



ELECTRONIC COPY

Volume I: Technical Proposal

AUGUST 8, 2017



City of Chesapeake, VA
**I-64 SOUTHSIDE WIDENING
AND HIGH RISE BRIDGE**
PHASE 1

STATE PROJECT NO.
0064-131-811, P101, R201,
C501, B662-B670, D637, D638

FEDERAL PROJECT NO.
NHPP-064-3(488)

CONTRACT ID NO.
C00106692DB93

LMB Constructors



August 8, 2017

Mr. Jeffrey A. Roby, PE, DBIA
Alternative Project Delivery Division
Virginia Department of Transportation
1401 East Broad Street
Annex Building, 8th Floor
Richmond, Virginia 23219

RE: Design-Build Project for I-64 Southside Widening and High Rise Bridge, Phase I
State Project No.: 0064-131-811, P101, R201, C501, B662-B670, D637, D638
Federal Project No.: NHPP-064-3(488)
Contract ID Number: C00106692DB93

Dear Mr. Roby:

LMB Constructors (LMB) is comprised of **The Lane Construction Corporation (LANE)**, **McLean Contracting Company (McLean)**, and **Branch Civil, Inc. (Branch)** (the joint venture partners) and presents our Technical Proposal for the above referenced Design-Build (D-B) project to the Virginia Department of Transportation (VDOT). Our response contains all information requested in the RFP dated December 14, 2016 and Addendums 1-8.

LMB is the Offeror and will be the overall authority for the Project. **LANE** will serve as the Lead JV Partner. We have teamed with **STV Incorporated dba STV Group Incorporated (STV)** as the Lead Designer, supported by **Johnson, Mirmiran and Thompson, Inc. (JMT)**, to provide VDOT with a Team that has a reputation for completing complex projects innovatively, on time, and often ahead of schedule. Our Team's experience will enable us to deliver the high quality and technically sound project both VDOT and the public expects. Our Team has taken every opportunity to provide enhancements, innovative ATCs, and value-added design features; diligently manage and mitigate risk; and reduce both construction and long-term maintenance costs.

4.1.1 Offeror's Full Legal Name and Address:

LMB Constructors
c/o The Lane Construction Corporation
90 Fieldstone Court
Cheshire, CT 06410

4.1.2 Declaration of Intent: It is the Offeror's intent, if selected, to enter into a contract with VDOT for the Project in accordance with the terms of the RFP.

4.1.3 120-Day Declaration: Pursuant to Part 1, Section 8.2, we declare that the offer represented by this Technical Proposal and our Price Proposal will remain in full force and effect for one hundred twenty (120) days after the date the Technical Proposal is submitted to VDOT ("Technical Proposal Submission Date").

4.1.4 Offeror's Point of Contact Information: Mr. John P. Havel, Jr. is the authorized representative and point of contact for the LMB Team for all matters associated with this submittal.

John P. Havel, Jr., PE, Pursuit Manager
The Lane Construction Corporation
14500 Avion Parkway, Suite 200
Chantilly, VA 20151
Tel: (412) 445-0423 Fax: (703) 222-5960
E-mail: JPHavel@laneconstruct.com

4.1.5 Offeror's Principal Officer Information: Mr. Joseph P. Lark is a Principal Officer of LMB Constructors.

Joseph P. Lark, Senior Vice President
The Lane Construction Corporation
14500 Avion Parkway, Suite 200
Chantilly, VA 20151
Tel: (703) 222-5670 Fax: (703) 222-5960
E-mail: JPLark@laneconstruct.com

4.1.6 Final Completion Date: In accordance with RFP Part 1, Section 2.3.1, LMB proposes a Final Completion Date of July 30, 2021.

4.1.7 Unique Milestone Dates: LMB does not propose any Unique Milestone dates.

4.1.8 Proposal Payment Agreement: An executed Proposal Payment Agreement (Attachment 9.3.1) can be found in the Appendix of Volume 1.

4.1.9 Certification Regarding Debarment Forms: Certifications for Debarment for Primary and Lower-Tier Transactions have been completed and executed for the Offeror and all subconsultants, subcontractors, and other entities identified as members of the LMB Team. These can be found in the Appendix of Volume 1.

The LMB Team appreciates the opportunity to provide our Proposal for this extremely important project. We look forward to working closely with VDOT and stakeholders in our development and delivery to make the I-64 Southside Widening & High Rise Bridge Phase 1 Project a landmark success for the citizens of Virginia.

Respectfully submitted,



John P. Havel, Jr., PE
Authorized Representative
LMB Constructors



4.2 - Offeror's Qualifications

4.2 | OFFEROR'S QUALIFICATIONS

4.2.1 Qualifications of Key Personnel

Since the submission of our Statement of Qualifications (SOQ) dated October 13, 2016, the LMB Team has made the following VDOT-approved changes:

- EV Williams, Inc. is now Branch Civil, Inc. and all references on the organizational chart have been changed to reflect this name change.
- Mr. Joe Sckinto, the Right of Way Lead is no longer with JMT. He has been replaced with Mr. Gerald Krebs, SR/WA. (Non-Key Personnel)
- Mr. Daniel Needham, the QA Lead Inspector (Bridge) is no longer with NXL. He has been replaced with Mr. Drew Powell. This non-key personnel change resulted in the following change in the SOQ organizational chart narrative:

QA Lead Inspectors, Mr. ~~Daniel Needham~~ Drew Powell (Bridge Elements) and Mr. Tony Guy (Roadway Elements), will report directly to the QAM, and will be assigned to the project on a full-time basis for the duration of construction operations.

The LMB Team confirms that all other information presented in the SOQ remains true and accurate in accordance with Part 1, Section 11.4. The Team proposed by LMB will remain intact for the duration of the contract.

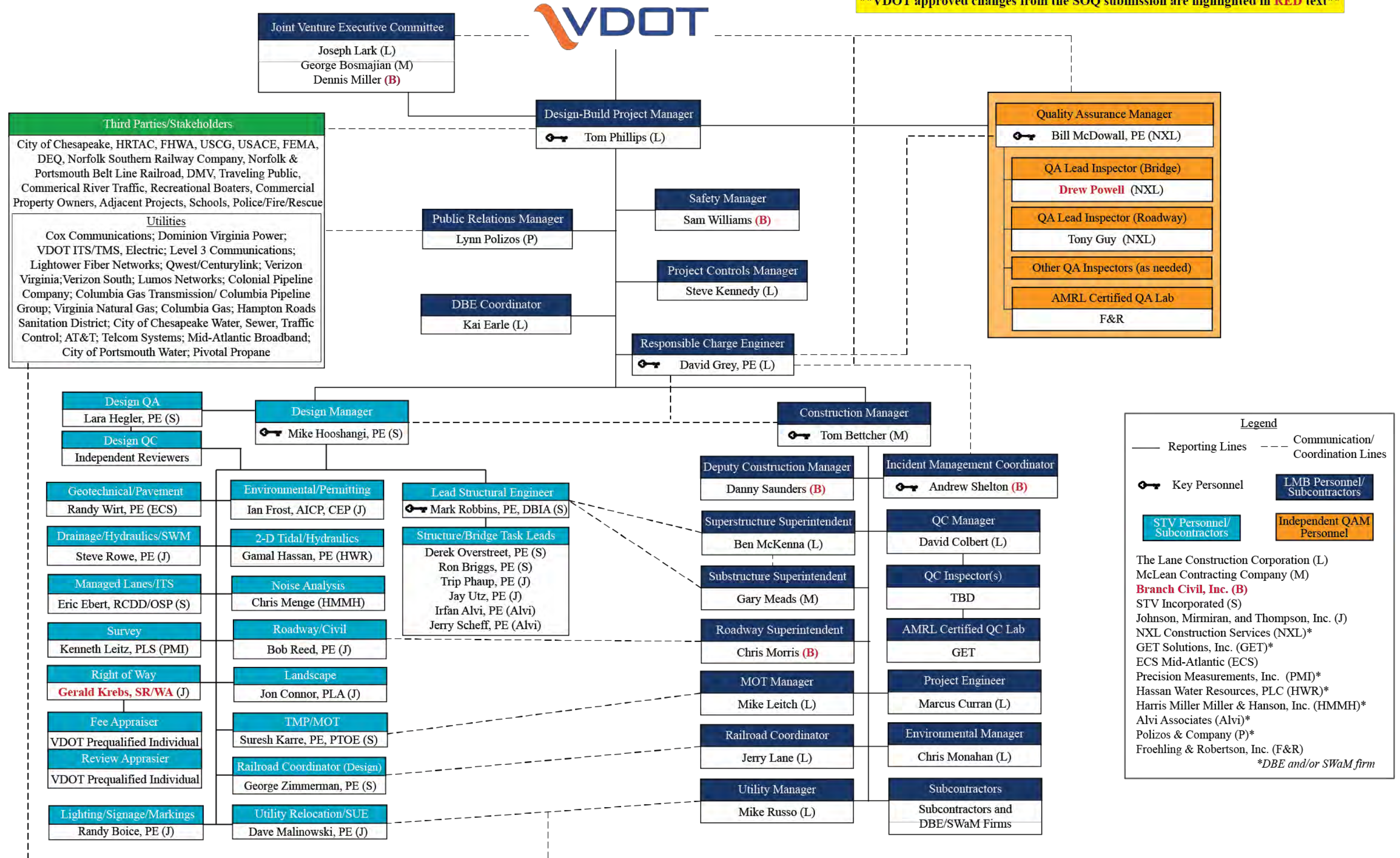
4.2.2 Organizational Chart

Under the leadership of our Design-Build Project Manager (DBPM), Tom Phillips, the LMB Team is structured to effectively manage and deliver the design and construction of this Project. The LMB Team is organized to provide VDOT with a single-source point of contact, responsible for all design and construction activities. Our Team organization has a straightforward chain of command, with individual tasks and functional responsibilities clearly identified. This organizational chart identifies key personnel and major functions to be performed for the successful management, design, and construction of the Project. Although the reporting relationships are rigid, the lines of communication within the LMB Team will remain fluid and flexible to meet the requirements of each individual Project task. To prevent unnecessary Project delays, it may be prudent, at times, for other members within the LMB Team to communicate directly with their counterparts at VDOT. This will be directed and authorized in advance by Mr. Phillips and the VDOT Project Manager.

Our updated organizational chart with the VDOT-approved changes is included on the following page.

The LMB Team organization has a straight-forward chain of command, with individual tasks, responsibilities, and functional relationships clearly identified. The following Organizational Chart depicts VDOT, third party stakeholders, key personnel, support personnel, and their respective relationships and functions.

****VDOT approved changes from the SOQ submission are highlighted in RED text****





4.3 | DESIGN CONCEPT

The Design Concepts for the I-64 Southside Widening and High Rise Bridge, Phase 1 (I-64 High Rise Bridge) Project provided in this Technical Proposal have been a coordinated effort between our design and construction teams to comply with the Technical Requirements; design and implement MOT plans to provide a **safe work zone for construction personnel and the traveling public, minimize impacts to traffic disruptions, improve the effectiveness of operations, and significantly reduce the need for future inspection and maintenance.**

The **LMB** Team Offers

Benefits to **VDOT**

<p>1</p> <p>Innovative Design with Incorporated Approved ATCs</p>	<ul style="list-style-type: none"> • Approved MASH Tested Guardrail detail at Noise walls (ATC-1) improves safety for traveling public and incorporates Phase 2 requirements • Separated HOT lanes (ATC-2) improves safety for the traveling public with enhanced separation • Shell Road Substructure (ATC-5) minimizes utility relocations, expedites construction operations, and minimizes traffic congestion at Shell Road • Improved public acceptance by providing new bridges at Yadkin Road and South Military Highway instead of widening existing bridges (ATC-2) • Safety, operations, schedule, and construction are all enhanced with our precast foundation soffit (ATC-3)
<p>2</p> <p>Conventional Bridge Design</p>	<ul style="list-style-type: none"> • Design facilitates more simplified construction techniques which enhances quality while minimizing inspection and maintenance efforts. • LMB's experience with pile foundations, prestressed girders, and steel plate girders over the navigable channel expedites construction schedule • Pile footings reduce inspection needs • Minimizing structural steel spans reduces inspection and future maintenance of joints and other bridge components
<p>3</p> <p>Practical Stormwater Management</p>	<ul style="list-style-type: none"> • Maximize treatment within existing right of way • Maximize use of nutrient credits to reduce long term maintenance • Allows offsite ponds to be used in future Phase 2 • Decreased operating costs by eliminating two SWM ponds
<p>4</p> <p>Incorporation of Future Phase 2 Scope</p>	<ul style="list-style-type: none"> • Separated HOT lanes (ATC-2) exceeds scope through early delivery of future Phase 2 construction and minimizes rebuild • Provides HOT lanes lighting for Phase 2 • Improves public acceptance and lower future costs • Eliminates need to demolish Phase 1 bridge work in Phase 2 • Permanent drainage designed to allow for Phase 2 • Allows Phase 2 lanes to be built in the median as opposed to the outside which eliminates the need to acquire ROW for added lanes • Eliminates need to acquire ROW to reconfigure Military Hwy interchange
<p>5</p> <p>High Rise Bridge Crossover</p>	<ul style="list-style-type: none"> • Separating live traffic from modification operations improves safety of the traveling public and Project personnel • Increases safety by providing access to shoulder/emergency lane • Improves quality with better access to work areas • Larger barrier offsets eliminate need to anchor to deck • Accelerates construction schedule • Eliminates movable bridge balancing operations affecting I-64 traffic • Allows eastbound approach work to be done away from I-64 traffic

Critical aspects of our Design Concept were derived from our Team's approved Alternative Technical Concepts (ATCs). These ATCs include various enhancements that exceed the RFP requirements, listed in the table below.

ATC-1**Noise Wall Protection System**

Up-to-date barrier meeting MASH crash test criteria providing added safety and avoiding the need for future upgrades

ATC-2**Managed Lane Realignment**

Separates the Managed Lanes into the median. In addition to enhanced safety during construction, Phase 2 implementation is simplified. New bridges are designed to current standards and can remain and be widened for Phase 2 in lieu of being replaced. Potential widening for Phase 2 can occur in the median and avoid impacts to noise walls, interchanges and ROW.

ATC-3**Special Design Precast Footing Soffits**

Significantly reduces the influence of tides during foundation construction, allowing interim schedule targets to be improved. Eliminates the need for a more extensive falsework system to temporarily support the wet concrete for the large cast-in-place footing pours.

ATC-5**Shell Road Substructure**

Provides a simplified pipe pile bent with a reinforced concrete cap for the widened substructure components at Shell Road. This concept will look similar to the existing substructure units, provide a durable corrosion resistant substructure, and minimize construction time in this congested area of the Project.

Our Conceptual Plans fully conform to all AASHTO, VDOT, and RFP requirements, including those listed in RFP Part 2, Attachment 2.2. Enhancements to the RFP Plans are highlighted on our Conceptual Plans. Our Plans do not include any design elements that require Design Exceptions and/or Design Waivers not identified in the RFP, addendums, or ATCs.

4.3.1 Conceptual Roadway Plans (Provided in Volume II)

Final plans will be prepared using MicroStation CADD and Geopak/OpenRoads. Electronic submissions of plans, reports, and calculations will follow VDOT's process, including an associated LD-436 quality checklist. Plans will be provided in .dgn and .pdf formats, as well as paper copies, at the milestones outlined in the RFP. Each submission will undergo an internal quality review process prior to submission. As-built plans of the Project will be provided in accordance with VDOT requirements.

(a) Project Limits

The entire Project is within the City of Chesapeake and contained within the ROW and Permanent Easements defined by VDOT on the RFP Conceptual Plans. Design begins with milling and overlay of the three existing lanes of eastbound (EB) traffic just east of the bridge over Rotunda Avenue. Full paving, including widening, begins at EB Sta. 1504+72.81. Proposed construction on the westbound (WB) lanes begins at WB Sta. 1030+57.06. **Under ATC-2, the HOT lanes in the EB and WB directions shift to the median of I-64 at about WB Sta. 1062+50 and rejoin the RFP Conceptual Plans at the Route 17 Interchange improving safety to the motoring public as well as public acceptance.** Hard Shoulder Running (where traffic is permitted to run on the shoulders for designated periods) begins along the outer shoulders of the EB and WB general purpose lanes just east of the George Washington Highway (Route 17) interchange and continues across the High Rise Bridge to Great Bridge Boulevard; this **improves safety and public acceptance.** Major work ends on the EB lanes at the entrance ramp from Battlefield Boulevard. Work in the WB lanes extends farther and ties into the existing CD lanes and other lanes just west of Battlefield Boulevard. The overall project length is approximately 8.7 miles. Work is also

conducted on connecting ramps and roads along I-64, including crossings at Battlefield Boulevard, Yadkin Road, Shell Road, Bulldog Drive, and Libertyville Road. The bridge crossing over I-64 at Great Bridge Boulevard will be replaced and the approaches will be realigned **enhancing public safety and acceptance**.

Potential Noise Wall #2 begins about 1,000 feet west of Rotunda Avenue, within the Project limits described above. Noise Wall 2 and the associated shoulder work, lighting, and drainage are included on the Conceptual Plans. The Preliminary Noise Report identified Noise Wall 2 as “feasible but not reasonable” and the noise wall may not be found to be feasible after the final noise analysis is conducted. If so, work on the EB I-64 shoulders west of Rotunda Avenue can be omitted.

(b) General Geometry, including Horizontal Curve Data and Associated Design Speeds

In general, the I-64 roadway design provides a 12-foot HOT lane in each direction plus two, 12-foot general purpose lanes in each direction, aligned with the existing adjacent lanes. An exception occurs through the limits of ATC-2, where the HOT lanes are located near the center of the existing median. *Table 4.3.1.a* summarizes pertinent geometric features for the major roadway components. The additional criteria listed in the RFP Attachment 2.2 will also be implemented. These design elements meet or exceed RFP requirements or approved ATC-2. Median conditions and shoulders vary throughout the Project area. Libertyville Road is designed to the City of Chesapeake standard for an Urban Local Street (GS-8).

Table 4.3.1.a. Geometric Features

	General Purpose Lanes	Managed Lanes	Interchange Ramps	CD Roads	Great Bridge Blvd	Other Cross Roads
Roadway Functional Classification	Urban Principal Arterial (Freeway)	Urban Principal Arterial (Freeway)	Interchange Ramp	Urban Principal Arterial	Urban Minor Arterial	Varies
Geometric Design Standard	GS-5	GS-5	GS-R	GS-5	GS-6	GS-5 thru GS-8
Design Speed	70 mph	70 mph	35 mph	60 mph	40 mph	35 to 55 mph
Access Control	Full	Full	Full	Full	Partial	N/A
Minimum Lane Width	12-foot	12-foot	16-foot	12-foot	12-foot	Varies
Min/Max Grade (%)	0.5 / 3.0	0.5 / 3.0	0.5 / 6.0	0.5 / 3.0	0.5 / 7.0	Varies

(c) Number and Widths of Lanes, Shoulders, Sidewalks, and Hard Shoulder Running

Along I-64, the Design Concept provides two, 12-foot-wide general purpose lanes and a 12-foot-wide HOT lane in each direction. Paved shoulders (12-feet wide and increased to 14 feet wide when adjacent to barriers) are used through the areas of the Hard Shoulder Running. Elsewhere, shoulder widths vary; 10-foot wide paved shoulders are used in areas along existing travel lanes permitted by the approved design waivers and exceptions, minimum 12-foot paved shoulders are used adjacent to new widening. The shoulders for the separated HOT lanes through the ATC-2 area provide a 6-foot right shoulder and 4-foot left shoulder in keeping with AASHTO recommendations to avoid promoting inappropriate shoulder operations. **Extra wide shoulders are provided on the approaches to the new High Rise Bridge to accommodate future Phase 2 construction traffic.** Sidewalks (5-foot width) are provided for relocated local roads including Libertyville Road and Great Bridge Boulevard **increasing pedestrian safety and public acceptance**. Emergency pull-offs are located between Sta. 1751+00 to 1765+00 adjacent to the EB lanes and from Sta. 1273+50 to 1282+50 adjacent to the WB lanes. Existing median crossovers are retained. Lane widths for other affected roadways, ramps, CD-roads, and crossovers are provided in the Conceptual Plans.

(d) Horizontal Alignments

The general horizontal alignments shown in the RFP Conceptual Plans are consistent with our design concept. Lane transitions are introduced to align with bridges and crown corrections **which will improve drainage, minimize hydroplaning and thereby improve safety**. All mainline alignments including the separated **HOT lanes through the ACT-2 limits are designed for 70 mph**. The ATC-2 alignment is generally concentric with

the adjacent existing lanes and all curves are superelevated to meet AASHTO and RFP requirements. Geometry for cross-overs, turning radii and intersection configurations, service roads, entrances, etc. have been verified and designed to meet the criteria referenced in the RFP. Except for curves listed in the RFP, superelevation is being improved for horizontal curves including correction of the existing superelevation through the EB and WB curves just west of Military Highway.

(e) Profile Grade Line for all Segments and Connectors

Our Conceptual Plans comply with those in the RFP and generally follow the profiles for the existing general purpose lanes or other associated roadways. **The profile along the managed lanes through the ATC-2 limits is raised at roadway crossing to accommodate full clearances for future Phase 2 widening as well as future roadway or rail widening beneath I-64 at Military Highway and Yadkin Road. This will improve public acceptance by constructing work that will not need replacement in Phase 2 to achieve higher clearances at bridges.** Except for tie-ins at the beginning and ends, the ATC-2 profile provides slopes exceeding 0.50% but still accommodates future widening in the median for Phase 2 HOT lanes. The maximum grade along the alignments occurs at the new High Rise Bridge at 3.0%. Roadway profiles, including maximum and minimum grades, are shown in the Conceptual Plans. A minimum grade of 0.50% has been applied for all new alignments; for existing alignments and transitions a flatter grade sometimes occurs and a “shoulder rolling” technique was applied to provide positive drainage. The Conceptual Plans note that where the existing roadway profile is to remain nearly level, edge profiles for widened shoulders are “rocked” to control ponding and ensure positive pavement drainage, **improving safety operations and public acceptance. Permanent and temporary lighting will be maintained at all times to mitigate substandard headlight sight distances through the existing sag vertical curves just east of Yadkin Road ensuring public safety.**

(f) Typical Sections with Cross Slopes and any Retaining Wall Structures of all Roadway Segments (Mainline, Interchange Ramps, Connector Roads and Roadway Crossings)

The lane widths, cross slopes, superelevation standards and pavement depths for all roadways will meet or exceed all criteria listed in the RFP and associated documents. Typical sections for affected roadways are shown in the Conceptual Plans.

ATC-2 will realign the location of the HOT lanes to create a two-way typical section which is barrier-separated with a 12-foot HOT lane on each side of the median barrier, a 4-foot shoulder on the inside shoulder adjacent to the barrier, and a 6-foot shoulder on the outside shoulder. **By separating the HOT lanes from the conventional lanes public safety and acceptance are enhanced. One of the many advantages provided under this configuration is the ability to add the future Phase 2 HOT lanes in the median adjacent to the Phase 1 HOT lanes. Future Phase 2 impacts along the outer edge of the existing lanes are reduced, enhancing public acceptance.** The typical sections for this ATC will not require design waivers or exceptions; the proposed typical section meets the requirement for Barrier-Separated, Two-Way HOV Lane Facilities per “AASHTO Guide for High-Occupancy Vehicle (HOV) Facilities, which further states “HOV envelopes in one direction over 22 feet may invite passing” therefore, a full breakdown shoulder is not recommended. The width proposed in ATC-2 will allow vehicles to maneuver around a disabled vehicle. All paving for ATC-2 will be full-depth pavement as stated in the RFP.

ATC-2 will accommodate future widening of Military Highway to a 6-lane facility with sidewalks and raised median. It will also accommodate one lane of future widening along Yadkin Road plus the addition of another rail track and service road. Minimizing future construction and improving public acceptance. The HRTPO (the local Metropolitan Planning Organization) does not include plans for widening either Military Highway or Yadkin Road on their Fiscally-Constrained 2034 Long Range Transportation Plan (LRTP) nor is widening on the candidate list for their updated 2040 LRTP. The City of Chesapeake includes widening of Military Highway, but not Yadkin Road, on their unconstrained 2050 Master Plan; supporting studies suggest that the accommodated 6-lanes are under consideration.

Much of the roadway is bordered by new noise walls. Our design concept would incorporate a composite system where the lower part of the noise wall serves as a low retaining wall and upper portions serve as noise walls. **This**

concept reduces the need for temporary grading or slope easements improving the construction schedule by eliminating ROW acquisition risk and future maintenance costs. Other retaining walls are associated with bridge abutments and approaches and are addressed later in Section 4.3.2 - Conceptual Bridge Plans.

(g) Conceptual Hydraulic and Stormwater Management Design

The drainage and stormwater management design for this Project will meet all RFP criteria. This includes application of Virginia Law, the VDOT *Drainage Manual*, applicable IIMs, and the technical criteria outlined in Part II B of the *Virginia Stormwater Management Program Permit Regulations*.

The LMB Team reviewed the RFP document and the CCTV/Pipe Inspection Reports included with RFP files. The pipes listed in the table found in Section 2.7.2 of the RFP, as well as the existing storm sewer system or culverts located east of WB Sta. 1413+50, have been identified to be removed and replaced. Some of these pipes will be removed and replaced in the same locations. Others will be replaced near the existing pipe. Existing pipes that remain will be plugged and abandoned. For the pipes listed in the Pipe Inspection Report, our Team has created an approach for repairing and or rehabilitating the pipes.

The LMB Team has evaluated the RFP drainage design to reduce the need for additional ROW and impacts to wetlands thus lowering construction costs, minimizing maintenance and improving acceptance. Our design advantages include:

- Use of water quality swales within the median to reduce the need for BMPs along the outside of the roadway, reducing the need for additional ROW
- Taking advantage of storage volume within the median to eliminate off-site stormwater BMPs allowing these areas to be used in Phase 2 to decrease Phase 2 ROW requirements.
- Reduced construction cost and maintenance cost to VDOT by purchasing the maximum 25% of water quality nutrient credits

H&H Analysis: The LMB Team will complete the necessary hydrologic and hydraulic (H&H) calculations to satisfy VDOT design criteria, as well as post-construction as-built requirements. There are several sensitive areas along the Project corridor prone to flooding. The Deep Creek Landing neighborhood is north of I-64 and adjacent to the Gilmerton Canal. A tide gate is proposed to alleviate flooding in this neighborhood. We are also directing all roadway runoff in the area to the south and discharging it into the canal downstream of the tide gate. During design, a detailed model of the area will be conducted to refine the design of the tide gate. Another sensitive area is the neighborhood west of Deep Creek High School in the vicinity of Hancock Drive. The proposed storm drain design will **limit runoff into the existing system** by staging and releasing runoff at a slower rate than in the existing condition **improving public acceptance**.

Stormwater Management Design: The Project is being designed in accordance with Part IIB of Virginia’s stormwater regulations. The Virginia Runoff Reduction Method (VRRM) has been used to determine the anticipated pollutant reduction requirement for the Project. The Project area is complicated and extends into three different Hydrologic Unit Codes (HUC). The pollutant reduction requirement must be addressed for each HUC. The total anticipated limits of disturbance is 120 acres. The required pollutant reduction for the Project is shown in *Table 4.3.1.b* and broken up by HUC. Also included in the Table are the proposed BMPs that will be used to address the pollutant reduction. Only 75% of the required pollutant removal will be achieved by the on-site BMPs. Water quality credits will be used to achieve the remaining 25%. **Buying credits reduces VDOT’s long term maintenance cost for the corridor.**

Table 4.3.1.b. Performance Based Water Quality Analysis Summary

HUC Label	Req. Phosphorous Removal (lbs./yr.)	BMP Type	Pollutant Removal (lbs./yr.)	Net Pollutant Loading (lbs./yr.)
JL-55	1.43	Dry Swale II	1.43	0
JL-53	108.77	Grass Channel I, Dry Swale II, Bioretention II, Wet Pond I	82.89	25.88
JL-51	8.67	Grass Channel I, Dry Swale II, Bioretention II, Wet Pond I	6.5	2.17
Total Remaining Phosphorous Loading				28.05

Wet ponds, bioretention basins/swales, and dry swales will be used to address the pollutant reduction requirement. Based on Project constraints, such as available ROW, median width, and groundwater elevation **using a treatment train approach of dry swales discharging into bioretention basins yielded the greater water quality benefit.** This approach also **allows for infiltration which reduces runoff volume, and staging minimal amounts of runoff in the median.** The minimal amount of storage adds up to a significant volume when analyzed by outfall. The infiltration and runoff stored in the median combine to address the outfall criteria governed by the Energy Balance Equation. Energy Balance is required to be used when storm sewer systems outfall into a natural channel. When discharging to a manmade system, the 2-year and 10-year storm events will be evaluated. The 2-year event will be used to determine channel stability using the Tractive Force Method and the 10-year event will be used to determine channel adequacy. The limits of these analyses will be either where the channel enters a mapped flood plain or the drainage area is one hundred times greater than the contributing drainage area.

Stormwater Quantity Management: The LMB Team will take advantage of the reduction to the post development Curve Number (CN) created using infiltrative BMPs. This approach combined with staging minimal amounts of runoff within the median will help offset the increase in runoff due to the increase in impervious area. Where the reduction in CN and the use of infiltrative BMPs are not enough, conventional wet ponds will be designed. Several of these ponds are needed along the Project corridor. These ponds will reduce the post developed runoff rates to acceptable flows.

(h) Proposed Right of Way Limits

The design concept for the roadway, including stormwater management facilities, will be contained within the ROW or permanent easement limits shown on the RFP Plans. Permanent utility easements and temporary construction easements will be identified during design and approved by VDOT prior to land acquisition. The Team has identified a few isolated parcels that traditionally require extra time for acquisition (churches, railroads, joint estates, etc.) and **developed a design to mitigate impacts to the schedule** caused by potential delays.

(i) Proposed Utility Impacts

Our design concept for utilities is based on the Subsurface Utility Engineering (SUE) mapping provided by VDOT for utilities crossing the Project; the designation of utilities running parallel to the roadway was generally not provided. Supplemental utility information has been collected from the City of Chesapeake, VDOT as-built plans (ITS), and from meetings we have held with each potentially affected utility owner along the corridor where mitigation options were discussed. Additional SUE work will be performed by the LMB Team during Scope Validation. A utility conflict matrix in Section 4.4.2 demonstrates the comprehensive array of utilities, impacts, and mitigation strategies being considered during design. Our Team is focused on minimizing potential conflicts and creating solutions that will best benefit VDOT while reducing disruption to the public and utility owners.

Our conceptual design avoids numerous utility conflicts. Our design minimized impacts to utilities through avoidance by introducing single-span bridges for ATC-2 which eliminates piers within the roadway underpasses at Military Highway and Yadkin Road. **This will minimize schedule impacts and possible service disruptions, increasing public acceptance.** “In-plan” design would be provided for “wet” utilities including replacement of the 10-inch watermain in Libertyville Road to avoid damage during adjacent bridge construction by heavy cranes. A new fire hydrant will be provided at Bainbridge Boulevard to supply the standpipe in the new bridge. **Other solutions for conflicts are noted on our Conceptual Plans.**

(j) Minimum Pavement Sections

The pavement design provided in the RFP has been incorporated into our design concept and is shown on the Conceptual Plans. During scope validation, additional geotechnical information will be obtained and used to validate the final pavement design. Ground improvements have been identified and incorporated for known areas of deficient subgrade.

