

# Sideling Hill Rock Cut Construction Management at Risk (CMAR) Project



CONTRACT: WA2515176  
INFORMATIONAL MEETING  
AUGUST 17, 2016

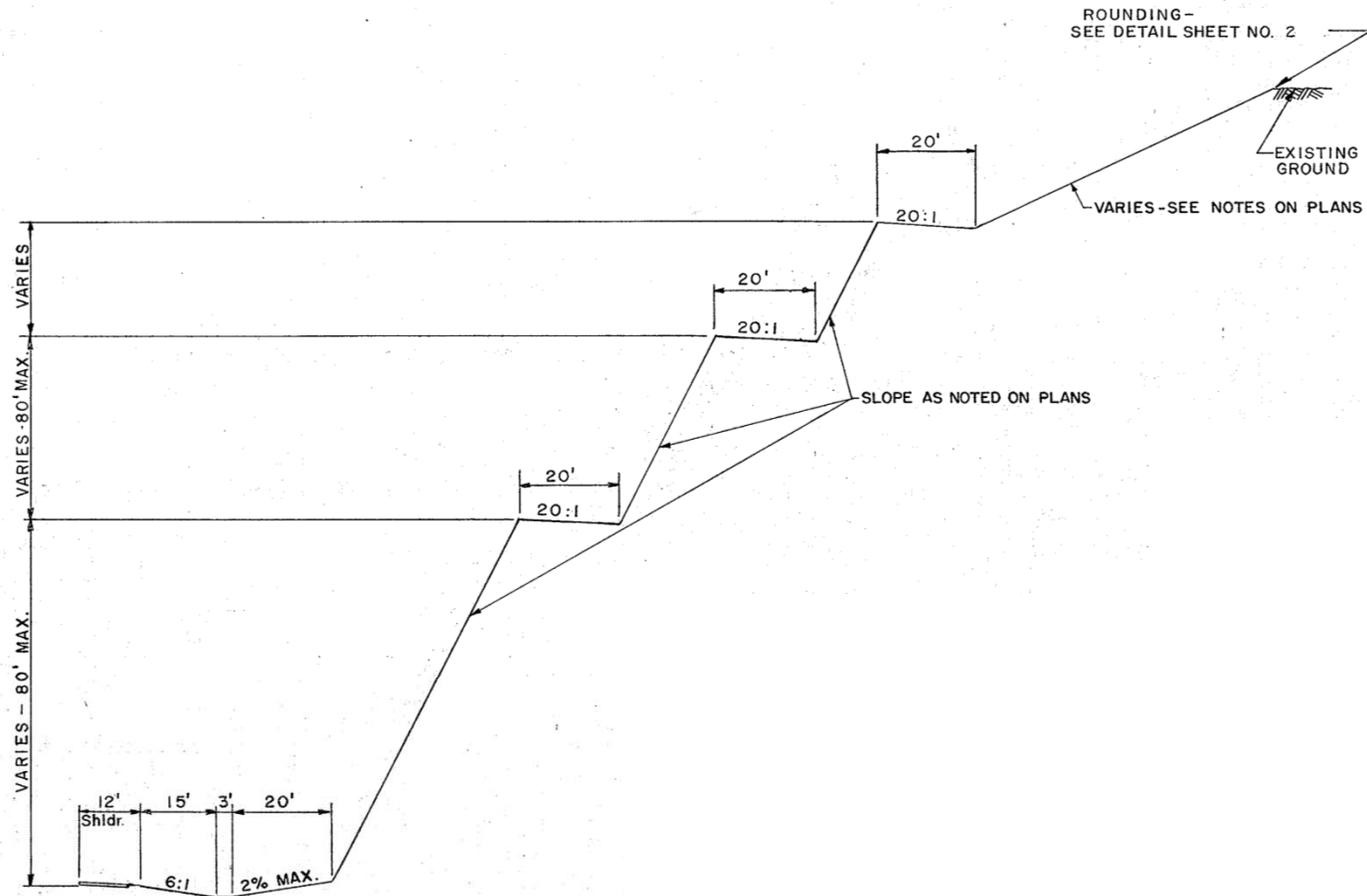
# Background

- ▶ Excavation began in April 1983, blasting was completed 16 months later in August 1984; Completed highway was opened in August 1985.
- ▶ Initially, slopes were cleaned and maintained on a regular basis by SHA forces.
- ▶ After about 1995, regular maintenance tapered off with the last bench clearing occurring in 2002, on the North side only.
- ▶ The cut is 340 feet deep from the ridge crest to road level. Surface elevation at the ridge crest is about 1,620 feet and at road level about 1,280 feet.
- ▶ The road cut is 200 feet wide at road level, 460 feet at 3<sup>rd</sup> bench, and 720 feet at the top of the cut.

# What We Did...

- ▶ June 2012, Schnabel Engineering completed a Geotechnical Report titled Sideling Hill Rock Slope Hazard Investigation and Remediation Concept Development.
  - ❖ LiDAR Surveys completed
  - ❖ Identified 3 scenarios for rockfall hazard mitigation.
    1. Scaling and Bench Clearing
    2. Rockfall Barriers
    3. Rockfall Drapery
  
- ▶ In 2014, design began on a combination of the first 2 scenarios.
  - ❖ Includes a preliminary MOT design. Final design dependent on contractor's means and methods.
  - ❖ PRD (MDE) permit at Final Stage. Depending on Contractor's L.O.D. needs, design is ready for Final Approval.
  - ❖ Programmatic Categorical Exclusion (PCE) approved for current design.
  
