Creek North Abutment including Tunnel
- ITS
- Toll Collection

LEGEND:
- O&M SCOPE
  - ROADWAY
  - MAIN SPAN
  - SR 265 BRIDGES
- AREA OUTSIDE OF O&M SCOPE

ROUNDABOUT INTERCHANGE DESIGN
- 44,000 SY reduction in pavement quantity
- 23,000 SF reduction in bridge deck quantity
- Removes traffic signals at intersection
- Safer and higher level traffic operations

SR 265 BRIDGE DESIGN
- Precast beams provide low maintenance
- Semi-integral end bents eliminate joints and bridge bearings maintenance

INSPECTION ACCESS IN MAIN SPAN BRIDGE
- O&M input included in the design of inspection access items will ensure optimal conditions for future inspections

LATEX MODIFIED CONCRETE OVERLAY
- Protects the reinforced concrete deck from wear and corrosion

WEATHERING STEEL ON THE EAST END BRIDGE
- Less painted area reducing maintenance costs
- Less risk for the environment

O&M BUILDING ACCESS
- O&M Building access to roadway
- Dedicated parking for users of the pedestrian/bike path

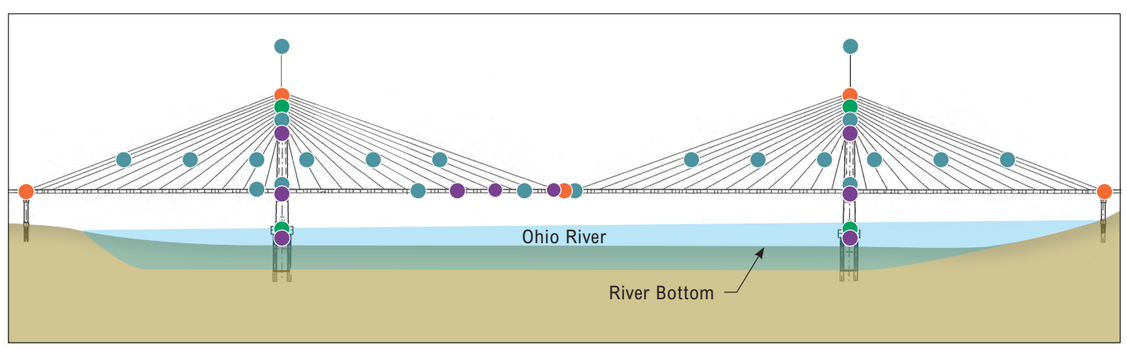
EXISTING SR 265 STRUCTURES: FULL DECK REPLACEMENT
- Full deck replacement based on WVB life-cycle analysis
- Results in reduced maintenance and disruptions and higher residual life for IFA

CONCRETE PAVEMENT: 50 YEAR DESIGN LIFE
- Less maintenance over the life of the Project
- Increased residual life Handback for IFA

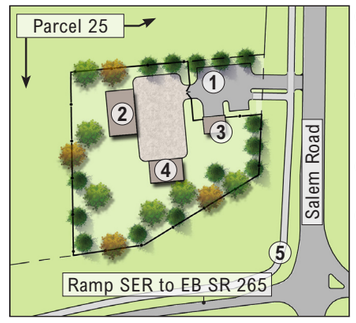
LOCATION OF ANCHOR PIERS 2 AND 5 OPTIMIZED
- Less potential for barge impact
- Less potential for corrosion
- Less potential for river bed scour

STRUCTURAL HEALTH MONITORING SYSTEM

WVB provides a state of the art Structural Health Monitoring System for the Main Span Bridge. The SHMS monitors both static and dynamic loads and effects. The System is configured for non-routine effects such as wind or impact, and for soft hazards such as fatigue, corrosion, and normal wear and tear. The information gathered links inspections, required maintenance, and rehabilitation. This system provides a baseline record for the structure and continues to provide valuable real-time information beyond the Term of the Contract.



O&M BUILDING ACCESS TO ROADWAY



4.3.1 OPERATIONS AND MAINTENANCE TECHNICAL SOLUTIONS

The WVB O&M Team has innovative, best practice O&M technical solutions to maintain safe, continued use of the Project by the traveling public throughout the Project's operational lifecycle. These include measures to ensure safe, cost effective routine maintenance activities; and well managed scheduling and delivery of necessary rehabilitation works.

Maintenance is managed according to delivery process D6 within the Project Integrated Management system (IMS) as shown in **Figure 4.3-2**. The IMS is described in Section 4.1.1 and provides a consistent approach to delivery, quality management and reporting in all Project stages.

4.3.1.1 ROADWAY AND BRIDGE OPERATIONS

The WVB O&M Team is responsible for Operation Patrolling on the Project, and the Incident and Emergency Response within the O&M Limits. Incident detection and response is fast, efficient and precise to ensure safe use of the roadway and bridge. The WVB O&M Team understands the local context, including interaction and interface with local authorities, public information provision and the anticipation and management of potential hazardous situations.

4.3.1.1.a Policing the Roadway and Bridge

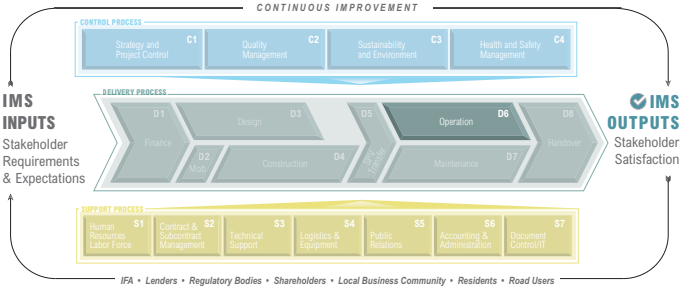
The WVB O&M Team's priority is safe passage for the traveling public and WVB, INDOT and KYTC staff. During the Operating Period, we patrol the roadway and bridge 24 hours a day, seven days a week. The WVB O&M Team uses two customized patrol vehicles dedicated to the Project. The Team has equipment such as movable flashing arrows and crash attenuator trucks for safer traffic management during incidents or maintenance activities.

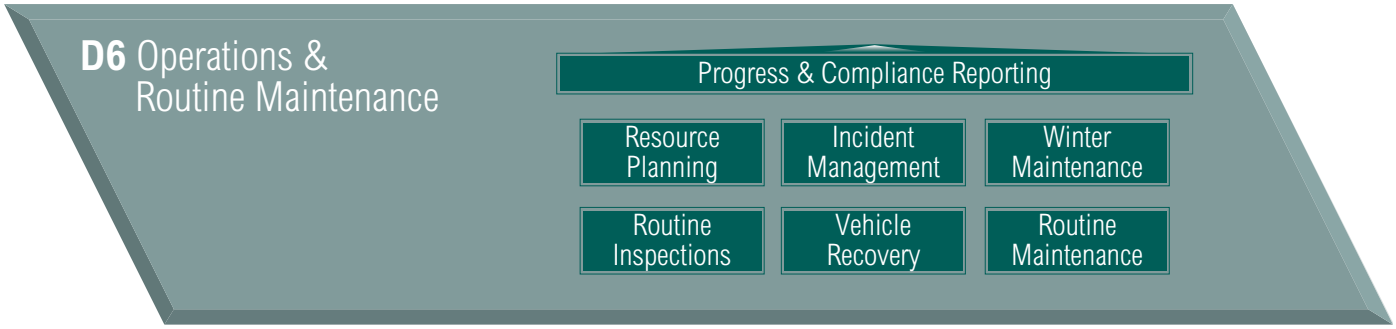
The WVB O&M Team will develop an O&M Plan that details all operation procedures. This aligns closely with our Project Safety Plan, detailed in 4.1.6.b and Section 22.1.7 of the Technical Provisions.

DETECTION OF EMERGENCIES: The WVB O&M Team has access to many sources of information to promptly detect and respond to incidents:

- The bridge structural health monitoring system
- WVB O&M Team roadway and bridge patrols
- Weather forecast monitoring
- The ITS, operated by INDOT and KYTC.

FIGURE 4.3-2 OPERATIONS AND MANAGEMENT PROCESS, D6, WHICH WILL BE MANAGED BY VINCENT MEYER, THE O&M MANAGER





RESPONSE TO EMERGENCIES: The WVB O&M Team follows the incident detection and response plan shown in **Figure 4.3-3**. Upon notice of an event, the WVB O&M Team immediately informs the Department's Traffic Management Center in Indiana and the TRIMARC Traffic Operations Center in Kentucky (collectively known as the TMCs).

After incident detection, WVB's O&M Team proceeds to the site to secure it and provide immediate assistance. With patrollers posted either at the O&M Building or working on the Project, response time is less than an hour. WVB O&M Team managers are on call, if needed to assist in incident management.

WVB O&M Team's focus is to keep the traveling public, adjacent landowners and all project staff safe. Team members use customized traffic control equipment and vehicles to secure the site. Quick installation of proper temporary traffic management measures will reduce impacts of an Incident, including secondary crashes and excessive traffic delays. The O&M Plan will detail the procedure for Incident Traffic Management, with the appropriate layout of the safety devices, according to the Manual on Uniform Traffic Control Devices (MUTCD) and checklist of actions to implement.

All measures necessary to move the Incident off the traveled roadway are carried out as soon as safely possible and at the direction of the emergency responders. The WVB O&M Team will reopen the roadway within 25 minutes of clearing any Incident.