(k) Location of Milling and Overlaying and/or Building Up of Existing Pavement

The majority of the existing pavement is being retained and will be milled and overlaid as required by the RFP. During scope validation, additional geotechnical information will be obtained and used to validate the

final pavement design. Pavement build up is anticipated through the horizontal curves west of the George Washington Highway interchange, including a portion of the ramps, as required by the RFP. **Adjustments to superelevations will improve safety.**

(l) Noise Walls

All noise walls shown on the RFP Conceptual Plans are included in our current design concept. The RFP stipulates locations for noise walls along roadways, ramps, and on the new High Rise Bridge based on a preliminary noise evaluation. The LMB Team will perform a Final Design Noise Analysis and submit it to VDOT for review and approval; changes due to traffic volumes and lane locations may affect the results of the analysis. Where the results of the Final Design Noise Analysis dictates; the LMB Team will provide permanent noise mitigation in compliance with applicable State and Federal policies and regulations. The RFP Conceptual Plans included a detail to protect noise walls located adjacent to shoulders; not all components of that detail are MASH-tested for crash protection. **Our ATC-1 addresses this issue and provides a wall protection system that is MASH-tested to be safer for the traveling public. Additionally, ATC-1 meets FHWA safety requirements and eliminates the need for future barrier replacement. When possible, some walls located along interchange ramps were shifted away from the ramp to also improve safety and reduce drainage impacts.**

(m) Traffic Structures

The LMB Team performed a comprehensive review of the existing overhead signing along the I-64 corridor utilizing the provided existing signing inventory, the conceptual signing roll plots, Traffic Safety Assessment document, field observations, and the language in the RFP. Existing overhead sign structure removals are shown in the Conceptual Plans and have considered the proposed roadway widening design. The proposed Standard VDOT sign structure locations are a product of this review and have been optimized to consolidate the new sign structure locations and place them in accordance with the 2009 MUTCD and proper clearances to other roadside features. Although the proposed sign faces are not required to be shown in our Conceptual Plans, the messages have been designed and positioned to determine proposed sign structure locations, sign panel sizes, and to provide the proper number of signs and spacing per the 2009 MUTCD requirements.

Signing for the HOT lanes was incorporated into the signing design and coordinated with the ITS plans. Toll pricing DMS signs are provided in accordance with the RFP and spaced appropriately. All access points are designed per the 2009 MUTCD, 2011 Virginia Supplement to the 2009 MUTCD, and the FHWA Priced Managed Lane Guide. **The LMB Team has previous experience in designing and implementing HOT lanes signing designs in Virginia and is familiar with the process and requirements.**

Signing for the hard shoulder running lane is incorporated into our design and coordinated with the ITS plan. Although not required to be shown in our Conceptual Plans, the ground mounted signs for the hard shoulder running lane facility and the emergency refuge areas were conceptually mapped for adequate placement and to determine the need for any additional roadside features.

All new signage will contain Type IX or higher retroreflective sheeting in accordance with Traffic Engineering Division Instructional & Informational Memorandum Overhead Sign Lighting (IIM-TE-380). **This will lower operating costs to VDOT as well as provide safety to the motoring public.**

The removal of the existing overhead sign structures and the installation of the proposed overhead sign structures will be phased throughout the construction staging. In some cases, overhead signs will be placed on temporary ground mounted bases along the side of the roadway as appropriate. Proper sign messaging will remain throughout construction utilizing the use of overlays or new construction guide signs. In other cases, the new overhead sign structure will be installed and unveiled prior to removing the existing sign structure and overhead signing. **Either solution will maintain public safety.**

Traffic Signal Structures will also be installed along the realignment of Great Bridge Boulevard and the I-64 EB off ramp. The above ground traffic signal infrastructure is included in our Conceptual Plans. **To maximize safety** the signal will be constructed in two stages, where traffic will remain on the existing alignment while the proposed

signal is being built, then once the proposed infrastructure is built, operational and in use, the existing structures will be removed.

(n) ITS/Tolling Infrastructure Features (CCTV, VDS, DMS)

Our Team has located ITS infrastructure consisting of proposed closed circuit television (CCTV), microwave vehicle detection sensors (MVDS), dynamic message signs (DMS), cabinets, and tolling locations along the I-64 corridor as shown in accordance with the RFP Conceptual Plans. The locations of the proposed CCTV devices have been coordinated with the signing plan to avoid obstructing camera views providing full coverage of the roadway. The MVDS are spaced every half mile on each side of the roadway and at all interchanges and on and off ramps to provide information for tolling and traffic management. MVDS and CCTV share a pole. Proposed CCTV, MVDS, and DMS locations share an equipment cabinet where possible and where distance permits to consolidate the total number of cabinets. **The sharing of poles and equipment cabinets will reduce the overall time spent on maintenance and will provide a cleaner design along the roadway.**

Using the existing ITS inventory and existing ITS drawings, our Team has determined where existing poles can be reused for proposed CCTV and MVDS, and where the ITS conduits and cables can remain in place. All existing CCTV and MVDS poles that are to remain will have new CCTV and MVDS to replace the existing devices on the pole. Where existing poles will be impacted by road widening and noise wall installation, the poles will be removed and proposed poles will be installed behind the noise wall structure due to spacing requirements and safety requirements for maintenance personnel. The equipment will be mounted high enough on the pole to eliminate any obstructions from the noise wall. Easy access to the ITS equipment will be provided through doors in the noise wall. **Locating the equipment behind the noise wall will provide a safer place for maintenance personnel to work and will also protect the equipment from possible damage due to vehicular accidents, thus reducing maintenance costs.**

VDOT has an existing backbone communications network that will be used for the proposed ITS infrastructure. Full details of proposed conduit and cabling is not shown on our Conceptual Plans, however impacts to the existing cable have been considered and have been relocated accordingly. Impacted fiber runs will be replaced by new fiber runs of the same strand count as existing, spliced into the backbone. Duct banks impacted by road widening will be relocated further from the roadway and the ITS equipment will be replaced. The ITS duct banks will be relocated behind all proposed noise walls due to the close proximity of the noise wall installation to the roadway and the spacing requirements of the duct bank installation. The proposed duct banks will contain a 4-inch conduit and a 4-inch spare for communications and a 2-inch conduit and a 2-inch spare for electrical. Trenching and boring locations based on grading has been coordinated. All new ITS infrastructure will feed into the Electronic Toll Collection system (ETC) or the Traffic Management System (TMS) for the roadway at the Traffic Operations Center (TOC).

A new 96 strand fiber backbone cable in a 4-inch conduit and an additional spare 4-inch conduit will be installed under the new High Rise Bridge. Two 2-inch electrical conduits will be embedded in the bridge parapet. CCTV and MVDS will be mounted on poles along the new High Rise Bridge to provide coverage of the new bridge and the existing drawbridge. A new cabinet will be provided for the Drawbridge Traffic Management System (DBTMS) on the east side of the existing drawbridge and the proposed CCTV and MVDS that view the existing bridge will feed into the DBTMS. Phasing of the ITS infrastructure and duct bank relocations during construction has been coordinated to avoid system downtime and to maintain operation of the existing system until the proposed system is in place and operational.

New service panels have been added, where necessary, to provide power to the field equipment cabinets and tolling technical shelters. Generators have been located adjacent to each service panel providing the tolling infrastructure with backup power in case of failure.

A toll gantry “truss box” cantilever structure is located in both the EB and WB directions of travel on I-64 in Segment 1 and will accommodate the tolling equipment specified in the RFP. The foundations of the tolling structures will be located in the median along with a tolling technical shelter to house the tolling equipment. The communications backbone will route under the roadway to provide connection to the technical shelter. The

technical shelter will be equipped with HVAC, fire and smoke detection, and equipment cabinets, containing the necessary equipment. Enforcement and maintenance bays will be located next to the gantries in the median for police surveillance of the area.

Two full color matrix dynamic message signs (DMS), and a toll registry point are provided in coordination with each of the HOT Lanes entry points to provide drivers with information on toll pricing. Spacing of the DMS signs follow the FHWA Priced Managed Lane Guide (Section 6.5). Each toll registry point will include a roadside cabinet at the entrances of the HOT lanes. The toll registry point cabinets will be shared with other ITS infrastructure at their respective locations and the toll transponder reader will be mounted to an existing structure.

(o) ITS for Hard Shoulder Running

In the location of the hard shoulder running lanes in both the EB and WB directions, lane control signals (LCS) are located every half mile. The LCS are mounted on signal mast arm sign structures or on overhead sign structures where the locations of each coincide. **The LCS share a cabinet with the MVDS and other equipment, where possible resulting in reduced maintenance cost.**

(p) Lighting

For locations requiring new continual freeway lighting, in accordance with the RFP, the Team has performed a preliminary photometric analysis to determine the location and height of the proposed poles as shown on the technical proposal plans. Spacing requirements and pole placements were designed to meet AASHTO Lighting Levels, VDOT standard lighting requirements, and IES RP-8-14 requirements. The luminaire type will be LED and the new light fixtures will be prewired 7-pin twist lock ANSI 136.41 as specified in the RFP. The pole locations along High Rise Bridge were also coordinated with the Conceptual Bridge Plans for proper overhead clearance and placement along the bridge.

Lighting will be maintained throughout construction to meet existing lighting levels. As construction progresses and the existing lighting is impacted, new LED luminaires will be used on temporary wooden poles where necessary. At some locations, proposed luminaires will be installed and become operational before turning off and taking down the existing luminaires. The reduced voltage associated with LED luminaires prevents overloading of the existing circuit as the temporary lights are being added to the existing circuit.

Lighting through the separated HOT lane segment (ATC-2) has been designed to use a single pole with twin luminaires and the foundation incorporated into the median barrier. The style of pole, the mounting height and type of LED fixture is the same as the proposed lighting on the EB and WB lanes. **This lighting design will not only illuminate Phase 1 lanes to meet minimum requirements but will also illuminate Phase 2 lanes to meet minimum requirements without additional lighting in the median barrier. This will reduce maintenance costs.** No temporary lighting should be required as this will be new construction.

(q) Guardrail/Barrier

All guardrail and traffic barriers used on this Project will be MASH-compliant. Most current VDOT standard concrete barriers have not yet been MASH crash tested but are still accepted for use. After December 31, 2019, all barrier systems installed on NHS roadways must meet MASH crash test criteria; AASHTO/FHWA is encouraging agencies to upgrade now. **Our ATC-2 replaces concrete barriers in front of noise walls with a fully MASH-tested system; this avoids the need for future upgrades and improves safety. To further reduce maintenance cost, improve safety and improve public acceptance Low Maintenance Impact Attenuators will be used on the Project at all permanent locations.**

(r) Location of Tide Gate

In accordance with RFP requirements a tide gate will be installed at the existing box culvert serving the Gilmerton Canal near WB Sta. 1234+00 as shown on Conceptual Plan sheet S-20. The southern end of the culvert will be modified using cast-in-place concrete to allow the tide gate system to be attached as shown on the Conceptual Plan sheet S-27. **An operational control platform will be installed at this location with an access walkway to Firman Street providing maximum safety for VDOT employees.**

4.3.2 Conceptual Bridge Plans – B662, I-64 (WB) over Southern Branch of the Elizabeth River, NPBL RR, and Route 166 (Proposed New High Rise Bridge)

The LMB Team’s approach to the Project is to provide a solution which meets or exceeds the RFP requirements with reliable and durable materials resulting in **safe operations, reduced long-term maintenance, increased long-term asset performance, improved constructability, and widespread public acceptance**. Superstructures utilizing standard concrete parapets, continuous steel plate girder spans, and prestressed concrete bulb-T beams allow standard construction methods to be implemented and produce a low maintenance solution. Substructure solutions were selected for their proven performance with respect to durability, reliability, functionality, and constructability.

Each discipline was integrated into the alternative process to meet or exceed the RFP requirements and coordinate solutions. For example, the superelevation roadway design was coordinated to refine the transition on the east end of the bridge that would be shifted to a point beyond Abutment B. This will **improve deck drainage** by minimizing potential ponding that can develop on bridges in areas of superelevation transition. Improved drainage **minimizes sediment buildup on bridge decks, reduces the potential of hydroplaning and ice accumulation all of which will reduce maintenance needs**.

The LMB Team has also evaluated the standpipe system, ITS and lighting features to **reduce the maintenance and provide long term durability** for the new High Rise Bridge. The stand pipe system will include anchorage details and expansion joints to control the thermal expansion in a manner that is consistent with the superstructure movements. This is important to **minimize inspection and maintenance efforts** as the stand pipe systems differential thermal movement could create maintenance issues if not properly addressed.

Our Team has evaluated and coordinated the location of the overhead sign structures and lane control signals on the new High Rise Bridge so that the location proposed coincides with a proposed pier location. This will allow us to extend the pier cap beyond the typical length and attach the sign structure to the top of a pier cap. This will avoid the need to attach the sign structure within a span, eliminating the design, construction, inspection and maintenance of complex and intricate diaphragms for the overhead sign support. **It will simplify sign connections and access for inspection can be performed concurrently with the pier inspection**.

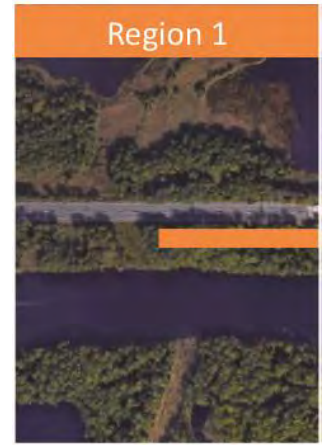
The overall length of the new High Rise Bridge encompasses several topographic features that are divided into the following five Regions: 1) land portion west of the river; 2) the river crossing excluding the channel area; 3) the channel area; 4) land portion east of the river to Bainbridge Boulevard and 5) east of Bainbridge Boulevard along Libertyville Road. Numerous bridge layout alternatives were evaluated by the LMB Team for each area and then integrated to meet or exceed the RFP requirements, constructability, cost effectiveness and schedule delivery. *Region number designations are used to describe design approach only and are not applicable to construction approach, schedule or sequencing.*



Exhibit 4.3.2.a. High Rise Bridge Regions

Region 1: Land portion west of the river. This Region’s primary site conditions include construction parallel to existing I-64 over land with intermingled wetland pockets and an overhead transmission line crossing. Retaining walls were implemented on the western end to shorten the bridge such that roadway embankment would be constructed under the transmission lines to eliminate a conflict with crane operations for bridge

construction. This solution provides several benefits to VDOT, project stakeholders, and the public. Prestressed concrete bulb-T beams allow continuous for live load detailing which **reduces the number of bridge joints and the maintenance concerns relating to exposure to water and chlorides**. This superstructure type simplifies biannual inspection by reducing the complexity and number of details to be reviewed which should **reduce inspection access timeframes**. Shorter timeframes **improve safety through the reduction in MOT control** and the corresponding exposure of inspection crews and impacts to vehicular traffic. VDOT benefits from the **high reliability** provided by prestressed concrete bulb-T beams with **minimal maintenance** items. Inspection needs would be minimized by the utilization of pile bents for the substructure as it is the simplest substructure solution. All parties benefit from the **reduced environmental impacts** associated with the smaller footprint and minimal visual sight lines of vertical pile bents.



Region 2: The river crossing, excluding the channel area. Region 2 consists of construction in the Elizabeth River and the application of Vessel Impact as appropriate. Method II Vessel Impact analysis will be used for the design of the structure. Water depths within this Region generally allow floating water access where construction will be performed from barges. This allows larger components to be implemented at the higher superstructure heights within this region of the bridge. **LMB Team members operate a fleet of large cranes mounted on barges which will safely construct this region of the bridge.** With these large lift capacities available to our Team, we evaluated the maximum beam length of 180 feet which is designed in accordance to the RFP requirements. Making use of longer spans reduces the number of spans and corresponding piers. Fewer spans require fewer beams and piers which benefits VDOT through the **minimization of inspection time and resources**.

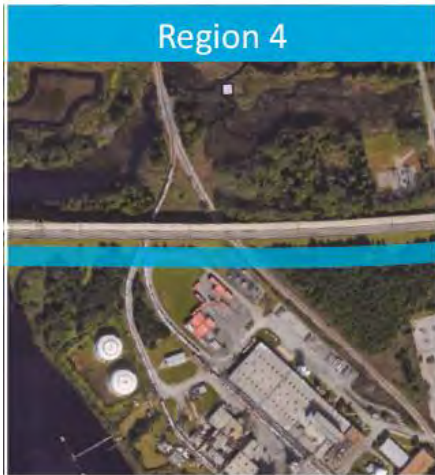
Minimizing these elements not only reduces the inspection and future maintenance for these larger elements, it reduces other elements such as bearings, diaphragms and joints which will also benefit VDOT and the public through lower inspection and maintenance costs. Fewer piers also benefit the public by **reducing the visual impact of the bridge and improves safety with longer spans for recreational marine use**.

Our Team evaluated several alternatives including drilled shafts and prestressed pile alternatives to support the cast-in-place concrete piers. Our evaluation of drilled shafts included inherent risks such as the potential anomalies during production, the corresponding schedule delays and loss of control associated with subcontracting critical elements to a specialty foundation contractor. Ultimately prestressed concrete piling was selected for the **enhanced quality control** associated with being produced in a controlled precast plant, **proven reliable performance**, and **improved schedule control** through the ability to self-perform installation. These benefits provide VDOT with a Project that will be functional with **minimal need for maintenance**. Additionally, the LMB Team will use a precast soffit to form the bottom of the pile footings located in water in accordance with VDOT's approval and related conditions for ATC-3. These soffits will meet or exceed the corrosion protection criteria for the permanent structure, however they will not be considered in the structural capacity of the permanent structure. The sacrificial soffits will permanently remain in place and will provide a barrier which will protect the bottom of the pile footings from the elements.

Region 3: The Channel Area. The main feature of this Region is the 125-foot main channel horizontal and 100-foot vertical clearance requirements along with the vessel impact forces determined through the Method II analysis. The channel horizontal clearance of 125 feet combined with the skew of the crossing creates a span length that **exceeds the maximum span length achievable with a prestressed bulb-T beam**. Therefore, hybrid continuous steel plate girders using ASTM A709 Grade HPS70W in select flange locations and ASTM A709 Grade 50W elsewhere were selected for the



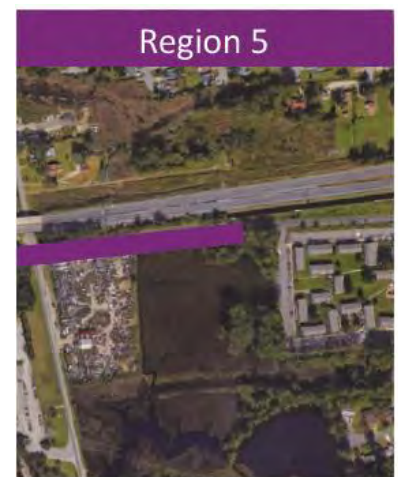
channel crossing to achieve a 300-foot main span length. **A three-span continuous unit was incorporated to minimize the number of joints and provide structural continuity for a more efficient solution.** All structural steel will be uncoated weathering steel. The steel unit over the channel provides a solution that has an **excellent track record of providing durable and reliable service** for VDOT and the public with **minimal maintenance and inspection needs.** A fiber reinforced polymer (FRP) fender is provided to re-direct errant vessels away from the bridge foundations on each side of the channel. Our fender design details are included on sheet S-11



Region 4: Land portion east of the river to Bainbridge Boulevard. East of the Southern Branch of the Elizabeth River to Bainbridge Boulevard is a bridge over land, crossing multiple railroad tracks and Bainbridge Boulevard. While most of this section of the bridge is in a tangent alignment, there is an area over the railroad tracks that includes a horizontal curve. Another key driver of the bridge solution is the overhead transmission line crossing between the industrial spur tracks and the Norfolk and Portsmouth Belt Line Railroad. The key features of Region 4 consist of the railroad crossings and the planned transmission line relocation within the bridge over land between the east bank of the Southern Branch of the Elizabeth River and Bainbridge Boulevard. Our solution minimizes the length of the structural steel unit to **reduce the potential future maintenance** needs and to maximize the use of low maintenance prestressed concrete beams. This was accomplished by utilizing slightly

shorter prestressed concrete bulb-T beam span lengths which was necessary to assist in simplifying beam erection around the transmission line relocation zone. Steel piles will be used for the pile footings within the transmission line so that shorter pile driving equipment can be used with the piles being spliced. Outside the transmission line relocation zone, prestressed concrete piles will be used for all pile footings.

Region 5: East of Bainbridge Boulevard along Libertyville Road. The driving factor in this region is the close proximity of existing I-64 on the north side and Libertyville Road on the south side. Two properties south of Libertyville Road create a boundary for which construction cannot impact. One of these properties is the Libertyville Wetland Mitigation Bank and the other is the Diggers Pick & Pull property. Our site evaluation included site visit meetings where designers and constructors specifically focused on this critical area. Based on our Team's collaboration meetings, we selected the minimum offset from the existing ROW to **eliminate impacting these two properties.** Once the alignment of Libertyville Road was selected our Team created and evaluated structural solutions that were constructible and met RFP requirements. Our approach to this section was to **minimize complexity and provide typical means and methods to provide a low maintenance, proven and durable solution.** The LMB Team evaluated numerous alternatives to meet these goals. Our span arrangement uses prestressed concrete bulb-T beam spans made continuous for live load and positions them so that a span is centered over the area where Libertyville Road extends under the new High Rise Bridge deck edge. Pile bents utilizing 36-inch square prestressed concrete piles are proposed for this Region of the bridge as allowed by the RFP. This combination of prestressed concrete bulb-T beams and pile bents will **reduce VDOT's inspection resources, maintenance efforts and ultimately provide durability and long term performance of the structure** through the elimination of more complicated solutions such as integral caps.



a) Plan View, Elevation View and Transverse Section

The LMB Team proposes a new bridge for the Project which provides a width that meets the typical section requirements for six lanes (three in each direction) during Phase 2 construction and subsequently two general purpose lanes and two managed lanes upon the completion of Phase 2. The Conceptual Plans (Volume II) include the plan view, elevation view and transverse sections on plan sheets S-1 to S-5. The plan view includes

the number of spans, their lengths, layout of continuous units, sign locations, ITS devices and lighting attachments. The elevation view provides substructure configurations.

b) Number and Widths of Lanes, Shoulders, and Hard Shoulder Running

The High Rise Bridge provides for 12-foot wide lanes including two general purpose lanes, one HOT lane, and one hard shoulder running lane. The proposed left and right shoulders are 15-feet wide. The Conceptual Plans include plan views and transverse section views in compliance with RFP requirements.

c) Horizontal and Vertical Clearance (including Navigable Channel)

The proposed bridge provides 100-feet of vertical clearance over the navigational channel and 125-feet of horizontal clearance. The vertical clearance requirement combined with the maximum allowable grade provides vertical clearance over the railroads, Bainbridge Boulevard, and Libertyville Road exceeding the minimum requirements of the RFP. The Conceptual Plans include the bridge plan views and elevation views on plan sheets S-1 to S-3. The horizontal clearance to the navigational channel, railroads, I-64 EB, Bainbridge Boulevard, and Libertyville Road are in compliance with the RFP requirements. The elevation view provides vertical clearance dimensions for the navigational channel as well the railroads, Bainbridge Boulevard, and Libertyville Road.

d) Abutment Configurations

The proposed abutments include a deep foundation consisting of two rows of prestressed concrete pile footings and caps for both abutments. The Conceptual Plans, sheet S-6, include the abutment configurations on the elevation view and supplemental plan sheets.

e) Pier Configurations (Approaches and Main Bridge)

In Regions 1 and 5 pile bents were used for the piers with 30-inch square and 36-inch square prestressed concrete piles respectively. In Regions 2, 3, and 4 the proposed piers use 36-inch square prestressed concrete piles to support cast-in-place concrete pile footings, columns and caps in a dual rectangular column configuration as shown in our Conceptual Plans. Two individual footings are used where the vessel impact loadings allow, however as vessel impact and loading demand increases approaching the channel, a combined single footing was used to support both columns. Our Conceptual Plans include the pier configurations on the elevation view and structural details sheets.

f) Fender System

A fender, detailed on sheet S-11, is provided to re-direct errant vessels away from the bridge foundations on each side of the channel. The fenders are designed to absorb energy up to the 400 ft-kips as required by the RFP documents. Fender design methodologies allow the fender to absorb energy through the deflection of the fender structure. Our Team has implemented a variable deflection criteria to dissipate the required energy. Using the higher deflection criteria for portions of the fender which are further away from the substructure allows for fewer elements to be installed in these areas which will **reduce future maintenance**. Additionally, the fender is detailed to include a walkway and access for the maintenance of navigational lighting on the fender.

g) Retaining Walls

MSE retaining walls are proposed at both abutments (Abutment A and Abutment B) to accommodate site conditions such as ROW limits, environmental features, Libertyville Road and I-64. Retaining walls are shown in the roadway plans and sheets S-12 through S-15.

At Abutment A, MSE walls were used to shift the bridge abutment east of the overhead transmission lines to avoid impacts to the lines and improve constructability including pile installation and beam erection activities. The retaining wall, which extends westward across a cove of the waterway, uses a prestressed concrete sheet piling system incorporating ground improvements and a load transfer platform to address the wet conditions and soft soils below the level of the MSE wall.

At Abutment B, the MSE walls shown in our Conceptual Plans are extended westward to provide a construction staging area between I-64 WB lanes on the north and Libertyville Road on the south. This **improves access and**

reduces bridge construction adjacent to I-64 WB. This will also **reduce the need for nightly lane closures to construct a bridge in this area.**

h) Roadway Lighting

Roadway lighting is provided on the south side of the new High Rise Bridge with the lighting structures attached to the concrete barrier rail parapet. Lighting locations are shown on the bridge plan view sheets S-1 to S-3 in our Conceptual Plans.

i) Marine Navigation Lighting

The bridge navigational lighting system is critical to the operations and safety of the shipping economy of the Hampton Roads area and specifically to the Elizabeth River area. The United States Coast Guard Bridge Administration Division requirements and guidance for moveable bridges will be used for the new High Rise Bridge and for the upgrade of the existing system on the existing bridge. Our Team will accommodate for the maintenance of the lighting system through the provision of access points and catwalks in accordance with standard maintenance procedures. Navigational lighting is also proposed for the fenders on both sides of the navigational channel. Lighting locations are shown on the bridge plan view in our Conceptual Plans Sheet S-11.

4.3.3 Existing Bridge Modification Conceptual Plans – B670, I-64 (EB) over Southern Branch Elizabeth River, NPBL RR, and Route 166

The LMB Team’s approach to the Project is to provide a solution which meets or exceeds the RFP requirements with reliable and durable materials resulting in **safe operations, reduced long-term maintenance, increased long-term asset performance, improved constructability, and widespread public acceptance.** Illustrated in our Conceptual Plan sheets S-16 to S-17, these modifications include removal of the existing median barrier, related deck repair, modifying the lane configuration within the typical section width to include two general purpose lanes, one HOT lane and a hard shoulder running lane as shown on the structure typical section sheet. ITS, signal, signing and traffic gates will be modified consistent with the changes in traffic pattern. Additionally, the balance of the double leaf bascule span will be adjusted to conform to the loading modifications.

a) Warning and Barrier Gates

The existing bridge movable systems, signing and traffic barriers are configured for two directions of traffic movements. This Project will modify the traffic pattern from the existing two lanes in each direction separated by a concrete median barrier to a single direction of traffic with two general purpose lanes, one HOT and one hard shoulder running lane. The existing warning and barrier gates will be replaced along the eastern approach to the bascule span and the existing warning and barrier gates will be removed from the western approach to the bascule span. Salvage materials will be transferred to VDOT. New warning and barrier gates will be constructed along the south side of the eastern approach to the bascule span. Structural modifications for the new gates will consist of new structural steel framing attached to the exterior girder as shown on sheets S-16 and S-17 in our Conceptual Plans. The existing gate supports will be evaluated and upgraded to support the additional loadings from the new gate system. The new warning and barrier gates on the EB approach side will span halfway across the deck width and will interlock when closed.

b) Drawbridge Message Signs

Traffic signals/DMS signs will be updated to reflect the new traffic pattern and the new structure will be supported from the existing structure. Structural modifications to the exterior girder and first interior bay will be implemented to support the new sign structure. The overhead sign structure will hold two DMS signs that will read “Stop – Draw Open” when the drawbridge is open. Two crossing bells mounted to the structure will accompany the DMS signs. Warning and barrier gates for the existing WB movement will be removed. A new overhead sign structure will be attached to the existing bridge girders for support as shown on sheets S-16 and S17. The structural supports will be modified to eliminate the maintenance concerns related to vibration noted in the RFP information provided.

c) Traffic Signals

Three-section head traffic signals for the existing bridge will be mounted on a proposed overhead sign structure on the east side of the bridge near the Drawbridge Traffic Management System (DBTMS) cabinet. A total of eight signals on two separate structures (four for each structure) will be provided for the movable span. One of these structures will be ground mounted just east of bridge. Each travel lane will have one three-section traffic signal centered overhead including hard shoulder running lane.

Two lane control signals will be added to the north side of the existing bridge. One will be installed on the existing overhead sign assembly for the WB lanes where the WB approach DMS/signals will be removed. The other lane control sign will be attached to a new overhead sign structure on the existing girder on the east side of the river as shown in our Conceptual Plans on sheet S-16. The signals will be integrated into the DBTMS and the Advanced Traffic Management System (ATMS).

d) CCTV Cameras

New CCTV cameras will be installed on the new High Rise Bridge and aimed down onto the existing bridge for full coverage of the existing bridge. These cameras will share a pole with the cameras that will provide coverage of the new High Rise Bridge, minimizing work on the existing bridge. These cameras will also be integrated into the DBTMS and ATMS. **This approach will minimize maintenance.**

e) Static Signs

The LMB Team will provide two ground mounted DRAW BRIDGE (W3-6) and STEEL GRID DECK AHEAD (W8-16) signs on each side of the bridge in advance of the movable bridge signals and gates to give warning to road users of the movable bridge signal and gates ahead. The warning signs will be placed approximately 1800-feet prior to the eastern bridge abutment. Two parapet mounted STOP HERE ON RED (R10-6) signs on either side of the bridge will be placed approximately 40-feet in front of the drawbridge signals in alignment with a 24-inch white stop bar.

f) Hard shoulder running

The LMB Team will implement the modifications to the existing High Rise Bridge converting the existing typical section to include hard shoulder running as shown on Conceptual Plan sheet S-16. These modifications include removal of the existing median barrier from the movable spans and the approach spans, and related modifications to the deck, steel grid and joint areas. This will allow the lane configurations to be shifted to include the two general purpose lanes, a four-foot buffer, a HOT lane and the hard shoulder running and corresponding shoulders as noted in the RFP. After the DMS sign and signals have been removed from the existing WB overhead sign structure, a new lane control signal will be attached. An additional lane control sign will be attached to the new overhead sign for the EB direction as shown in our Conceptual Plans.

4.3.4 Conceptual Bridge Replacement Plans – B663, Route 190 (Great Bridge Blvd.) over I-64

The LMB approach to the design of the replacement of the existing bridge carrying Route 190 (Great Bridge Boulevard) over I-64 was to develop a cost-effective bridge and **reduce long-term maintenance needs for VDOT. Aesthetics will be enhanced** through the architectural treatment and concrete staining in accordance with the RFP for the outside of the BR27 rails, terminal walls, abutment elements, and abutment retaining walls.