- ▶ In 2016, CMAR was identified as the proper advertisement.

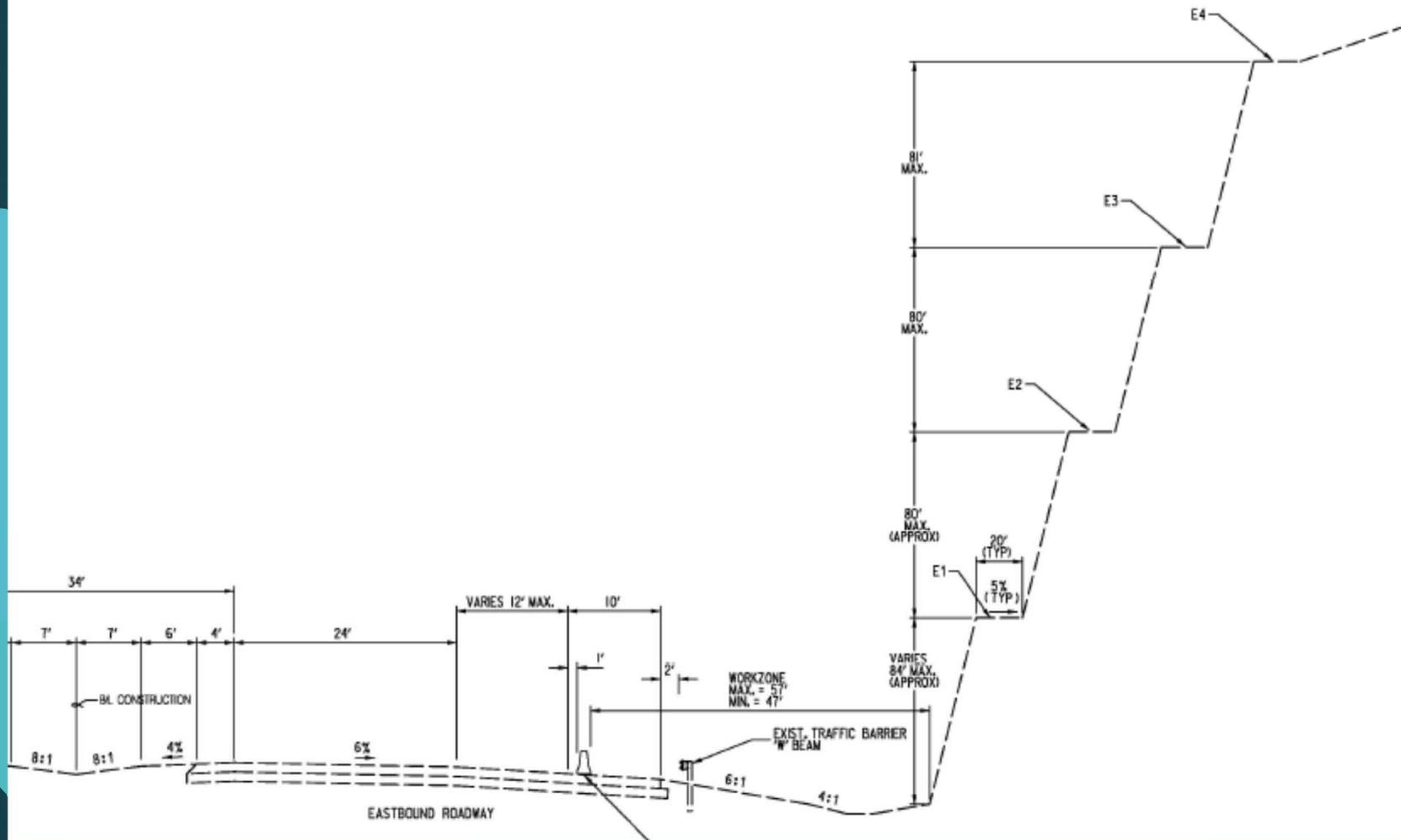
# Typical Section per Original Plans



## ROCK FALL BENCH DETAIL

Scale 1" = 20'  
STA. 2477+50 TO STA. 2499+00, RT. & CONSTR. U.S.48  
STA. 2479+50 TO STA. 2497+00, LT.