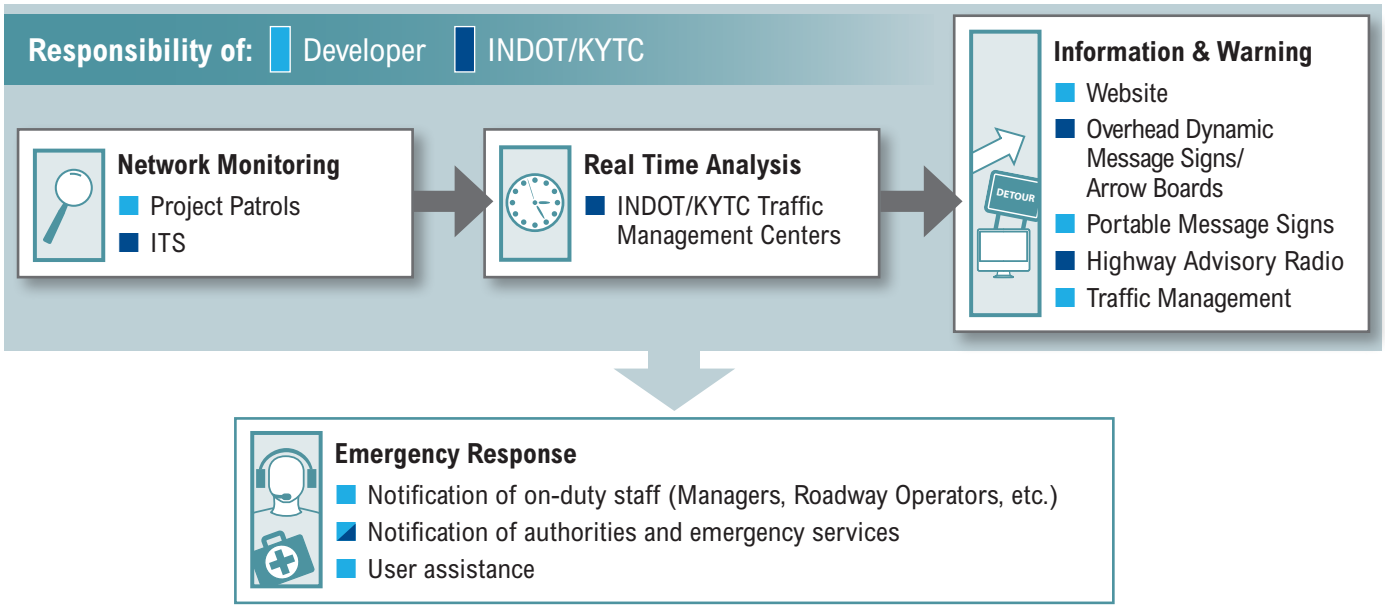
KEEPING THE TMCs AND USERS INFORMED: The WVB O&M Team immediately informs and continuously updates the TMCs of any Incident, its impact on traffic, response actions undertaken, the restoration of traffic and any related information.

Once informed by the WVB O&M Team or the ITS, the two TMCs alert users to the presence of any Incident using Dynamic Message Signs (DMSs), Lane Control Signals and the Highway Advisory Radio. The WVB O&M Team uses the latest technologies and social media, such as Twitter, Facebook and email to inform users. This combined approach helps minimize impacts of Incidents and maintain good public relations.

4.3.1.1.b. Coordination with Emergency Service Providers

Prior to the Operating Period, the WVB O&M Team coordinates with INDOT, KYTC, appropriate emergency service providers, law enforcement agencies and relevant private sector responders (e.g. towing and hazardous materials contractors) to develop a Project Emergency Plan. This plan details WVB O&M Team actions in case of emergency and establishes lines of communication with emergency responders.

FIGURE 4.3-3 WVB O&M TEAM DETECTION AND RESPONSE PROCESS



In an emergency, the WVB O&M Team informs the appropriate authorities and implements the Project Emergency Plan. A WVB O&M Team roadway patroller and crash attenuator truck are dispatched to ensure the safety of the site and the traveling public. Once the emergency responders arrive on site, they take the lead. The WVB O&M Team will continue to provide traffic management at the direction of the emergency responders.

WVB has experience throughout the world working with emergency services, as shown in **Figure 4.3-4**.

FIGURE 4.3-4 COORDINATION WITH EMERGENCY SERVICES ON CALIFORNIA-SR91

The WVB O&M Team participates in quarterly traffic incident management team meetings led by INDOT. The Emergency Plan is updated to account for feedback and lessons learned. After consultation and discussion with INDOT and KYTC, a contract will be established with local towing partners to enable them to intervene on the roadway in line with the performance standards set in the agreement.

4.3.1.1.c. Accident Analysis and Implementation of User Safety Improvements

Accidents are reported daily and monthly, in accordance with requirements defined in the Project O&M Plan. A quarterly Operations Report summarizing the findings of daily and monthly reports is issued to IFA. All accidents are treated as non-conformances within the O&M Quality Plan, see Section 4.3.2.

Three types of events are considered within the WVB O&M Team's review and assessment process:

- **Near misses:** events that in slightly different conditions, would result in an Incident
- **Incidents:** events with low consequences
- **Accidents:** Incidents with significant consequences

The O&M Plan describes WVB's methodology to:

- Report accidents, incidents and high potential near-misses
- Manage the investigation of accidents, incidents and high potential near-misses
- Determine remedial/preventive measures
- Monitor effective implementation of actions

Data provided is analyzed by the WVB O&M Team to identify root causes of events. The WVB O&M Team considers potential remedial measures (such as installing attenuators, concrete barriers, guardrails or warning signs) that improve user safety; **Figure 4.3-5** summarizes this process.

The WVB O&M Team regularly conducts safety audits to assess effectiveness of Project safety, identify and implement areas for improvement, and review newly developed industry best practice. Any mitigation measures introduced throughout this process will be recorded and monitored to assess their effectiveness.

FIGURE 4.3-5 ACCIDENT ANALYSIS AND IMPLEMENTATION OF IMPROVEMENTS

4.3.1.2 ROUTINE MAINTENANCE

During the bid phase, the WVB O&M Team has been fully involved in the design process with the Walsh-VINCI CJV and WVB Design Team to produce an optimal design.

WVB's routine maintenance strategy is structured around proactive preventive maintenance. Our comprehensive Maintenance Plan, with a frequent inspection program, ensures early identification of maintenance needs and their quick correction to prevent small deteriorations from becoming larger problems.

In developing our proposal, WVB paid close attention to the impact of maintenance activities on availability of Project facilities. The conceptual design of the Project is optimized to minimize lane closures during the Operating Period.

4.3.1.2.a. Life Cycle Cost Analysis over the Duration of the Agreement

The WVB O&M Team remains fully involved throughout design development to assist with maintenance and lifecycle optimization of design and the anticipation of resulting maintenance costs.

To determine expected material durability and useful lifespan, WVB uses benchmark data from its extensive list of projects in operation, combined with up to date best practice guidelines and industry research data. We have taken into account all Performance and Handback Requirements.

For each Element of the Project, the WVB O&M Team analyzed potential technical solutions accounting for variability of cost; increasing labor rate; and impacts of maintenance on roadway availability.

By using an internal discount rate, the WVB O&M Team calculated a Net Present Value (NPV) for each technical solution, allowing us to compare them and determine optimal lifecycle solutions (see **Figure 4.3-6**). This led to significant design improvements that lower the financial costs and limits traffic disruption.

LONG-TERM ASSET

Life Cycle Cost Analysis Example: There are two possible pavement solutions: asphalt and concrete. There is a 5% premium for concrete at construction, however, by analyzing maintenance costs, availability costs (fewer road closures for concrete maintenance) and expected price variation (higher for asphalt than concrete), WVB found the total lifecycle costs of concrete is 20% lower over 35 years. At Handback, concrete provides more than 12 years remaining Useful Life, exceeding the PPA requirements.

The WVB O&M Team, coordinating with Walsh-VINCI CJV, feeds into the construction and design quality assurance and control processes to ensure full consideration of material durability during specification, procurement and construction. This ensures selection and appropriate use of the most durable materials to provide the highest quality end product.

FIGURE 4.3-6 LIFE CYCLE COST ANALYSIS PROCESS

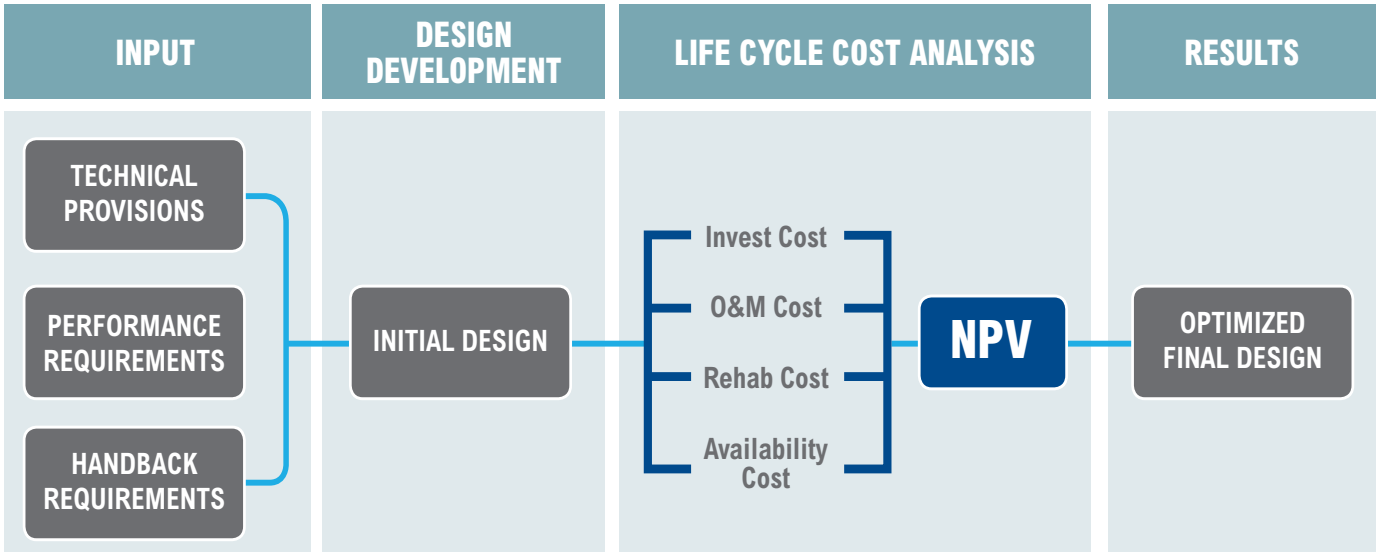
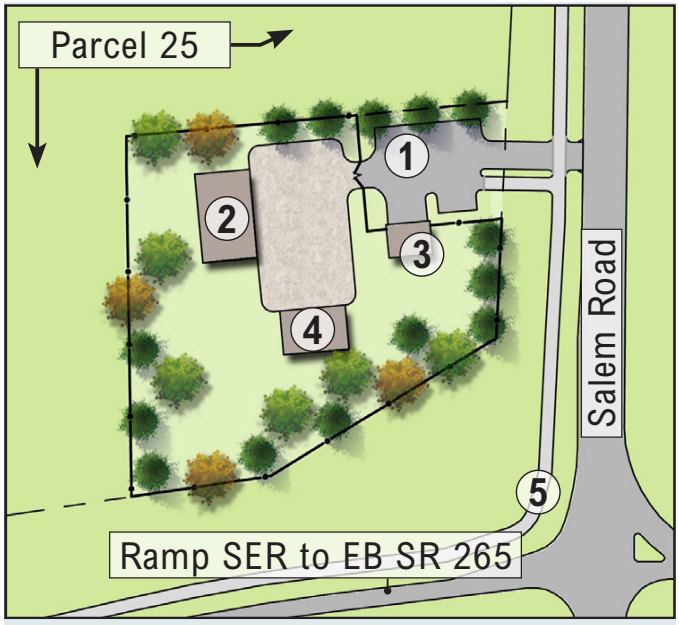


FIGURE 4.3-7 MAINTENANCE YARD AND FACILITIES



The WVB O&M Team is implementing this process on all elements of the Project, confident that we are providing an optimized lifecycle cost and a predictable maintenance strategy beyond the Term of the Contract.