The LMB Team's conceptual design **reduces the need for future inspection and maintenance** by incorporating the following materials:

- ✓ Uses low permeability concrete in the superstructure and substructure elements.
- ✓ Uses Low Shrinkage Class A4 modified concrete in the deck slab and integral backwalls.
- ✓ Uses CRR steel in accordance with VDOT S&B-IIM-81.7 (IIM) including Class II CRR steel in the superstructure elements defined in the IIM and Class I CRR steel in the substructure elements defined in the IIM.

a) Plan View, Elevation View and Transverse Section

The superstructure will consist of 85-inch deep prestressed concrete bulb-T beams made continuous for live load with a composite reinforced concrete deck. The LMB Team also evaluated a 2-span continuous structural steel plate girder superstructure, however the use of a prestressed concrete beam superstructure offered many advantages over structural steel plates girders including **reduced material lead times, faster fabrication and delivery times, reduced erection time and associated impacts to traffic along I-64, lower long-term maintenance needs, and smaller live load deflections**. The superstructure will be constructed in conformance with VDOT's jointless philosophy.

b) Number and Widths of Lanes, Shoulders and Sidewalks

The proposed structure will have an out-to-out width of 44-foot 6-inches accommodating two 6-foot bicycle lanes, two 12-foot lanes and a 6-foot 6-inch raised sidewalk. A VDOT Standard BR27 bridge railing, 4-foot 6-inches tall, and pedestrian fencing will be provided along both sides of the bridge.

c) Horizontal and Vertical Clearances

Our concept proposes to span over I-64 and the future CD system with a 2-span structure. This prestressed concrete bulb T-beam superstructure will have horizontal and vertical clearances in accordance with the RFP requirements as shown in our Conceptual Plans on sheet S-18.

d) Abutment Configurations

The abutments will both be designed as fully integral founded on driven steel H-piles. The piles will be HP12x53 and will be isolated from the MSE wall fill with sleeves of corrugated metal pipe filled with sand.

e) Pier Configurations

The interior piers will be cast-in-place multi-column piers supported on pile footings as shown in our Conceptual Plans on sheet S-19.

f) Lighting

Lighting will be provided along Great Bridge Boulevard as shown on sheet S-18. Our lighting analysis under the Great Bridge Boulevard site included the standard freeway lighting in the median along I-64. The illumination levels produced from these lights combined with the non-pedestrian nature of I-64 did not warrant under bridge lighting.

g) Retaining Walls

The embankments for the approach roadway will be retained using U-back MSE walls oriented parallel to traffic along Great Bridge Boulevard. The MSE walls at the bridge abutments will be designed for a minimum service life of 100 years. Corrosion Resistant Reinforcing (CRR) Steel Class I will be provided in portions of the MSE walls located within the splash zone of the future CD system in accordance with VDOT IIM-S&B-81.7.

4.3.5 Conceptual Bridge Plans – Bridge Widening

Widening 1 - I-64 EB (B-664) and I-64 WB (B-665) over Routes 13 and 460 (Federal ID 21862, 21864) & Widening 2 - I-64 EB (B666) and I-64 WB (B667) over Yadkin Road and Norfolk Southern Railroad (Federal ID 21858, 28160):

Our Team's approach to bridge widenings was to provide the best value solution for VDOT integrating the scope of the High Rise Bridge Phase 1 Project with consideration for the future Phase 2 Project. This identified the primary issue that the widenings completed in Phase 1 would ultimately be completely replaced during the future Phase 2 Project as a result of structural condition, substandard shoulders, and substandard horizontal and vertical clearances. Our Team has implemented ATC-2 (Managed Lane Realignment), which will shift the HOT lanes from a concurrent HOT lane configuration with a 4-foot buffer as shown in the RFP Conceptual Plans to a separated HOT lane configuration located near the center of the median at these two bridge sites. The HOT lane roadway realignment will facilitate the design and construction of two new single-span structures carrying both HOT lanes and required shoulders over Routes 13 & 460 and Yadkin Road & Norfolk Southern Railroad

(NSRR). This concept was discussed during the ATC process and the LMB Team submitted ATC-2 which was subsequently approved with conditions. We refined the approach with adjustments to implement the conditions. This approach provides the following benefits at these two bridge sites:

- Eliminates the need to widen and modify the existing four bridges (B664 –B667)
- Significantly minimizes impacts to existing utilities
- Reduces impacts to NSRR by eliminating all bridge demolition activities over the NSRR corridor and it eliminates all pier / crash wall construction activities adjacent to the active tracks.
- The new bridges will be designed and constructed to meet current standards for horizontal and vertical clearances.
- The superstructures for the new bridges will be constructed in conformance with VDOT’s jointless philosophy.
- The new bridges will be designed so they can be widened in the future to add an additional HOT lane in each direction during the future Phase 2 project.

The LMB Team’s approach to the design of the new bridges carrying the HOT lanes over Routes 13 & 460 and Yadkin Road & NSRR was to develop a cost effective bridge design and **reduce long-term maintenance needs** for VDOT. The superstructures of both bridges will consist of a single structural steel plate girder span utilizing ASTM A709 Grade 50W (weathering steel). All structural steel will be unpainted in conformance with VDOT’s current practices for jointless structures. The LMB Team’s conceptual design reduces the need for **future inspection and maintenance** by incorporating the following materials:

- Uses low permeability concrete in the superstructure and substructure elements.
- Uses Low Shrinkage Class A4 modified concrete in the deck slab.
- Uses CRR steel in accordance with VDOT S&B-IIM-81.7 (IIM) including Class II CRR steel in the superstructure elements defined in the IIM and Class I CRR steel in the substructure elements defined in the IIM.

Widening 3 - I-64 EB (B668) and I-64 WB (B669) over Route 648 (Shell Road) (Federal ID 21858, 28160):

The approach to the Shell Road site followed a similar path as discussed above and this site in ATC-2 was discussed during the ATC process. However, the narrower I-64 median over Shell Road prevented implementation and it was not included in ATC-2. In an effort to reduce widening costs given the future replacement with Phase 2, the LMB Team identified an alternative structural solution that was submitted and approved as ATC-5 for the Shell Road site. ATC-5 allows the implementation of a coated steel pipe pile solution to **reduce substructure costs and reduce construction schedule**.

a) Plan View, Elevation View and Transverse Section

The Conceptual Plan sheets S-20 through S-23 include a plan view, elevation view and transverse section for a new one span bridge for the I-64 crossings at Route 13&460 and Yadkin Road/ NSRR consistent with our approved ATC-2 approach. At the Route 13&460 site, the plan view has been refined to incorporate the comments from the ATC-2 approval as shown on sheet S-24. We have coordinated the City of Chesapeake’s Fiscally Constrained Master Plans, illustrating the future widening at Route 13&460. We have allowed for additional widening at Yadkin Road site.

The plan view, elevation and transverse section for the Shell Road site is included on sheets S-25 and S-26 in our Conceptual Plan. These drawings illustrate the widening of the existing bridges to meet RFP requirements and the implementation of approved ATC-5 for the coated steel pipe pile bents on the interior piers.

b) Number and Widths of Lanes and Shoulders

The Conceptual Plan sheets S-20 to S-21 and S-22 to S-23 meet approved ATC-2 of providing a new bridge at Route 13&460 and Yadkin & NSRR in the existing median configured for one HOT lane, a six-foot outside shoulder and a four-foot wide inside shoulder in each direction. A median barrier separates each direction of traffic. At the Shell Road grade separation of I-64, both the existing bridges are widened to the median side to provide a 14-foot outside shoulder, two general purpose lanes, a four-foot buffer, one HOT lane and 10-foot inside shoulder.

c) Horizontal and Vertical Clearances

At the Route 13&460 grade separation and the Yadkin & NSRR grade separation, the horizontal and vertical clearances are shown in our Conceptual Plans sheets S-20 and S-21. The vertical clearances have been increased to provide the RFP clearances for the Phase 2 configuration as noted on sheet S-24.

At Shell Road grade separation of I-64, both of the existing bridges are widened to maintain the existing horizontal and vertical clearances.

d) Hard Shoulder Running

The grade separation at Route 13&460 and at the Yadkin & NSRR site are beyond the hard shoulder running limits. The Shell Road grade separation of I-64 has been widened to provide the hard shoulder running. The inclusion of the hard shoulder running required the crown point to be shifted, which we will accomplish through a bridge deck overlay using latex modified concrete as shown in our Conceptual Plans on sheet S-26.

4.3.6 Conceptual Plans – Tide Gate at Gilmerton Canal

The LMB Team’s approach to the Tide Gate was to provide a solution which meets or exceeds the RFP scope of work with reliable and durable methods and materials in the areas of safety, operations, schedule, construction and public acceptance. The proposed solution is illustrated on sheet S-27 in our Conceptual Plans.

a) Plan/Schematic of Gate System

The existing culvert will be modified with cast-in-place concrete to create a headwall type structure to mount the vertical style tide gate. In addition to the culvert modifications, a tide gate and a platform will be constructed for VDOT staff to access the gate system, its controls, generator and cathodic protection elements. Access to the platform will be provided by a ramp structure to Firman Steet with a provision for parking off the Firman Street shoulder. The access ramp and platform sides will have handrails, security fencing, and a gate. Security fencing will reduce potential issues relating to theft and vandalism. Access was selected from Firman Street because of the lower traffic volume and lower vehicular speed to **increase safety for maintenance personnel**.

b) Connection to Existing Box Culvert

A cast-in-place box culvert extension will be constructed to extend the walls, floor slab and roof slab modifying the culvert southern end to avoid a reduction in cross sectional flow area. This allows the walls to be thickened to create an area wide enough on each side of the opening for the tide gate stainless structural steel components to be attached. The thickened walls will extend from the inside of one existing culvert wing to the other culvert wing. The proposed concrete will be integrally connected with the existing structure using adhesively anchored dowels.

c) Tide Gate Access

As it relates to operations, the tide gate system will include a camera to monitor the installation, audible and visual alarms, operational alarms, disconnects for hand operations to protect workers from accidental mechanical activation, and the ability to transmit operational warnings to the appropriate personnel.

The proposed tide gate installation provides safe and simple access to the components, durable materials configured for a low maintenance facility with security and safety features to protect the workers and the public.



Exhibit 4.3.6.a. Vertical slide gate similar to the photograph above is proposed



4.4 | PROJECT APPROACH

The LMB Team's approach to design and construction of the Project meets and exceeds the RFP requirements while maximizing the benefits to VDOT and stakeholders. Central to our approach is the promotion of **innovative design concepts** evidenced by four (4) approved ATCs, **optimized safety to the motoring public** by minimizing interface with construction activities, and **enhancements to long-term maintenance** through reduced complexity of details and demand for inspections. Our approach emphasizes conventional VDOT-endorsed structural design concepts of **long-standing industry acceptance and durable materials that eliminates long-term risks**. Our Team's local knowledge of permitting and relationships with various agencies affords the LMB Team confidence in **minimizing risk of delays** that could otherwise hamper start of construction. The Team's past experience and relationship with USCG and USACE will prove effective in obtaining required approvals necessary for the navigable channel closures.

The **LMB** Team Offers

Benefits to 

1	Experienced and Efficient Environmental Management	<ul style="list-style-type: none"> • Team that offers innovative solutions to permitting challenges with a history of working with Federal and local agencies along the corridor including our recent experience with the Dominion Boulevard and Jordan Bridge projects. • Integrated approach to environmental management and permitting led by environmental leads from both the design and construction team.
2	Proactive Approach Minimizes Utility Risks	<ul style="list-style-type: none"> • Eliminates conflicts with gas, water and communication lines as evidenced by the new bridge over Yadkin Road. • Relocations are designed to stay within current ROW, eliminating the risk of construction delays due to ROW acquisitions. • LMB has a proven track record of providing assistance and support to local utilities to ensure relocation schedules are maintained, minimizing impacts to the overall Project Schedule.
3	Innovative Solutions to Geotechnical Design and Mitigation	<ul style="list-style-type: none"> • Minimizes potential geotechnical impacts on existing foundations by choosing driven piles over drilled shaft construction. • Proven evidence of our ability to manage risk through design and construction experience with multitude of solutions in local area and geology including the Dominion Boulevard and Jordan Bridge projects. • Mitigation strategies reduce impacts at existing foundations and slopes by building new structures at Yadkin Road and Military Hwy.
4	Proven and Effective QA/QC Policies and Procedures	<ul style="list-style-type: none"> • Conventional design of High Rise Bridge eliminates need for additional VDOT inspectors • The use of previously approved precast facilities ensures proper QA/QC procedures are implemented. • Experienced LMB staff ensures clear procedures for design and construction quality which minimizes the need to expand VDOT's contract administration efforts

4.4.1 Environmental Management

Approach to Environmental Management During Design and Construction

The LMB Team has developed an integrated and thorough environmental management approach during design and construction to avoid, minimize, and mitigate impacts to environmental resources, meet NEPA commitments, secure all required environmental permits expeditiously, anticipate and minimize potential delays, and construct the Project in compliance with environmental requirements. The Team will employ the same successful environmental management strategies that we have used for other complex environmental projects including the Dominion Boulevard and the Jordan Bridge over the Elizabeth River. The specific environmental management efforts that the LMB Team will use are summarized below:

Streamline NEPA Re-Evaluation by Avoiding Disturbance Outside Existing ROW. Our design avoids expansion of the ROW from the RFP Conceptual Plans. As our design progresses, we will ensure that the limits of disturbance and ROW do not expand beyond those evaluated in the Environmental Assessment; thereby **avoiding the need for additional NEPA studies and avoiding Project delays.**

Prepare Environmental Management Document During Design. The LMB Team has prepared an Environmental Management Document, which identifies all required environmental permits and identifies environmental commitments made in the RFP, amendments, and the Environmental Assessment/FONSI. We will use this table to track environmental permit acquisition and minimize potential project delays, ensure that each environmental permit/approval is accounted for in the Project schedule, and ensure environmental compliance.

Environmental Management Plan (EMP)

Our Team will prepare an EMP that includes an environmental compliance matrix, which identifies all required environmental permits and identifies all environmental commitments made in the RFP and Amendments and the Environmental Assessment/FONSI. This will be used to track environmental compliance during design and construction.

Environmental Training During Design and Construction. Before construction begins, our environmental team will conduct a half-day training session for the Senior LMB Team on the environmental resources, which resources must be avoided, compliance with the environmental permits. We will make a video of the training and show it to new project personnel and subcontractors and use it for re-training during construction. This training will be documented and implemented for new personnel and periodically will be utilized to re-emphasize environmental awareness. This will ensure the LMB Team is aware of all environmental conditions, environmental resources, and commitments and **minimize potential delays due to environmental non-compliance.**

Approach to Environmental Permitting During Design and Construction

The LMB Team will use the following environmental permitting efforts during design and construction to avoid, minimize, and mitigate for impacts to environmental resources.

Permit Segmentation for the Project during Design. The Team met with environmental regulatory agencies to discuss permit segmentation and the agencies agreed to consider this approach. We will continue to pursue this approach with the agencies for permitting the western portion (Segment 1A) of the Project from 0.6 miles east of

Environmental Management Benefits

*The LMB Team has refined stormwater management treatment to **minimize long-term maintenance and reduce adverse effects** due to ground-water infiltration including effects of high water tables and tidal flow conditions. **Runoff from I-64 to the Gilmerton Canal is eliminated to help control existing local flood risks.** The intent of the design is to maintain all existing drainage courses and natural divides while managing the additional runoff attributed to the increases in impervious area. Our design **maximizes the use of proffered and purchased nutrient credits.** Efficient application of SWM facilities within the roadway alignment **reduces the need for off-site ROW acquisition.***

I-264 to the interchange with Military Highway separately from the other Segments. This section of the Project, or other sections between intersection/interchanges, are single and complete projects, per the Section 404 (B) 1) and USACE/DEQ guidelines. Because the Segment is basically a simple median widening and will not require Section 408 approval or a Section 9 bridge permit, the environmental **permits should be issued more expeditiously, allowing our Team to start construction on the Project earlier than if we waited until the entire Project was permitted.** We will continue to coordinate with the DEQ, USACE, and VMRC regarding this strategy following the NTP. Because this segmentation strategy is not guaranteed to be accepted by the agencies, we have shown a Proposal Schedule with the entire Project permitted as a single and complete Project.

Permit Segmentation

Our Team has already discussed permit segmentation with the regulatory agencies. We will pursue separate environmental permits for Segment 1A, which is a single and complete project. This strategy enables an earlier start of construction compared to permitting the entire Project.

Complete Environmental Resource Surveys/Analysis Early in the Design. To minimize chances of Project delays we will immediately upon NTP coordinate with the regulatory and consulting agencies to determine if any special status species surveys or habitat assessments may be required (potentially for the dismal swamp shrew and northern long-eared bat). If required, we will conduct the studies as soon as possible and within any survey windows established by the agencies. Early coordination on this issue will be important because some species surveys, such as the northern long-eared bat (NLEB), have constrained survey windows.

Develop Avoidance and Minimization Measures Early in the Design. Our Environmental Lead will continue to collaborate with the design and construction teams to avoid and minimize impacts to important environmental resources. **We will invite the regulatory agencies to participate in workshops to get agency “buy-in” on the avoidance and minimization measures early in the design process. This will help to identify potential agency concerns early and minimize potential delays.** We will ensure wetland impacts are avoided and minimized to reduce the impacts below the maximum allowed by the RFP (13.83 acres). **The wetland impact for our Conceptual Plans is 12.1 acres, illustrating our successful efforts to date to avoid and reduce these impacts.** We will continue to analyze and implement additional cost-effective avoidance and minimization measures, to minimize the potential for Project delays from permitting.

Early Agency Involvement in Design. We will begin agency coordination with the permitting agencies (USACE, DEQ, VMRC, USCG) and the other consulting/approval agencies (EPA, USFWS, NMFS, DHR, DGIF, DCR, VDACS, VIMS) immediately upon NTP to pro-actively address avoidance and minimization measures and get buy in for the mitigation measures and compensation requirements, establish alternate TOY measures, and minimize potential project delays. **We have already discussed the permit process for an Elizabeth River crossing with the USACE and DEQ to gain insight on their key issues and discuss how to streamline permit issuance.** Coordination with the Operations Branch of the USACE Norfolk District will continue to ensure we streamline the Section 408 approval for the modification to the navigable channel in the Elizabeth River. Our proactive approach will confirm that the permits are “reasonable” and do not present conditions or limitations that negatively impact the constructability of the Project. **Our working relationship with the regulatory agencies on past D-B projects will benefit the permit coordination process.**

Identify Suitable Mitigation Early in the Design. The LMB Team will work with the regulatory agencies to find acceptable compensation for unavoidable impacts to jurisdictional wetlands and waters. In our experience, the best method to expedite permit acquisition is to purchase credits from an approved mitigation bank, of which there are several for this watershed. We have already consulted with the approved banks in the appropriate HUC codes to verify that available credits for all the types of wetland and stream impacts are available. In addition, we will get concurrence from the agencies that compensation for temporary wetland impacts and impacts (other than forested conversion) to jurisdictional ditches will not be required. This will ensure our permit application is processed quickly and minimize potential for Project delays due to permitting.

Environmental Permit Compliance During Construction. The LMB Team will monitor environmental compliance during construction as required by the environmental permits to minimize potential compliance problems and potential delays due to environmental deficiencies. The LMB Team will use exclusion fencing around resources/areas of concern to ensure they are not impacted by construction. This would protect resources

such as non-impacted wetlands, the Chesapeake Land Development Tidal Bank, Deep Creek Middle School and Crestwood Intermediate School, and Diggers Pick & Pull facility.

Approach and Solution to Environmental Conditions/Areas of Concern within the Project Footprint

As shown in the Table 4.4.1.a., the LMB Team has identified Environmental Conditions/ Areas of Concern within the Project footprint, analyzed the risk to that environmental condition/area of concern, and identified avoidance and mitigation strategies to avoid adverse effects to the environment condition/area of concern.

Table 4.4.1.a. Environmental Mitigation Strategies for Areas of Concern/ Environmental Conditions

Environmental Condition/Area of Concern	Avoidance, Minimization, and Mitigation Strategy
Section 4(f) resources including Deep Creek Middle School and Crestwood Intermediate School	<ul style="list-style-type: none"> Coordinate design plans with Chesapeake Public Schools and FHWA/VDOT to maintain de-minimis effect to 4(f) resources/recreational facilities at the Deep Creek Middle School and Crestwood Intermediate School. Place exclusion fencing along the Project boundary with the schools to protect during construction.
Noise	<ul style="list-style-type: none"> Complete and furnish a final Noise Analysis Design Report (NADR) including the affected landowner/impacted receptors survey. Conduct final design noise analysis in compliance with the VDOT State Noise Abatement Policy, VDOT Highway Traffic Noise Impact Analysis and Abatement Guidance Manual. Design and construct noise walls recommended by FHWA, Chief Engineer and Noise Abatement Design Report.
Wetlands and Waters of the US (WOUS)	<ul style="list-style-type: none"> Continue to incorporate avoidance and minimization measures through agency workshops to minimize impacts and keep permanent impacts below the 13.83 acres maximum allowed by RFP. Our Conceptual Plans result in 12.1 acres of permanent impact, so we have already implemented some avoidance and minimization measures. Complete wetland/WOUS delineation for construction access, laydown, staging, and borrow sites Implement ATC-3, which reduces the impact of footings in the Elizabeth River Develop restoration approaches for temporary impact areas and use of mitigation banks for required compensation for permanent impacts Use exclusion fencing along the non-impacted wetlands in ROW to protect during construction Use of concrete sheet piling and appropriate sequence of construction for the retaining wall for the western abutment at the Elizabeth River to work “in the dry” and minimize water quality impacts
Hazardous Materials	<ul style="list-style-type: none"> Our construction plan avoids dredging of Elizabeth River sediments, avoids impacts to water quality from dredging and the need to manage potentially contaminated spoils Our plan avoids impact to Diggers Pick and Pull facility and minimizes impacts within the Norfolk Southern ROW as required by the RFP Prepare a Spill Prevention Control & Countermeasure Plan Compliance with Section 411.01 in the 2007 Road and Bridge Specifications for Type B structures Follow VDOT Special Provisions for asbestos inspection and abatement Conduct Phase I ESA in accordance with ASTM Standard E 1527-13 for ROW
Miscellaneous Environmental Areas of Concern	<ul style="list-style-type: none"> Design plans submitted avoid impacts to sensitive environmental sites such as the Deep Creek Broodstock Oyster Reef, historic properties including the Sunray Historic District, and the Chesapeake Land Development Tidal Bank.
Special Status Species	<ul style="list-style-type: none"> Coordinate with agencies early in the environmental permitting process, update IPaC etc. information, conduct surveys/habitat assessments of borrow sites, staging, laydown areas Seek concurrence from the agencies for in-lieu of mitigation strategies for the TOY for disturbance within 600 feet of the falcon’s nest on the existing bridge and the possible TOY for in-stream work to protect anadromous fish during pile driving. We will implement TOY for tree clearing for the Northern long-eared bat if required. Include TOY restrictions in environmental compliance training.

Project Schedule Integration with Environmental Milestones

Obtaining environmental permits and environmental approvals in a timely manner is always a schedule and planning priority for any project because construction cannot start until the permits are issued. As described below, the LMB Team has already integrated the environmental activities with the schedule.

Integration of Environmental Milestones into the Schedule. We have integrated key environmental permits, environmental hold points, and approval activities into the Schedule, including:

Key Environmental Activities	Duration (Work Days)
JPA application preparation and submittal	60
JPA application review and issuance of environmental permits	175
EQ103, EQ200 and EQ201 reviews	21
Nationwide Permit 6 (NWP) application preparation for test piles and geotechnical borings	15
NWP 6 issuance for geotechnical borings and test piles	45
Wetland delineations and special status studies for construction access points, laydown, borrow sites and staging areas	25
Phase 1 Environmental Site Assessments for ROW acquisition	25
Avoidance and minimization workshops	20
Environmental permit compliance monitoring	698

The LMB Team will track the environmental activities scheduled throughout the design and construction of the Project to meet the Schedule and avoid letting permit acquisition impact the Project.

Account for TOY Restrictions in the Schedule. We have identified potential time of year (TOY) restrictions for the Project, including a TOY for in-stream work due to the migration of anadromous fish, a TOY for disturbance within 600 feet of the falcon’s nest on the existing bridge during the nesting season, and a possible TOY for tree-clearing for the northern long-eared bat (NLEB). **We have coordinated with the regulatory agencies to secure potential exceptions for these TOYs so that they do not adversely impact Critical Path activities such as pile driving for the bridge.** Use of exclusion netting or re-location of the nest box will be pursued “in-lieu” of the TOY pertaining to the falcon’s nest and we will propose bubble curtains and turbidity curtains in lieu of the TOY for anadromous fish related to pile driving. These “in-lieu” TOY measures have been granted in the permits on other Elizabeth River projects including the Dominion Boulevard and Jordan Bridge projects. We have factored TOYs and potential TOYs into our Proposal Schedule.

Integration of Environmental Activities with Project Schedule

Our Proposal Schedule includes environmental milestones and activities to their projected durations are accounted for and tracked.

4.4.2 Utilities

Approach for Utility Coordination, Adjustments, and Relocations: The LMB Team’s approach to utility coordination, adjustments, and relocations is simple: minimize conflicts and relocations that pose a risk to the schedule and/or Project costs. We have carefully reviewed the RFP Conceptual Plans, performed visual inspections, coordinated with each impacted utility company, and researched available records to accurately develop our Conceptual Plans and Schedule accordingly. Our Team will leverage the information gathered with our extensive local knowledge and experience working with the utility companies in the corridor to provide VDOT with a comprehensive approach to minimizing utility impacts to the Project.

Established Relationships with Local Utility Owners

LMB Team members have long-standing, established relationships with every utility owner in the corridor. These relationships will help expedite the utility procedures, protocols, and requirements when working around their facilities. These relationships will also help with utility relocations.

The following flowchart demonstrates our approach and process for addressing utilities on the Project from the RFP phase through Project execution.

1. Review RFP Plans	<ul style="list-style-type: none"> Initial plan review Highlight potential utilities/conflicts Determine ROW and project limits/utility easements
2. Review Existing (SUE) Reports	<ul style="list-style-type: none"> Review test hole information in plans Review data from subsurface utility engineering studies Update our initial Utility Matrix, inclusive of all utilities
3. Site Inspections	<ul style="list-style-type: none"> Experienced local team members make site inspections Identify and quantify utilities not shown on RFP Plans and SUE Update our utility conflict matrix and evaluate potential solutions
4. Find Solutions for Conflicts	<ul style="list-style-type: none"> Highlight potential alternative solutions Coordinate with design engineers to develop solutions Develop innovative approaches to avoid conflicts
5. Utility Coordination	<ul style="list-style-type: none"> Meet with each utility (private and public) Develop the Utility Relocation Schedule Update the relocations in the Schedule
6. Finalize Schedule/ Cost	<ul style="list-style-type: none"> Verify each private utilities' prior rights Prepare VDOT UT-9 Forms for each utility Prepare the final relocation schedule and pro rate costs
7. Finalize Documents	<ul style="list-style-type: none"> Finalize relocation/adjacent plans with public utilities Combine schedule with plans and design documents Submit to VDOT for approval
8. ROW	<ul style="list-style-type: none"> If needed, obtain easements for relocation Prioritize acquisitions to support early utility relocations and construction Advise utilities when ROW is available for relocations to begin
9. Execution	<ul style="list-style-type: none"> Begin utility relocation/adjustments Monitor operations for unforeseen/unknown utilities and take action Maintain open communications to quickly resolve unforeseen issues

Potential Utility Conflicts and Mitigation Measures: We understand the importance of avoiding utility conflicts and relocations wherever possible. If conflicts cannot be avoided, we will work to minimize relocations with design modifications and/or protection of the asset; only as a last resort will utilities be relocated to accommodate proposed improvements. All relocations will be individually addressed in detail in the construction schedule, with emphasis to avoid Project delays and define with logic where work can be shifted, when necessary, to avoid any delays to daily construction efforts.

The matrix below identifies a portion of utilities that conflict with the proposed work and our Conceptual Plans.

Utility Owner	Conflict Location	Public/Private	Conflict Status	Mitigation	Responsible Party (LMB/Utility)
verizon ✓	South Military Highway	Private	Adjacent to abutment	Locate & protect during construction	LMB

 Dominion Energy	Yadkin Road	Private	Overhead clearance restriction	Reduce working height	LMB
 Verizon	Yadkin Road	Private	Adjacent to abutment	Relocate	Utility
 Dominion Energy	I-64 Mainline	Private	Overhead transmission lines	Raise towers for bridge clearance by June 2018	VDOT and Utility
 Dominion Energy	I-64 Mainline	Private	Poss. noise barrier conflicts (6) locations	Raise pole height	LMB
 Virginia Natural Gas	I-64 Mainline	Private	6" gas line and noise wall	Design around/relocate	LMB
 COX	Shell Road	Private	Close to end bent	Locate & protect during construction	LMB
 Dominion Energy	Shell Road	Private	Conduit close to end bent	Locate & protect during construction	LMB
 Verizon	Bainbridge Boulevard	Private	UG Cables	Relocate or protect	LMB
 Chesapeake VIRGINIA	Libertyville Road	Public	City 10" water main	Relocate	LMB
 Dominion Energy	Libertyville Road	Private	OH dist. line parallel roadway	Relocate	LMB
 COX	Libertyville Road	Private	OH cable line	Relocate	LMB
 Dominion Energy	Bulldog Dr.	Private	OH power	Relocate	LMB
 COX	Bulldog Dr.	Private	OH cable	Relocate	Utility
 Verizon	Bulldog Dr.	Private	UG cable	Relocate	LMB
 Chesapeake VIRGINIA	I-64 Mainline 1461+17	Public	20" water main in casing	Extend casing under noise barrier	LMB
 Verizon  COX  Dominion Energy	I-64 Mainline 1459+38	Private	Joint use 30" casing	Extend beyond widening	Utility

With all projects, the potential exists to encounter unknown utilities during construction. Our Team consists of dedicated Utility Managers for both design and construction. The Utility Manager for Design will act as a single point of contact with the Team, VDOT Utility Managers, and the Utility Owners during the permitting and design phase. Once construction begins, the Utility Manager for Construction will take the lead in coordinating the utility impacts and relocations. The Utility Manager for Design will be responsible for ensuring relocation plans are coordinated among the design disciplines and various utilities owners, however, both Utility Managers will work closely together to develop alternatives to remove or mitigate conflicts and relocations.

Project Sequencing Integration. The LMB Team has identified conflicting utilities and incorporated them into our staging plans, work schedules, MOT planning, and permitting. Our Proposal Schedule includes planning and time to relocate the conflicting utilities which may include the water lines on Libertyville Road, Bainbridge Road, and several overhead CATV, telecommunications, and electrical power lines crossing perpendicular to the I-64 mainline. Relocating these identified

Methods for Keeping Utility Relocations On-Schedule

- Supplemental SUE/test holes to confirm avoidance
- Modify our design to avoid utility conflicts, where possible
- Dedicated utility team whose primary goal is to mitigate and manage utility relocations
- Establish and adhere to a utility relocation schedule, with buy-in from the utility owner
- Establish monthly coordination meetings with the utility owners
- Supporting the utility owners by assisting them with their work, where possible

conflicting utilities early in the **Project will reduce or eliminate delays to construction activities**. We will be working closely with the utility companies which will allow us to minimize or avoid outages to the stakeholder's customers and the public. The utility matrix will be continually updated as design progresses and will be used during the construction phase of operations to document completion of adjustments, and relocations.