# Typical Section per LiDAR Surveys (at peak)

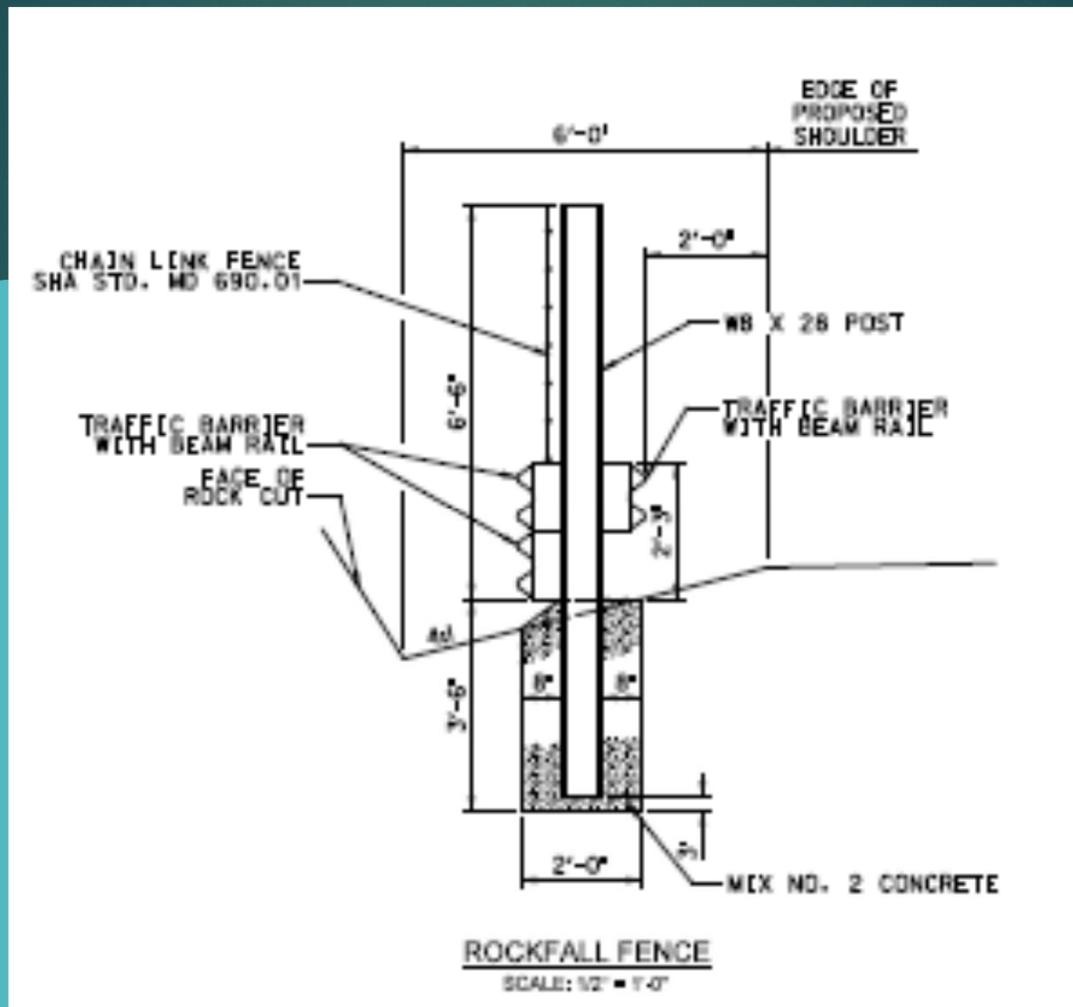


# Construction Elements:

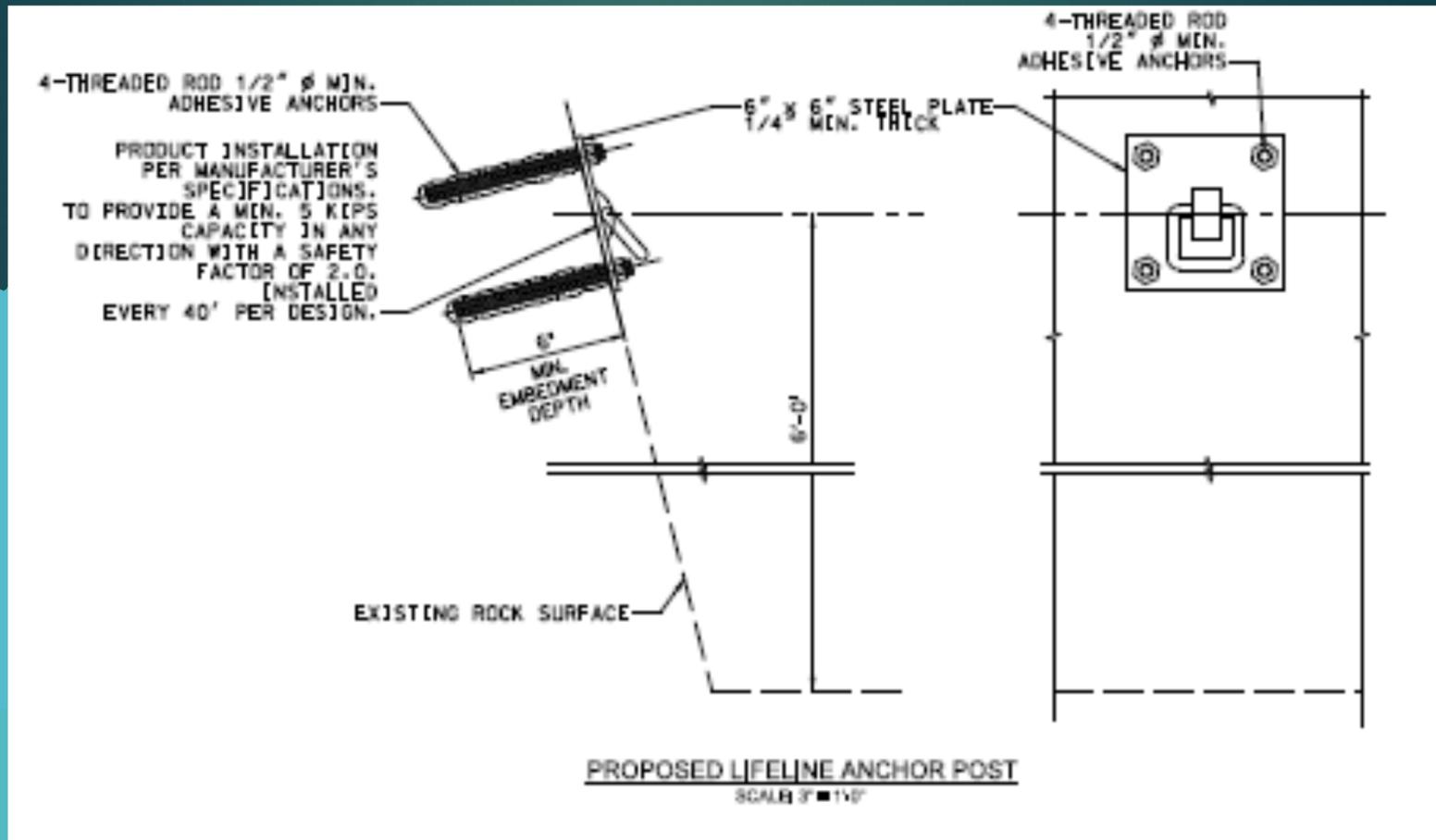
Construction is anticipated to consist of the following major elements:

- Maintenance of Traffic.
- Possible SWM and ESC.
- Removal of the existing rock sediment build-up from benches.
- Roadway protection for I-68 traffic from falling debris.
- Potential Stream impacts, wetland mitigation, forest mitigation.
- Lifeline Anchors on benches for future cleaning and maintenance.
- RockFall Protection Traffic Barrier.
- Potential Signing and pavement marking if existing is impacted.

# RockFall Protection Traffic Barrier:



# Lifeline Anchor System:



# Construction Challenges:

- The Maintenance of Traffic (MOT) plan needs to provide sufficient capacity and safety during construction while minimizing the number of phases.
- Potential time of year restrictions with any in-stream impacts.
- Avoidance and minimization of impacts to natural resources during construction.
- Access to the upper benches.
- Safe removal of sediment debris from benches at higher elevations.
- Deteriorated current conditions of the benches.
- Work will most likely carry over through Winter Season.
- Continuous access to Rest Stop Facilities

# Project Status and Issues:

- ▶ Project has approx. 90% design level plans developed.
- ▶ As-builts of original construction through cut is available.
- ▶ Coordination is ongoing with Environmental Agencies on allowable impacts. Permits are required prior to Notice to Proceed for Construction.
- ▶ Site Development approval based on Final Review Plans.
- ▶ Project will require a National Environmental Policy Act reevaluation (Joint Permit Application).
- ▶ Anticipated construction schedule to start by Summer 2017 and be completed by Summer 2018.