4.3.1.2.b. Details and Locations of Maintenance Yard and Facilities

As described in Section 9 of the Technical Provisions, and shown on **Figure 4.3-7**, WVB builds a maintenance yard and operations facility on parcel 25 of the excess right of way.

These facilities include:

1. Parking lot for staff and visitors
2. Covered vehicle garage
3. Office building with public reception area
4. Sand and salt covered storage facility
5. Dedicated parking for users of the pedestrian/bike path

4.3.1.2.c. Preliminary List of Specialized Maintenance Equipment

The WVB O&M Team specialized maintenance equipment include the following:

Patrolling Equipment

- Two patrol trucks, customized for high visibility and to fit the needs of the WVB O&M Team
- Portable luminous arrow boards
- Portable changeable message signs
- Crash Attenuator truck

Routine Maintenance Equipment

- Boom Truck (subcontractor)
- Small Tools and Workshop Material
- Lawn Mowers and Landscape Equipment
- Traffic Management Safety Items
- Snooper Truck (subcontractor)

Winter Maintenance Equipment

- Winter maintenance trucks
- Blades, mobile spreaders
- Rubber Titled Loader

4.3.1.2.d. Supply and Management of Maintenance Spare Parts

The WVB O&M Team uses dedicated software to manage and monitor the supply and use of spare parts. This ensures an up-to-date inventory of all parts to support expected maintenance requirements plus a reasonable amount for emergencies. Quantity of spare parts used and ordered is reviewed on an ongoing basis to identify and resolve any issues where parts are failing more often than expected.

The most significant requirement for maintenance spare parts are light bulbs and electric equipment to support lighting maintenance; barriers; guardrail and impact attenuator components; and signage elements.

4.3.1.2.e. Routine Maintenance Activities Approach

The WVB O&M Team's approach is to maximize self-performance of the basic routine maintenance activities and work with expert subcontractors where necessary to complete specialized maintenance. This allows access to the latest specialist knowledge, best

practice and research data of our shareholders and specialized partners.

Where feasible, specialized activities such as drainage, pavement, lighting and landscaping maintenance is subcontracted to local firms. The WVB team endeavors to contract with local DBE firms. The frequency and planning of these activities is handled by the WVB O&M Team; strict safety and quality control procedures apply.

Whether self-performing or subcontracting work, the WVB O&M Team focuses on safety. Working on a live roadway is risky for maintenance staff and the traveling public. We complete a detailed risk assessment to identify, prioritize and address all potential hazards.

SWEEPING, CLEANING AND THE REMOVAL OF DEBRIS: The WVB O&M Team staff includes Patrollers working on a 24/7 basis and Roadway Maintenance Operators working on a daily basis. These personnel are fully equipped, qualified and trained to safely complete debris removal, general sweeping and cleaning of the roadway. After each winter season, the WVB O&M Team powerwashes all bridge structures to extend the life of bridge components.

ROADWAY MAINTENANCE

WVB partners bring maintenance experience from over 2,700 miles of highway under operations including VINCI Highways Network

GRAFFITI REMOVAL: The facilities will be inspected daily for graffiti. If identified, the WVB O&M Team will remove it from structures within 24 hours and from gantries and high masts within 72 hours. Anti-graffiti coating is used on exposed surfaces of all walls and bridge abutments.

ICE AND SNOW REMOVAL: WVB O&M Team's goal is to keep the roadway clear and safe at all times. In the winter months this means using our own in-house staff and equipment to plow and deice the roadway. These efforts may be supported, when necessary, by local DBE firm Messier and Associates. In line with IFA requirements, we will target a maximum circuit time of two hours on the roadway. The WVB O&M Team's winter maintenance procedures ensure that, following any winter weather event, bare pavement is restored within two hours.

WVB'S SNOW AND ICE CONTROL PLAN:

- Expected average number of yearly snow events: 20 events, seven hours each.
- Two adjacent plows in the WVB fleet easily provide a two-hour circuit time for the five miles of roadway.
- Subcontractor plow support from DBE subcontractor Messier & Associates if needed.

All winter maintenance measures are described in the Project Snow and Ice Control Plan. This is updated annually to reflect changing project requirements, best practice and lessons learned. One source of lessons learned is the winter patrol diary our patrol teams complete daily during the winter season.

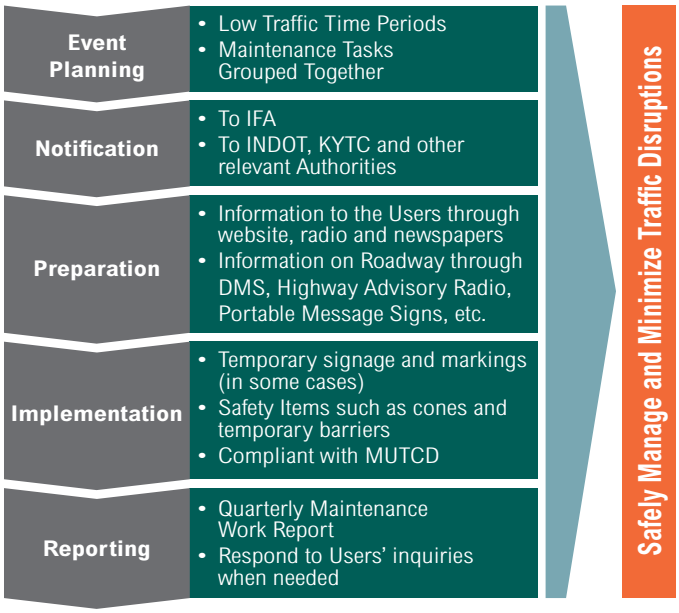
The WVB O&M Team completes an annual winter maintenance exercise at the beginning of each winter season. During this exercise we train our staff and those of our specialized subcontractor partners in all related methods, risks and safety requirements. This exercise will also enable us to check all winter maintenance equipment is operational and ready for the winter season.

4.3.1.2.f. Traffic Management During Maintenance

All lane closures for Planned Maintenance work comply with the IFA Interstate Highways Lane Closure Policy (March 2010). The WVB O&M Team coordinates maintenance activities and associated lane closure requirements with IFA, INDOT and KYTC a minimum of two weeks in advance of planned activities. Where unplanned lane closures are required, the WVB O&M Team coordinates with the Department and KYTC as soon as possible and prior to taking any action to close lanes.

The WVB O&M Team follows a five-step traffic management procedure to implement safe, timely maintenance work, as illustrated in **Figure 4.3-8**. When maintenance is urgently required (e.g. to enable hazard mitigation), the procedure can be accelerated.

FIGURE 4.3-8 TRAFFIC MANAGEMENT PROCEDURE



EVENT PLANNING: The WVB O&M Team is responsible for planning and coordinating all routine and rehabilitation maintenance performed whether by the WVB Team, a subcontractor or by other entities, such as public agencies, toll collection operators or their subcontractors.

NOTIFICATION: Monthly Planned Maintenance and Routine Maintenance schedules are submitted to IFA for approval at least 30 days in advance of the work. Annual Planned Maintenance schedules are submitted for IFA review and approval at least 90 days ahead of the year in question. Schedules describe, for each section of the works, all scheduled maintenance tasks or activities; the dates, times and durations for each activity; the total quantity of Planned Maintenance hours; and total number of Routine Maintenance lane hours.

PREPARATION: For Planned Maintenance that affects the roadway, sidewalk or bridges, or any other event involving temporary traffic control, the WVB O&M Team prepares a Traffic Control Plan. The purpose of this is to ensure safety of staff and the traveling public. We coordinate with the Department and KYTC to ensure DMS and Highway Advisory Radio messages give accurate information to the traveling public about lane closures or other traffic impacts. We support the communication of public information by the Department and KYTC via press releases and other media (e.g. newspapers, radio, television, websites and social networks) where required.

IMPLEMENTATION: The placement, maintenance and removal of traffic control devices and temporary signage meets the approved Traffic Control Plan and the MUTCD. Traffic and safety conditions are monitored, with the assistance of our Patrollers and Roadway Maintenance Operators. In case of congestion caused by the works, the traveling public is notified by the TMCs through the DMSs.

REPORTING: All routine maintenance and minor repair works are recorded by the WVB O&M Team using the Computerized Maintenance Management System (CMMS) provided by the Department. These records are used to develop the quarterly Maintenance Work Reports to be submitted for IFA review. For each month of the quarter in question, the report identifies all maintenance and rehabilitation activities planned, details actual works performed and confirms that completed work complies with approved maintenance procedures. This reporting feeds into the quarterly Operations Report provided to IFA.