Upon notice of award, LMT Team member, JMT, will conduct subsurface utility engineering (SUE) including test holes to precisely locate and identify underground dry and wet utilities that appear to conflict with the planned Project construction. **JMT is one of the few SUE firms that has experience in locating underwater utilities** such as the duct banks in the Elizabeth River. Simultaneously, we will schedule utility meetings with all utility stakeholders that have active utility infrastructure near or within the Project limits.

Local Knowledge and Experience. Our Team has worked with every utility company that has been identified as having infrastructure within the Project limits and has long-established working relationships with these local utility companies

successfully completing many large-scale projects in the area. Branch Civil's Dominion Boulevard Interchange project required the appointment of a utility coordinator to assist the City of Chesapeake with the utility evaluation, mitigation and coordination of utility relocation activities to keep the project on schedule. Additionally, team members are actively relocating utilities at the Military Highway Continuous Flow Intersection D-B project which includes the relocation of 12-inch and 16-inch gas mains and the conversion of overhead dry utilities (electric and communications) to underground dry utilities to eliminate conflicts. During these and many other local projects we have established professional working relationships with the local utility companies and continue to sustain these key relationships which will be essential to the successful and timely completion of this Project.

4.4.3 Geotechnical

The LMB Team has demonstrated competency of the geotechnical design concepts and construction activities to adequately manage geotechnical risk associated with the Project through the following items:

- Our local geotechnical experience with similar projects in the region,
- Understanding of the geotechnical issues common to the Hampton Roads region, primarily time-dependent settlement due to soft alluvial soils and organic deposits, and
- Successful completion of projects in this region using the following procedures to mitigate geotechnical risks:
 - Establishing consistent communication between the geotechnical designers and Contractor from design through construction,
 - Using our knowledge of typical settlement magnitude and time rate issues in the region to apply the most appropriate ground improvement technologies,
 - Proactive identification of unsuitable and/or problematic soils early in the design phase, and
 - Prompt review of field instrumentation and monitor data during construction.

The goal of LMB Team's approach is to identify and mitigate geotechnical risks by evaluating the existing Project data and information, conducting additional geotechnical investigations, and establishing geotechnical recommendations that fit the overall Project schedule, and effectively implement design concepts during construction of the Project.

The Project is located in Virginia's Coastal Plain Geologic Region which presents a variety of challenging geotechnical conditions; ranging from near-surface, wet and soft subgrade soils to deeper soft, compressible, plastic clay soils that are often interbedded with sandier layers of varying fine-grained silt and clay materials to

Innovative Design to Eliminate Conflicts

ATC-2, which uses single span bridges, eliminates conflicts with underground water lines, force mains, telephone, electric distribution duct banks, and fiber optic cable duct banks. This concept saves VDOT, the utility companies, and more importantly the consumers, both time and money with less disruptions to existing critical infrastructure systems including water, sewer, electric and communications.

occasional lenses of highly organic peat layers.

The **LMB Team members** possess **experience on successful similar projects on soft ground** using a variety of site-specific techniques including surcharge fills and staged embankment filling, Prefabricated Vertical (PV) drains to accelerate settlements of compressible soils, in-situ admixture soil stabilization using lime or cement, geotextile stabilization, undercutting/replacing unsuitable soils, and in-situ stabilization/reinforcement of soft soils with aggregate piers or “rigid inclusions” including cementitious piers or concrete columns (*Figure 4.4.3.a*). These same technologies are being considered for this Project.

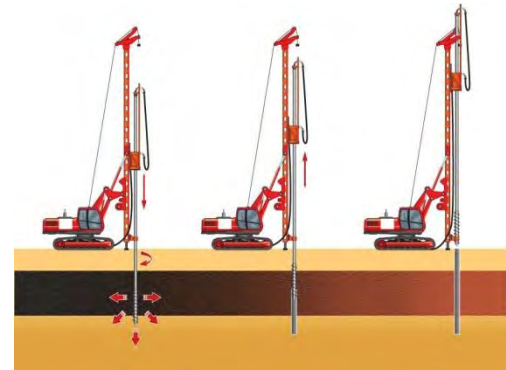


Exhibit 4.4.3.a. Rigid Inclusions Schematic

ECS will be the Geotechnical Engineer of Record (GER) and will support the design team during design and construction to take full advantage of the D-B process by integrating geotechnical design concept development with construction practices and means/methods. ECS has supported D-B projects with this approach on I-66/Route 15 DB Interchange, Route 285 over I-64 DB Interchange, and I-64 Widening – Short Pump DB. **ECS’ successful approach to identifying problematic soils specific to Coastal Plain Geology and providing technical and economical solutions for roadway, embankment, and bridge construction has been used on recent nearby projects including Dominion Boulevard, Jordan Bridge, MLK Expressway, Midtown Tunnel, and Gilmerton Bridge.**

Geotechnical Design and Analysis Practices. Our Team has thoroughly reviewed the VDOT-provided geotechnical documents including the Geotechnical Data Report (GDR) by ECS dated August 10, 2016, the AMEC Pavement Evaluation Report dated April 21, 2016, and supplemental addenda to the RFP. A total of 142 Standard Penetration Test (SPT) soil borings and four Cone Penetrometer Test (CPTu) soundings were completed for the GDR. These values represent approximately 15% of the geotechnical boring coverage that will ultimately be supplemented to meet minimum requirements in Chapter III of VDOT’s Manual of Instructions (MOI). A limited number of CBR tests were performed for roadway pavement design and existing pavement evaluation. SPT borings were not drilled for specific retaining wall locations, noise walls, large pipe/culvert structures, and stormwater management facilities.

Prior to acquiring additional geotechnical data, a comprehensive review and evaluation of all available data and information regarding the Project area and subsurface soils will be completed. A thorough site reconnaissance will be conducted to confirm the potential geotechnical risks, to identify any additional site constraints, and to tailor the geotechnical exploration program to address the real geotechnical issues relative to the proposed design.



Exhibit 4.4.4.b. Barge-Mounted Geotechnical Exploration

The **supplemental geotechnical investigation program will be developed** based on Chapter III MOI minimum requirements and all additional exploration, investigation, and testing will be performed in support of the required final design level geotechnical engineering report (GER). As the RFP GDR suggests, unsuitable soils, CBR values through the corridor, and possible deep layers of Peat and/or highly-plastic soils warrant specific consideration. Sampling and testing of in-situ soils will be focused on obtaining field and laboratory soil data to provide an accurate estimate of the magnitude and time rate of settlement in the median and for bridge abutments and approach embankments.

A summary of existing geotechnical data, additional available geotechnical information, planned final design-phase exploration, and proposed analyses will be presented in a detailed fashion in the LMB Team’s Geotechnical Exploration Plan (GEP).

In addition to conventional SPT drilling, sampling and standard soil index testing, we plan to perform CPTu, PMT, DMT, Shelby tube sampling, pitcher sampling, consolidation tests, and direct shear and triaxial shear testing to support the settlement calculations, global stability analyses, and bridge and retaining wall structure foundation designs. Groundwater monitoring wells are also planned to document as-drilled and long-term water levels.

Upon completion of the geotechnical field exploration and laboratory testing, the LMB Team will use all available geotechnical information (existing VDOT data and additional subsurface exploration data) to delineate the subsurface profile, evaluate stratum-specific soil parameters, perform engineering analyses, and provide geotechnical recommendations for the design and construction of bridge foundations, noise walls, drainage structures, retaining walls, slopes, roadway embankments and subgrade, pavements, and stormwater management facilities. **The design of geotechnical features will be in accordance with AASHTO LRFD Bridge Design Specifications, 7th Edition, VDOT’s Manual of Instruction, and the Project Technical Provisions.**

Location, lateral and vertical extent, and compressibility of soft soils through the Project corridor will be the primary driver of proposed ground improvement methods implemented during construction. The LMB Team is prepared to address large embankment footprints with a variety of improvements including over-excavation and replacement, PV drains combined with surcharge fills, aggregate piers and controlled modulus columns or “rigid inclusions”.

Construction Methods. To implement all geotechnical design recommendations during construction, the LMB Team will have members of the geotechnical design team intimately involved during construction. Settlement monitoring and instrumentation readings will be provided to the GER, promptly reviewed, and results/recommendations provided to the construction team, the QC Team, and VDOT representatives.

Geotechnical Risks and Challenges: The following geotechnical risks and challenges were identified based on our understanding of the geologic setting for the Project; review of the existing information provided by VDOT, additional available soils and geological information for this area explored by the LMB Team, and a review of the potential impacts to quality and schedule.

- Unsuitable subgrade soils
- Ground improvement of soft soils for settlement and stability
- Downdrag and bridge foundations
- Working around existing foundations and structures
- Maintaining existing slopes

Our proven risk mitigation approach is **to identify potential risks as early as possible in the Project, develop a mitigation action plan, and communicate/ implement the action plan with all appropriate parties.** To take appropriate safeguards and use

Geotechnical Exploration Plan (GEP)

A summary of existing geotechnical data, additional available geotechnical information, planned final design-phase exploration, and proposed analyses will be presented in a detailed fashion in the LMB Team’s GEP.

<i>Planned Field Exploration:</i>	<i>Planned Laboratory Tests:</i>
▶ 600 – 675 SPT Borings	▶ 1,500 – 1,800 Classification
▶ 40 – 60 CPTu Soundings	▶ 150 – 200 Organic Content
▶ 20 – 30 DMT Soundings	▶ 50 – 70 CBR
▶ 10 – 15 PMT Tests	▶ 40 – 50 Soil Chemistry
▶ 60 – 100 Shelby Tubes	▶ 75 – 100 Shear Strength
	▶ 30 – 40 Permeability
	▶ 40 – 50 I-D Consolidation

Geotechnical Risk Management

- *Identify potential geotechnical design and construction risks*
- *Incorporate potential design and construction risks into the Schedule*
- *Use the scope validation period to obtain additional geotechnical information*
- *Confirm the extent and critical nature of the potential impacts*
- *Select and implement appropriate geotechnical solutions in accordance with our risk remediation strategies*
- *Manage construction operations to minimize schedule risk and enhance quality*

mitigation strategies to achieve a quality product, significant design and construction coordination is required between the GER, RCE, CM, Construction QC Manager, and QAM. The Geotechnical Engineer will provide the appropriate expertise and oversight to manage the geotechnical risk.

The geotechnical risks have been appropriately accounted for in the Proposal Schedule in Section 4.7. The design section of the Proposal Schedule includes activities for geotechnical investigation, analysis, and recommendations. In the construction schedule, roadway productions have been adjusted to account for remediation of unsuitable soils and settlement of the roadway approaches. These geotechnical risks have been vetted based on the available data to date and do not specifically affect the Critical Path. Following NTP and as preparation of the GER progresses, the Schedule will be revisited to incorporate all geotechnical mitigation measures and subsequent geotechnical construction is accurately incorporated and updated where required.

Unsuitable Subgrade Soils. Based on review of the provided GDR and Pavement Report the LMB Team created an unsuitable soils matrix to identify station ranges of potential unsuitable soils that could be encountered during construction. The near surface soils generally consist of coarse-grained soils (SC, SM, SC-SM and SP-SM) and are generally suitable subgrade materials. Lean clay (CL) with appreciable amount of sands and lower plasticity fines also has the potential to be suitable subgrade material, but was only encountered in the near surface at isolated locations. The LMB Team evaluated the upper 3-feet of subgrade soils through the corridor and used four major criteria for identification of potential unsuitable soils including:

- Loose or Soft Soils with SPT N-values $<$ or $=$ 4 blows per foot (bpf)
- Highly Plastic or Organic Soils with USCS Classification of CH, MH, OH, and/or OL)
- Soils with excess moisture $>$ or $=$ 130 % of optimum moisture content
- Soils with CBR values $<$ 10

Using the available geotechnical data and the criteria above, the LMB Team delineated specific station ranges of potential unsuitable soils throughout the Project corridor. We anticipate unsuitable subgrade soils could account for 20 to 25% of the planned subgrade footprints.

Following the design level geotechnical investigation, locations where unsuitable soils are anticipated to be encountered will be delineated on the Project drawings (both area and depth) and discussed with the DBPM and CM. Collectively the Geotechnical Engineer, CM and MOT Coordinator will develop an unsuitable soils remediation plan that considers constructability, safety, schedule, and cost. The final Unsuitable Soil Remediation Plan will be shared with the RCE and QAM in compliance with the Project requirements and will show the extents of unsuitable soils, the cause for unsuitability, and availability of multiple viable subgrade treatment options to provide maximum construction flexibility. **On-site testing and monitoring during construction will ensure unsuitable subgrade soils are appropriately addressed prior to any fill or pavement base placement.**

Ground Improvements for Settlement. There are several areas of the Project that will require ground improvements to address issues of settlement magnitude, settlement duration, and global stability due to the presence of highly compressible clays and/or organic soils at relatively shallow depths and/or shallow soft granular deposits common in the geology.

Review of the GDR, Conceptual Plans, and preliminary calculations indicate predicted maximum roadway embankment settlement in the widening areas of up to 12-inches in areas with 10- to 15-feet of fill and 3- to 6-inches in areas with 5- to 10-feet of fill., Bridge approach embankment fills reach maximum fill heights on the order of 25- to 30-feet with corresponding predicted maximum settlement values ranging from 8- to 18-inches. Corresponding unmitigated settlement durations range from 30-days to 6+ months. The key to mitigating settlement risk is accurately identifying the location, extent, magnitude and time rate of potential settlement. In

Unsuitable Soil Remediation Plan

The final Unsuitable Soil Remediation Plan will be shared with the RCE and QAM to ensure compliance with Project requirements. We will show the extents of unsuitable soils, the cause for unsuitability, and availability of multiple viable subgrade treatment options to provide maximum construction flexibility.

this geology, particular emphasis will be placed on the soil strata above the Yorktown Formation, which was observed consistently in the range of El. -30 to El. -40 through the corridor. Conventional SPT drilling will be supplemented with PMT and/or DMT testing and CPT soundings with pore pressure dissipation testing. At critical locations, groundwater monitoring wells will be installed to accurately measure long-term groundwater levels. The in-situ PMT and/or DMT tests along with the consolidation tests will provide the soil parameters to enable accurate estimates of the total settlement, and the consolidation tests paired with the groundwater information will allow accurate estimates of the time rate of settlement.

With the high-quality soil parameters from both the in-situ and laboratory tests as the inputs, the LMB Team plans to use a combination of two-dimensional (2D) and three-dimensional (3D) settlement analysis software to calculate the settlements. The LMB Team is also prepared to use finite element analysis software PLAXIS 3D® to check the settlements at select critical locations.

Based on the results of the settlement and stability analyses and depending on the contributing factors to the settlement and/or stability, a number of mitigation options will be evaluated including lightweight fill, ground improvements such as aggregate and cementitious piers, excavation and replacement, PV drains, and surcharge fills. The final settlement mitigation option will be based on soil and groundwater conditions, soil strength and compressibility, and schedule flexibility in each location. Initial ground improvement recommendations based on RFP GDR data is presented in *Table 4.4.3.h* herein.

Ground Improvements for Stability. For slopes greater than 10-feet in height, detailed global stability analyses will be performed using site specific soil strength parameters as obtained from laboratory tests. Slope stabilization measures available include geogrid reinforcement, high strength geotextile fabrics, stabilizing berms, ground improvements including undercut, rammed aggregate piers, and deep foundations. The LMB Team plans to maintain existing slopes and bench into the existing slopes for new embankment filling in lieu of attempting to steepen existing slopes. Final configurations will be analyzed to meet or exceed the minimum factors of safety for stability presented in Table 3-7 of VDOT's Manual of Instruction.

One critical Project element is the retaining wall and the retained embankment fill at Abutment A of the new High Rise Bridge (*Exhibit 4.4.3.g*). The controlling design factors will be global stability and long-term settlement. To satisfy required factors of safety for this embankment, that is immediately adjacent to Deep Creek, extensive ground improvement of the underlying soft clays, silts, and organic soils that vary in depth and vertical extent will be required. Rigid inclusions are planned to support the embankment and MSE wall through this area. A load transfer platform (LTP) is planned to distribute the load from the embankment soils to the rigid inclusions. Concrete sheeting will be used to allow for construction of the ground improvements. Approved MSE wall panels will be used on the exterior face.

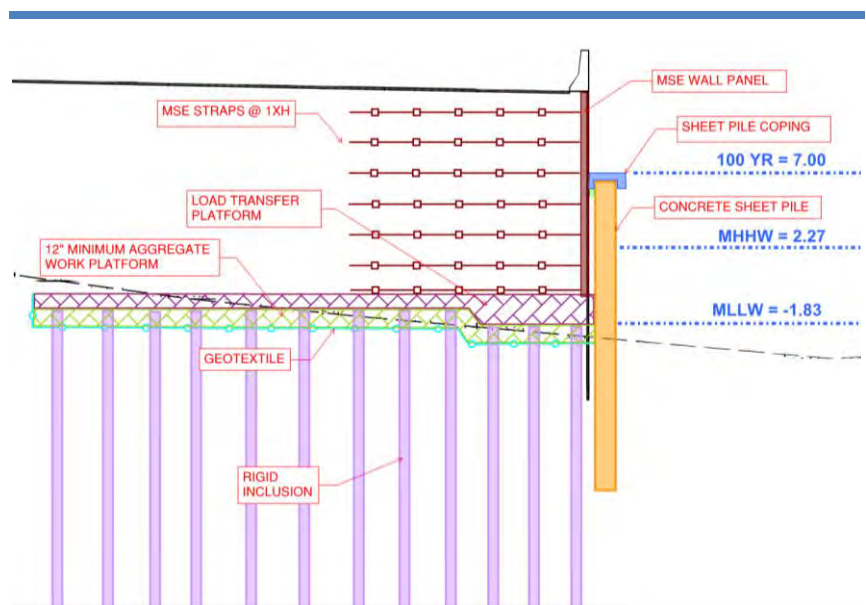


Exhibit 4.4.3.g. Retaining Wall at High Rise Bridge Approach Embankment (Typical for Sta. 1280+00 to 1288+00)

After analyzing existing data as well as data generated during geotechnical testing post award a final design of Ground Improvement Methods will be generated. A summary of the assumed ground improvements through the Project corridor is presented in *Table 4.4.3.h*.

Table 4.4.3.h. – Ground Improvement Locations

Structure and Station Range	Ground Improvement Method	Benefit
<i>Western Approach to High Rise Bridge</i>		
Sta. 1274+50 to 1280+00	Densified Aggregate Piers 30-inch diameter @ 3D spacing, Tip El. -45	Improve stability and settlement control
Sta. 1280+00 to 1288+00	Rigid Inclusions / CMCs 12- to 18-inch diameter 5D to 6D spacing, Tip El. -45	Improve stability and mitigate settlement of wall and embankment in the cove
Sta. 1288+00 to 1299+00	Densified Aggregate Piers 30-inch diameter @ 3D spacing, Tip El. -40	Improve stability and mitigate settlement
<i>Eastern Approach to High Rise Bridge</i>		
Sta. 1362+00 to 1368+50	Densified Aggregate Piers 30-inch diameter @ 3D spacing, Tip El. -40	Improve stability and mitigate settlement
<i>I-64 Managed Lanes over Military Highway</i>		
Sta. 1090+00 to 1100+00	PV Drains 7-ft triangular spacing, Tip El. -30	Accelerate Settlement Timeframe
Sta. 1102+00 to 1120+00	PV Drains 7-ft triangular spacing, Tip El. -30	Accelerate Settlement Timeframe
<i>I-64 Managed Lanes over Yadkin Road & Norfolk Southern Railway</i>		
Sta. 1120+00 to 1131+75	PV Drains & Preload 7-ft triangular spacing, Tip El. -30	Accelerate Settlement Timeframe Reduce Long-term settlement
Sta. 1134+00 to 1152+00	PV Drains & Preload 7-ft triangular spacing, Tip El. -30	Accelerate Settlement Timeframe Reduce Long-term settlement
<i>Great Bridge Boulevard over I-64</i>		
Sta. 131+50 to 135+25	PV Drains & Preload 6-ft triangular spacing, Tip El. -30	Accelerate Settlement Timeframe Reduce Long-term settlement
Sta. 137+50 to 141+00	PV Drains & Preload 6-ft triangular spacing, Tip El. -30	Accelerate Settlement Timeframe Reduce Long-term settlement

At all the ground improvement locations above, settlement monitoring during construction will be performed to evaluate real-time settlement magnitudes and consolidation rates, optimize potential construction impacts, and to manage settlement risks.

Downdrag and Bridge Foundations. There are five locations along the proposed alignment where widening of I-64 EB and WB is anticipated to result in **large embankment fills being placed in the direct vicinity of existing structures and new foundation elements**. As-built bridge plans show that the existing bridge piers and abutments are supported by deep foundation piles. The GDR and the existing VDOT bridge plans indicate that the subsurface profiles at each bridge location is fairly consistent through the corridor. Further, the Yorktown Formation, the typical bearing stratum in this geology, is relatively consistent in top elevation. Based on the information currently available, we expect to use driven pre-stressed/ pre-cast concrete piles at the bridge abutments.

When settlement of the existing subsurface soils occurs in the vicinity of the existing and proposed bridge abutments, negative skin friction or downdrag develops which imparts an additional load on the deep foundation elements. Downdrag forces will be incorporated in the design of the geotechnical capacity of the piles and considered for impacts to the construction schedule as it relates to the time frame under which downdrag will occur. The LMB Team has used this for our approach to the Great Bridge Boulevard substructures and will be confirmed in final design.

Maintaining Existing Structures and Slopes and Working Around Existing Foundations. There are isolated locations through the Project corridor where new construction will take place in and around existing foundations. The LMB Team has considered foundation options and ground improvement alternatives that will minimize potential impacts to existing structures. **Driven piles (PSC, steel pipe and H-pile) to support the bridge structures were chosen to avoid potential soil loss that is possible with drilled shaft foundation elements that could negatively impact adjacent existing roadway embankments, railroad alignments, existing bridge structures, and existing utility foundations.** Examples of this are the new bridges at Yadkin Road and Military Highway in Segment 1, the bridge widening at Shell Road in Segment 1, the High Rise Bridge in Segment 2, and

the bridge piers adjacent to Libertyville Road in Segment 2. Analytical empirical methods will be used in conjunction with construction monitoring to evaluate potential impacts to existing foundations and structures in the vicinity of driven pile foundations. Existing piers and bridge beams will be protected during construction and construction will be sequenced to achieve global stability of the foundations during construction.

A similar design and construction approach is planned for embankment widening through the corridor. **Steepened slopes have not been designed into the Project, as existing slopes will be maintained and benched to support the adjacent new embankment fill.** The geotechnical engineer will confirm conformance with the minimum factors of safety for the final slope configurations in accordance with Chapter III of VDOT's MOI, specifically Table 3-7 and design slope stabilization if required. During construction, the LMB Team will implement an instrumentation and monitoring plan to document settlement of embankment fills and compare the data to calculated values.

Minimum Safety Factors
Slope configurations and reinforcement will be evaluated according to the minimum factors of safety for both short-term and long-term conditions per VDOT's MOI.

4.4.4 Quality Assurance/ Quality Control (QA/QC)

Approach to QA/QC During Design and Construction

Our QA/QC program approach in design and construction is to establish, implement, and maintain QA and QC procedures and systems necessary to provide VDOT assurance that the design of the facilities, components, systems, and subsystems that make up the Project meet the contract requirements. The LMB team will implement this approach by integrating our own proven quality programs into the RFP requirements including VDOT's Minimum Requirements for Quality Assurance and Quality Control on Design-Build and Public-Private Transportation Act Projects January 2012 (VDOT QA/QC). This approach will provide a QA/QC Plan which will include design QA/QC and construction QA/QC that will deliver clear and easily auditable documentation of project compliance with the contract. All entities delivering elements of the project will comply with the requirements of this plan throughout the duration of the Project.

Design QA/QC Approach and Staffing

Design Manager, Mike Hooshangi, PE will establish, oversee and update the design QA/QC program for all disciplines involved in the design of the Project and will report to the DBPM. Lara Hegler, PE will lead the QA staff and will report to Mr. Hooshangi. Ms. Hegler is responsible for the QA of design elements included in the Project and will perform a complete QA review of all design documents. QC staff will also report to Mr. Hooshangi. Design QA/QC functions are anticipated to involve 40 staffing assignments which will vary as the Project design progresses. QA responsibilities and procedures will be separate from the QC roles and both will be detailed in the Design QA/QC Plan. QA staff assignments will be independent from design production and QC functions. The QA and QC teams will each implement a section of the Design QA/QC Plan which will stand alone and can be read independently for QA or QC. Mr. Hooshangi will implement design QA/QC by adhering to the approved Design QA/QC Plan including conducting design reviews, completing interdisciplinary coordination, performing constructability reviews, involving VDOT in the overall design review process, and seeing that all design and field changes follow the same QA and QC procedures. Mr. Hooshangi will verify conformance of submittals to the Design QA/QC Plan prior to submission.

Design QA/QC Plan

The Design QA/QC Plan will establish the following:

- Well-structured record keeping and document control, **minimizing VDOT contract administration efforts**
- QC procedures for contract compliance, preparing, checking, and correcting all drawings, specifications, calculations, and other design submittals prior to submission;
- QA procedures for evaluation of problem assessment, applied analysis and personnel qualifications

- **Specific QA and QC procedures and staffing assignments for specialty structures such as the modifications to the existing bascule span on the existing High Rise Bridge and the design of the tall piers and long spans on the new High Rise Bridge;**
- Procedures to require that all drawings, specifications, and other design submittals are signed and sealed by an appropriate licensed professional (Professional Engineer, Land Surveyor, Architect, or Landscape Architect) holding a valid license in the Commonwealth of Virginia;
- The level, frequency, and methods of review for the adequacy of the design of the Project, including methods for completing independent reviews of final drawings, specifications, and other design submittals
- Procedures for coordinating work performed by different persons in the same or adjacent area, fabrication shops, casting yards, and other pertinent fabrication facilities to ensure that conflicts, omissions, or misalignments do not occur between drawings or between the drawings and the specifications and to coordinate the review, approval, release, distribution and revision of documents involving such persons;
- **Procedures for identifying design elements that require special construction QA and/or QC attention or emphasis such as ground improvements or deep foundations for structures;**
- Identification by firm, discipline, name, qualifications, registrations, duties, responsibilities, and authorities for all persons and entities assigned to be responsible for design QA or QC activities, including sub-consultants.
- Design QA/QC functions, including scheduled activities for design QA and QC, identifying the drawings, specifications, and other design submittals to be submitted to VDOT for review at each stage of the design work.
- The Design QA/QC Plan will include QA and QC procedures for right of way appraisals, data entry, and VDOT's Right of Way and Utilities Management System (RUMS), including completeness of contract information, utility agreements, and surplus property data.

The RCE will ensure that engineering services are performed by qualified professionals and that all drawings, specifications, and other design submittals are signed and sealed by an appropriate licensed professional holding a valid license in the Commonwealth of Virginia. The QAM will require that all design related Work Packages submitted for payment have been certified by the Design Manager as being in conformance with the contract documents and the Design QA/QC Plan.

Design Quality Reviews. The LMB Team will utilize a QA/QC design log to track the completion of design and the status of QA and QC reviews. Each review is tabulated on a review summary form, which indicates by signature that the QA and QC Reviewers have completed their respective reviews and that the Design Manager has confirmed that all review comments have been properly incorporated into the design documents. The review documents, including the review summary form, become a permanent part of the project files. **Quality reviews will be conducted for any design changes that may be necessary during construction resulting in a reduction of VDOT's review level effort.**

Right of Way and Construction plans will be accompanied by 1) a completed VDOT LD-436 Quality Control Checklist for the specific submittal, and 2) a written notice signed by the Design Manager that includes the following:

- The logical subsections or work packages for which review and approval is being requested;
- Confirmation that the submittal has been checked and reviewed in accordance with LMB's approved QA/QC Plan; and
- Confirmation that the submittal either meets all requirements of the contract documents and reference documents or that any deviations have been identified and previously approved by VDOT.

Interdisciplinary Coordination and Constructability Reviews. The interaction and coordination amongst the various pertinent design disciplines will be the responsibility of the Design Manager. The Design Manager will

conduct interdisciplinary reviews weekly during design of the Project with all relevant disciplines for proper coordination and consistency between the discipline interfaces (e.g., geotechnical with bridge foundations, roadway layout with bridge layout, pavement marking and signing with roadway plan/layout), and to mitigate or eliminate conflicts, errors, misalignments, and/or plan inconsistencies before they get into the field under construction.

Constructability reviews are a critical component of the LMB Team's QA/QC program. By holding these reviews our Team is able to address construction issues as the design is being advanced, which **will minimize RFIs and field issues during construction**. Our Team will hold weekly internal design meetings that will be attended by construction staff. These weekly internal design meetings will give the construction staff an opportunity to review the design for constructability and provide immediate feedback regarding the design so that appropriate adjustments can be made. Prior to each plan submission, a formal constructability review will be scheduled and comments will be provided to the Design Manager for incorporation and/or further discussion prior to completing each design phase.

Design changes, including field changes, will conform to the same design QA and QC measures and procedures with those that were applied to the original design portion of the Project being changed; however the RCE will be directly involved and have control authority when making and approving these changes. Design changes, including field changes and nonconformance evaluations, will be maintained in a database to track design and field changes and update the as-built documents.

Construction QA/QC Approach and Staffing

Construction QA/QC is established in our Construction Quality Management Plan (CQMP) to ensure clear and complete procedures for construction inspection, testing and the oversight of the project and its processes. **Our CQMP will operate with real-time data collection and on-site reporting**. All Team members as well as the subcontractors and suppliers for the Project will be required to submit corresponding Quality Plans ensuring compliance with our CQMP. Any variance from the Project standards will not be tolerated; and as such, continuous audits will be performed to verify adherence to the CQMP.

Streamlined Processes
Our CQMP provides a streamlined process thus reducing the on-site commitments of VDOT.

Construction Quality Control (QC). Management and leadership will be provided by the Construction QC Manager and ultimately with the DBPM. All work will be in accordance with the CQMP derived from the LMB Team's in-house construction QC Plan, the requirements of the RFP and VDOT's QA/QC Manual. The CQMP addresses every task, operation, and completed activity. Continuous assessments of all activities will be made throughout construction, and when necessary, adjustments to methods or materials to achieve the required quality levels will be made. Mandatory preparatory meetings, including all design, construction, and VDOT personnel, will take place prior to commencing an activity. The meetings will be key to identifying processes and indicating the appropriate hold points that will gauge quality and ensure operations are not moving forward without confirmation. In the case of a Non-Conformance Report (NCR), we will react rapidly and adjust processes, materials, or techniques to correct and re-establish a process that is significantly improved with results meeting the Project requirements. **Our proven and robust CQMP assures quality with respect to all aspects of the Project requiring minimal input from VDOT.**

Construction Quality Assurance (QA). Led by Quality Assurance Manager (QAM), Bill McDowall, PE, the Quality Assurance program operates independently from the construction QC program and has oversight/verification responsibilities for all QC testing and monitoring activities. The QAM provides confirmation that all RFP requirements, specifications and special provisions are being met or exceeded. The independent role of the QAM provides direct information to the DBPM, RCE, and VDOT outside of the Construction QC chain of command. Additionally, QA will monitor and audit QC procedures and activities to verify proper performance. A high level of authority is given for the QAM to ensure that the Construction QA function is effective and as such **minimizes the requirement of resources and involvement by VDOT**. The

QAM is authorized to stop work on this Project if quality procedures, measures and controls are not being properly maintained.