# Current Sideling Hill Benches Conditions



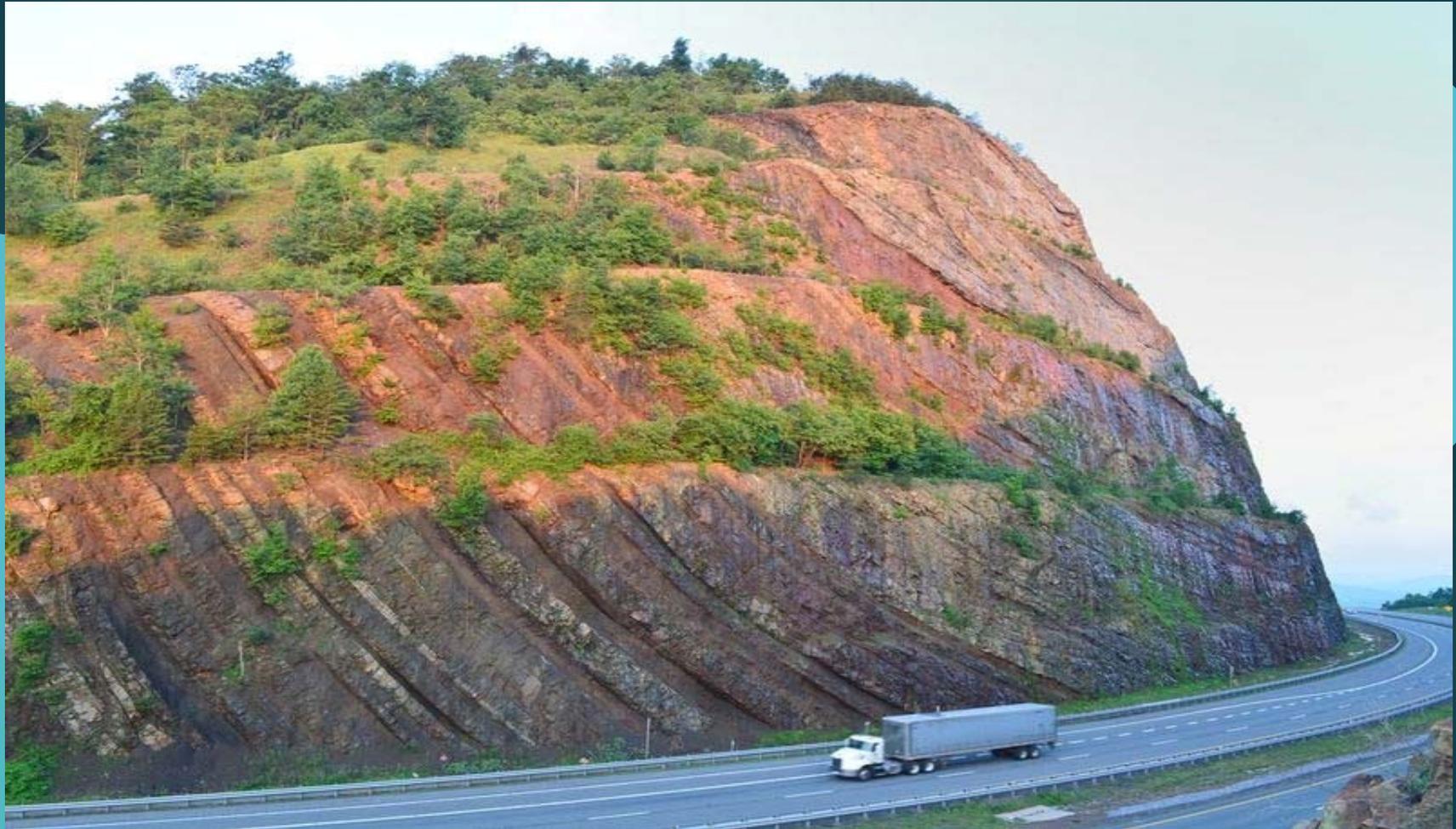
I-68 WB Northern Benches

# Current Sideling Hill Benches Conditions



Northern Bench Vegetation and Rock Debris

# Current Sideling Hill Benches Conditions



Southern Benches Vegetation and Rock Debris

# Current Sideling Hill Benches Conditions



WB I-68 View in Winter

# Current Sideling Hill Benches Conditions



**PHOTOGRAPH No.:** 30

**Photo Taken:** 03-15-2011

**LOCATION:**

South Face, Toe of Slope,  
Approx. Station 2493+00; looking  
east

**COMMENTS:**

Severe differential weathering and undercutting in the Rockwell Formation will continue to degrade slope over time. Wedge of accumulated rock debris at toe may not need to be removed. Some small rockfall blocks in the catchment area are shown. Typical size is less than 0.5 ft wide.

# Current Sideling Hill Benches Conditions



**PHOTOGRAPH No.: 4**

**Photo Taken: 03-15-2011**

**LOCATION:**

South Face, 1st Bench, Approx.  
Station 2485+00; looking west

**COMMENTS:**

Trees at edge of bench in steepest portions of the slopes should be removed. Wedge of rock debris on bench should also be removed. Differential weathering and overhanging rock ledges shown will continue to degrade over time.

# Current Sideling Hill Benches Conditions



**PHOTOGRAPH No.: 5**

**Photo Taken: 03-15-2011**

**LOCATION:**

South Face, 1st Bench, Approx.  
Station 2485+00; looking east

**COMMENTS:**

Overhanging rock debris and boulders at bench edge. Loose, unstable blocks should be removed during scaling. Overhanging rocks that do not appear loose may not need to be removed. Trees on benches in steepest portions of the slope should be removed.

# Current Sideling Hill Benches Conditions



**PHOTOGRAPH No.: 27**

**Photo Taken: 03-15-2011**

**LOCATION:**

South Face, 1st Bench, Approx.  
Station 2492+00; looking east

**COMMENTS:**

Wedge of accumulated rock debris should be removed. Steepness of debris made this section too treacherous to pass on foot during the site visit.

# Current Sideling Hill Benches Conditions



**PHOTOGRAPH No.:** 6

**Photo Taken:** 03-15-2011

**LOCATION:**

South Face, 1st Bench, Approx.  
Station 2485+00; looking up

**COMMENTS:**

Differential weathering and  
overhanging rock ledges here will  
continue to degrade over time.  
Overhanging boulder on 2nd  
bench above should be removed.

# Current Sideling Hill Benches Conditions



**PHOTOGRAPH No.: 7**

**Photo Taken: 03-15-2011**

**LOCATION:**

South Face, 1st Bench, Approx.  
Station 2487+00; looking west

**COMMENTS:**

Loose rock debris at bench edge should be removed. Wedge of accumulated rock debris has completely filled bench. Debris should be removed. Trees on bench near edge should also be removed.

# Current Sideling Hill Benches Conditions



**PHOTOGRAPH No.: 11**

**Photo Taken: 03-15-2011**

**LOCATION:**

South Face, 1st Bench, Approx.  
Station 2490+00; looking east

**COMMENTS:**

Wedge of accumulated rock debris  
has filled bench and will need to  
be removed. Small trees on bench  
should also be removed.

# Current Sideling Hill Benches Conditions



**PHOTOGRAPH No.: 13**

**Photo Taken: 03-15-2011**

**LOCATION:**

South Face, 1st Bench (back slope), Approx. Station 2491+00; looking west

**COMMENTS:**

Wedge of accumulated rock debris should be removed or regraded. Steepness of debris made this section too treacherous to pass on foot during the field visit.

# Current Sideling Hill Benches Conditions



**PHOTOGRAPH No.: 25**

**Photo Taken: 03-15-2011**

**LOCATION:**

South Face, 2nd Bench, Approx.  
Station 2491+00; looking east

**COMMENTS:**

Wedge of rock debris has filled the narrow rock bench in this area and should be removed or regraded. This area was impassable on foot during the site visit due to steepness of the debris wedge. Small trees at bench edge in the steepest portions of the cut slopes should be removed.