4.3.1.2.g. Inspection, Testing and Defect Management

Regular inspections and tests are a crucial part of our proactive, preventive maintenance approach; they enable early identification of maintenance needs. This is important as it allows us to address correctable issues before they can develop into larger problems. It also allows more time to:

- determine deterioration rates
- identify methods to mitigate deterioration
- allow for adequate budgeting for future corrective actions
- mitigate any potential disruption to road users

The WVB O&M Team schedules inspections and tests to be completed by certified personnel. A General Inspection, including a pavement survey, is carried out each year.

SNOOPER TRUCK

Structural components can easily be accessed from ground level using a lift of can be accessed from the bridge deck using a snooper truck. The snooper truck can be placed on the shoulder to enable all lanes of traffic to remain open during the bridge inspection.

Both FHWA and AASHTO recommend routine inspections of new bridges at least once every two years. It is recommended to conduct inspections in both climate extremes. Structures will be inspected in detail and rated as per National Bridge Inspection Standards (NBIS) every two years.

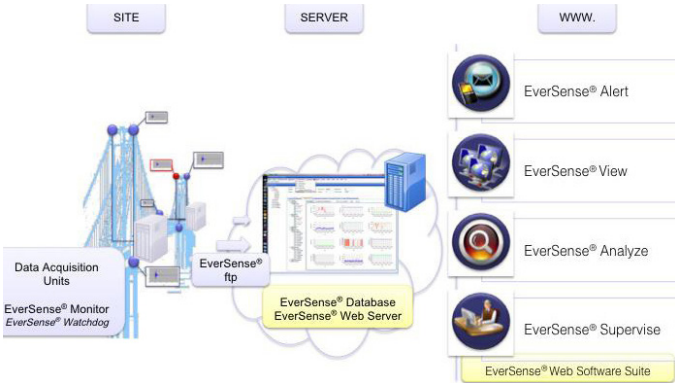
For the Main Bridge of the Project, the WVB O&M Team and the WVB Design Team will produce an inspection manual, including inspection frequencies, before Substantial Completion. This manual will be submitted to INDOT, FHWA and IFA for approval and will include provisions for:

- Routine Inspection every two years
- In-depth Inspection every six years
- Underwater inspections every four years
- Post Extreme Event Inspections as needed.

Results of the inspections are summarized in an inspection and test report, which identify, classify and prioritize any defects found. Our O&M Manager Vincent Meyer, uses this information to implement a maintenance strategy to rectify any noted items.

RIVER CROSSING STRUCTURAL HEALTH MONITORING SYSTEM: The VINCI Group in-house monitoring systems specialist dedicated to the long-term inspection and monitoring of bridges, Advitam, has employed a risk-based analysis of the Main Bridge structure to ensure its continued safe functioning.

FIGURE 4.3-9 STRUCTURAL HEALTH MONITORING SYSTEM



The Structural Health Monitoring System (SHMS) of the Main Bridge is designed to monitor both static (temperature, corrosion, etc.) and dynamic (wind, fatigue) phenomenon, which is important for the high strength, cable-stayed wires and the bridge deck. The system brings a helpful complement to visual inspections for phenomenon that either can not be seen or are not relevant under a two year inspection cycle. Based on the data provided by the WVB Design Team, the system is configured for non-routine effects such as wind or impact, and for soft hazards such as fatigue, corrosion and normal wear and tear, to yield immediate and long-term performance at reasonable costs. The information gathered through the Eversense® software, shown in **Figure 4.3-9**, links inspections, required maintenance and rehabilitation over the 35-year Operating Period according to the decision making process. This system continues to provide valuable real-time information beyond the Term of the Contract. The SHMS is tested during the yearly routine inspection.

LONG-TERM ASSET

Monitoring All American Bridges: Within the framework of a Federal Highway Administration (FHWA) research project, Advitam, has won a contract to monitor the country's almost 600,000 bridges. Advitam has developed a combination of Scanprint®, a software for the management and long-term monitoring of infrastructure, and Eversense®, a program for the acquisition and analysis of instrumentation data. This solution makes it possible, via a single interface, to access inventory data, information concerning visual inspections and non-destructive testing, and real-time instrumentation data, to manage the structures.

4.3.1.2.h. Maintain Accurate As-Built, Inspection and Maintenance Records

As described in 4.1.7, the Walsh-VINCI CJV will create a DyMaDoc database of all as-built drawings and construction records. This is transferred to the WVB O&M Team before Substantial Completion as part of the transition process.

The WVB O&M Team uses the Department's CMMS to record all maintenance activities. Before Substantial Completion, using the Final Design, we create the Project asset database on which the CMMS will be based. The CMMS database includes all of the assets to be maintained throughout the Operating Period and a description of each item and piece of equipment.

The CMMS database includes the preventive maintenance activities required, as well as details of activities performed including dates and repair history. It records detailed information regarding the type of repairs made at any point and any failures experienced as well as all maintenance work performed.

This tool is used to maintain accurate as-built, inspections and maintenance records. The WVB O&M Team uses the CMMS for the quarterly Maintenance Work Reports listing all assets in the O&M program with a summary of all maintenance activities performed each month and the complete history of maintenance for the asset as reported by the CMMS.

4.3.1.3 REHABILITATION WORK

The WVB O&M Team has a proactive, preventive maintenance approach to the Project. Inspections and preventive maintenance will result in early identification of issues. Corrective actions are taken so the problem is solved at a minimum cost and minimum disruption to the traveling public.

Rehabilitation works are managed according to delivery process D7 in the IMS, illustrated in **Figure 4.3-10**. This establishes procedures for the inspection of assets to identify the need for rehabilitation works; the planning and design of any major works required; the construction activity, and ongoing inspection and testing that ensures this work is satisfactorily completed, including certification of all completed works.

Rolling Program of Major Maintenance

The WVB O&M Team forecasts maintenance activities anticipated during O&M. An associated cost estimate of each activity is updated regularly to account for inflation, price of materials and other factors that affect cost.

Based on past project experience and statistical data, we have developed a preliminary rolling program of maintenance to meet the Performance and Handback Requirements. This program is optimized to minimize lane closures and disruption to the traveling public. The

FIGURE 4.3-10 APPROACH TO REHABILITATION WORKS

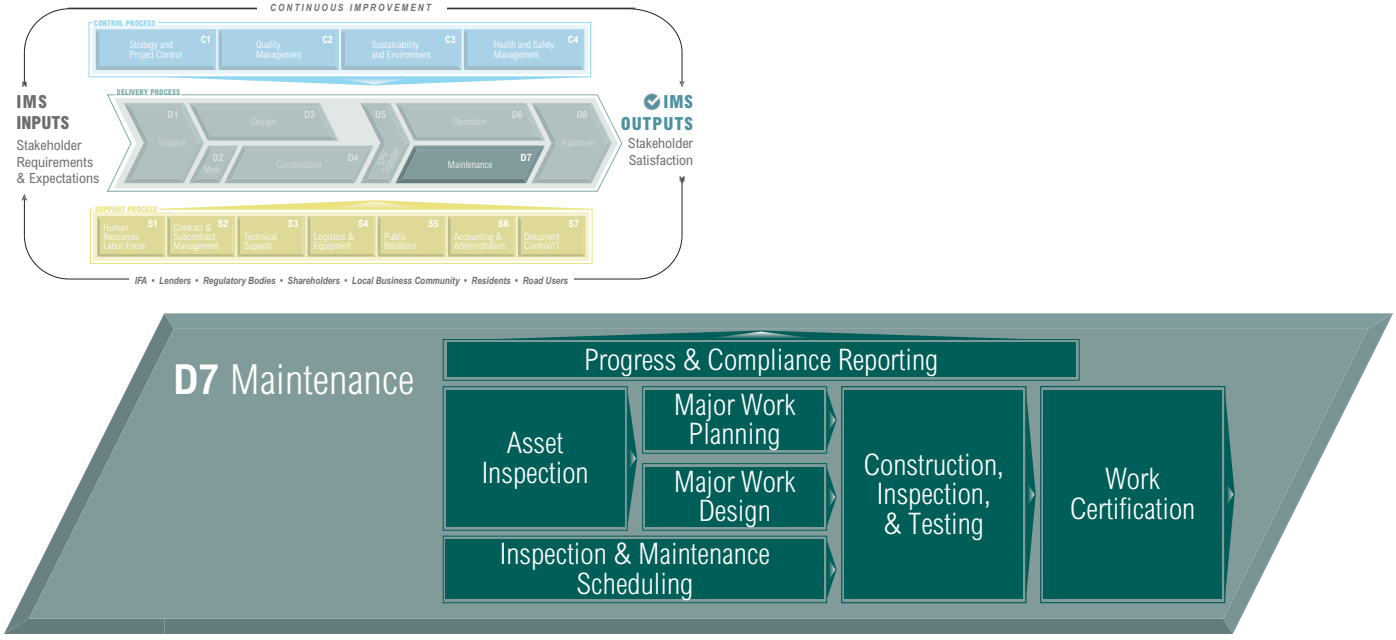
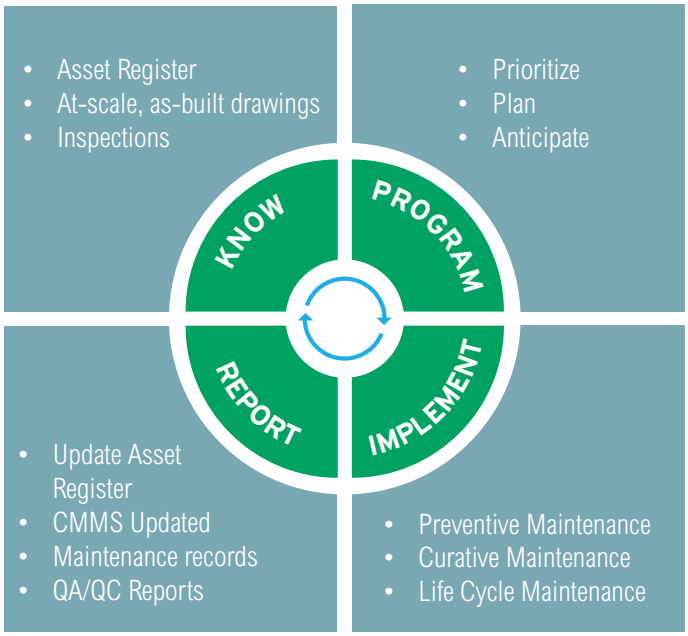


FIGURE 4.3-11 ROLLING PROGRAM PROCESS



WVB O&M Team's Rolling Program of major maintenance will follow the process outlined in **Figure 4.3-11**.