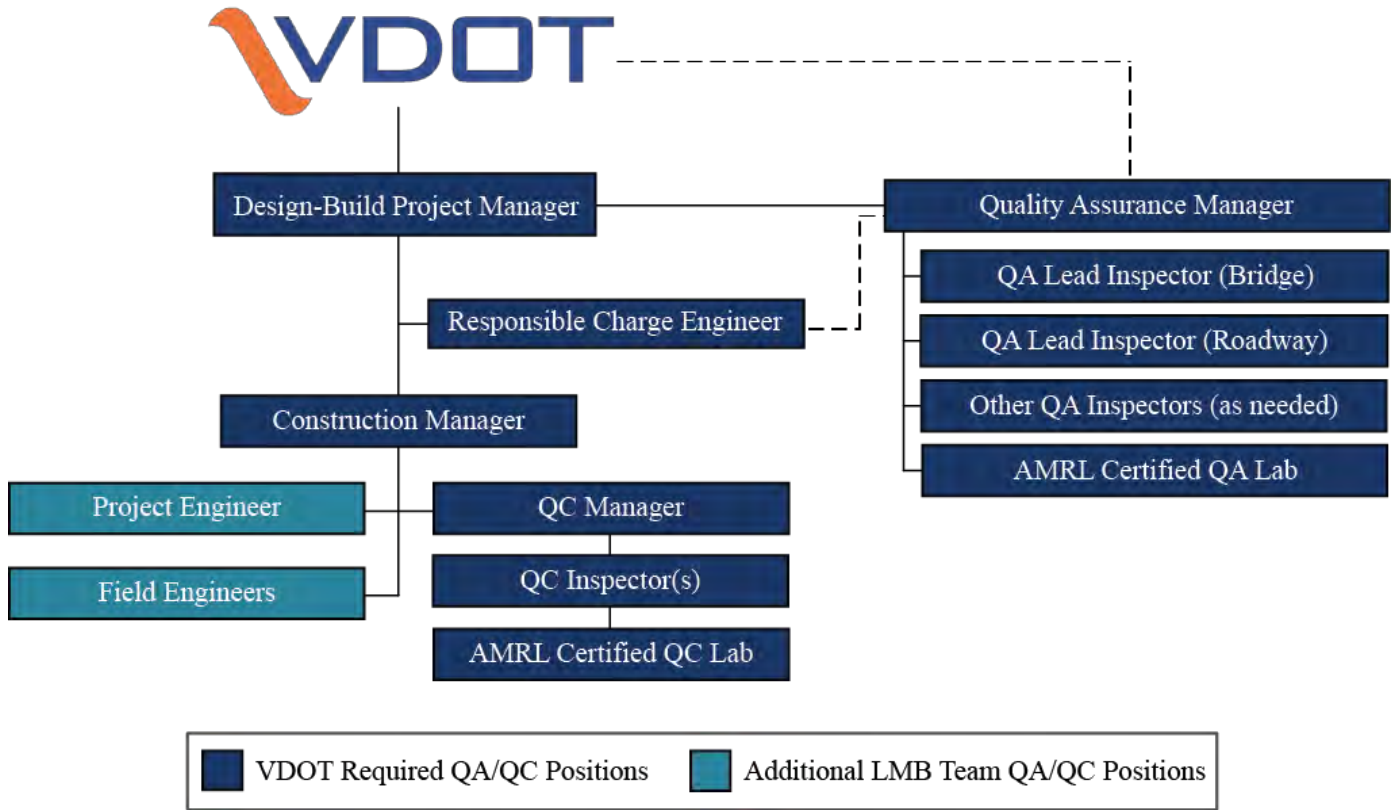


Figure 4.4.4.a. LMB's construction QA/QC Team

For a project of this size, scope, and complexity, the LMB Team realizes that our QA/QC staff must be experienced and robust to ensure we deliver a final product that meets or exceeds the requirements. The LMB Team will incorporate proven processes and procedures to standardize and streamline the construction quality approach. The procedures developed establish proper controls so that the Project will meet all quality requirements and contractual expectations of VDOT and will be built to meet or exceed service-life requirements. The DBPM will have ultimate responsibility to ensure that Project policies are effectively implemented. He also will ensure that the Team is staffed with knowledgeable and dedicated people who are committed to designing and constructing this Project.

The construction quality team will consist of three entities, as depicted in the figure on the following page.

Performing the QA/QC as prescribed by LMB will avoid VDOT having to augment the Quality effort with additional resources. The implementation of our Quality system is comprehensive and imposes responsibility on our team at all levels. LMB anticipates having between 30 and 35 individuals (see Figure 4.4.4.a) actively involved in the Construction QA/QC side of the project. Our QMP is a core component of the LMB team overall management approach.

The Construction Quality Team



Field Engineers

Field Engineers will conduct in-progress surveillance checks on work to verify that the work is installed per the work package and the design documents.



Quality Control

LMB-employed inspectors will monitor the construction work for compliance during installation and receipt of equipment and material.



Quality Assurance

An independent firm will perform inspections, third-party testing activities, audits, and surveillance on work processes and procedures.

Construction Field Engineers (FEs) will perform in-process surveillance inspections on construction activities under their work areas according to the inspection and test plans (ITPs). **Performing in-process quality surveillance is a proactive approach that identifies potential quality concerns before they become an issue and impact schedule, cost, or impact VDOT staff.** In-process inspections assist in the LMB Team's "right the first time" philosophy. FEs are responsible for QC of the construction and fabrication activities and for making sure that equipment and facilities are erected and installed in compliance with Project plans, specifications, and other appropriate requirements.

The **Construction Quality Control Manager (CQCM)** ensures that inspectors and FEs **know the requirements of the Contract and are adhering to the design requirements toward a quality finished product, resulting in less VDOT oversight being needed.** The CQCM works closely with the FEs. The CQCM and his inspectors will perform inspections on finished work products in line with the ITP. The CQCM also is responsible for the review of subcontractor QC documentation to ensure its compliance with the Project requirements. QC Inspectors examine ongoing work as required per the ITP. FEs will coordinate with the QC inspectors to verify and confirm that work is constructed in accordance with the requirements

The CQCM, in coordination with the QAM, is responsible for preparing the ITPs, which will be prepared in consultation with the FEs.

For each identified inspection and test, the ITP will include:

- A list of inspections and tests to be performed.
- Specification paragraphs containing the inspection or test requirements.
- Responsibility for performing inspection and testing.
- Schedules for inspections and testing.
- A list of the independent test laboratories, specialized equipment, and/or personnel training or qualifications required.
- Source inspections.

Coordination is key to the success of a quality project. Upon transition from the design phase to the construction phase, the design organization will evolve into a delivery function supporting construction of the new project. With design personnel integrated into the construction team, the LMB Team will be an effective and cohesive team focused on compliance with quality requirements.

The **QAM** has overall responsibility for the development of and adherence to the QA/QC Plan. **He will manage and direct action on all quality matters, will schedule and coordinate all QA audits and prepare and submit monthly quality reports to VDOT in a format that will minimize VDOT review time.** The **QA inspectors (Bridge and Roadway)** will be responsible for QA testing and/or inspection of items of work for conformance with plans and specifications. The Quality Manager will manage and direct action on all quality

matters and will schedule and coordinate all QA audits and prepare and submit monthly quality reports to VDOT. Audits will be conducted internally and on subcontractors throughout the life of the Project. The Quality Manager will oversee and ensure follow-up, documentation, and positive closure of all observations and findings arising from Quality Audit and inspection activities.

Project management, including JV executives, will participate in monthly walk-throughs of the Project to observe work in progress and recognize craft and subcontractors performing good quality practices. Our policy is to reward personnel for actions that drive good quality behaviors.

QA/QC Procedures for Critical Element on High Rise Bridge – Driven Pile Foundations:

The prestressed concrete piling for the High Rise Bridge is a unique and critical element of the project due to the multiple layers of design discipline interaction, volume of construction work and critical position in the construction schedule. The design of the piling integrates the hydraulic design/scour depth, the added loading demands from vessel impact, geotechnical investigation/design and structural analysis/design. Additionally, the solution that will meet these design requirements must be coordinated with construction staff to validate installation means and methods to the required depth to achieve vertical and lateral capacity. It is critical that each of these items are completed, properly coordinated, integrated, submitted and approved such that delivery is coordinated for construction to begin upon receipt of permits.

Design Perspective. QA/QC for the foundation design for the new High Rise Bridge is critical to the Project to ensure the longevity, sustainability, performance, durability, and minimization of future maintenance. The Design QA/QC Plan will specifically address the following procedures for the driven pile foundations:

1. For each of the individual disciplines involved (Geotechnical, Hydraulics, Structural) with the bridge foundation implementation of the Design QA/QC procedures in compliance with VDOT QA/QC including but not limited to detailed checks of the design, including all calculations, drawings, specifications, reports, shop drawings, WEAP driveability analysis and other required foundation piling deliverables.
2. Complete interdisciplinary coordination checklist to summarize key elements for each discipline are in compliance.
3. Review by STV's National Director of Bridge Engineering (soil structure interaction analysis, interdisciplinary coordination, vessel impact analysis, structural analysis and constructability for the foundation).
4. Design QA review
5. Design Manager verifies compliance with Design QA/QC Plan

The summary procedural steps above for the foundation piling will minimize the need for expansion of VDOT's contract administration efforts and provide a durable solution which reduces maintenance.

Construction Perspective. A critical element of the new High Rise Bridge structure is the fabrication and installation of the deep foundations. Foundation piling will be precast off-site and transported to the Project. Piling will be plant inspected by VDOT inspection personnel for QA/QC during fabrication once design has been accepted.

Submittals for all piling such as shop drawings submittals, source of materials submittals, plant inspection reports, and all submittals pertaining to piling will be reviewed for completeness in accordance with design specifications and source of materials.

Prior to beginning work, a preparatory meeting will be held to verify all submittals have been received and accepted. Specifications will be reviewed for driving the pile relating to proposed tip elevations, pile capacity, and pile hammer size. The LMB Team will present the plan for installing the pile including the lift plan for handling large piling. Personnel performing blow count monitoring will be instructed on practical refusal of the pile in accordance with design criteria.

Upon delivery to the site, the piling will be inspected for damage occurring during transport and handling. Any damage will be documented and a deficiency report generated. Should any damaged piling be noted, it will be analyzed by the design team and will only be incorporated into the bridge with the design engineer's approval.

During driving operations, the QC staff will continuously monitor and record blow counts until piles reach the minimum tip elevation and satisfies pile driving criteria. QA staff will monitor pile operations daily to verify QC operations and accuracy of documentation. Wave analysis of piling will be conducted by appropriate testing personnel and monitored by QC and QA staff. Any piling failing to meet design criteria will be found in non-conformance and the LMB Team will present a recovery plan to rectify the non-conformance. The QAM will review the recovery plan and in conjunction with design engineer's recommendation and approval, will either accept or reject the plan and the pile. Splicing, if required, will be performed in accordance with the design procedures and Section 403.03 of the Road and Bridge Specifications.

Upon completion of pile driving at any location, the QC staff will perform center of gravity calculations to verify all pile in a group are located correctly in accordance with Section 403 of the Road and Bridge specifications. If the center of gravity is found outside acceptable tolerance, a non-conformance report will be generated and the LMB Team will present a recovery plan.

All inspections will conform to the VDOT's QA/QC Manual. Due to the critical nature of the deep foundations for this project, QC and QA will continuously monitor all piling operations independently. By complying with the requirements included in VDOT's QA/QC Manual and other applicable VDOT standards, and by implementing the robust proposed LMB quality plan, the Project can be carried out in accordance with the RFP requirements with minimal VDOT intervention.

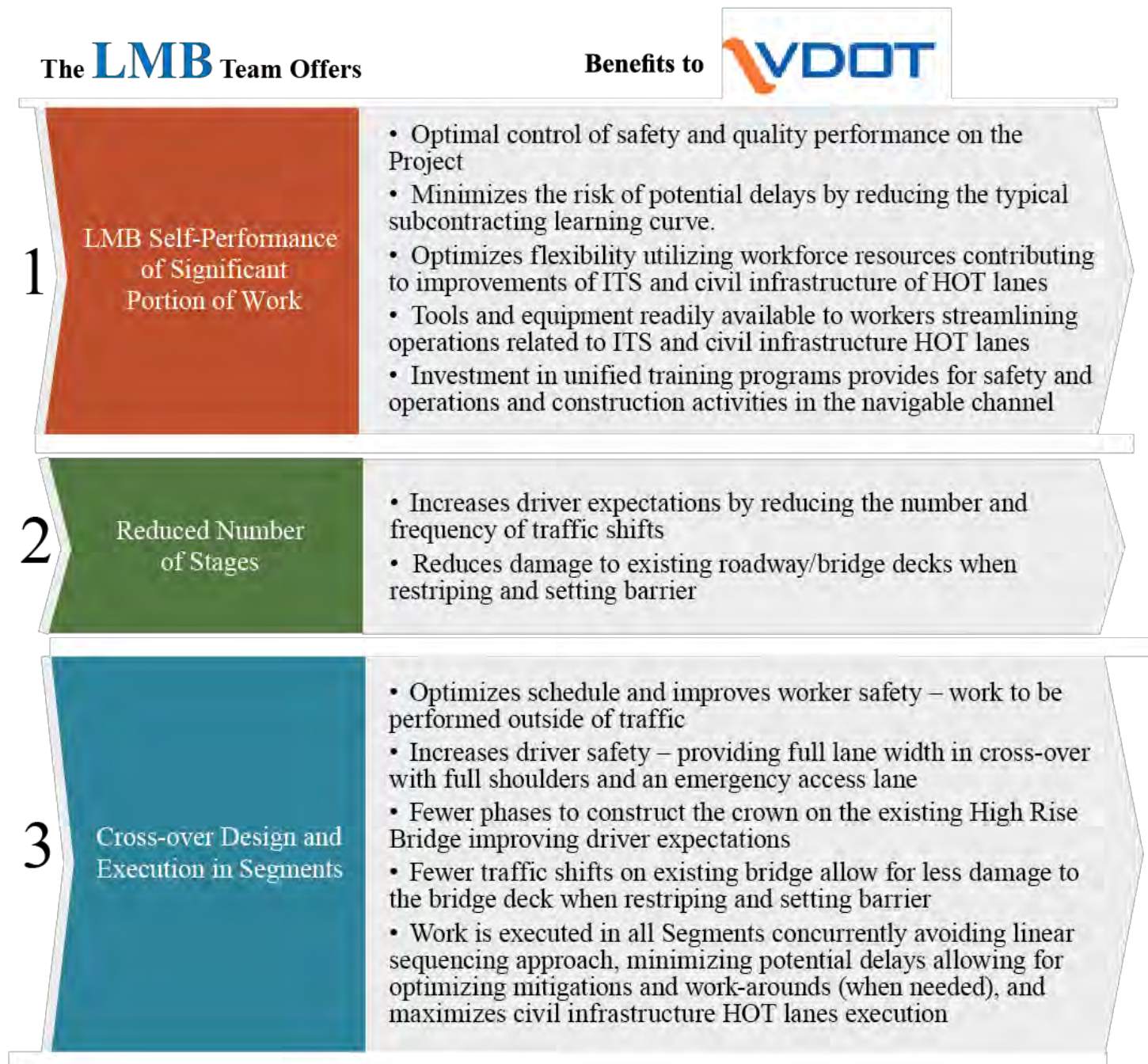
QA/QC during the foundation construction of the new High Rise Bridge will lead to the longevity, sustainability, performance, and durability necessary to allow the bridge to function with minimal need for future maintenance. By utilizing long-standing construction means and methods and an assertive QA/QC effort, the role of VDOT will be minimized to the greatest extent possible.



4.5 - Construction of the Project

4.5 | CONSTRUCTION OF THE PROJECT

The construction operations for the Project will be a well-coordinated effort that will employ appropriate means and methods to complete all work while maintaining safe and efficient movement of traffic throughout the Project corridor. The LMB Team’s approach to this Project involves organizing a team that will execute through state of the art equipment, highly-skilled personnel, exceptional technical knowledge and expertise that when set into motion and properly guided and directed will drive the means and methods used to deliver the Project successfully. Adherence to a Project-specific and established Project Management Plan (PMP) will be the hallmark of our performance. The LMB Team’s capacity to self-perform a significant portion of the work provides the control that is needed to ensure timely delivery. Additionally, no construction activity will proceed without assurance that all safety and environmental protection measures are implemented. **The LMB Team’s capacity to self-perform a significant portion of the work provides the control that is needed to achieve a timely Project.**



4.5.1 Sequence of Construction

General Sequence of Activities

Construction operations are organized logically and systematically into three Segments of the Project alignment, each with established stages of work. Each Segment is specifically established to achieve, without delay, our Final Completion Date of July 30, 2021. Dividing the Project into strategically-defined Segments allows the LMB Team to **effectively coordinate our design and construction elements** and **efficiently manage the resources required for environmental permitting, ROW, stakeholder coordination, safety and utility relocations**.

Segment 1 consists of the portion to the West of the proposed new High Rise Bridge. **Segment 2** encompasses the new and existing High Rise Bridge and **Segment 3** involves the alignment located to the East of the new High Rise Bridge. Segments have been further divided into sub-segments based on similar constructability attributes. The construction widening has been staged to reduce impacts to the traveling public by limiting the number of traffic shifts per segment along the alignment. A total of two traffic shifts along the mainline will be performed to construct the new HOT lanes. The first shift will be towards the outside to construct the median portion, traffic will then be shifted onto the new HOT lanes footprint to install the final roadway features, noise wall, and complete bridge work. In addition, during construction a minimum 9-foot wide shoulder has been provided throughout the project limits (except in bridge locations where 2-foot wide shoulders are provided) providing adequate space to accommodate disabled vehicles and emergency access.

Full depth construction of the ramps and CD roads have been staged with traffic shifts to avoid long-term lane closures and high traffic volume impacts (Segments 1 and 3).

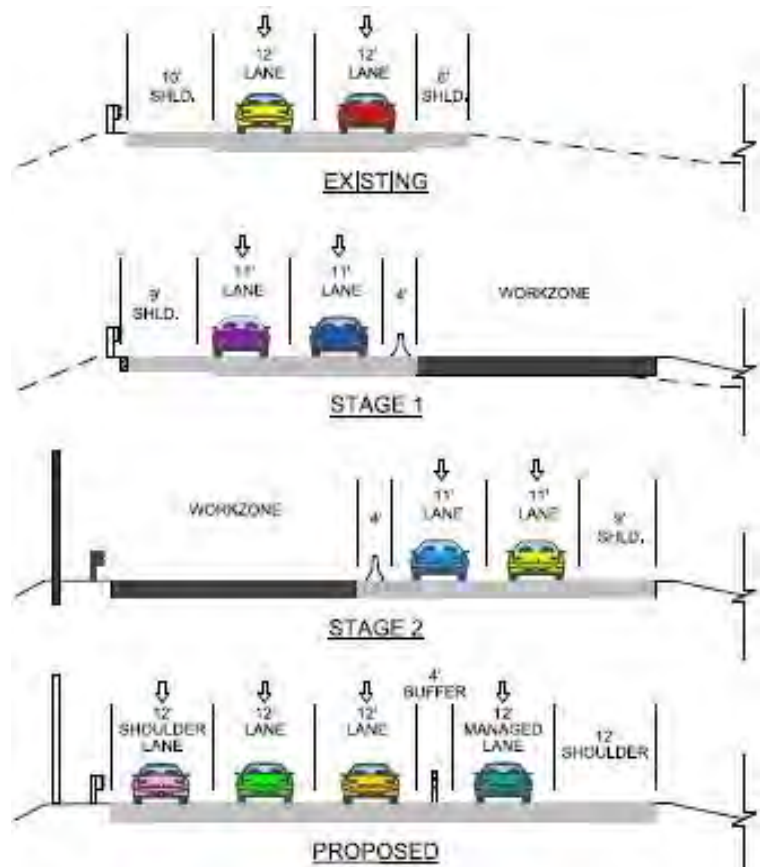


Figure 4.5.1.a. MOT Typical (except at ATC-2)

Due to the restricted cross-section of the existing High Rise Bridge, the modifications to the existing bridge will be constructed utilizing a crossover of the EB I-64 traffic onto the WB I-64 lanes after the new High Rise Bridge is completed. The crossover eliminates the need for multiple shifts to build the new crown on the existing High Rise Bridge; thus, providing a safer environment for both drivers and construction crews.

The ITS infrastructure, conduits, and cabling will remain operational throughout the sequence of construction. At locations with potential impacts to the system, the ITS will be relocated to either its permanent location outside of any construction impacts, or it will be located in a temporary location outside of any construction impacts. The system will therefore be able to monitor traffic conditions and safety throughout the corridor. The HOT Lanes ITS civil infrastructure construction will begin after the HOT Lanes have been constructed and traffic has been shifted onto the new HOT Lanes, allowing for the outer roadway ITS and tolling features to be constructed.

Since transportation projects often encounter unforeseen impacts or delays that must be addressed, we have structured our schedule sequence to provide flexibility enabling us to address such issues. As further outlined in our Project Controls Plan, our Team will have a group of schedulers working under the Project Controls Manager dedicated to tracking and updating the schedule on a weekly basis and providing schedule-related information to the construction team.



Segmentation Plan and Sequence

<p>I-64 Segment 1 (West of High Rise Bridge) EB Sta. 1489+33 to 1790+19 WB Sta. 1015+90 to 1275+50</p>	<p>I-64 Segment 2 (High Rise Bridge) EB Sta. 1780+26 to 1849+33 WB Sta. 1275+50 to 1372+00</p>	<p>I-64 Segment 3 (East of High Rise Bridge) EB Sta. 1838+65 to 1950+25 WB Sta. 1368+50 to 1467+30</p>
<p>I-64 Segment 1 is broken down into 3 sub-segments (1A, 1B, and 1C) per similar geometric constraints. These segments are constructed in 2 consecutive stages.</p>	<p>I-64 Segment 2 is broken down into 3 different sub-segments (2A, 2B, and 2C) for the construction of the proposed High Rise Bridge and existing High Rise Bridge modifications. Segment 2 will be constructed in 2 stages (with sub stages).</p>	<p>I-64 Segment 3 is broken down into 2 sub-segments (3A and 3B). Segment 3A is constructed in 4 stages (with sub-stages) and Segment 3B is constructed in 2 stages.</p>
<p><u>Segment 1A - Stage 1</u> Traffic Shifted out to construct the inside widening for the I-64 HOT Lanes within the median. Complete Managed Lane Bridges (B-664/B-665 & B-666/B-667) over Military Highway and Yadkin Road.</p> <p><u>Segment 1A - Stage 2</u> Traffic shifted in to construct proposed roadway features and remaining full depth pavements. Final overlay and pavement markings will be installed at the end of the staged work. Construct Noise Barriers 4-5.</p> <p><u>Segment 1B - Stage 1</u> Traffic shifted out to construct the inside widening for the I-64 HOT Lanes. Widen Bridges (B-668 & B-669) over Shell Road.</p> <p><u>Segment 1B - Stage 2</u> Traffic shifted in to construct proposed roadway features and remaining full depth pavements including the outside Hard Shoulder Running Lane. Final overlay and pavement markings will be installed at the end of the staged work. Complete bridge widenings (B-668 & B-669) over Shell Road. Construct Noise Barriers 4, 5, 6, 7 & 8.</p> <p><u>Segment 1C - Stage 1</u> Traffic shifted out to construct the entire paved median section for the I-64 HOT Lanes.</p> <p><u>Segment 1C - Stage 2</u> Traffic shifted in to construct proposed roadway features and remaining full depth including the outside Hard Shoulder Running Lane. Construct the tie-in from the existing I-64 alignment to the proposed I-64 High Rise Bridge. Construct temporary median crossover for use in later stage. Construct Noise Barriers 7 & 8.</p>	<p><u>Segment 2A - Stage 1</u> Construct proposed High Rise Bridge Abutment A to Pier 4, superstructure Span A to H (Unit 1). Construct the West side of the Temporary median crossover to be utilized during Segment 3A, Stage 4. Median barrier & all final roadway features will be installed after all work in Segment 3A Stage 4 is complete.</p> <p><u>Segment 2B - Stage 1</u> Construct proposed High Rise Bridge Pier 5 to Pier 19 and superstructure Span I to S (Units 2 & 3).</p> <p><u>Segment 2C - Stage 1A</u> Construct High Rise Bridge from Pier 20 to 30. Begin construction of superstructure spans T to II (Units 4 & 5). Libertyville Road to be closed (with VDOT approval of detour), a detour will be provided until completion of HRB and the reconstruction of Libertyville Road are complete.</p> <p><u>Segment 2C - Stage 1B</u> Shift I-64 EB & WB traffic North to construct High Rise Bridge from Pier 31 to Abutment B after Segment 3A - Stage 1A. Libertyville Road to remain closed with VDOT approval of detour.</p> <p><u>Segment 2 - Stage 2</u> Open new High Rise Bridge and utilize temporary median crossover per Segment 3A - Stage 4. Construct existing High Rise Bridge modifications. Concurrently construct proposed Libertyville Road.</p>	<p><u>Segment 3A - Stage 1A</u> Shift traffic out to construct temporary pavement in median for use in Segment 2C Stage 1B.</p> <p><u>Segment 3A- Stage 1B</u> Shift traffic in from the East abutment of the existing High Rise Bridge to approx. Sta. 1860+50 and begin construction of Noise Barrier 10. Shift traffic out from approx. stations 1399+00 to 1407+50 to construct the temporary median crossover to be utilized in a later stage. Begin the construction of Great Bridge Blvd Bridge (B-663) Abutments A, Abutment B and the spans over I-64.</p> <p><u>Segment 3A- Stage 1C</u> Continue construction of Great Bridge Blvd Bridge (B-663) Abutments A, Abutment B and the spans over I-64. Shift traffic out to construct permanent median roadway features. Stage concurrent with Segment 2C Stage 1B.</p> <p><u>Segment 3A- Stage 2</u> Continue construction of Great Bridge Blvd Bridge (B-663) Abutments A, B and the spans over I-64. Shift WB I-64 Lanes north to construct the re-alignment and HSR lane from High Rise Bridge Abutment B to the Exit Ramp to Great Bridge Blvd and Noise Barrier 9. Stage 2 and its sub-stages run concurrent with Segment 2C - Stage 1B.</p> <p><u>Segment 3A- Stage 2A</u> Complete the construction of the re-alignment of WB I-64 Lanes and HSR, from High Rise Bridge Abutment B to the Exit Ramp to Great Bridge Blvd and Noise Barrier 9. Complete construction of the I-64 WB Exit Ramp to Great Bridge Blvd realignment, the Great Bridge Blvd Realignment and associated signal work. Construct portions of ITS infrastructure, as well as, Noise Barriers 10, 11, and 12.</p> <p><u>Segment 3A - Stage 2B & 2C</u> Complete the full depth pavement construction under I-464 overpass for the C-D Lanes and thru lanes. Construction is split between WB Stage 2B and EB Stage 2C.</p> <p><u>Segment 3A - Stage 3</u> Shift EB traffic to ultimate alignment and WB traffic south to construct proposed roadway features and remaining full depth pavements for median section. Demolition of the existing Great Bridge Blvd. bridge must be completed by the end of Stage 3. Complete construction on portions of Noise Barriers 10, 11 and 12 and all outside roadway features including the remaining portion of the EB Hard Shoulder Running Lane.</p> <p><u>Segment 3A - Stage 3A</u> Shift WB traffic onto new High Rise Bridge. Construct all remaining median roadway features west of Great Bridge Blvd.</p> <p><u>Segment 3A - Stage 4</u> EB traffic utilize temporary crossover, complete all remaining roadway features and HSR on the north side of I-64. Concurrent with Segment 2C Stage 2</p> <p><u>Segment 3B - Stage 1</u> Construct widening for the CD Lanes for the EB I-64 Exit Ramp to Battlefield Blvd and Noise Barriers 13B & 15. Begin the construction of the realigned Bulldog Drive.</p> <p><u>Segment 3B - Stage 2</u> Complete the widening for the CD Lanes for the EB I-64 Exit Ramp to Battlefield Blvd. Complete the realigned Bulldog Drive construction. Final overlay and pavement markings will be installed at the end of the staged work.</p>

Segments 1A, 1B, 1C, and 2A - Stage 1: I-64 West End Mainline Median

Utilizing overnight single lane closure operations; the LMB Team will construct approximately one foot of temporary pavement along the outside shoulder in locations with an existing shoulder width of less than 11-feet. Traffic will be shifted to the outside, providing two 11-foot lanes. **The entire median section will be constructed behind Traffic Barrier Service (TBS) for safety of workers and the motoring public**

In the locations of I-64 crossings at Military Highway and Yadkin Road new bridges for the managed lanes will be constructed by dedicated teams in tandem with earthworks fill operations to bring new median roadway up to elevation. Fill operations from established borrow pits will commence soon after clearing followed by inside widening for I-64 HOT lanes and widening of the bridge at Shell Road.

Along the limits of ATC-2, the entire paved median section for the I-64 HOT lanes will be constructed outside of traffic minimizing railroad coordination due to single span bridge design at Yadkin Road as well as providing added safety to workers and traffic by creating a separation between the work and traffic.

Between approximate Sta. 1278+00 to 1285+00, existing median pavement will be prepped for use in a later stage of construction as a temporary traffic crossover.

Segments 1A, 1B, 1C, and 2A – Stage 2: I-64 West End Mainline Outside Roadway Features & Noise Wall

Once Stage 1 construction is complete, traffic will be shifted inside to the HOT lane and adjacent shoulder constructed in the previous stage. TBS will be placed along the outside shoulder and two 11-foot lanes and one 9-foot wide shoulder will be provided. Noise Walls #2, #4 and #8, guardrail, signs and lighting, ITS infrastructure, any remaining full depth roadway construction, and other final roadway features will be constructed behind the traffic barrier service. **Final overlay and pavement markings will be installed at the end of the staged work utilizing single-lane, off-peak lane closures to minimize disruption to the motoring public.**

To construct the full-depth section of I-64 at the Route 17 intersection, traffic will be shifted towards the median leaving a 2-foot buffer on each side of the proposed median barrier while maintaining two 11-foot travel lanes at all times. Route 17 on-off-ramp entrances and exits will be shifted towards the median to provide enough room for full-depth construction while still maintaining ramp movements.

The LMB Team will build construction access within the area of the western peninsula of land at the west approach with access to this area supported by a pre-arranged construction easement to be secured by contract agreement. The Special Design Retaining Wall including ground modifications will be constructed. Permanent construction of the new High Rise Bridge will start with piling at Abutment A, and continue toward the water. While the marine crews drive piles from barges, the Segment 2A crews will install sheeting and construct a trestle at Pier 5 allowing the pile crew from Segment 2A to drive the piles at Pier 5 from land. Retaining wall crews will construct the retaining wall at the bridge approach starting with ground modifications involving rigid inclusion columns followed by MSE walls, while the structural crews continue to drive piles and construct the substructure. When the retaining wall is substantially complete, the structural crews will return and complete Abutment A. Erection of concrete girders is followed by the installation of diaphragms and concreting of decks in Unit 1. The Segment will finish by constructing the approach roadway, and installing ITS, signs, lighting, permanent pavement markings and landscape elements.