# Current Sideling Hill Benches Conditions



**PHOTOGRAPH No.: 14**

**Photo Taken: 03-15-2011**

**LOCATION:**

South Face, 2nd Bench, Approx.  
Station 2487+00; looking west

**COMMENTS:**

Wedge of accumulated rock debris should be removed or regraded. Trees have grown in rock debris and will also need to be removed. Differential weathering and undercut within the Rockwell Formation creates overhanging sandstone ledge in the Purslane Formation.

# Current Sideling Hill Benches Conditions



**PHOTOGRAPH No.: 17**

**Photo Taken: 03-15-2011**

**LOCATION:**

South Face, 3rd Bench, Approx.  
Station 2490+00; looking west

**COMMENTS:**

Reportedly, a large section of this bench was lost during construction. Severe differential weathering and undercutting have completely eroded the bench making it impassible during the site visit. The faulted, coal-bearing beds are particularly susceptible to differential weathering effects. Loose rock debris on the edge of the bench should be removed during scaling.

# Current Sideling Hill Benches Conditions



**PHOTOGRAPH No.: 23**

**Photo Taken: 03-15-2011**

**LOCATION:**

South Face, 3rd Bench, Approx.  
Station 2491+00; looking east

**COMMENTS:**

Severe differential weathering and undercutting have completely eroded the bench in this area making it impassible during the site visit. The coal-bearing beds in this area are particularly susceptible to differential weathering effects. The slope will continue to degrade over time in this area, increasing the rockfall hazard. Loose rock debris on the edge of the bench will need to be removed.

# Current Sideling Hill Benches Conditions



**PHOTOGRAPH No.:** 20

**Photo Taken:** 03-15-2011

**LOCATION:**

South Face, 4th Bench, Approx.  
Station 2486+00; looking east

**COMMENTS:**

Benches at the east and west ends of the cut slopes appeared relatively stable compared with the steeper portions of the slopes. Trees in these areas do not need to be removed unless they are deemed to increase the rockfall hazard on a case by case basis.

# Cultural Significance

- ▶ The I-68 roadcut through the crest of Siding Hill in western Washington County, Maryland, created one of the best geologic exposures in the northeastern United States, which adds to the tourist attractions to the rest area.
- ▶ Reveals a cross section through a synclinal ridge. This massive cut has proven to be a significant educational and research tool for local schools and universities.



# Construction Management at Risk (CMAR) Project Delivery



# What is CMAR?

A project delivery method where SHA utilizes a two-phase construction contract with a General Contractor to:

- 1) Provide Preconstruction Services which may include, but are not limited to, constructability analysis, value analysis, scheduling, site assessments, and cost estimating;
- 2) Construct the project based on final design plans (or design packages) at an agreed Guaranteed Maximum Price (GMP)

# Authority

- State – Code of Maryland Regulations (COMAR) 21.05.10
- Federal – Moving Ahead for Progress in the 21<sup>st</sup> Century (MAP-21) – *Construction Manager/General Contractor (CM/GC)*

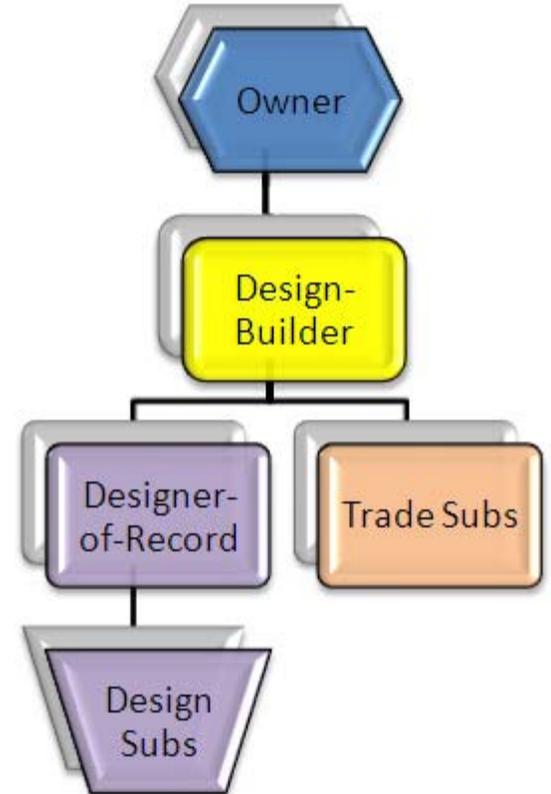
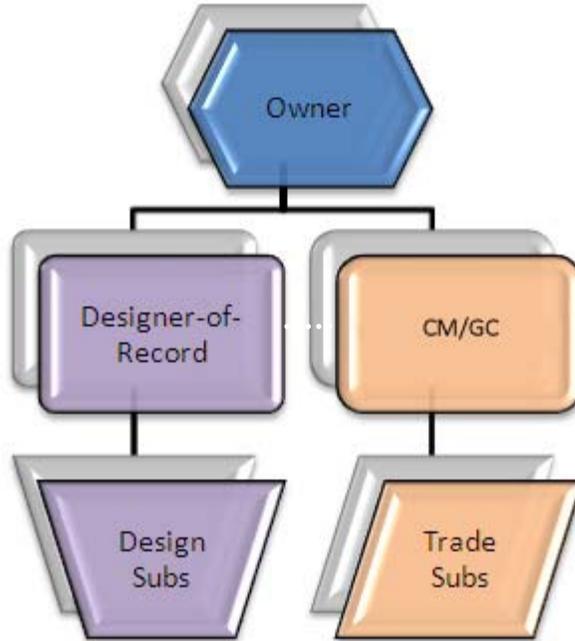
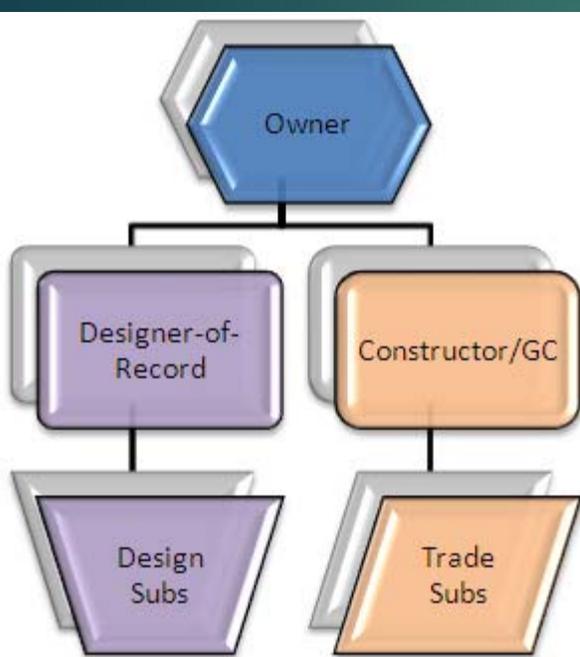