MINIMIZING TRAFFIC DISRUPTIONS: The WVB O&M Team has a preventive maintenance strategy, effectively minimizing full reconstruction and therefore limiting the disruptions for the traveling public, see **Figure 4.3-12**.

The WVB O&M Team will, whenever possible, maintain works during off peak hours (period B) to further minimize the impact to the traveling public. Only major deck repairs and the latex overlay on the main bridge require long-term closures. These activities are tracked on the rehabilitation schedule providing for early notification to IFA, the Department, KYTC and the traveling public.

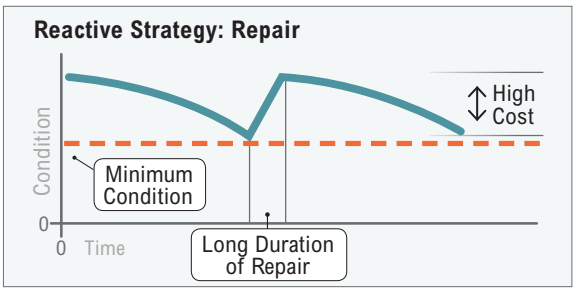
Programming of Works

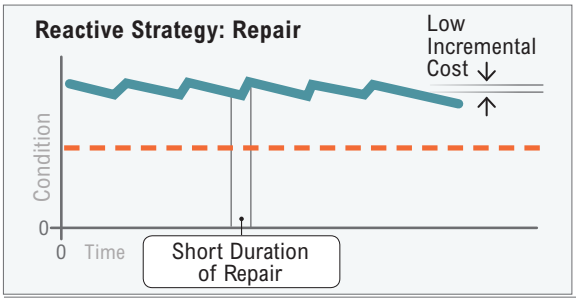
The rehabilitation schedule, **Figure 4.3-13**, details the WVB O&M Team's anticipated programming of maintenance works. This schedule is based on assumed design life combined with past project experience.

REHABILITATION OF PAVEMENT: The measured condition of the pavement is an important factor in determining the most effective timing of major rehabilitation works. The surface condition dictates the safe operation of the roadway and provides direct interaction with the public in terms of user safety, comfort and general awareness of how well the roadway is being managed. Close consideration is paid to the traffic management to safely undertake the pavement works and minimize the delay and disruption to the user.

REHABILITATION OF THE MAIN BRIDGE: The WVB O&M Team pays particular attention to the Main Bridge, as this element is critical and complex. Each element of the Main Bridge has been closely discussed between the O&M Team and the Walsh-VINCI CJV to optimize maintenance through bridge design. For example, the bridge inspection catwalk below the deck provides for thorough and safe inspections while maximizing uninhibited flow of the traveling public.

FIGURE 4.3-12 BENEFITS OF A PREVENTIVE MAINTENANCE PROGRAM





Example:

If a small concrete defect on a bridge deck is identified, it can be patched on a limited surface during a night maintenance window.

If the concrete defect on the bridge deck deteriorates more, the reinforced steel will start to corrode and a complete deck replacement, with full lane closures over several days, will be needed.

FIGURE 4.3-13 PRELIMINARY REHABILITATION SCHEDULE

The WVB O&M Team performs preventive maintenance to extend the life of the bridge components beyond the Term of the Contract.

REHABILITATION OF EXISTING AND NEW STRUCTURES: The Project has ten new bridges and five existing bridges on the roadway. The Maintenance Strategy on these bridges included the following:

- Daily Visual Inspections by the Patrollers and Roadway Maintenance Operators,
- In-Depth Inspections every two years,
- Powerwash all structures at the end of the Winter Maintenance Period to wash away chlorides,
- Surface seal the deck and concrete barriers every four years to protect from chloride aggression,
- Limited rehabilitation and deck overlay are expected at 15-year intervals during the Operating Period.

COSTING: During the Operating Period, the WVB O&M Team has an annual budget that is updated yearly to coincide with the programming of the rehabilitation works. This process is illustrated in **Figure 4.3-14**.

The cost of Rehabilitation works is budgeted according to cost data from similar projects and market prices. Throughout construction the budget is reviewed and adjusted to match the as-built product.

HANDBACK REQUIREMENTS: The WVB O&M Team analyzed the Performance and Handback Requirements of the Project Elements. These requirements influenced the design of some elements, such as bridge deck and pavement, to meet or exceed the targets.

To ensure that Handback Requirements are met, the WVB O&M Team worked backwards from the Residual Life and Useful Life requirements at the Term of the Contract. To meet these targets, the appropriate rehabilitation works have been included in the overall Rehabilitation Schedule.

The WVB O&M Team will develop a Handback Plan six years before the Term of the Contract. This will describe the three Residual Life Inspections to be performed and establish a strategy for any rehabilitation works needed to meet the Handback Requirements.

SCHEDULE: The preliminary rehabilitation schedule is presented in **Figure 4.3-13** and is discussed in Section 4.3.2.2.

STAGED CONSTRUCTION: The WVB O&M Team analyzed the roadway and bridge design to ensure that future rehabilitation works can be accommodated by staged construction. For example, during the LMC overlay on the Main Bridge, we close the shoulders, install temporary barriers and shift the traffic to allow for two lanes of traffic in each direction. All traffic movements are compliant with INDOT and MUTCD standards. By applying the safest traffic management procedures, the WVB O&M Team limits disruption to the traveling public.

MANAGEMENT OF REHABILITATION WORK SIMULTANEOUSLY WITH STANDARD O&M: The WVB O&M Team uses an integrated approach with one team and one manager; Vincent Meyer, handling both routine Operations and Maintenance and Rehabilitation works. This single point of leadership provides a coordinated approach to:

- Activity Planning
- Traffic Management
- Safety
- Quality Control

Wherever feasible, we schedule activities in the same location and time to minimize impacts to the traveling public.

FIGURE 4.3-14 PROGRAMMING AND COSTING

4.3.2 OPERATIONS AND MAINTENANCE MANAGEMENT APPROACH

The WVB O&M Team's approach to the O&M of the facilities is to maximize self-performance by our fully integrated team, led by Vincent Meyer with support of specialist organizations. This approach ensures we maintain the Project understanding gained from our design-build process and combine with our subcontractors' specialized knowledge, equipment and best practice. Our use of local DBEs and SMEs will maximize local economic benefits.

This section outlines the preliminary Operations and Maintenance Management Plan (O&MMP) which is part of the general Project Management Plan (PMP) described in 4.1. The O&MMP complies with all principles described in the PMP.

Plans that apply during the Operating Period, and form part of the O&MMP, include:

PLANS	UPDATED
Operations and Maintenance Plan	Yearly
Maintenance Plan	Yearly
• One-Year Plan	Quarterly
• Five-Year Plan	Yearly
Snow and Ice Control Plan	Yearly
Handback Plan	Six years before the end of Term
Sustainability Management Plan	Every five years

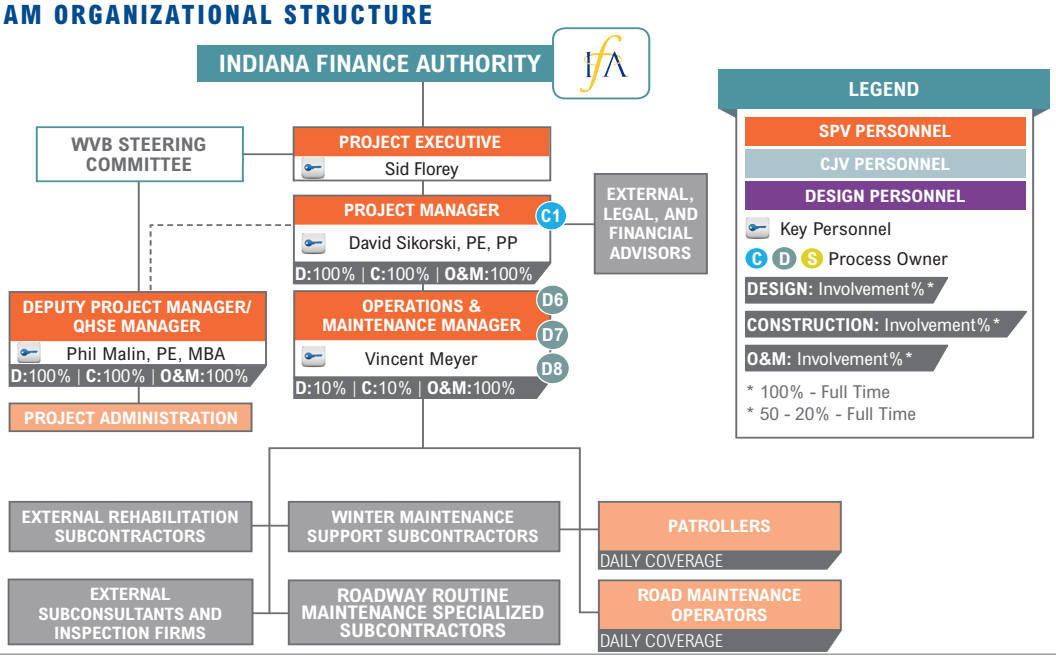
4.3.2.1 ORGANIZATION

WVB's organization reflects industry best practice and our experience operating and maintaining similar facilities. We effectively integrate all disciplines within our team, including specialist subcontractors. Team members are chosen for technical expertise and their collaborative attitude.

4.3.2.1.a. O&M Organization, Participating Firms/Organizations and Individuals

As part of our vertical integration, the WVB O&M Team self-performs O&M through the life of the agreement. We subcontract major maintenance and rehabilitation work, and specialized maintenance. The WVB O&M Team uses contractors who worked in the construction phase as much as possible. This is possible since the lead CJV partner, Walsh Construction, is a local-Indiana firm, who will continue to work in Indiana and Kentucky. Firms such as Milestone and James H. Drew and local DBE firms when appropriate, are consulted during design-build to establish long-term relationships for specialized maintenance activities.