Segment 2B –High Rise Bridge: Pursuant to acquiring the required permits, the LMB Team will mobilize the marine equipment and concurrently the Team will locate and mark the submarine cable. We will use two pile crews working at opposite ends of the Segment from Piers 5 to 19 moving towards the middle. The LMB Team will commence the piling work by installing the special design precast footing soffits at an elevation near mean high water to be used as the pile driving template. These soffits will be supported by a pile supported falsework beam system that can be lowered to the final bottom of soffit grade elevation of 1-foot below mean lower low water, after the pile installation. Piles will project 4-feet into the CIP pier foundations to accommodate this work. Once the piles are driven and the precast special design soffits lowered to grade, we will use two foundation crews working sequentially with the pile driving crews to form and place the foundations. The two foundation operations will work toward each other, until they converge at Pier 15.

The remaining substructure operations will then start at Pier 6, and work in the direction of Pier 19. The LMB Team is considering use of a barge-mounted concrete batch plant including a placing boom plus supporting material barges for uninterrupted supply of cement and aggregate.



Figure 4.5.1.b. Special design precast footing soffits on the Elizabeth River

After substructure construction, the bridge girder erection operation will commence. Subsequently, superstructure operations including deck pans, diaphragms, overhangs, edge forms and steel reinforcement installation will follow girder installation working from superstructure Unit 2 to Unit 3. Precast girders will be transported via local roads and barges. Deck pours for Unit 2 occurs in the late Fall of 2019, while deck pours for Unit 3 will follow in the Spring of 2020. Under-deck electrical and ITS conduits start after the deck placements, while parapets for Units 2 and 3 will start after the curing of the deck. Bridge lighting, cable trays, deck grooving, ITS and sign structures will start after the completion of the deck concrete work. These are the last construction activities required for opening the bridge to vehicular traffic. Channel navigational lights and the FRP fender system installation will start after the completion of superstructure work to protect the bridge footings. These activities are not required for opening

the new High Rise Bridge to vehicular traffic and are therefore deferred to reduce clustering of activities at the location of the channel thereby **reducing associated safety risks for both the construction work force and the river traffic.**

Segment 2C Stage 1A & 1B – East End High Rise Bridge Approach & Libertyville Road and Segment 3A Stage 1A & 1B - I-64 from Great Bridge Boulevard to Battlefield Boulevard:

New High Rise Bridge eastside retaining wall and approach (Segment 2C) and I-64 roadway construction sequence (Segment 3A) are connected and the construction of these two Segments must be carefully coordinated to complete Unit 5 and the connecting approach roadway to meet the time constraints of the RFP. Segment 2C will start with Stage 1A - detouring and demolition of Libertyville Road based on proposed detour plans and the construction access road to provide access for cranes to safely construct the east end of the new High Rise Bridge and to construct the new Libertyville Road alignment. The LMB Team's initial analysis indicates that traffic will be diverted around the closure utilizing Great Bridge Boulevard and Bainbridge Boulevard to Dominion Boulevard. LMB understands that the closure and detour of Libertyville Road is dependent upon VDOT approval. Subsequently, the LMB Team will go to the edge of water, excavate and start the pile driving operation in support of Pier 20. From Pier 20, the sequence of construction progresses toward Pier 30. The substructure work of this abutment will follow the piling operations. While Segment 2C Stage 1A is underway, the LMB Team will install MOT and shift the traffic toward the outside shoulders and construct the temporary median from the existing bridge. Two key overlapping construction sequences will transpire after this temporary work, in order of commencement:

- Segment 3, Stage 1B - Shifting the EB traffic south, and start construction of Noise Wall #10 along the north shoulder of I-64 between the existing High Rise Bridge and Great Bridge Boulevard. The LMB Team will construct the median crossover between approximate Sta. 1399+00 to 1407+50 for use in a later stage.
- Segment 2C, Stage 1B – Remove existing median barrier and shift traffic north utilizing the temporary median constructed in Segment 3A Stage 1A to create enough room to construct the proposed High Rise Bridge from Pier 31 to Abutment B. Cross section will consist of four 11-foot lanes (two EB, two WB separated by TBS) with 2-foot shoulders. The LMB Team will install piles and construct piers from Pier 31 to Abutment B.

Segment 2C pile driving operation will be working at Pier 30 when the work from between Pier 31 to Abutment B becomes available at which time the LMB Team will immediately mobilize the pile driving operation from Pier 30 to Abutment B to drive the piles at the abutment. Following piling work, the LMB Team will construct

the MSE retaining wall on the new High Rise Bridge approach, and at Abutment B. From Abutment B, the piling operation will work toward Pier 31 so the substructure construction can continue its existing progression toward Abutment B. From this point, Segment 2C work can continue

independent of Segment 3A until the completion of Units 4 and 5. The LMB Team will construct Units 4 and 5 simultaneously, with Unit 5 staggered behind Unit 4 due to the later availability of Abutment B.

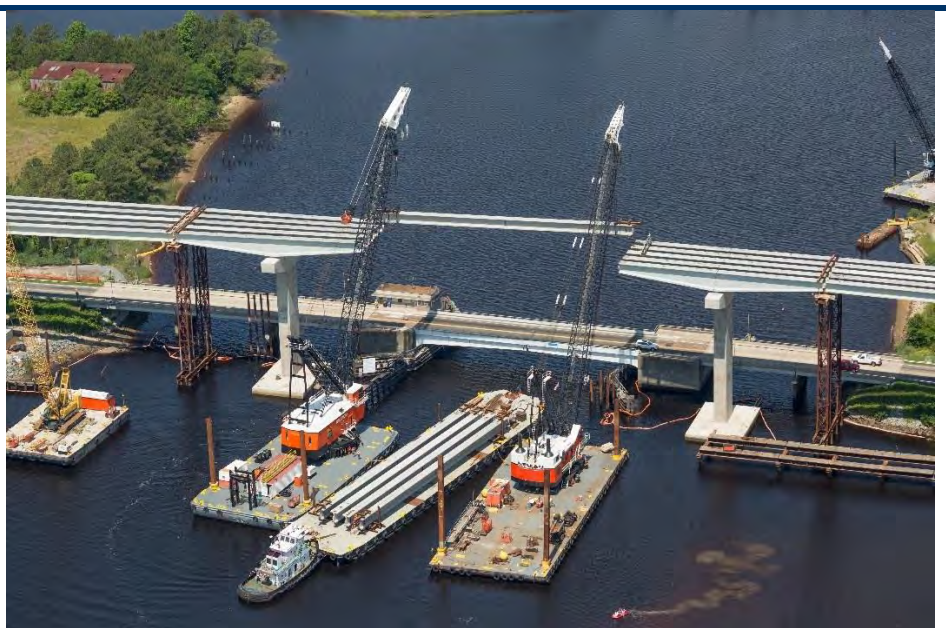


Figure 4.5.1.c. LMB Team member girder erection over the Southern Branch of the Elizabeth River. A similar method will be used on this Project.

Segment 3A Stage 1C - I-64 from Great Bridge Boulevard to Battlefield Boulevard Median:

Segment 3A, Stage 1C runs in conjunction with Segment 2C, Stage 1B. The LMB Team will shift traffic out to provide a median work zone to the eastern terminus of the Project. The LMB Team will continue work in the median constructing the permanent median features and the realignment of I-64.

Segment 3A Stage 2 - I-64 from Great Bridge Boulevard to Battlefield Boulevard Re-Alignment:

For Segment 3A, the completion of Stage 1B drives the start Segment 3A, of Stage 2 work, where the LMB Team can shift the WB traffic north, and construct the remaining re-alignment of I-64 from Segment 3A, Stage 1C to the I-64 WB off-ramp to Great Bridge Boulevard, and the remaining noise wall. This work also includes the hard running shoulder lane construction. Segment 3A Stage 2A work represents a sub-stage for the construction I-64 WB off-ramp to Great Bridge Boulevard. The LMB Team will finish the construction of the re-alignment of the I-64 WB Exit Ramp to Great Bridge Boulevard and its associated traffic signal modifications. Sub-stages 2B and 2C represent full-depth CD road pavement work at the I-464 underpass. Construction is split between WB Stage 2B and EB Stage 2C. Both stages of work shall be executed during Stage 2. For the Great Bridge Boulevard bridge replacement, the LMB Team will construct the work independent of the other Segment 3A scope. ITS construction will take place during Stages 2 (2A, 2B, and 2C). Portions of Noise Walls #10, #11 & #12 will be constructed behind traffic barrier service and installation will continue throughout Stages 2A, 2B, 2C, 3 and 4.

Segment 3A – Stage 3: East High Rise Bridge to Great Bridge Boulevard Median

In Segment 3A, Stage 3 EB traffic will be shifted to the ultimate alignment between the existing High Rise Bridge and Great Bridge Boulevard, and WB traffic will be shifted to the south to create a median work zone. The LMB Team will construct lighting, ITS, signing structures, and the remaining full-depth pavement for the median section. Segment 3A, Stage 3A represents a sub-stage for the construction of the new roadway that conflicts with the existing bridge footer. The WB traffic will be transferred to the newly completed High Rise Bridge and ultimate alignment allowing room to construct the remaining roadway features in the median from the existing High Rise Bridge.

Segment 3A – Stage 4: Temporary Crossover Remaining Roadway Features

In Segment 3A, Stage 4, the LMB Team will use the temporary median crossover constructed in Segment 3A Stage 1B, to shift EB traffic onto the WB lanes and new High Rise Bridge alignment. Moveable barrier will be provided to provide positive protection for counterflow operations. An adequate acceleration lane will be provided for the SB I-464 to EB I-64 on-ramp. This will allow for the final construction of the remaining roadway features along the EB I-64 re-alignment including the hard running shoulder facility. In addition, this will allow for the modifications to the existing High Rise Bridge, described below in Segment 2C, Stage 2 to be completed outside of traffic and within the time constraints of the RFP. Once Segment 2C, Stage 2 is complete, traffic will resume ultimate alignment and the remaining roadway features along the temporary crossover footprint will be constructed.

Segment 2 – Stage 2: Existing High Rise Bridge Modifications

Segment 2, Stage 2 work will begin after the proposed High Rise Bridge is completed and traffic has been crossed over from the EB lanes onto the WB lanes in Segment 3A, Stage 4. In this stage, the modifications to the existing High Rise Bridge will be completed and ITS elements will be installed. Libertyville Road reconstruction will start after the completion of the new High Rise Bridge.

Segment 3B – Stage 1: Battlefield Boulevard South Ramp & CD Road Full Depth

Utilizing overnight shoulder closure operation, a length of approximately 600-feet of 8-foot wide temporary pavement along the gore-side edge of the existing Battlefield Boulevard ramp will be installed prior to commencing Stage 1 activities utilizing an off-peak partial exit ramp closure operation. Battlefield Boulevard ramp traffic will be shifted north to use this temporary pavement while maintaining a 12-foot wide travel lane. Temporary TBS will be placed along the right edge-line of the ramp and a portion of the full depth pavement will be constructed behind the TBS. During short-term closures along Bulldog Drive place 4.5-feet of temporary pavement to maintain two 10-foot lanes of traffic that will be used in Stage 2 to accommodate traffic. ITS construction will take place in this area during this stage along with the construction of Noise Wall #13B and #15.

Segment 3B – Stage 2: Battlefield Boulevard South Ramp & CD Road Full Depth

Battlefield Boulevard ramp will be shifted south onto the full depth pavement section built in Segment 3B - Stage 1. The remaining full depth pavement on the gore area side of the ramp will be constructed behind barrier and the final tie-in portion will be constructed during off-peak hours. Battlefield Boulevard CD road will remain one lane and will be shifted south onto the previously built full-depth pavement from Stage 1. Temporary TBS will be placed along both edge lines of the CD lane maintaining a 12-foot wide travel lane. The remainder of the full depth pavement north of the concrete traffic barrier service will be constructed. Subsequently, use 4.5-feet of temporary pavement to shift the two 10-foot wide lanes along Bulldog Drive. Place barrier on north side of Bulldog Drive then begin construction of all elements between Bulldog Drive and I-64 CD Road. Perform modifications to the existing High Rise Bridge.

Approach to Safety and Operations

The LMB Team will make safety the top priority each day. The DBPM, Safety Manager as well as the supporting staff of Segment Safety Managers, will manage a stringent Safety Program that will empower employees at all levels to stop work anytime an unsafe action takes place. LMB's Safety Plan will be based on our proven and successful Safety Plans from other recent VDOT projects.

Proven Safety Performance
Between LANE's 495 and 95 Express Lanes projects, 9,824,436 hours were worked without any lost time injuries.

Incident Management Plan: LMB will developed an Incident Management Plan (IMP) which will define our response and management of incidents. The IMP will be developed in coordination with VDOT, local EMS, and other stakeholders to identify the protocols pertaining to those parties that will be contacted in case of an incident including coordination with the police. The IMP will be reviewed and approved by VDOT before any work zones and/or lane closures become active on the Project. This plan will consider the type of incident, estimated duration and will define key project team members, EMS and the procedures required to clear the

incidents to meet the requirements of Part 2, Section 2.10.2. The IMP will demonstrate that LMB has full control of all matters pertaining to incidents that occur within the Project area.

Further, Incident Detour Plans identified under RFP Attachment 2.10.2-2 will be used, as needed, based on the notifications received from the Hampton Roads TOC. Any other potential routes to accommodate detours will be closely coordinated with VDOT and the City of Chesapeake. These emergency response protocols will be reviewed at regular team stakeholder meetings to identify any potential improvements and/or modifications.

Four (4) wireless closed circuit television cameras will be used and maintained throughout the construction period for the use of viewing traffic operations and identifying incidents. The IMC and key members of the LMB Team will coordinate with VDOT TOC to place the cameras in appropriate locations to maximize coverage.

Our incident management team will be led by our Incident Management Coordinator (IMC), Mr. Andrew Shelton. **We will augment this team with additional personnel (who will have the required credentials and training per RFP requirements) to provide 24/7 incident management coverage of the Project.**

Efforts during Design to Avoid/Minimize Potential Safety Impacts to the Construction Workers and the Traveling Public: As previously discussed safety will be first and foremost. Our design for the Project uses an integrated approach that includes the LMB Team and VDOT. While the design team will use the Manual on Uniform Traffic Control Devices (MUTCD) and Virginia Work Area Protection Manual (VWAPM) in the development of the traffic control plan, there could be variables related to means and methods of construction that may require additional considerations in the design of the traffic control plan. By including the contractor in the early identification of these variables through the constructability review process and the weekly TWG meetings it will allow the design team to incorporate and manage safety and mitigate un-safe conditions prior to finalizing the plans. By doing so, we will **greatly improve the safety of the work zone for construction personnel and the traveling public.**

Efforts during Construction to Avoid/Minimize Potential Safety Impacts to the Construction Workers and the Traveling Public: A Zero Accident Philosophy is a belief that all accidents are preventable, predictable, and unacceptable. Implementing this attitude will increase morale for our employees and enhance safety for all, including the general public. The LMB Team consider the safety of its employees and the general public to be a matter of prime importance and we have already developed a joint policy for project safety specific to this Project.

While safety is mainly thought of with respect to construction operations, we mention above that the LMB Team will activate our safety mindset long before the work begins. During the design process, our Team will involve our operations personnel with their design counterparts so that constructability and safety procedures go hand-in-hand in plan and schedule development. At the same time, the development of our various management plans (TMP, PICP, etc.) will also take place with similar collaboration, coordination and planning meetings among design and construction personnel as well as VDOT. We will establish procedures to carry the safety requirements through all aspects of the Project, incorporating ongoing safety patrol, first responder, and incident response factors. Stakeholder collaboration will also be key in our management plans when it comes to safety.

We know that working in high traffic volumes, both day and night, involves many variables that need to be planned with the safety of our employees and stakeholders in mind. We aim to proactively address potential hazards long before losses occur and **we will never sacrifice safety for production and cost savings.** Underground utilities are similarly addressed by locating, marking and protecting them because of our required VA 811 notification supported by the of our SUE program. LMB's objective will be to achieve an impeccable safety record on the Project- we want all employees to safely go home to their families at the end of each day and to produce a safe environment for all.

Public Safety: The LMB Team mandates that the most stringent safety guidelines are established and provide proven safety leadership always starting at the highest levels of our organization to attain the zero incidents goal. During the construction sequence, we will emphasize public safety through our Public Information and Communication Plan (PICP) and reinforce travel expectations through work zones regularly to the appropriate audience. As motorists enter the work zone the signs and markings will provide clear and easily understood guidance through the Project

alignment. Our past experiences in Hampton Roads has guided our TMP and MOT plan development in such a manner that eases congestion allowing continuous and safe travel through the work zones by:

- Minimizing weaving;
- Placing linear approach and barrier patterns;
- Minimizing impacts to GP lanes during HOT lanes construction; and
- Maintaining maximum safe speeds through the corridor.

Construction Operations Over the Elizabeth River Navigable Channel

A detailed work plan for all work activities around the active navigational channel will be developed and coordinated with VDOT, USACE and USCG. This plan will outline our approach to those work activities including detailed drawings of the position of our construction equipment relative to the channel and sequence of construction for all required activities within that area. **LMB has experience working around active marine navigational channels and understands that certain activities must be performed during times of low traffic volume.** Any partial or complete channel closures will be coordinated with USCG well in advance of all those activities to allow for proper public notice to mariners.



Figure 4.5.1.d. Construction operations over active navigable channel on Southern Branch of Elizabeth River by LMB team member.

Furthermore, the LMB Team understands that partial or complete channel closures will have time of year and closure time restrictions and are contingent on USCG and USACE approval of work plans.

For this Project, there are two main operations that need to take place that will affect marine traffic. The first operation will be the erection of the structural steel girders over the channel. This work will require a drop-in or center section of the span to be erected after the girder spans are in place and require the placement of floating equipment directly in the channel. Also, this operation will be performed utilizing several individual closures of the channel during a specified period to minimize any interruptions to marine traffic and it will be performed during off hours with a maximum closure time as set forth under approved work plans.

The second major activity around the channel will be the installation of the new fender system. Fender system installation activities will take place with only partial channel closures. Our equipment will be placed behind the existing or new fender system as much as possible to perform this work. To install the fender system in front of the existing bascule piers this activity will require a partial channel closure to place the equipment to one side of the channel thereby leaving the other side open for marine traffic. For all this work, proper signage and advance warnings to the marine traffic will be required. Also, **all barges and vessels will be properly outfitted with the required lighting and our crews and vessels will constantly monitor Channels 13 and 16 to maintain constant communications with all marine traffic within the area.**

Minor operations around the navigational channel (that won't directly affect the marine traffic) include the construction of the navigational piers located each side of the channel and the bridge deck over the top of the channel. For the navigational piers, all equipment will be positioned outside the channel. For the bridge decks located directly above the channel, debris netting or other approved devices will have installed to protect the marine traffic including recreational craft from any incidental items that might fall during the deck construction.

Coordination with Railroads

LMB will coordinate construction activities with the NSRR and the local short line railroad organizations (Segments 1 and 2). A comprehensive schedule of planned activities in or over the railroad ROW will be

provided to Norfolk Southern. It will be updated as necessary to guarantee they have the requisite advance notice to provide a Radio Flagman or Line of Road Engineer.

We will plan and coordinate all overhead operations with the railroad to achieve minimal impact to the railroad operations and provide maximum safety precautions for all personnel involved. Railroad safety briefings will be conducted on-site with all Team members and training will be provided to verify everyone is familiar with the hazards of working within the railroad ROW and near any tracks, engines, or cars.

LMB has a FRA Certified Railroad Freight Conductor and Remote Control Operator on our staff who will conduct training prior to the beginning of any operations. No operations will be conducted without the direct coordination with the Railroad Safety Representative.

Following contract award, a coordination meeting will be scheduled with the appropriate railroad personnel to establish positive and direct communications between all parties, including the LMB Team, VDOT, NSRR, and our subcontractors.

Geotechnical Constraints

The LMB Team is aware of the constraints imposed by geotechnical conditions of the Project. A thorough geotechnical investigation is planned during the Scope Validation Period to confirm locations and extent of the underlying soils, and evaluate their potential for settlement.

During construction work activity at all the critical structure locations settlement monitoring will be performed to evaluate settlement magnitudes and consolidation rates, optimize potential construction impacts and to manage settlement risks.

One critical element is the retaining wall and the retained embankment fill located at the eastern approach of the WB new High Rise Bridge abutment. The controlling design factors for this wall and roadway embankment will be global stability and long-term settlement. To satisfy minimum factors of safety for this embankment, extensive ground improvement of the underlying soft clays, silts, and organic soils that vary in depth and vertical extent will be required. Rigid inclusions will be installed to support the planned embankment and MSE wall through this area.

The Yadkin Road, Shell Road, Great Bridge Boulevard, South Military Highway and new High Rise Bridge approaches will receive new fills of 10 to 30+ feet, and settlements of underlying soils could reach up to 12-inches or more. The time rate of the anticipated settlement could range up to 30-days to several months; a constraint and consideration that has been factored into our sequence and schedule for construction.

The LMB Team will have members of the geotechnical design team intimately involved during construction to properly execute in the field under control of the geotechnical team. This approach is essential to emphasize the need for an important role in settlement monitoring of the embankment and bridge abutment fills, implementation of the subgrade remediation measures, and ground improvement implementation.

Environmental Impacts

Since the Project will be constructed per our Segmentation Plan, the application for permit coverage will include the total proposed Land Disturbance Area and the total Land Development Area, including LMB's off-site facilities in the ROW, for the entire Project. LMB intends to submit a SWPPP (including a complete Erosion and Sediment Control Plan, a complete Stormwater Management Plan, and P2 Plan) subsequently covering each Segment of the Project that includes the scope and extent of land disturbing proposed for that Segment. The SWPPP for the initial phase will be submitted with the application for permit coverage. Furthermore, the individual phase submittals will be self-sustaining and not incur a deficit in post-construction stormwater management design requirements requiring mitigation on successive phases. Subsequent work phase submittals will include the required modifications to the Land Disturbance Area.

Right-of-Way Acquisition

The Project will be contained within the ROW or permanent easement limits shown on the RFP Plans. Easements for temporary construction (including slopes), permanent drainage (other than permanent drainage

easements for storm water management facilities already shown on the plans) and permanent utility easements will be identified as the design progresses and is approved by VDOT prior to land acquisition. Replacement easements for utility relocations will be acquired for those with prior rights. Utilities without prior rights will be urged to relocate within the proposed ROW saving acquisition costs.

No occupied residences or businesses need to be relocated for this Project. Based on our extensive ROW experience, not all ROW negotiations can be expected to take the same duration. Parcels have been mapped by their expected duration of negotiations and factored into the overall construction schedule. Currently, the start of Sub-Segment 3B construction activities will be driven by ROW acquisition.

Staging, Construction Access, and Storage Areas

The location of our proposed staging and storage areas is critical to the success of the construction operations. Key related issues that will be addressed specifically in our mobilization plan include:

- Safety of the traveling public as well as security for residents and employees
- Safe ingress and egress for construction vehicles, workers, and equipment to/from the construction site; large quantity of material, equipment, and supplies that will require a temporary home
- Close-proximity to the segment work areas for access and operational efficiency
- Removal from the travel ways when prohibited during non-work hours
- Adequate size to operate efficiently
- Appropriate environmental controls required for material/equipment stored
- Located away from residential areas to eliminate noise and view impacts

Our planning dictates that multiple staging sites will be required near the actual work areas of each Segment to include (staging areas will be established using sheet piles and granular base material):

- McLean's yard, located at 100 Republic Avenue located north of the High Rise Bridge for storage of bridge structural components and materials
- Bulkhead located north of the existing High Rise Bridge at the river's shoreline
- Branch Civil's laydown yard located at the end of Steele Street, near Seward Marine (for storage of barrier and aggregates)
- Anticipated Project office at 5100 Bainbridge Boulevard
- Warehouse area tentatively identified on Military Highway for materials and equipment needing climate-controlled conditions
- Area located beneath the existing High Rise Bridge east of the river and accessed from Bainbridge Boulevard for storage of bridge beams and girders and forming materials and accessories, rigging equipment, etc. (subject to approval by VDOT)

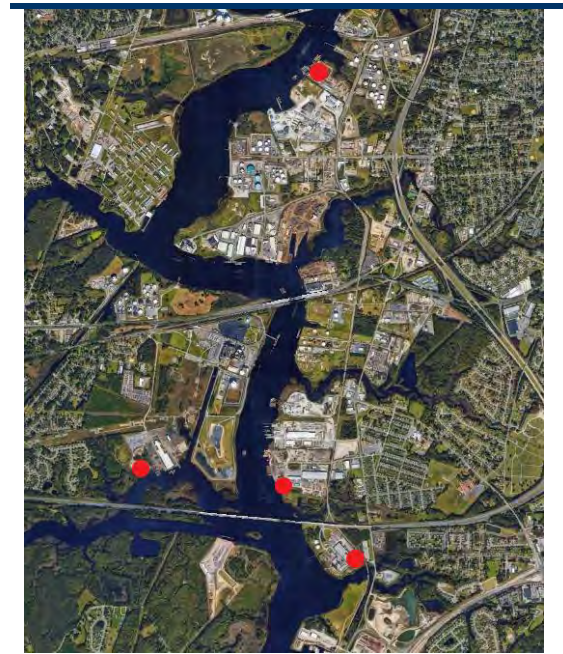


Figure 4.5.1.e. Staging, storage, and anticipated Project office locations

Intelligent Traffic Systems (ITS) and Civil Infrastructure for HOT Lanes

The LMB approach to maintaining continuous operation of the Intelligent Traffic System (ITS) is to avoid disruption of the system during all phases of construction. There are two primary areas of concern that have been addressed through many discussions within the construction and design team. The first area of concern is the installation of new gantries and cantilever Variable Message Signs (VMS) throughout the project limits. Our goal is to have the new gantries and cantilever supports in place and operational prior to taking any existing panels out of service. If necessary during cut-over and testing activities, LMB will provide temporary trailer-mounted VMS to maintain system integrity.

Our second concern is the anticipated conflict with the underground cabling and installation of proposed noise walls throughout the Project alignment. Our approach will be to relocate the cabling (existing or new) to a permanent location prior to installation of noise wall columns. It may be necessary to briefly disrupt various sections of the system to cut-over to the relocated or new cabling. These very short-term disruptions will be directly coordinated with VDOT and all other agencies to schedule the disruptions during low-volume corridor use by the traveling public.

During the design phase, the Team will work diligently to minimize the conflicts and provide alternate solutions and scheduling support to make system integrity a priority and protect the safety of the traveling public, members of the LMB Team, subcontractors, and suppliers. All construction operations will be fully briefed and our on-site supervisors will monitor all operations as we locate and protect any underground and above ground facilities to include but not limited to all cameras, power supply and cabling cabinets, interface equipment, communications circuits. In the event a camera pole or other part of the system must be relocated, a temporary camera pole, cabinet, power supply or communications cabinet will be provided until the permanent installation of the new or relocated equipment is accomplished.

Anticipating and Mitigating Potential Delays to Construction

The LMB Team has identified potential conflicts, that if not properly addressed, could cause significant impacts. Workarounds and solutions have been developed to mitigate potential issues. *Table 4.5.1.c* lists potential issues and our Team’s mitigation approach.

Table 4.5.1.c. – Conflict Mitigation

Element (s)	Location	Issue/Conflict	Mitigation/Solution
High Rise Bridge	Segment 1	Delivery of precast girders/beams to High Rise Bridge on west end	Deliver by barge to avoid street traffic and complications of off-loading on I-64; improves safety and avoids road closures
Subgrade	Segment 1	Earthwork fill for HOT lanes realignment must be completed early and expedited	Multiple borrow pits have been identified to continuously supply material
Utilities	Segments 1-3	Minimize impact due to utilities during construction period	Regular updating of the utility matrix during design to track/document the completion of adjustments/relocations
Foundations	Segments 1-3	Unsuitable soils can cause schedule impacts and delays	Investigated during scope validation; develop an Unsuitable Soils Remediation Plan
All	Segment 2	Minimize impacts due to TOY restrictions	Neutralize impact to fish by use of bubble curtains; avoid impacts to other restrictions that directly affect the critical path; employ adequate measures in the Environmental Management Plan
All	Segments 1-3	High monthly WIP average requires peak workforce of 500-600	Labor suppliers have been identified and engaged to provide craft workers based on anticipated manpower requirements
All	Segment 1	Approvals of environmental permits can potentially delay construction start of activities	A phased permitting allows Segments 1 and 3 to commence in advance of the Segment 2 permit; comprehensive Interface Plan with USACE
All	Segments 1-3	Workers/foremen parking along alignment contribute to congestion and safety hazards between heavy equipment and vehicles	A busing plan be implemented to alleviate parking of POVs in construction areas; buses will transport workers to/from established off-site parking areas

Public Involvement/Stakeholder Coordination

A comprehensive public outreach program will serve as the primary strategy to manage public opinion, understanding and acceptance of Project. The PICP will be designed to effectively inform, engage, educate and raise awareness of the Project among all interested stakeholders; reduce motorist impact during construction; emphasize work zone safety during construction; minimize potential public opposition; acclimate key audiences on the benefits and proper use of HOT lanes; mitigate or eliminate potential conflicts that may affect the successful delivery of the Project; strengthen the Team's credibility; and build and maintain public acceptance, trust and support throughout the life of the Project.

Communications Strategies: Building and managing public awareness and public opinion through a strategic communications approach will be essential to the public outreach program. Early and sustained communications to the public and key stakeholders will keep them fully informed of the project benefits, impacts, and proper use of HOT lanes. Preliminary strategies will include:

- Educate citizens on the use of HOT lanes through a host of multi-faceted communications channels.
- Maximize public interest and understanding of the project through an integrated mix of communications tactics – from media relations and community outreach engagements to interactive marketing initiatives and social media networking.
- Reduce project risks with the development of comprehensive crisis communications and risk management response plans.

PICP: The PICP will be developed in accordance with VDOT Hampton Roads District's regulations, policies and procedures, and will serve as the roadmap for all communications activities. The plan will include established program objectives, strategies and a variety of integrated public relations initiatives such as:

- ***Dedicated PR Manager/Public Information Officer (PIO)*** will be assigned to manage all public affairs initiatives in close collaboration with VDOT and the City of Chesapeake. The PIO will respond to media and public inquiries; provide Project status and traffic information to the media and public; and prepare and support the Team with crisis communications counsel.
- ***Project Brand***, complete with consistent graphics and messaging, will be developed to successfully communicate the Project benefits and impacts as well as impart consistent messages to build and maintain credibility. The Project brand will be brought to life through a host of strategically designed communications materials.
- ***VDOT/Project Web Page*** will serve as one of the Project's most valuable communications tools to inform the public and stakeholders of the latest project news.
- ***Media Relations*** will be an integral component of the public outreach plan and will include feature articles and broadcast interviews on the Project, traffic alerts, safe driving practices and Project updates to fully inform the public.
- ***On-Site Media Availability Events***, including a groundbreaking ceremony, will be scheduled to periodically to inform citizens of key milestones as well as educate citizens on the use of HOT lanes.
- ***Paid Media Placement*** among print, online, broadcast and social media outlets will be planned to effectively reach the public about lane closures, project status, work zone safety, HOT lanes and scheduling.
- ***Collateral/Print/Broadcast/Online Materials*** such as brochures, fact sheets, quarterly newsletters, project presentations, and multi-media ads will clearly convey the project brand, benefits, potential impacts and specific messages relating to the project.
- ***Social Media*** presence on Facebook, Twitter and other social media sites will afford the public and other stakeholders the opportunity to learn of the latest news, traffic, work zone safety and updates.
- ***Project Online Subscriber Database*** will be developed to send email blasts on project and traffic updates directly to interested subscribers/stakeholders.
- ***Email Blast Project Updates*** will be distributed to key industry segments throughout Hampton Roads including school systems, hospitals and medical facilities, military community, municipal entities, emergency responders, and the trucking community.