# Project Delivery Methods

Design-Bid-Build

CMAR

Design-Build

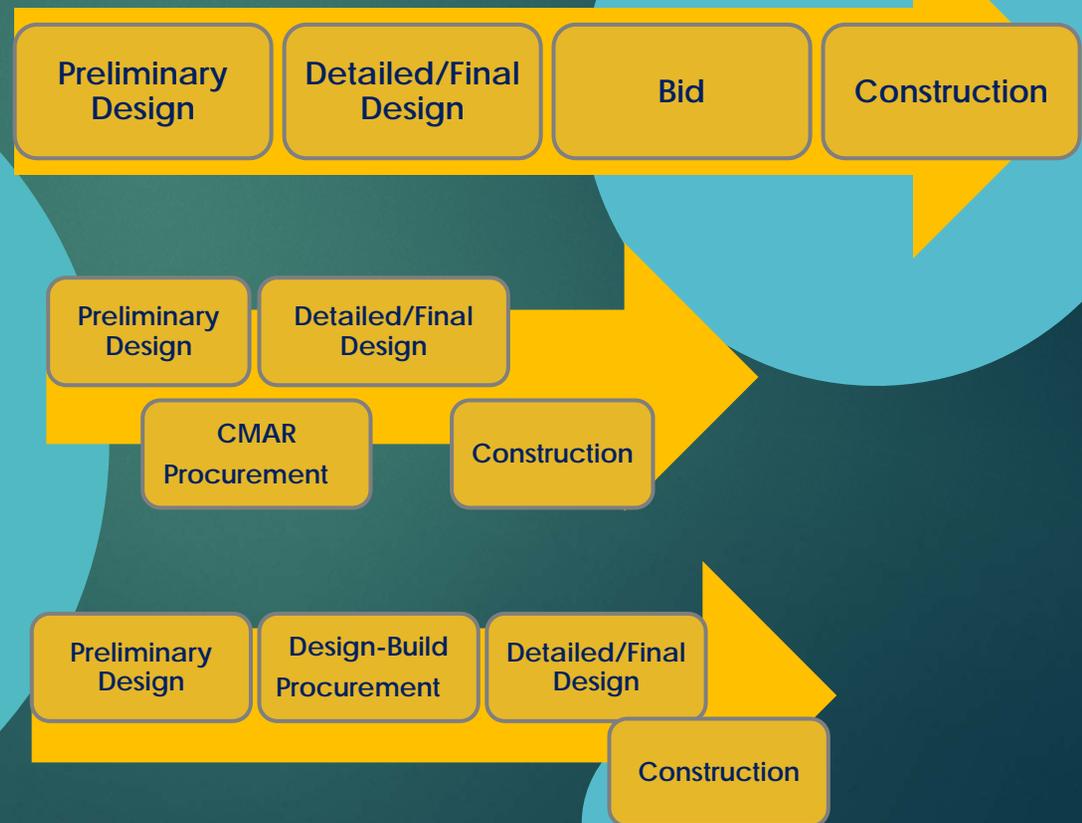


# Project Development

Design-Bid-Build  
(DBB)

CMAR

Design-Build  
(DB)

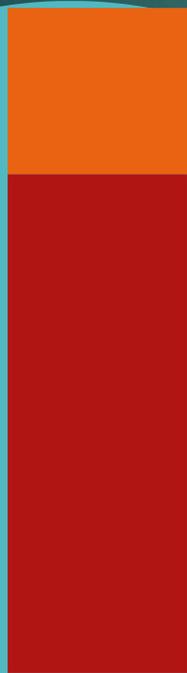


# Reasons for choosing CMAR

- Shorten Project Delivery
- Project Complexity
- Contractor Input During Design
- High Number of Potential Risks/Risk Allocation
- Scope Flexibility/Maximizing Dollars
- Cost Analysis of Multiple Design Options
- Informed Owner Decision Making

# CMAR – Risk Allocation

35



DBB



DB



CMAR

■ Contractor  
■ Owner

# CMAR Expectations

- ▶ Meet Project Goals
- ▶ Fair Market Price
- ▶ At or Below Proposed Price
- ▶ Improved Schedule
- ▶ Fewer Change Orders