WVB O&M TEAM ORGANIZATIONAL STRUCTURE



4.3.2.1.a-i. Roles and Responsibilities

WVB's O&M Team's proposed organizational structure is shown on the previous page, with the interrelation and lines of communication and reporting between all Project partners indicated. Each key partner's roles and responsibilities are also described in **Table 4.3-2**.

4.3.2.1.a-ii. Key O&M Personnel Function and Responsibility

Vincent Meyer, O&M Manager, is an IFA-specified Key Personnel. He provides input during design-build of the Project to ensure O&M requirements are met. Vincent has more than 16 years of experience in design, construction, operation and maintenance of major transportation road infrastructure. Recently, he served as maintenance manager on the ASF network (624 miles of highway with 2,000 civil works structures) in France from 2008 to 2011. He is currently in charge of VINCI Concessions O&M on several PPP projects in the development phase.

Vincent provides 100% of his time to the Project during the O&M phase.

4.3.2.1.a-iii. Qualification and Experience

To ensure personnel meet and exceed IFA's requirements for safe, high quality O&M delivery, WVB only employs suitably qualified and experienced personnel (SQEP). To achieve this, our project management team follows our SQEP procedure, as explained in Section 4.1. For every position, this establishes the role requirements and responsibilities, experience and qualifications needed, see **Table 4.3-3**. Once hired, candidates are given site specific training as required and periodic performance reviews to ensure professional development.

4.3.2.1.b. Unified Approach to O&M

The WVB O&M Team is committed to working collaboratively as a joint venture and with IFA/INDOT/KYTC at every stage. The common integrated management system applied is set out in our Project Management Plan.

TABLE 4.3-2 RESPONSIBILITIES OF EXPERIENCE STAFF

Staff	Responsibility
David Sikorski Project Manager	• Accountable for the delivery of the PPA contract – project manage and direct the whole team • Act as a single point of contact for the IFA • Coordinate the efficient management of all resources • Define, deploy, review and maintain the business vision, values and strategy for a safe, quality O&M delivery • Report on Project progress and performance to the Client and Lenders • Communicate and contribute to community stakeholders: manage public relations with the Client
Phil Malin Deputy Project Manager/QHSE	• Ensure O&M strategy, quality, safety, and environmental policy align with PPA requirements • Develop, review, and maintain the IMS for effectiveness and performance • Report on performance as required by the PPA • Coordinate quality / process improvement activities, including liaising with the Client and third parties on QHSE management • Asses, monitor and report on compliance against relevant legislation, WVB policies and PPA
Vincent Meyer Operations and Maintenance Manager	• Ensure safety on the Project for the users and the staff of WVB • Preserve the condition of the assets in accordance with the legislation and the Technical Provisions • Ensure quality of the service provided to users • Define and implement the maintenance strategy of WVB • Procure and coordinate with specialized maintenance subcontractors
Administrator	• Coordinate and manage financial accounting and reporting, implementing robust systems and processes • Coordinate and manage statutory accounts preparation, audit clearance, and treasury management
Patroller	• Patrol the project; prevent safety issues; assistance to the traveling public; action in case of incident; participation in routine maintenance; participation in winter maintenance activities
Roadway Maintenance Operator	• Participation in routine maintenance, cleaning, minor repair, etc • Participation in winter maintenance activities • Implementation of Management of Traffic during Maintenance Works • Action in case of Incident if needed

TABLE 4.3-3 O&M PERSONNEL QUALIFICATIONS

Role	Required Qualification	Experience	Additional Site training
Patrollers	Must have a Commercial Driving License	1-3 years in construction or operations	Safety, Emergency Crisis and Winter Maintenance trainings
Roadway Maintenance Operators	Must have a Commercial Driving License and a High School Diploma	1-3 years in construction or operations	Safety, Emergency Crisis and Winter Maintenance trainings
Rehabilitation Subcontractors	Construction Engineers among the staff	10-15 years in construction	WVB QHSE Procedures
Winter Maintenance Subcontractors	Adequate experience and training	5-10 years in winter maintenance	WVB QHSE Procedures
Specialized Routine Maintenance Subcontractors	Adequate experience and training	5-10 years in their speciality	WVB QHSE Procedures
Inspectors	Certified personnel as per INDOT and FHWA Standards	10-15 years	WVB QHSE Procedures

COLLABORATIVE PARTNERING APPROACH: The Project vision, values and objectives agreed at the Project outset are upheld throughout the Operating Period of the work. As our O&M team members join the Project they are asked to review and sign the Partnering Agreement, signaling their commitment to it. Project induction training and regular briefings continually communicate our partnering approach. To support team building, we encourage attendance at regularly scheduled social events.

UNIFIED QUALITY APPROACH: WVB's governance approach and decision making processes established during design and construction remain consistent through the Operating Period. Both decision making and quality assurance are led by Deputy Project Manager, Phil Malin, and supported by our inspection and reporting activities. Active throughout the Operating Period, Phil ensures objective review, approval and channeling of our delivery, to maintain a uniform quality approach.

Common induction training communicates our management approach, individual responsibilities, safety rules and specific quality messages. Focused training is conducted to explain quality standards to maintenance subcontractors.

4.3.2.1.c. Decision-Making Process and Dispute Resolution

Project Manager, David Sikorski, with the support of the WVB Steering Committee, provides clear leadership, including objective setting and decision making.

Through our dispute resolution process, every WVB O&M Team manager is aware of their autonomy to make decisions. This encourages correct and rapid resolution of issues at the lowest possible level. To facilitate decision making we use a matrix of potential issues that could arise. This clarifies the escalation and reporting that applies in each case.

All partners commit to resolve any internal disputes according to the terms of the contract. Our priority in the event of any dispute the efficient continuation of O&M activities.

4.3.2.1.d. Training Program

To ensure continuous improvement and safe O&M, the staff is regularly trained. WVB's O&M Team is trained to understand the importance of the O&M quality management system, including a special focus on the safety of users and workers.

The O&M requirements for a cable-stayed structure are highly technical. In order to ensure the O&M staff is properly trained, experts from VINCI Concessions providing O&M for cable-stayed structures worldwide, will provide annual on-site training. The WVB O&M management team will also travel abroad to visit other VINCI Concessions' projects to foster ideas for improvement.

Patrollers and Roadway Maintenance Operators are trained several times a year. These trainings are carried out either by the Managers of the O&M Team or by external experts from the VINCI Concessions network.

Subcontracted firms are trained as required for major maintenance works. Potential training programs that will be conducted include:

TRAINING PROGRAM	MANAGERS	PATROLLERS
Crisis Exercise	Yearly	Yearly
Winter Maintenance	At start of winter	At start of winter
Safety	Yearly	Daily
Quality Management System	Yearly	N/A
Fire and Hazardous Mitigation	Yearly	Yearly
Human Resources Management	Yearly	N/A
Environmental Compliance	Yearly	Yearly

4.3.2.1.e. Communication and Documentation

Internal lines of communication and reporting during the Operating Period follow the O&M organizational structure discussed in Sections 4.3.2.1.a and 4.3.2.1.a.i. Document sharing requirements are detailed in all O&M management system procedures, including method statements and reporting templates.

INTERNAL COMMUNICATION: Internal communication is facilitated through multiple formal and informal channels to maximize collaboration and trust in the WVB O&M Team (including supply chain) and support continuous performance improvement. Since the WVB O&M Team is small, and located in the O&M Building, internal communication will be naturally facilitated.

MEETINGS: A schedule of meetings will be developed and implemented to enable our O&M management team to meet with each other and with our specialist subcontractor partners to review performance, ensure good governance and project control, support effective communication and facilitate decision making during the O&M stage of the Project. If subcontractor performance is inadequate this is discussed at the regular performance meetings and an improvement plan is created, implemented and monitored.

DOCUMENTATION AND DATA: Project management documentation and data is stored electronically and shared via the common collaboration and document management platform DyMaDoc, used during construction. Asset management and maintenance records are stored in the INDOT-supplied CMMS. Access to both systems is provided to all authorized members of our Team and subcontractors as necessary. The systems will facilitate document sharing and review by allowing information to be issued electronically to select lists of email addresses. Maintaining centralized data sources eliminates the potential use of outdated information.

REPORTING: The WVB O&M Team has clear reporting responsibilities within our organization. Report templates will be agreed with IFA and used to make sure the current data is available, to ensure consistency and facilitate interpretation of results. Senior managers use these reports to support continuous improvement.

4.3.2.1.f. Approach to O&M Prior to and Following Substantial Completion

O&M Manager, Vincent Meyer, is involved during design-build to ensure he is aware of issues that arise and to provide input into any decisions that will affect the Operating Period.

Coordination between Vincent, and the Walsh-VINCI CJV Construction Manager, Brian Hoppel, is particularly important in the six months prior to Substantial Completion. Vincent and his team participate in the preparation and resolution of the punch list with the Walsh VINCI CJV. This process prepares the O&M Team to be fully operational on the day of construction Substantial Completion. This Pre-Operation Period is also a time when the O&M Team is able to focus on handover activities from construction to operation, including asset inventory, commissioning and testing. This ensures the appropriate transfer of knowledge and control from the construction team (Walsh-VINCI CJV) to the operating team (WVB O&M Team).

During the Pre-Operation Period, the O&M Team gradually ramps up to be fully staffed at least one month before Substantial Completion. The time leading up to Substantial Completion is used to train the O&M staff.

Following Substantial Completion, the Walsh-VINCI CJV continues to work on Punch List items. At this time, the WVB O&M Team is fully in charge of organizing the planning, safety and traffic management of the Walsh-VINCI CJV works. David Sikorski, Project Manager during both construction and O&M, will ensure completion of the project delivery.

4.3.2.1.g. Interfaces During O&M

Throughout the Operating Period, establishing open, honest relations with the IFA, the Department and all applicable third parties is vital to smooth, safe operation and maintenance of high quality facilities. The overall approach described in our Project Management Plan (see section 4.1.1.b) still applies. **Table 4.3-4** shows how we interact with key O&M interfaces.