- **Public Informational Meetings** scheduled regularly throughout the project will provide project partners, the public and other stakeholders a platform on which to share project updates, primary benefits, potential impacts, opinions and potential concerns.
- **Business Advisory Committee Meetings** will be held quarterly among businesses affected by construction and the Team to exchange information, discuss Project-related issues, and ideas of how they can work together to cope with construction.
- **Civic/Community Engagement.** Presentations to civic/neighborhood leagues, area schools, and selected employers, will serve as an opportunity to share project updates and build familiarity with the Project.
- **Business E-Tool Packages** will be comprised of a variety of electronic marketing tools for surrounding businesses to send to their respective databases. Printed project materials may also be disseminated to businesses for distribution to their customers.
- **Crisis Communications/Risk Management Response.** Crisis communications and risk management response plans will be developed to anticipate and mitigate any potential concern or controversy.
- **Public Opinion Research** consisting of pre- and post-construction quantitative studies among the public and key stakeholders may be useful to determine attitudes, opinions, perceptions and general awareness levels.
- **Performance Measures** such as public opinion research can serve as a significant yardstick in measuring the success of the public outreach campaign. The assessment of pre- and post-construction awareness and opinion levels, evaluation of media coverage, and review of public comments will be key determinants in gauging the effectiveness of public outreach efforts.

Positive public opinion and stakeholder expectations can be significant influencers in the success of Project. Therefore, the development of a comprehensive public outreach plan designed to effectively inform, raise awareness, mitigate impact and emphasize the Project’s benefits to key stakeholders will serve as the cornerstone of the public communications program. **A strategic communications approach comprised of a variety of integrated communication tools, including a strong project brand identity, a proactive media relations program, and a wide range of print, broadcast and interactive communications, will provide the reach and frequency necessary to positively engage and influence all stakeholders throughout the Project.**

Government Approvals

Our Team will coordinate permit and plan approvals with government entities. This will include regularly scheduled meetings to provide status and progress updates on key approvals. Key government approval activities have already been identified and incorporated into our Proposal Schedule so that their progress can be tracked. These activities have been prioritized based upon the needs of the Project to minimize the impact to the overall project schedule. Durations on the proposal schedule were developed based upon our team’s experience and market knowledge to allow the maximum time for approvals by government agencies.

Table 4.5.1.a. Summary of Key Construction Aspects of the LMB Team

Safety and Operation	The LMB Team mandates that the most stringent safety guidelines are established and provide proven health and safety leadership at all times starting at the highest levels of our organization to ensure attainment of the zero incidents goal. Incident Management Coordinators play a key role during operations.
Construction over a Navigable Channel	Any partial or complete channel closures will be coordinated by LMB with USCG and USACE well in advance of all channel activities to allow for proper public notice to mariners. There are two main operations that need to take place that will affect marine traffic; erection of the structural steel girders over the channel and installation of the new fender system. LMB selected steel girders to aid in minimizing channel closures.
Coordination with Railroads	LMB provides comprehensive schedule of activities pertaining to the railroad right-of-way to Norfolk Southern and to insure railroad companies have the

	requisite advance notice to provide a radio flagman or Line of Road Engineer to insure safety and minimize disruption to railroad operations.
Control of Delays and Mitigation Plan	Proactive anticipation where delays can and often occur managing in advance to avoid potential delays.
Geotechnical Constraints	Thorough understanding of subsurface conditions to avoid unexpected and differing site conditions. Design attributes to avoid geotechnical complexities and optimize constructability. LMB will perform geotechnical exploration and prepare and submit its GED during the scope validation period which our Design Execution Plan will address in detail.
Environmental Impacts	Stringent compliance with applicable laws, regulations; pro-active approach with VDOT, USACE, USCG, other regulatory agencies and stakeholders to effectively manage the permitting/approval process. Individual segment permit applications.
ROW Acquisition	Capitalize on available ROW utilization to minimize the time constraints of obtaining easements and additional property and manage process of acquisition to facilitate continuous construction activities.
Staging and Storage Areas	These areas will be outlined in specific detail under our Mobilization Plan, to be located away from residential areas to eliminate noise and view impacts and of sufficient area to accommodate material supply demands of each segment.
ITS & Civil Infrastructure	Maintain continuous operation of the Intelligent Traffic System (ITS) to avoid disruption of the system during all phases of construction. Provide temporary trailer-mounted VMS to maintain system integrity and install the cabling (existing or new) to a permanent location prior to installation of noise wall columns.
Public Involvement, Stakeholder Management	All information regarding the construction schedule, temporary road closures, and other information will be communicated often and updated regularly to the public and among contractors engaged in other active projects in the area through the PICP and LMB’s consultant.
Government Approvals	Approval of permits has been given a high priority in development of our overall strategy and plan to execute the project. Attention to stakeholder coordination and management is paramount to Project delivery success.

4.5.2 Transportation Management Plan

The LMB Team has the knowledge, understanding, and experience developing Transportation Management Plans (TMP) involving major interstate and bridge projects that safely and effectively manage both traffic during construction and communications with the project stakeholders.

Maintain Traffic Through All Phases of Construction: The LMB Team will prepare a comprehensive Transportation Management Plan (TMP) consistent with the requirements of VDOT IIM-LD-241.5/TE-351.3. Since the construction of the Project is anticipated to cause sustained and substantial work zone impacts, a Type C (Category V) TMP is needed. **The TMP will be developed based on effective and efficient temporary traffic control (TTC) strategies to address the requirements of VDOT and the City of Chesapeake to identify, communicate, and minimize work zone impacts.** The TMP will make sure that all construction activities are performed in accordance with the Virginia Work Area Protection Manual (VWAPM), applicable VDOT Standards, and Part 2, Section 2.10 of the RFP.

In addition to providing detailed description of all construction phases, the TMP will address the safe and efficient operations in the work zone and adjacent roadway transportation system. This includes highways, local streets, transit facilities, residential and business communities near I-64 that will be impacted by the Project. Our TMP will focus on addressing the potential impacts to ALL users including motorists, pedestrians, bicyclists, and transit vehicles and will include a Busing Plan to provide worker access to work fronts without congestion imposed by

personal vehicles. **A comprehensive TMP incorporating robust and effective stakeholder involvement plan will lead to the successful completion of the Project on-time and within budget.**

Approach to Proposed Lane or Ramp Closures, Temporary Detours, Time of Day Restrictions: The TMP will document the required information regarding work zone speed limits, minimum allowed lane and shoulder widths, allowable lane closure hours, and construction entry/exit points including the temporary acceleration/deceleration lanes.

The TMP will reference the requirements for a minimum of 11-foot travel lanes and 9-foot paved shoulders. A one foot shy line will be provided at all locations where TBS is used. At existing bridge locations, and their approaches, a minimum of 2-foot shoulders are required. Adequate and appropriate construction signage and temporary pavement markings will be provided and maintained to safely navigate traffic through the work zone. Proper removal of the temporary pavement markings will occur when moving from one stage of construction to the next. The speed limit through the work zone shall be reduced to 55-mph through the duration of the Project and will be signed according to TE-340.1 requirements. The work zone speed limit was previously approved by the Regional Traffic Engineer utilizing the *Engineering and Traffic Investigation Work Zone Speed Limit Analysis* tool.

As described in Section 4.5.1, each Segment requires different approaches to maintaining traffic throughout construction. The sequence of construction will be incorporated into the TMP along with associated temporary traffic control plan. Some of the specific traffic control plans that will be used from the 2011 VWAPM include:

- TTC 6.1: Shoulder Closure with Barrier Operation
- TTC 7.0: Shoulder Closure with Barrier and Lane Shift Operation
- TTC 8.0: Pull-Off Areas on Limited Access Highways
- TTC 37.1: Work Operation in the Vicinity of an Exit Ramp
- TTC 38.1: Partial Exit Ramp Closure Operation
- TTC 39.1: Work Operation in the Vicinity of an Entrance Ramp
- TTC 40.1: Multilane Shift Operation
- TTC 52.1: Signing for Speed Limit and Fine Signs in Work Zones

The LMB Team has developed a sequence of construction to reduce the number of temporary lane, shoulder, and road closures to reduce the overall impacts to the traveling public. Temporary lane and shoulder closure operations will only be used for construction activities outside of the normal sequence of operation. These activities include, but are not limited to, installation of traffic control devices necessary for traffic shifts, installation of proposed guardrail, bridge pier work, delivery of materials, and pavement tie-in work. **All lane and shoulder, closures will be coordinated and approved beforehand with VDOT, City of Chesapeake, and Hampton Roads Traffic Operations Center (TOC).** The Team understands that temporary lane closures are at the sole discretion of VDOT.

The LMB Team acknowledges the lane, shoulder, and road closure restrictions as well as the Holidays identified in Section 2.10.4 of the RFP. These restrictions will be incorporated into the TMP and any deviation will be verified through the analysis of Work Zone Traffic Impact to identify appropriate mitigation and adjustment to construction schedule. It is the intent of the LMB Team to maintain all on- and off ramp operations within the Project limits throughout the construction period. As an example, the TMP will incorporate a multi-stage MOT approach (elaborated in Section 4.5.1) to stagger the mainline/C-D road widening around the on- and off ramps in Segment 3 to continuously maintain the ramp operations. The LMB Team will perform an extensive public involvement campaign to notify the traveling public of construction activities as covered in the PICP portion of Section 4.5.1. **Some of the tools the LMB Team will use to keep the traveling public informed include, but are not limited to, a Project website, portable changeable message boards, static signing, overhead DMS, and media releases.** Further discussion of the public involvement plan is identified below.

Any potential ramp closures outside the allowable hours and/or temporary reconfiguration at the interchanges will be evaluated through a detailed traffic analysis consistent with the requirements of IIM 241. In coordination with VDOT and the City of Chesapeake, specific consideration will be given to the mitigation measures that

minimize the work zone impacts to the commuters as well as local community. **The LMB Team will attend public meetings to encourage communication with the communities, as well as, keeping them informed on construction schedule and impacts to their communities and businesses.**

The LMB Team will evaluate traffic operations in respect to time of year. Heavier traffic volumes are seen in the spring and summer months due to tourist and beach traffic. **The LMB Team understands the importance of the tourism industry and will analyze traffic volumes and appropriately stage construction activities around the impacted months.** A similar exercise was performed on the Valley View Boulevard project to provide construction staging around the busy holiday shopping season. A traffic analysis was performed, coordinated, and approved through VDOT and FHWA to maintain sufficient operations along the highway and adjacent travelways.

TBS is proposed during multiple construction phases of the Project. The LMB Team has extensive knowledge and experience in evaluating the work zone channelization and barrier analysis per the 2011 VWAPM, Appendix A. The guidelines from RFP Section 2.10.3 and in conjunction with the step-by-step guidance from the Appendix A of the 2011 VWAPM will be used in the selection and application of appropriate TBS and anchoring requirements. The TBSC selected will maintain proper drainage at all times.

An analysis of the Work Zone Traffic Impact will be completed for each Segment and stage of construction, as needed. These analyses will be completed using Synchro 9.0 and methodologies consistent with the 2010 Highway Capacity Manual and VDOT Traffic Operations and Safety Analysis Manual (Version 1.0). This analysis will evaluate the construction impacts to traffic and allow our Team to identify and implement any adjustments or improvements that may be required to optimize the safety and mobility of the corridor.

Traffic signal modifications required to accommodate any detours associated with potential lane/road closures will be detailed in the TMP and any planned detour will be communicated to the public in advance. Temporary signal timings may be required to aid in the traffic operations as well as to relieve congestion. All lane closures and lane shifts will be coordinated with, and communicated to, the multiple stakeholders to provide the least amount of disruption to traffic. For example, the proposed closure of the Libertyville Road section from Bainbridge Boulevard to Windward Place during the Segment 2C construction will result in traffic diversion on to Dominion Boulevard and Great Bridge Boulevard potentially requiring traffic signal timing adjustments along Great Bridge Boulevard. The LMB Team will work with VDOT to adjust traffic signal timings as necessary during construction. We have the relevant expertise in developing traffic signal timings for other VDOT projects including the complex GRTC BRT project in Richmond.

The TMP shall also address the needs and concerns of the marine and railroad traffic. The LMB Team's Railroad Coordinator will address the concerns of the railroad companies.

Approach to Maintaining Access: During construction, we will coordinate closely with VDOT and the City of Chesapeake on potential impacts to adjacent roadways and properties. The TMP will outline the need to maintain access to all businesses, residential communities, and private entrances at all times. All entrances, intersections, access points that will be affected by the traffic control devices will be maintained or an acceptable alternative will be established.

As an example, the potential Libertyville Road work during the widening of Segment 2 will limit the Rivers Apartment community access to and from Bainbridge Boulevard. Therefore, reasonable detour routes were identified via Dominion Boulevard and Great Bridge Boulevard to facilitate the access to the affected community. **These detour routes will be communicated to the public as well as emergency responders in advance of any planned detour.**

Potential impacts to marine traffic will also be coordinated with the local agencies, as well as, the USCG. Access under the existing and new High Rise Bridge will be coordinated and signed appropriately. Underbridge lighting will be maintained throughout the Project to achieve safe passage of marine traffic during construction.

Railroad traffic will not be impacted and will be coordinated with the railroad companies through our Railroad Coordinator.

Incident Management Plan: As previously discussed in Section 4.5.1, the TMP will also include an IMP which will detail our response to incidents. The plan will be developed in coordination with VDOT, local EMS, and other Stakeholders to identify the protocols for who will be contacted in case of an incident. The plan will be reviewed and approved by VDOT prior to any work zones and/or lane closures becoming active on the Project. The plan will also consider the type of incident and estimated durations.

Additional Considerations: The LMB Team acknowledges that I-64 is an identified evacuation route for the Hampton Roads region. Therefore, **the TMP will specifically identify and incorporate evacuation plans to address potential lane reversal of WB lanes to accommodate EB (outbound) traffic.**

Project Stakeholders

Public Opinion / Stakeholder Expectations. Building and maintaining positive public opinion and stakeholder expectations during the life of the Project is vital to the Project's success. Without it, the propensity for negative public opinion can result in significant Project challenges and opposition as well as adversely impact the reputation among key project stakeholders. Potential Project risks and challenges as they relate to public opinion and stakeholder expectations include but are not limited to:

- Temporary motorist impacts due to lane reductions and lane shifts during construction
- Potential public opposition to the proposed HOT lanes on the new High Rise Bridge
- ROW opposition and/or reduction in access among affected businesses along the corridor
- Ineffective public education and outreach program to address Project risks

Stakeholder Identification. The identification of key stakeholders will be the first step in the public outreach initiative. The LMB Team will define the stakeholders at every level for inclusion in a comprehensive outreach database. Initial key audiences requiring consistent, message-specific communications will include but are not limited to:

- VDOT
- City of Chesapeake Elected Officials and Staff
- Local/State/Federal Agencies and Government Officials
- Emergency Responders
- U.S. Coast Guard
- Local Businesses and Business Associations
- Neighborhood Civic Organizations
- Public/Private Schools
- Healthcare Institutions/Medical Facilities
- Local and Regional Media Outlets
- End-Users, i.e., Motorists, Bus Transit, Recreational Boaters, Heavy Vehicles/Truckers

Mitigation Strategies. A comprehensive public outreach program will serve as the primary strategy to manage public opinion, understanding and acceptance of the Project. The PICP will be designed to effectively inform, engage, educate and raise awareness of the Project among all interested stakeholders; reduce motorist impact during construction; emphasize work zone safety during construction; minimize potential public opposition; acclimate key audiences on the benefits and proper use of HOT lanes; mitigate or eliminate potential conflicts that may affect the successful delivery of the project; strengthen the Team's credibility; and build and maintain public acceptance, trust and support throughout the life of the Project.

Communications Objectives. Preliminary objectives of the public outreach communications program include but are not limited to:

- Create a foundation of public awareness about the benefits of the Project and its design, such as enhanced capacity, reduced traffic delays, improved travel times, and enhanced safety.
- Educate citizens on the benefits and proper use of HOT lanes.
- Increase community understanding to minimize negative impacts and maximize positive outcomes.

- Consistently engage key stakeholders in the development, details and scheduling of the Project construction, and integrate their concerns and needs into the process.
- Build and sustain strong and trusting relationships with community leaders, businesses and appropriate public entities through open communication over the life of the Project.
- Maintain a close and collaborative partnership with VDOT Hampton Roads' Communication Office, the City of Chesapeake, and other key Project partners to most effectively garner public and stakeholder understanding and acceptance of the Project.

LANE's I-495 Express Lanes team received the *VDOT and Megaprojects, Commonwealth of Virginia Award of Excellence, Integrated Communications* award for their continuous efforts to involve and inform the public throughout the duration of the Project.



4.6 | DISADVANTAGED BUSINESS ENTERPRISES (DBE)

The LMB Team embraces and supports VDOT's DBE program and is committed to meeting or exceeding the 8% goal for the design and construction of this Project. Furthermore, we will take all necessary and reasonable steps to provide SWaM firms with the maximum opportunity to compete for and perform services on this contract.

DBE Subconsultants: The LMB Team includes the following highly qualified DBE subconsultants: NXL Construction Services, Precision Measurements, Inc., Hassan Water Resources, and Alvi Associates.

Subcontracting Plan: LMB will implement a subcontracting plan that offers the maximum opportunity for DBE and SWaM subcontractors to qualify for and provide services. The first step is source selection. LMB researches the capabilities of a wide range of subcontractors. This includes an evaluation of past performance, socioeconomic status, financial condition, current availability, and safety performance. Based on this research, a list of potential subcontractors is developed. The second step is the outcome of the proposal process. Once a solicitation for pricing has been set, potential subcontractors have the opportunity to respond with their site-specific worker protection program and best price proposals. LMB reviews the price proposal to determine price reasonableness. The final selection of the subcontractor is made by combining the results of the safety and price evaluations to determine the proposal that provides the best value to VDOT and LMB. LMB will continue the DBE outreach efforts throughout the duration of the project.

Safety is an integral part of any scope of work performed on this project. Accordingly, a subcontractor's safety approach is a key component of our evaluation process. All subcontractors must meet our stringent safety requirements to be a member of the Team.

LMB will also conduct a technical evaluation of the qualifications presented in the subcontractor's proposal, as well as an independent review of their past performance. References provided with their price proposal are contacted and questioned about the subcontractor's past performance. The topics covered include safety, schedule and cost compliance, and quality of work. If the potential subcontractor has worked for LANE, McLean, or Branch Civil before, its past performance and safety record will be evaluated. If the potential subcontractor is required to submit a Quality Control Program or Worker Protection Program with their proposal, these documents will also be evaluated. If the subcontractor has not previously worked for a member of the JV, a project interview will be required.

LMB will solicit subcontractor and supplier price proposals and evaluate for award of a subcontract or purchase order based on quality, past performance, and competitiveness. Once these reviews are complete, our evaluation team members will discuss the results and select the subcontractors and suppliers that best satisfy the requirements of the contract. Any subcontractor that fails to meet these requirements will be eliminated without further consideration. **This approach was successfully employed on LANE's I-495 and I-95 Express projects. Both projects obtained their goals; I-495 Express Lanes was awarded the Virginia DBE project of the year.**



4.7 | PROPOSAL SCHEDULE

4.7.1 Proposal Schedule

The LMB Team’s Proposal Schedule outlines our plan to successfully design and construct the I-64 High Rise Bridge Project in compliance with the RFP. The Proposal Schedule depicts the activities, tasks, overall sequence of work, and major deliverables required to complete the Project. This Proposal Schedule is broken down into major phases using the hierarchical Work Breakdown Structure (WBS), showing major phases of work, including but not limited to Project milestones, project management, scope validation, design, public involvement, environmental, ROW acquisition, construction, utilities, and railroad impacts. It demonstrates the anticipated Critical Path (based on the longest path), review responsibilities by VDOT, FHWA, USACE USCG, City of Chesapeake and other regulatory agencies, as well as activities for the LMB Team and our suppliers and subcontractors.

4.7.2 Proposal Schedule Narrative

The LMB Team has developed the following Proposal Schedule narrative detailing the overall sequencing of the Project, the Critical Path and key assumptions on which the Proposal Schedule is based.

Milestones

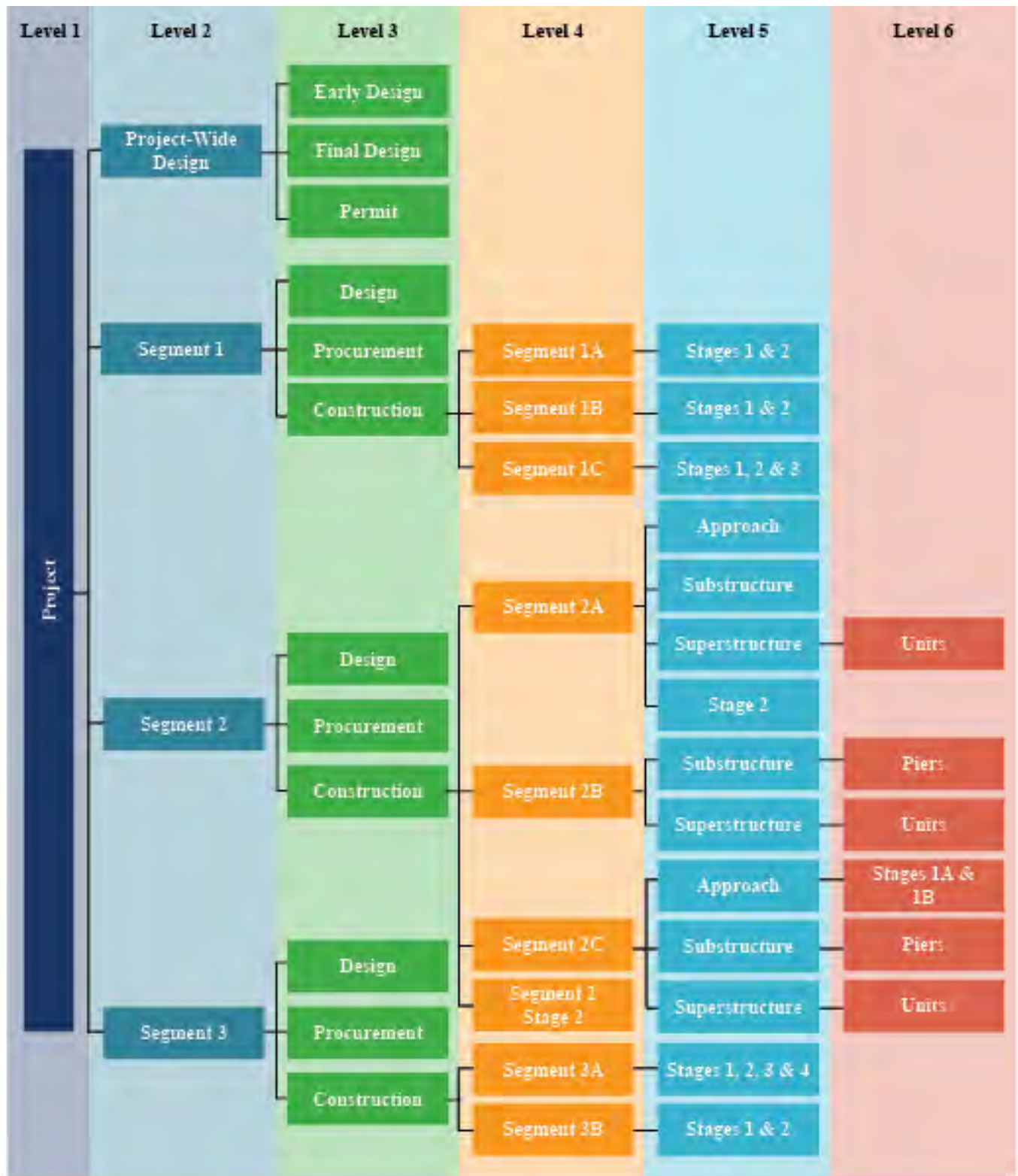
The LMB Team is committed to the Final Completion Date of July 30, 2021. The table below identifies Key Milestone dates which, to be met, will require coordination not only between the Team and VDOT, but also other reviewing agencies (FHWA, USFWS, etc.).

Milestones	Milestone Date
CTB Approval/Notice to Award	October 23, 2017
D-B Contract Execution	November 15, 2017
NTP	November 17, 2017
Final Completion Date	July 30, 2021

Work Breakdown Structure (WBS)

The WBS is a multi-level, hierarchical arrangement of the work to be performed on the Project. Through a collaborative process with the design and construction teams, the overall Project is subdivided into manageable units of work for efficient and effective planning and control. Each WBS level not only identifies Project level details but also implies a level of management responsibility. The WBS facilitates efficient electronic migration of data between the Project cost estimate, cost control budgets, cost forecasts, schedule, and the corresponding management reports. It is developed from the division of the major segments, stages, and activity types. The disciplines are further divided into Segments, Stages and respective components such as Milestones, Project Management, Scope Validation, Environmental/Permitting, ROW, Design, Public Involvement, Utility Relocation, and Construction.

The WBS has been developed as a collaborative effort between the design and construction teams by evaluating the components of the overall Project including consideration of the type of work along the alignment, design-related considerations, and approach to management of the construction operations.



Level 1 is the Project, while Levels 2, 3, 4, 5, and 6 of the WBS, as depicted in the Proposal Schedule, include but are not limited to the following items for the respective Project components:

- Project-wide design and permitting
- Project Segments – 1, 2, 3
- Segment-specific design and material procurement.
- Segment-specific construction, which is further broken-down into sub-Segments 1 into 1A, 1B, and 1C, Segment 2 into 2A, 2B and 2C, and Segment 3 into 3A and 3B.
- For Segment 1 and 3, each sub-segment is further broken into stages of construction.

- For Segment 2, each sub-segment is further broken into its applicable components – Approach, Substructure and Superstructure.

Calendars

The LMB Team uses six different calendars to represent a variety of work scenarios:

- **“7 Days per Week”** – Based on seven days per week and is used for review periods and milestones.
- **“5 Days / Wk with Holiday No Weather”** – Based on five working days per week and includes standard holidays and issued for design activities and work not impacted by adverse weather and holiday restrictions and is used for design and document development.
- **“5 Days / Wk with Holiday & Weather”** – Based on five (5) working days per week, specified holiday restrictions, and anticipated weather days and is used for construction activities.
- **“5 Days / Wk with Holiday & Low Weather”** – Based on five (5) working days per week, specified holiday restrictions, and anticipated heavy weather days and is used for construction activities with low weather sensitivity.
- **“5 Days / Wk with Holiday and Paving”** – Based on the “5 Days / Week with Holiday & Weather” with non-working periods from December through February and is used for asphalt paving activities and bridge deck pours.
- **“5 Days / Wk with Final Paving”** – Based on the “5 Days / Week with Holiday & Weather” with non-working periods from December through March and is used for surface asphalt paving activities.

For weather analysis, the LMB Team has reviewed the weather data (November 2011 to October 2016) provided by the NOAA observation center located at Norfolk South, VA. Using 0.1 and 0.5 inch of participation per day as the threshold for impact for normal and low weather sensitive construction activity; and with weekends taken into consideration, the LMB Team schedule allows for the following number of weather days, by respective months:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Normal Sensitivity	8	8	8	7	8	8	7	8	7	6	6	7
Low Sensitivity	2	2	2	2	2	3	3	2	2	2	1	2

The LMB Team will observe New Year’s Day, Memorial Day, 4th of July, Labor Day, Thanksgiving and the Friday after, and Christmas holidays from 2017 to 2021, with these dates reflected as non-work days within the schedule.

Plan and Strategy

The LMB Team will develop a comprehensive plan to complete the High Rise Bridge, I-64 roadway and bridge widening, and the modification of the existing bascule bridge in a timely and professional manner. **Our goal is to minimize the number of construction phases, traffic pattern changes, and interruptions to the travelling public.** We will coordinate our MOT staging for smooth transitions between the bridge and roadway construction operations. The Team’s design and construction plan is based on the following concepts:

- Strategically divide the design and construction of Project into three geographic Segments – West of High Rise Bridge (**Segment 1**), the actual High Rise Bridge (**Segment 2**), and East of High Rise Bridge (**Segment 3**). This will allow the Project to geographically align the design packages with Project segments and streamlines the design-to-construction process.
- Due to the differences in the general nature of Work between three segments, the LMB Team will concurrently operate for all three Segments with a high level of coordination between each Segment. The Proposal Schedule demonstrates how the LMB Team will progress the Work in all three Segments concurrently.
- The LMB Team has identified three TOY Restrictions in the Project, and has developed specific methods to mitigate these restrictions. The Proposal Schedule includes the mitigation methods in the construction sequence of the Project.

Design

The three (3) Segments allow the design for each Segment to be developed concurrently with minimal schedule dependency on the other Segments. Design packages for each Segment will be submitted for VDOT review in accordance with the RFP requirements and RFC design completion stage, ensuring comprehensive VDOT oversight while maintaining design progress.

The Proposal Schedule incorporates all phases of design including preparation, design QA/QC reviews, and submission of roadway, right-of-way, drainage, SWM, E&S, MOT, signing, pavement marking, signal, lighting, ITS and bridge plans at multiple stages of the design process including a 21-calendar day activity for VDOT review/approval with each submission.

The design phase also includes non-schedule critical activities for completion of surveys, utility designations, noise wall studies, utility relocation, the Scope Validation Period and geotechnical investigations, including a 90-calendar day activity for VDOT's review of the geotechnical report prior to submission of the final roadway and bridge designs. Our Team will begin the design immediately pursuant to Notice to Proceed to secure an early start on roadway and bridge plans, temporary traffic control, and the ROW acquisition.

Environment and Permitting

Our Proposal Schedule assumes a conservative approach to securing permits for the entire Project, however, we have developed a proactive strategy to expedite the environmental permitting and environmental approvals. We have held preliminary discussions with regulatory agencies and have recognized and discussed a potential for securing environmental permits earlier for Segments 1 and 3. After NTP, we will work closely with the regulatory agencies to phase the environmental permits in order to secure early starts to our construction activities. If the agencies agree to release of phased environmental permits, the **LMB Team will be able to significantly improve the schedule completion dates.**

The LMB Team engage the regulatory agencies early in the Project by conducting a series of avoidance and minimization workshops with the regulatory agencies to secure buy-in for the proposed mitigation measures, proposed impacts and proposed compensation. Our Proposal Schedule accounts for potential Time-of-Year (TOY) restrictions stipulated in the RFP.

Our Proposal Schedule accounts for the timeframe needed to complete environmental fieldwork such as potential habitat surveys for special status species and the final noise modelling and technical report. The Proposal Schedule also accounts for the preparation of the environmental permit packages (JPA, Section 408, and VPDES), coordination with the agencies, for permit review and VDOT reviews, and the timeframe for issuance of the Section 404 Permit, Section 10 Permit, and Section 408 approval from the USACE, Water Protection Permit and VPDES Permit from the DEQ, Sub-Aqueous Bed Permit and Tidal Wetlands Permit from the VMRC, Section 9/bridge Permit from the USCG, as well as the stormwater management plan, erosion and sediment control plan, EQ 103, EQ200, and EQ 201 submittals and approvals from VDOT

ROW Acquisition

ROW activities are critical to the success of the Project and the schedule. The Schedule details the acquisition process for the ROW including title research, appraisals, offers, and negotiations. Except for permanent utility easements (yet to be identified) and possible temporary construction easements, the LMB Team proposes the Project alignment will be contained within the ROW limits shown on the RFP Conceptual Plans. To that extent, the LMB Team will advance the ROW acquisition in accordance with the guidelines established by VDOT and other Commonwealth and Federal guidelines. The ROW activities shown on the Proposal Schedule mirror the process provided by the guidelines.