# CMAR Benefits

- ▶ Opportunity to bring on contractor during the design phase to work as an integrated team with the owner and its consultant/engineer to deliver the most efficient, and cost effective design
- ▶ Promotes innovation & collaboration
- ▶ Owner maintains decision making authority
- ▶ Greater cost certainty through GMP and reduction in change orders
- ▶ Still allows phased construction similar to design-build resulting in accelerated completion times. Phases must be stand alone and severable.
- ▶ Risk identification & management during design phase and controlled by the team
- ▶ Owner gets up front benefit of value engineering
- ▶ CMAR design documents are biddable packages, not necessarily full set of biddable contract documents

# CMAR Potential Risks

- Transparency – Technical Qualifications and Approach are Main Elements for Selection
- Cost Validation – “Negotiated” vs. Bid
- Culture – New Process for All (SHA, Consultants, Contractor, Regulatory Agencies, Etc.)
- Risk – Limited Historical Usage for Heavy Highway Construction

# CMAR Project Team

- ▶ Owner (SHA)
- ▶ Engineer under separate Contract with owner to provide all design services for the project.
- ▶ Two Phase Contract with General Contractor (GC)
  - ▶ GC selected through Best Value process
  - ▶ Phase 1 – Preconstruction Services - GC considered part of the design team providing constructability, cost, schedule and risk management input.
  - ▶ Phase 2 – GC and Owner agree on GMP to construct the project based upon final design plans (or design packages). If GMP cannot be agreed upon, then advertise as design-bid-build.

# Independent Cost Estimator

- ▶ Independent party hired by SHA to prepare a series of detailed estimates.
- ▶ Estimates are performed independently from Contractor and SHA's Designer.
- ▶ Estimates are utilized as a basis of comparison for review of Contractor's GMPs and award of Construction Contract.

# Cost Model Development

- Develop Cost Model for Project
  - Opinion of Probable Construction Cost (OPCC)
  - Guaranteed Maximum Price (GMP)
- Elements of Cost Model
  - CMAR Management Fee Percentage (from Price Proposal)
  - Items
    - Equipment Types and Rates
    - Material Sources
    - Labor
  - Subcontractor Items of Work
  - Risk Sharing Pool (Assignment and Agreement of Risks)
  - Schedule Agreement

# Cost Model Development

- OPCC
  - To be submitted at various Design Completion milestones
  - Blind Estimate Comparison
  - Report of Items Outside of Tolerance (>10%)
  - Reconciliation Meeting to discuss differences in bidding assumptions

# Once Design is Complete

- Contract documents have been developed collaboratively by team
- Follow typical procedures
  - DBE goals established for construction
  - 2008 Standard Specifications and current SP/SPIs
- GMP - Contractor and ICE will independently price project

# Once GMP is Submitted

- Contractor and ICE prices
- Price Reconciliation Meetings as needed
- Up to 3 GMP Submittals allowed
  - Accept GMP and Award Contract
  - Terminate Contract and Bid Project as DBB

# Procurement Process



# Competitive Sealed Proposals

*CM at Risk contracts will be procured using the "Competitive Sealed Proposals" procurement method as defined in the COMAR 21.05.03.*



# Competitive Sealed Proposals

## *One Step Procurement Process*

### *Request For Proposals (RFP)*

- *Technical Proposal*
- *Price Proposal*

*Note: Proposers are responsible for all costs associated with responding to the RFP. All information included in responses to RFP shall be become property of SHA.*

# *Technical Proposals*

## *Evaluation Factors*

- *Project Management Team/Capability of Proposer*
- *Project Approach*
- *Legal and Financial Information*

# *Technical Proposals*

- ▶ Project Management Team/Capability of Proposer
  - ▶ Composition of the Project Management Team
  - ▶ Key Staff
    - ▶ Project Manager – must be employee of the Prime or JV Contractor
    - ▶ Construction Manager
    - ▶ Cost Estimator
  - ▶ Past Project Performance

# *Technical Proposals*

- ▶ Project Approach
  - ▶ Preconstruction Approach
  - ▶ Construction Approach
  - ▶ Risk Management

# *Price Proposals*

## *Evaluation Factors*

- *Preconstruction Fee (Lump Sum price)*
- *Construction Cost*

# *Evaluations of Technical and Price Proposals*

- Technical and Price Proposals are evaluated separately
- Best Value Process – most advantageous to the State considering technical evaluation factors and price.
- Adjectival Rating process
- Evaluation Factors and Subfactors weighting – Critical, Significant, Important
- Importance of Technical Proposal is significantly more important than Price Proposal

# *Request For Proposals (RFP)*

## PROPOSED PROCURMENT SCHEDULE

Issue RFP	August 30, 2016
Final Date for Proposer's Questions	September 13, 2016
Letter of Interest Due	September 20, 2016
Technical and Price Proposal Submittal to SHA	September 27, 2016
Selection of Successful Proposer	October 27, 2016
Preconstruction Notice to Proceed	December 12, 2016
Construction Notice to Proceed ( <b>TARGET</b> )	May 1, 2017

# Questions/Feedback?

Information related to this presentation will be available at the following:

[www.roads.maryland.gov](http://www.roads.maryland.gov) under Business Center, Contracts, Bids & Proposals, Construction Management At Risk Projects, WA2515176

Email: SHAWA251IS68@sha.state.md.us