David Sikorski, is the main contact for IFA, INDOT and KYTC. He is supported by our Operation and Maintenance Manager, Vincent Meyer, who coordinates with applicable third parties. The WVB O&M Team regularly reports on performance in relation to Project progress, quality and safety as well as upcoming Planned Maintenance works.

4.3.2.1.h. Public Information and Communications Approach

PUBLIC INFORMATION AND COMMUNICATIONS APPROACH DURING O&M: The WVB O&M Team understands the importance of efficiently providing clear, reliable and prompt information to the public throughout the Operating Period. This will be important to maximize safety and maintain a high quality image of the Project. We provide information for press releases and access to a company spokesperson when needed. The WVB O&M Team provides advance information to IFA for approval prior to distribution to the public.

Public information and communication in all project stages is controlled by the WVB Public Information Plan. This is updated to become the O&M PIP to ensure it reflects the changing requirements for public communications at this stage of delivery.

QUALIFICATIONS AND EXPERIENCE OF PUBLIC INFORMATION AND COMMUNITY OUTREACH STAFF: David Sikorski provides Public Information for the Project during the Operating Period. During design and construction David supports Dan Hartlage of Guthrie/Mayes in the Public Information effort. David will be involved in all facets of the O&M and will bring a complete understanding to the task of providing Public Information. David has over 25 years experience in transportation engineering and operations with particular expertise in Public Private Partnerships. He draws on this experience and his work with Dan during design and construction to effectively manage the PIP.

OPERATING PERIOD PIP: Procedures set out in the O&M PIP ensure the full and regular consultation of all parties. This occurs annually, prior to substantial changes in practice or as part of the planning process for activities with significant potential impacts (e.g. major rehabilitation activities). All relevant information is provided in advance and sufficient notice given to allow all parties concerned to consider potential issues. Notification to the public about upcoming lane closures/lane adjustments and detours will occur after IFA approval. David directly handles communications with local businesses.

TABLE 4.3-4 COMMUNICATION APPROACH

ORGANIZATION	COMMUNICATION APPROACH	FREQUENCY
IFA / INDOT / KYTC (and consutants)	The WVB O&M Team will organize meetings with appropriate representatives to discuss: future lane closures; the previous month's maintenance activities and outcomes; Planned Maintenance activities for the next month and any expected impacts or issues; Incidents / accidents; adjustments to the Availability Payment; assessment of Non-Compliance points, Unavailability Events, and other pertinent information.	Monthly
Traffic Incident Management Team	The WVB O&M Team will attend all meetings to review near miss, Incident and accident data and identify measures to reduce the occurrence of such Incidents. The effectiveness of measures already introduced will also be examined.	Quarterly
Federal, state and local agencies	The WVB O&M Team will organize meetings with appropriate agencies affected by rehabilitation work. The WVB will attend meetings requested by agencies to coordinate with future projects.	As Needed
Utilities	The WVB O&M Team will organize meetings with utilities affected by rehabilitation work. The WVB will attend meetings requested by Utilities to coordinate future utility projects.	As Needed

POSITIVE IMPACT ON THE COMMUNITY

The WVB O&M Team will have an open-door policy to address any customer complaints. The O&M Building will have a reception area, with panels presenting technical information on the Main Bridge.

4.3.2.2 BASELINE SCHEDULE

WVB has a detailed Operation and Maintenance Schedule showing all major components. This schedule is summarized in the preliminary baseline schedule as provided in Volume 2 Appendices. The baseline O&M schedule provides an outline of our expectations for all maintenance requirements over this 35-year agreement. This schedule has been developed based on the specific design of the Project and our experience performing similar services on many past projects. This includes understanding of the latest industry best practice, the expected design life of the structures being constructed and manufacturer expectations of the materials to be included.

4.3.2.2.a Schedule – Proposed O&M Schedule Methodology

The O&M schedule remains a live document throughout Project lifecycle and is subject to ongoing review and update. It enables us to manage all O&M activity effectively, allocate resources efficiently and closely monitor performance in all areas to achieve continuous improvement. This includes the activities of all subcontractors.

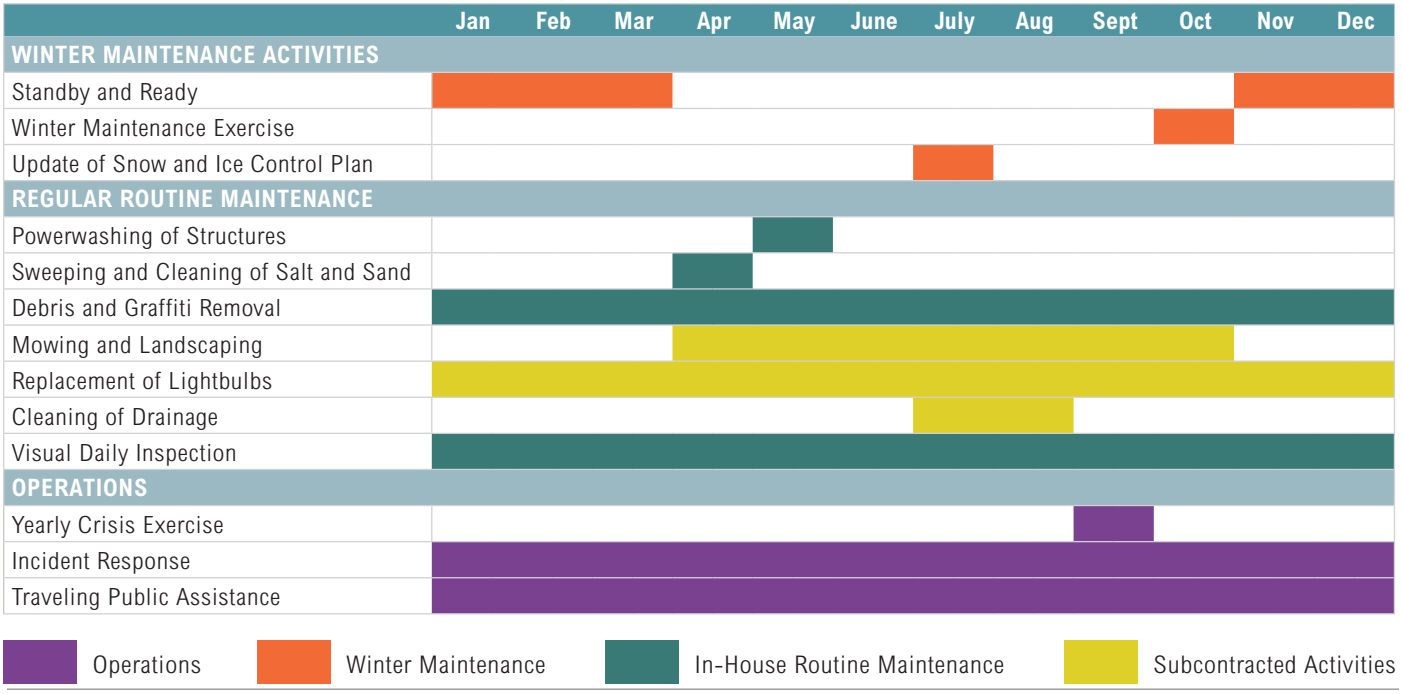
4.3.2.2.a-i. Approach for Project Schedule and Payment Requests

PREPARING, CONTROLLING AND UPDATING THE SCHEDULE: The Planned and Routine Maintenance Schedule is an annual schedule showing all daily, weekly and monthly scheduled maintenance activities, see **Figure 4.3-15**. Vincent Meyer, has the flexibility to plan these activities according to local requirements, in response to the weather, special events or to minimize traffic disruption. This schedule is updated weekly and submitted to IFA monthly. It is reviewed internally to enable refined scheduling on a weekly/daily basis.

The Rehabilitation Works Schedule is a 35-year schedule showing annual Planned Maintenance. This is updated yearly to allow activities to be planned for the following years in response to issues identified during the periodic visual and detailed inspections.

CALCULATING PERFORMANCE MONTHLY: Compliance with the Project requirements is monitored throughout the Operating Period. Any issues, events or defects are recorded as non-conformances.

FIGURE 4.3-15 ANNUAL O&M SCHEDULE



The quarterly Operations Report provided to IFA includes the following O&M records: complete records of any Incidents, inspections, and assessments, details of rehabilitation works, monthly lane closures and supporting information necessary to confirm the occurrence and satisfactory resolution of any non-compliance events, unavailability events or defects. Based on this information, the report includes a high-level summary of Non-Compliance Events, Unavailability events and Non-Compliance Point assessments.

With the CMMS, the WVB O&M Team can access real-time reports on the roadway O&M. Performance compliance data is extracted monthly from this to enable real-time reporting and quick corrective actions to be taken in response to any Non-Compliance Event.

All reports to be provided as per the PPA and Technical Provisions will feed into the performance calculation.

PREPARING QUARTERLY PAYMENT REQUESTS: The WVB O&M Team calculates the quarterly payment request with data (e.g. Lane Closures and Non-Compliance Events) from the CMMS and O&M reports. This calculation is based on three items:

- **Unavailability Adjustment,** based on the Lane Closures Record
- **Non-Compliance Adjustment,** based on the monthly Performance Calculation
- **Other Non-Compliance Adjustment,** calculated quarterly as events arise

The WVB O&M Team also includes the supporting information on which the payment request is based.

4.3.2.2.a-ii. Approach to Integrating Subcontract Activities

The WVB O&M Team subcontracts services to specialists where this expertise benefits IFA. To ensure smooth management of the Project, all subcontract work is integrated seamlessly into our O&M work plan. The subcontractors become part of our 'one team' approach, through their inclusion in joint training activities and our shared project goals. This includes involving them in weekly and monthly schedule review meetings as appropriate to their level of activity on the Project.

Some subcontractor repair activities are emergencies. As such, direct communication and coordination with them at all times is important and therefore contractually assured. We incorporate the performance requirements of the Technical Provisions into all subcontracts, including financial penalties, to ensure our partners are aware of the Project quality, safety and environmental requirements and abide by them. For example, our winter maintenance subcontractor is required to achieve bare pavement within 2 hours of the end of any winter event, as set out in the PPA documents.

TIME & BUDGET

All subcontractors will be required to use the WVB O&M Team scheduling and reporting systems to ensure consistency and easier performance monitoring by IFA.

All WVB O&M subcontractors are required to commit to our management objectives. These are defined in a charter which all project participants (including WVB O&M Team, subcontractors, inspection organizations and main suppliers) are asked to review and sign upon joining the Project team.

4.3.2.2.a-iii. Approach to Achieve the Project Schedule and Recover any Schedule Slippage

MANAGING RESOURCES AND ACTIVITIES: Setting and communicating the expectations for the scheduling of maintenance activities is our primary method of managing resources and activities (both our own and subcontractors) in order to achieve the Project schedule. This will be supported by accurate field updates of progress for incorporation into the schedule, these updates will identify any areas of slippage. Updated schedules will be included in the quarterly Operations Report to IFA.

RECOVERING SCHEDULE SLIPPAGE: Early identification of negative variance from either the maintenance or rehabilitation schedule, through our ongoing review of performance against the schedules, limits the need for any schedule recovery. If any slippage does occur we will identify the causes and accelerate related activities on a critical path to enable schedule recovery. This includes the allocation of additional management resources if required and increased performance measurement until the schedule slippage has been recovered.

4.3.3 OPERATIONS AND MAINTENANCE QUALITY MANAGEMENT

O&M QUALITY MANAGEMENT APPROACH: The WVB O&M Team is committed to achieving exceptional quality performance and meeting all of IFA's quality expectations for the Operating Period of the Project. Our general approach to quality management has been described in Section 4.1.5. Quality management is one of the key processes within our IMS (control process C2), which will apply throughout all Project stages to achieve a consistent approach to quality management, from design and build through O&M.

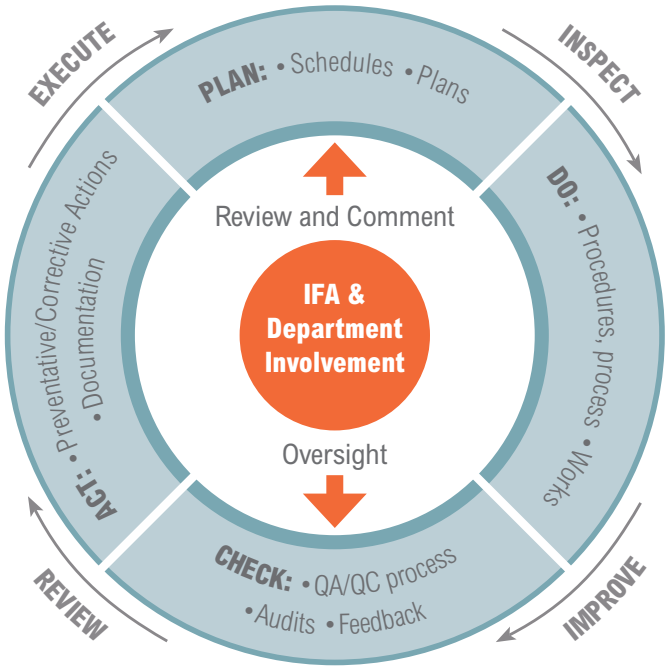
During the O&M phase our quality commitments will be to:

- Achieve the contractual quality, deadline and budget goals set in the PPA in accordance with the applicable legal framework and standards
- Ensure the O&M Team meets all Project operation and maintenance requirements in line with the contractual requirements, public safety standards, WVB's safety standards and environmental standards
- Establish best practices and foster continuous improvement through collected and solicited feedback.
- Communicate with all interested parties, including IFA, users and nearby residents, to promote a positive image of the project and anticipate and address any potential sources of dissatisfaction.

The O&M Quality Plan identifies the means for monitoring and evaluating all aspects of Project delivery against the Performance Requirements specified in the Technical Provisions. All of the supporting data and calculations used will be submitted to IFA in the quarterly Operations Report. Because the final design, equipment selections, and construction quality impacts the requirements of the Plan, the WVB O&M Team considers these requirements further during the design development phase. At that time, our outline Plan will be adapted to ensure it meets the specific requirements of the facilities that we design and build.

As shown on **Figure 4.3-16**, the WVB O&M Team follows the same quality assurance and control principles used in the design and construction stages of the Project detailed in Section 4.1.5. The quality assurance system will include procedures to validate the data, times, dates and logs that are the basis of the Availability Payment and Noncompliance Points Adjustment calculations.

FIGURE 4.3-16 QUALITY MANAGEMENT APPROACH



A DESCRIPTION OF QUALITY ASSURANCE AND QUALITY CONTROL FUNCTIONS: Deputy Project Manager, Phil Malin, will be responsible for quality throughout the Operating Period. The approach and quality plan will be continued from the design-build processes to provide consistency from design, construction and through the Operating Period.

This includes our independent quality assurance team, which will remain separate from the teams actually carrying out the activities being monitored and assessed.

APPROACH TO INVOLVEMENT REPORTING RELATIONSHIPS AND RESPONSIBILITIES FOR IFA AND DEPARTMENT OVERSIGHT: The quarterly Operations Report provided to the IFA form the basis of the IFA and Department's review of our performance and progress. This key report includes all quality system results, including reports on closures, Unavailability Events, Non-Compliance and Incident

log data. It includes all findings from the O&M quality management and assurance system as well as our assessment of O&M subcontractor activities, potential areas for performance improvement and lessons learned where appropriate.

The WVB O&M Team also provides the following reports for IFA's use.

REPORTS	GENERATED
Winter Patrol Diary	Daily during winter
Incident Reports	When arises
Planned Maintenance Schedule	Monthly
Lane Closures Record	Monthly
Non-Compliance Events Report	Monthly
Operations Report	Quarterly
Unavailability Adjustment Report	Quarterly
Unplanned Maintenance Activities Report	Quarterly
Maintenance Work Report	Quarterly
Non-conformance Report	Quarterly
Performance Inspections Results	Yearly
General Inspection Report	Yearly
Performance and Measurement Table	Yearly
Rehabilitation Work Report	Yearly
Pavement OBSI tests Reports	Every 3 years

The O&M Quality Management Plan details how the WVB O&M Team collects and records the information for these reports. Information collected will include (but not be limited to) details of:

- Incidents
- IFA / User satisfaction
- Process performance
- Inspection and audit results
- CMMS data
- Other IMS activities (including meeting minutes, management review findings, etc.)

The analysis of this information is reviewed at dedicated meetings to verify overall compliance to the PPA requirements. These reports are provided for IFA Oversight.

QUALITY

The Deputy Project Manager, Phil Malin is in charge of quality management through the O&M stage. He has defined authority for ensuring the continued implementation and maintenance of the PMP and reporting to IFA.

During the O&M Period, IFA has access to:

- Accompany the WVB O&M Team on physical performance inspections, conducting its own performance inspections and assessing and scoring the WVB O&M Team's O&M records

- Monitor and audit the WVB O&M Team's detection, reporting, response times and times to rectify breaches and failures for which non-compliance points or unavailability adjustments may be assessed pursuant to Section 11.3 of the PPA in accordance with Exhibit 10 (Payment Mechanism)

The WVB O&M Team coordinates and cooperates with IFA, its authorized representative and the Department to facilitate IFA's and the Department's oversight activities. IFA has the ability to use and access the CMMS to capture these observations. Observations will be identified either as conforming or non-conforming to related requirements of the PPA documents. The WVB O&M Team responds to all detected instances of non-conforming work using the CMMS.

Phil has quality management authority independent to that of the Project Manager and has direct quality reporting obligations to the Project Steering Committee and to IFA in relation to O&M quality management.

INTERNAL PROCESS FOR PREPARING AND REVIEWING REPORTS:
WVB O&M Team Patrollers and Roadway Maintenance Operators have a daily record of operations that will document all Incidents, Non-Compliance Events, Unavailability Events, lane closures and any issue that might arise on the Project. The O&M Manager reviews and approves the record at the end of each day. These records are reviewed weekly by the Project Manager.

DOCUMENTATION AND CORRECTION OF NON-COMPLIANCE ISSUES: The WVB O&M Team procedure for issuing non-conformance reports is set out in the O&M Quality Plan. These can be issued either by IFA or the WVB O&M Team. All Non-Compliance Events are considered as non-conformances. Non-conformances could arise in relation to:

- Application of the project management system (e.g. company quality, health, safety, environment and sustainable development measures), detected during audits, following complaints or via claims from IFA.
- The operation and maintenance services provided by the WVB O&M Team.
- The project assets, as identified during project inspections.

The Quality Plan explains the methodology for dealing with any actual and potential non-conformances in a timely and efficient manner as well as for triggering corrective and improvement/preventive actions.

The key steps to document and correct a non-conformance event are as shown in **Figure 4.3-17**.

CONTINUOUS IMPROVEMENT THROUGH REMEDIAL AND PREVENTIVE ACTIONS: The WVB O&M Team uses the results of our formal O&M quality performance audits, tests and inspections, together with any team observations, claims or reported failures to comply with contract requirements, and identify continuous improvement opportunities. This will include both remedial actions needed to correct deviations and avoid their recurrence and preventive actions needed to prevent future deviations from occurring at all.

As remedial and preventive actions are identified, they will be recorded in an Actions List. This explains how each action was defined, its approval cycle and related monitoring requirements. For all approved actions the list includes a detailed description, date of issue, deadline for action and identified owner.

Phil Malin will use the Action List to track the progress of remedial and preventive actions implemented. The Action List will be reviewed monthly, as an important part of the ongoing Management Review process. After a suitable period of time (depending on the action), we assess whether actions have been successful. Evidence will be captured to document this. Once we are satisfied the problem is not recurring, the issue is closed and recorded as such on the Actions List. Successful actions are then introduced into our standard maintenance procedures as best practices.

GOLDEN EARS BRIDGE

Phil Malin brings lessons learned and experience from a similar PPP cable-stayed bridge, Golden Ears Bridge in British Columbia.

FIGURE 4.3-17 PROCESS TO IDENTIFY, CORRECT AND REPORT NON-CONFORMANCE WORK