Preliminary activities such as title exams, preliminary appraisals and preliminary reports can begin before VDOT's Notice to Proceed for ROW acquisition. Once VDOT NTP for ROW is received, durations and interaction times are tightly controlled by the Guidelines which require notice durations, minimum response times, and VDOT review and payment processing durations. The ROW and Utilities Management System (RUMS) reporting system is updated throughout the duration of the entire Project.

Utility Relocation

Section 4.4.2 lists a portion of anticipated utility relocations and potential conflicts for the Project. The locations and magnitude of these impacts are reflected accordingly in the Proposal Schedule.

The implementation of ATC-2 eliminated numerous utility conflicts at both the South Military Highway Bridge and the Yadkin Road Bridge. By eliminating these conflicts, we have avoided significant schedule impacts to the Project.

Public Involvement

The LMB Team will develop the PICP in accordance with RFP Part 2 Section 2.11. The Proposal Schedule has incorporated activities to represent the development and implementation of the PICP.

Construction

The LMB Team's sequence of construction was developed to mitigate impacts to the traveling public, avoid delays to construction, and ultimately, facilitate the successful opening of High Rise Bridge and the Final Completion of the Project.

In developing the schedule and construction sequence, the Team considered public safety as the priority and incorporated specific measures to limit disruptions to vehicular traffic on I-64 and rail traffic on the railroad lines. To achieve this, the LMB Team's approach:

- Minimizes the number of construction stages in each sub-segment: 2 stages for Segment 1A, Segment 1B, Segment 2, and Segment 3B, 3 stages for Segment 1C; and 4 stages for Segment 3A.
- Expedites the construction of Segment 2B piers and subsequent activities by incorporating ATC-3 (use of special design precast footing soffit). The Proposal Schedule has incorporated this ATC into the Project and reflects the schedule benefit accordingly.
- Allows for construction of multiple stages of roadway in the same sub-segment. This is represented by the start-to-start and/or finish-to-finish activity relationships shown in the Proposal Schedule. Time Lag is applied to these relationships to represent the time and distance buffer required between the operations.
- Incorporates a minimum time buffer between the two operations for the required QC and QA inspection, testing and reporting to occur.
- Creates review activities to account for VDOT's plan review and approval time for each design deliverable, submittal, and shop drawing contained within the schedule. The duration of these review activities are 21 calendar days.

Segment 1 - I-64 West Widening Scope

The LMB Team's Segmentation Plan has sub-divided Segment 1 into Segment 1A, 1B, and 1C based on the three roadway scope types – construct HOT lanes in the median (ATC-2), widening I-64 to the median, and realigning I-64 into the new bridge. This work break-down allows the LMB Team to develop specific sequences of construction for each installation type (sub-segment).

Segment 1A MOT / Stages: The scope of work is based on ATC-2, which includes the construction of I-64 HOT lanes in the median, drainage, ITS, lighting, SWM facilities, sound barrier, and construction of two (2) new bridges for the HOT lanes at Yadkin Road and South Military Highway.

- **Stage 1:**
 - Install MOT and temporary construction access
 - Construct the I-64 HOT lanes in the existing median, including clearing and grubbing the existing median, earthworks, installation of drainage, subbase, AC paving and installation median signs and lighting
 - Constructing the two new bridges for the HOT lanes at Yadkin Road and South Military Highway
 - Construct the toll gentry structures and their associated infrastructure
- **Stage 2:**

- Move the MOT and shift traffic to close the outside shoulder for constructing the noise barrier walls, ITS, signage, drainage, lighting and roadway work in the area.

Segment 1B MOT / Stages: The scope of work includes converting the existing median on I-64 into pavement, drainage, barrier wall, ITS, lighting, SWM facilities, noise barrier walls, and widening and repairing of existing bridges at Shell Road.

- **Stage 1:**
 - Construct temporary widening of I-64 utilizing night shift lane closure, then install MOT and shift traffic outward
 - Replace the existing median with paved roadway, including clearing and grubbing the existing median, earthwork, installing drainage, subbase, constructing median barrier wall, AC paving, and installing median signs and lighting
 - Incorporate the inside lane portion of the Route 17 Intersection full depth pavement scope
 - Construct the widening of the Shell Road bridges (ATC-5), including the partial demolition of the existing bridge decks, repairing existing substructure, installing new piles, constructing shared substructure, and widening existing decks
 - Construct the toll gantries and the toll technical shelter.
- **Stage 2:**
 - Move the MOT, and shift traffic inwards onto the new roadway
 - Close the outside lane and shoulder to construct the proposed noise barrier walls, ITS, signs, drainage, lighting, and hard shoulder running in the area
 - Remove and replace the existing compression seals at joints with new elastomeric expansion dams and placement of latex concrete overlay at the Shell Road bridges.
 - Construct the full depth pavement replacement at Route 17 interchange in two sub-stages

Segment 1C MOT / Stages: The scope of work includes converting the existing median on I-64 into paved roadway, drainage, barrier wall, ITS, lighting, SWM facilities, noise barriers and construct the re-alignment of I-64 Westbound traffic onto the new High Rise Bridge.

- **Stage 1:**
 - Construct temporary widening of I-64 utilizing night shift lane closure
 - Install MOT and shift traffic outward
 - Replace the existing median with paved roadway, including clearing and grubbing the existing median, earthwork, installing drainage, subbase, AC paving, constructing median barrier wall
 - Install median signs and lighting.
- **Stage 2:**
 - Move the MOT and shift traffic inwards onto the new roadway
 - Close and demolish the existing WB lanes
 - Construct the proposed roadway re-alignment, including earthwork, drainage, subbase, AC paving, ITS, signage, lighting, and noise barrier walls in the area
 - Construct the noise barrier wall and hard shoulder running on the I-64 EB shoulder.

Segment 2 - High Rise Bridge Scope

Segment 2 incorporates three Sub-Segments:

- Segment 2A includes west bridge approach, and bridge structure over land on the west
- Segment 2B includes bridge structure over water and the fender system
- Segment 2C includes east bridge approach, and bridge structure over land on the east

To complete the Project in timely manner, the LMB Team will work in all three Sub-Segments simultaneously and the Team also will utilize an Early Test Pile Program to perform the test pile work during the design phase, which allows the fabrication of piles to commence prior to the start of construction.

Segment 2A Construction:

- Install erosion control and MOT devices
- Clear and grade the construction site and build site access
- Pile driving at Abutment A, and continues towards the water
- Construct the retaining wall at bridge approach, while the structure crews continue to drive piles and construct substructure
- Complete retaining wall, construct Abutment A
- Erect concrete girders, and construct diaphragms and decks of Unit 1
- Finish with constructing the approach roadway and temporary crossover, and install ITS, signs and lighting
- Segment 2A Stage 2 construction:
 - Existing High Rise Bridge is completed, traffic switches to its final alignment
 - Remove the temporary crossover
 - Complete the remaining median barrier that was left out for the temporary crossover.

Segment 2B Construction:

- Set precast soffit in place and utilize these soffits as templates for driving piles on the water
- Install sheeting and construct trestle at Pier 5
- Drive the pile at Pier 5 from land
- Lower soffits (ATC-3) to elevation and start the substructure construction
- Erect concrete girders and construct diaphragms and decks of Unit 2 and 3
- Finish installing ITS, signs and lighting
- Removal and replacement of the existing fender system is deferred until superstructure of Unit 3 (to avoid congestion of the waterway).

Segment 2C Construction:

- Stage 1A
 - Install erosion control and MOT devices, then close and demolish Libertyville Road and build construction access
 - Mobilize resources to the west end of the segment and start driving piles at Pier 20
 - Continue pile driving operation towards Abutment B. The substructure operation will follow the pile sequence.
- Stage 1B
 - Segment 3A, Stage 1A temporary paving complete, switch the traffic off existing median to gain access to Abutment B and Piers 31 - 34
 - Drive piles for Abutment B, then 34 - 31
 - Construct the retaining wall at bridge approach
 - Substructure continues towards Abutment B
 - When the retaining wall is complete, construct Abutment B
 - Erect concrete girders and construct diaphragms and decks of Unit 4 and 5
 - Finish constructing the approach roadway, and installing ITS, signs and lighting.

Segment 2 Stage 2 - Eastbound Lanes:

- Open new High Rise Bridge and close the existing High Rise bridge for modifications to existing bascule and fixed span bridges.
- For the bascule spans:
 - Removal of existing DBTMS and existing median barrier wall
 - Construct a new median barrier wall, repair the existing deck, install the new DBTMS, and rebalance the bascule span for operability.
- For the fixed spans:

- Demolish the existing median barrier wall
- Construct new barrier wall, repair the existing bridge deck, install ITS, and modify the existing roadway to WB traffic
- After completion of the existing bridge modification, shift traffic in its final alignment, and complete all remaining roadway work in Sub-Segments 2A and 3A.

Since the LMB Team utilizes the Libertyville Road area as construction access, reconstruction of this road will commence after the opening of the new High Rise bridge. The scope of work starts the installation of MOT and erosion control followed by earthwork, drainage, bases, asphalt paving, sidewalk construction, signs and lighting.

Segment 3 – I-64 East Widening Scope

The LMB Team will construct Segment 3 in 2 sub-segments: 3A and 3B. Segment 3A includes the construction of I-64 mainline from bridge retaining walls to east terminus of the Project and includes the replacement of Great Bridge Road bridge and the realignment of Great Bridge Blvd. Segment 3B includes the Battlefield Boulevard CD Road and Bulldog Drive.

Segment 3A MOT / Stages:

- **Stage 1**
 - Stage 1A construct temporary pavement in the median from existing bridge to the Great Bridge Road underpass
 - Stage 1B - construct permanent pavement in the median from Great Bridge Road to eastern terminus of the Project which includes the temporary crossover for Segment 2, Stage 2
 - Shift traffic off the alignment of the proposed High Rise bridge and the retaining walls onto the temporary pavement from Stage 1A
 - Stage 1C includes closing the north outside shoulder to construct the proposed driving lane, sound barrier walls, ITS, signage, drainage, lighting and Hard Shoulder Running
 - Start the construction of the Great Bridge Blvd. bridge.
- **Stage 2**
 - Widening of I-64 and realignment of the Great Bridge Boulevard ramp
 - Construct the proposed sound barrier walls, ITS, signage, drainage, lighting and other roadway work in the area
 - In Stage 2A- complete the realignment of I-64 Off-Ramp to Great Bridge Boulevard
 - Stage 2B and 2C, perform the full width roadway reconstruction at the I-464 underpass
 - Complete the construction of Great Bridge Boulevard bridge
 - Construct the realignment of Great Bridge Boulevard
- **Stage 3**
 - Removal of the existing Great Bridge Boulevard bridge
 - Complete the remaining median roadway work from Sta. 1362+70 and east terminus
 - Start Stage 3A after the new High Rise Bridge is completed
 - Construct Temporary crossover
 - Shift all bridge traffic to the new bridge
 - Remove the temporary pavement from Stage 1A, and construct the permanent roadway in the median except for the Eastbound crossover
- **Stage 4**
 - Upon completion of the existing High Rise Bridge modifications, switch all traffic into permanent alignment
 - Remove the temporary close over, construct remaining roadway
 - Construct the barrier wall to close the opening at the temporary crossover

Segment 3B MOT / Stages: The LMB Team will construct this Segment in two stages:

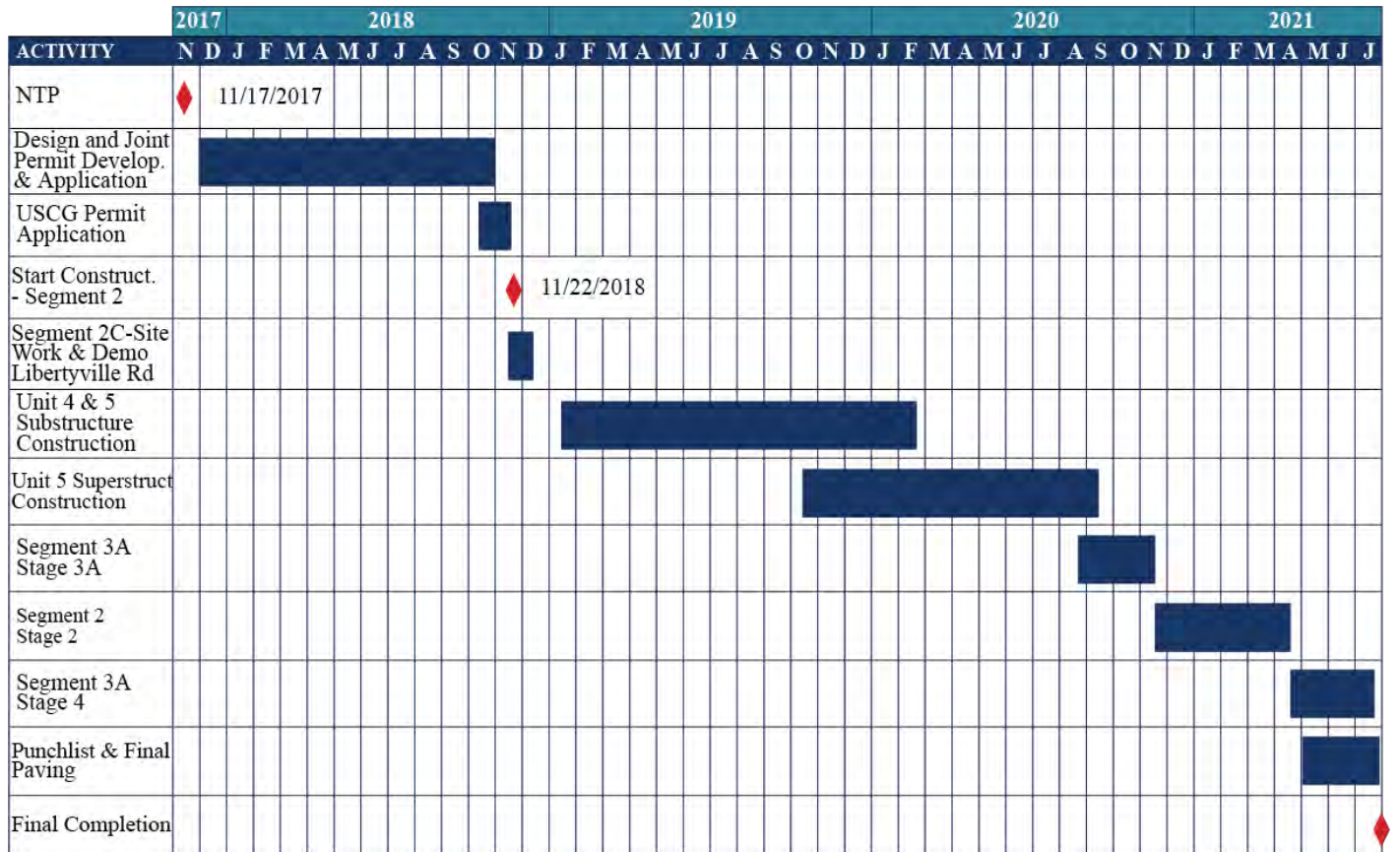
- **Stage 1:**
 - Construct the re-alignment of Bulldog Drive

- Shift traffic off the proposed ramp alignment to construct the CD ramp widening on outside lanes
- Construct temporary pavement, earth work, asphalt paving, drainage, lighting, signs, noise barrier walls, and other roadway construction.
- **Stage 2:**
 - Shift traffic onto the new roadway to construct the inside lane widening
 - Construct earthwork, asphalt paving, drainage, lighting, signs, noise barrier walls, temporary pavement removal, and other roadway construction.

Critical Path

The Critical Path starts with design leading to development of the joint permit application followed by the USCG permit application. After completion of permit applications/approvals, the Critical Path runs through activities, generally described:

- Segment 2C closure and demolition of Libertyville Road
- Site work and crane mobilization, and the construction Pier 20 piles and substructure
- Substructure construction sequence from Pier 30 to Abutment B
- Abutment construction sequence
- Girder erection and deck construction of Unit 5
- Construction completion of the new High Rise Bridge
- Construction of the temporary crossover and switching over of EB bridge traffic to the new High Rise Bridge
- Construction of Sub-Segment 3A, Stage 3A
- Switching all bridge traffic onto the new High Rise Bridge and closure of existing High Rise Bridge for the modifications
- Removal of the temporary crossover and installation of the remaining median barrier wall section left-out for the crossover in Segment 3A, Stage 4
- Punchlist and Project Final Completion activities.



7/30/2021 ◆

Schedule Assumptions

Various assumptions are incorporated into the Proposal Schedule. These assumptions are:

- ROW acquisition activities included in the schedule throughout the alignment reflecting estimations regarding parcels needed for land acquisitions or easements.
- Permit – Anticipates final approval of all environmental permits approvals within 12-month time frame. TOY Restriction – Regulatory agencies to allow use of proposed mitigation measures and avoid impacts to critical construction activities.
- Utility Relocation – Estimates of schedule impacts for utility relocation are based primarily on the input from the utility stakeholders and historical data from the VDOT data base.

LMB has developed a Proposal Schedule and narrative that demonstrates our understanding of the complexities and interrelationships of the phasing elements of the two project scopes. Additionally, our Proposal Schedule considers: design plan development, internal plan reviews, VDOT plan reviews and approvals, environmental permitting, ROW acquisitions, utility relocations, and construction sequencing, staging and activities.

The LMB Team is committed to develop an accurate and robust Baseline Schedule, all. Once NTP is issued, all team members will actively work together to make this a high quality, efficient and award winning project.

Schedule Management/Means and Methods

The LMB Team will develop and maintain the Project Schedule in accordance with the VDOT Special Provision for Design-Build Project Schedule (RFP Exhibit 11.1). The LMB Team will use Primavera P6 (P6) scheduling software to plan, schedule, and monitor this Project. The Project Schedule will be developed, maintained, and updated by the Senior Scheduler and his/her reporting scheduler(s), who will be part of the LMB Project Controls Team. This team will be based in the Project office, and will be responsible for cost control, planning and scheduling, document control and the management of change. The Project Controls Manager, supported by the Construction Manager and reporting to the Design-Build Project Manager, is ultimately responsible for the implementation of the project-specific Project Controls System (PCS).

Pursuant to award of the contract, the LMB Team will collaborate with VDOT to develop a detailed, Project Schedule based on our Conceptual Plans. After an internal analysis, extensive meetings, input from the construction team and review of the schedule logic and Critical Path, the schedule will be completed. The Project Controls Team will generate the Baseline Schedule, as required, for submission to and approval by VDOT.

The Baseline Schedule will indicate the necessary procurement and construction activities for each Segment of the project. Various calendars will be incorporated into the Project Schedule to reflect holidays, seasonal work, temperature, and other requirements. The activities within the Project Schedule will be governed by the Project Controls Plan and organized by WBS and an Activity Coding Structure will be utilized in the Project Schedule to organize data output. The Schedule will be the tool used for oversight by the DBPM and the LMB Executive Management team. Schedule updates will be used by the DBPM, Construction Manager, and JV Design Manager to review progress and coordinate the efforts of all project team members.

Separate short-term (3-week look-ahead detailed Level 5 schedules) will be used to plan and monitor specific sections of work and will be prepared, as necessary, to sequence specific work packages or shorter duration activities as the need arises. As the work progresses, start dates, finish dates, percent complete, and remaining durations will be updated to report the progress of each work activity. The planning and scheduling team will incorporate updated data into the CPM schedule on a monthly basis, they will review the results internally and with VDOT and prepare the required reports for formal submission. Monthly updates of the CPM schedule provide the foundation of progress reports utilized by LMB.

When changes or unforeseen circumstances arise that impact the Project Schedule, the LMB Team will immediately notify VDOT (and other appropriate stakeholders) and begin incorporating changes into the “live” CPM schedule. If any changes result in schedule slippage, the DBPM will evaluate the issue to determine

whether such changes warrant or require additional manpower, equipment, use of multiple shifts, changes to subcontractors, or additional subcontractors. Necessary resources will be directed to correct the slippage and to recover the schedule. Throughout the Project, the schedule will be clearly communicated to all subcontractors and key suppliers and delays and schedule slippage will not be tolerated.

Conclusion

The LMB Team has developed a Proposal Schedule and narrative that demonstrates our understanding of the Project offering the following benefits to the Project and VDOT:

- Reflects our Segmentation Plan which organizes the Project into manageable segments for design and construction and confines impacts within the Segments and makes the Schedule flexible against delays and impacts
- Incorporation of four (4) innovative ATCs; all contributing improvements to the schedule
- Meets all the time-line and schedule requirements of the RFP.

The LMB Team is exploring various options to attain Early Completion Incentives. Since these options cannot be confirmed during the proposal phase, the LMB Team has not included them in the Proposal Schedule. These options are:

- Permit application and approvals, by Segments, to potentially improve the overall permit application time period and allow LMB to start construction activities in the field earlier.
- Development of early work packages – identify vital Project scope that can be broken-out from the main design packages. This approach streamlines the design review and approval allowing construction activities to start earlier.
- Start existing High Rise Bridge modification work not requiring lane or bridge closure, before Segment 2, Stage 2. This will reduce the work on the Critical Path and potentially result in earlier completion of the Project.

Activity ID	Activity Name	Original Duration	Start	Finish	2017 2018 2019 2020 2021 2022																																																			
					Jun	Jul	A	S	Oct	N	D	Jan	F	M	Apr	M	Jun	Jul	A	S	Oct	N	D	Jan	F	M	Apr	M	Jun	Jul	A	S	Oct	N	D	Jan	F	M	A	M	Jun	Jul	A	S	Oct	N	D	Jan								
I-64 Southside Widening and High Rise Bridge, Phase 1 with Appro																																																								
A0-0-1000	Notice of Intent to Award	0	20-Sep-17*		◆ Notice of Intent to Award																																																			
A0-0-1010	CTB Approval / Notice to Award	0	23-Oct-17*		◆ CTB Approval / Notice to Award																																																			
A0-0-1020	Design-Build Contract Execution	0	15-Nov-17*		◆ Design-Build Contract Execution																																																			
A0-0-1030	NTP	0	17-Nov-17*		◆ NTP																																																			
A0-0-1040	High Rise Bridge (B-662) Construction Completion	0		18-Aug-20	◆ High Rise Bridge (B-662) Construction Completion																																																			
A0-0-1050	System Integrator Full Access to Construction Zone	180	10-Sep-20	08-Mar-21	System Integrator Full Access to Construction Zone																																																			
A0-0-1060	Roadway ITS / TMS User Acceptance	60	08-Jan-21	08-Mar-21	Roadway ITS / TMS User Acceptance																																																			
A0-0-1100	DBTMS / Bridge ITS User Acceptance	20	01-Apr-21	20-Apr-21	DBTMS / Bridge ITS User Acceptance																																																			
A0-0-1070	Burn-In Period (30 Days)	30	21-Apr-21	20-May-21	Burn-In Period (30 Days)																																																			
A0-0-1090	Punchlist, Project Wide	60	01-Jun-21	30-Jul-21	Punchlist, Project Wide																																																			
A0-0-1080	Project Final Completion (7/30/21)	0		30-Jul-21*	◆ Project Final Completion																																																			
Project Wide Design																																																								
Early Design																																																								
QC/QA Plan																																																								
D0-0-1030	Prepare Design QA/QC Plan	15	17-Nov-17	11-Dec-17	Prepare Design QA/QC Plan																																																			
D0-0-1040	CJV Review/Approval Design QA/QC plan	15	12-Dec-17	03-Jan-18	CJV Review/Approval Design QA/QC plan																																																			
Scope Validation																																																								
D0-0-1060	Prepare Scope validation investigations/submissions	82	17-Nov-17	16-Mar-18	Prepare Scope validation investigations/submissions																																																			
D0-0-1070	VDOT Review Scope Validation	21	17-Mar-18	06-Apr-18	VDOT Review Scope Validation																																																			
Geotechnical Schedule																																																								
Geotechnical Exploration																																																								
Geotechnical Exploration Plan																																																								
D0-0-6530	Develop GEP	22	23-Oct-17	21-Nov-17	Develop GEP																																																			
D0-0-6540	Internal Review	3	17-Nov-17	21-Nov-17	Internal Review																																																			
D0-0-6560	VDOT Review	21	22-Nov-17	12-Dec-17	VDOT Review																																																			
D0-0-6550	Submit GEP	0	22-Nov-17		◆ Submit GEP																																																			
D0-0-6570	Implement/Resolve GEP Comment	10	13-Dec-17	27-Dec-17	Implement/Resolve GEP Comment																																																			
Field Exploration																																																								
D0-0-6590	Surveying (assuming services provided by others)	60	13-Dec-17	08-Mar-18	Surveying (assuming services provided by others)																																																			
D0-0-6600	Utility Clearance	75	14-Dec-17	30-Mar-18	Utility Clearance																																																			
D0-0-6620	Drilling (6 rigs f/t @ 100 ft/day @ 80% production)	75	19-Dec-17	04-Apr-18	Drilling (6 rigs f/t @ 100 ft/day @ 80% production)																																																			
D0-0-6630	Drilling Environmental	75	18-Jan-18	02-May-18	Drilling Environmental																																																			
D0-0-6610	Traffic Control	75	18-Jan-18	02-May-18	Traffic Control																																																			
Laboratory Testing																																																								
D0-0-6660	Laboratory Testing Environmental	80	01-Feb-18	23-May-18	Laboratory Testing Environmental																																																			
D0-0-6650	Laboratory Testing	80	01-Feb-18	23-May-18	Laboratory Testing																																																			
Pavement Condition Report																																																								
D0-0-6680	Pavement Condition Survey	10	28-Dec-17	11-Jan-18	Pavement Condition Survey																																																			
D0-0-6690	Prepare Pavement Condition Report	10	12-Jan-18	25-Jan-18	Prepare Pavement Condition Report																																																			
D0-0-6710	VDOT Review	21	26-Jan-18	15-Feb-18	VDOT Review																																																			
D0-0-6700	Submit Pavement Condition Report	0	26-Jan-18		◆ Submit Pavement Condition Report																																																			
D0-0-6720	Respond to Comments/Report Revisions	10	16-Feb-18	01-Mar-18	Respond to Comments/Report Revisions																																																			
Geotechnical Engineering Reports																																																								
ROW/SWM/Prelim Retaining Walls																																																								
D0-0-6750	Prepare Engineering Report	25	08-Feb-18	14-Mar-18	Prepare Engineering Report																																																			
D0-0-6760	Internal Review	5	08-Mar-18	14-Mar-18	Internal Review																																																			
D0-0-6780	VDOT Review of Engineering Report	20	15-Mar-18	11-Apr-18	VDOT Review of Engineering Report																																																			
D0-0-6770	Submit Report Submittal - Milestone	0	15-Mar-18		◆ Submit Report Submittal - Milestone																																																			
D0-0-6790	Respond to comments/Report revisions by ECS	25	29-Mar-18	02-May-18	Respond to comments/Report revisions by ECS																																																			
D0-0-6800	Internal Review	5	26-Apr-18	02-May-18	Internal Review																																																			
D0-0-6820	Incorporate Recommendations	20	03-May-18	31-May-18	Incorporate Recommendations																																																			
D0-0-6810	Submit Final Report	0	03-May-18		◆ Submit Final Report																																																			
D0-0-6830	Internal Review	5	24-May-18	31-May-18	Internal Review																																																			
D0-0-6840	Plan Submittal (90 days after Initial Report Submittal)	0	14-Jun-18		◆ Plan Submittal (90 days after Initial Report Submittal)																																																			
High Rise Bridge (B662)																																																								
D0-0-6860	Prepare Engineering Report	30	15-Feb-18	28-Mar-18	Prepare Engineering Report																																																			
D0-0-6870	Internal Review	5	22-Mar-18	28-Mar-18	Internal Review																																																			
D0-0-6890	VDOT Review of Engineering Report	20	29-Mar-18	25-Apr-18	VDOT Review of Engineering Report																																																			
D0-0-6880	Submit Report Submittal - Milestone	0	29-Mar-18		◆ Submit Report Submittal - Milestone																																																			

█ Remaining Level of Effort
 █ Remaining Work
 ◆ Milestone
█ Actual Work
 █ Critical Remaining Work

Activity ID	Activity Name	Original Duration	Start	Finish	2017 2018 2019 2020 2021 2022																																																			
					Jun	Jul	A	S	Oct	N	D	Jan	F	M	Apr	M	Jun	Jul	A	S	Oct	N	D	Jan	F	M	Apr	M	Jun	Jul	A	S	Oct	N	D	Jan	F	M	A	M	Jun	Jul	A	S	Oct	N	D	Jan								
Vessel Collision Method II 86 17-Nov-17 30-May-18																																																								
D0-0-8000	Assemble vessel data	10	17-Nov-17	11-Dec-17	Assemble vessel data																																																			
D0-0-8010	Determine design vessel	10	12-Dec-17	03-Jan-18	Determine design vessel																																																			
D0-0-8020	Determine vessel loads	10	04-Jan-18	26-Jan-18	Determine vessel loads																																																			
D0-0-8030	Prepare Method II Analysis Report	32	29-Jan-18	06-Apr-18	Prepare Method II Analysis Report																																																			
D0-0-8040	Internal Review	10	20-Mar-18	06-Apr-18	Internal Review																																																			
D0-0-8050	Submit VDOT Review and Approval	0	09-Apr-18		Submit VDOT Review and Approval																																																			
D0-0-8060	VDOT Review and Approval	21	09-Apr-18	29-Apr-18	VDOT Review and Approval																																																			
D0-0-8070	Address Review Comments	15	30-Apr-18	30-May-18	Address Review Comments																																																			
D0-0-8080	VDOT Approval	0		30-May-18	VDOT Approval																																																			
Utility 117 17-Nov-17 07-Aug-18																																																								
D0-0-8160	Prepare Property Owner Notification Letters for Utility Test Holes (PR)	1	17-Nov-17	17-Nov-17	Prepare Property Owner Notification Letters for Utility Test Holes (PR)																																																			
D0-0-8170	Perform SUE Designations and Test Holes	20	04-Dec-17	15-Jan-18	Perform SUE Designations and Test Holes																																																			
D0-0-8180	Preliminary Utility Field Inspection (PUFI) Meeting with Utility Owners	5	19-Jan-18	29-Jan-18	Preliminary Utility Field Inspection (PUFI) Meeting with Utility Owners																																																			
D0-0-8190	Obtain Easement, UFI, and Determine Prior Rights	26	31-Jan-18	28-Mar-18	Obtain Easement, UFI, and Determine Prior Rights																																																			
D0-0-8200	Prepare Preliminary Utility Status Report (120 Days from NTP)	15	23-Feb-18	28-Mar-18	Prepare Preliminary Utility Status Report (120 Days from NTP)																																																			
D0-0-8210	Utility Design by Others	60	30-Mar-18	07-Aug-18	Utility Design by Others																																																			
Supplemental Survey 75 17-Nov-17 07-Mar-18																																																								
D0-0-1090	Perform Supplemental Survey & SUE	60	17-Nov-17	14-Feb-18	Perform Supplemental Survey & SUE																																																			
D0-0-1100	Update Base Mapping Files	15	15-Feb-18	07-Mar-18	Update Base Mapping Files																																																			
River Hydraulics 98 17-Nov-17 26-Jun-18																																																								
D0-0-2060	Hydrology and Storm Surge	10	17-Nov-17	04-Dec-17	Hydrology and Storm Surge																																																			
D0-0-2050	Perform Supplemental Survey	53	17-Nov-17	05-Feb-18	Perform Supplemental Survey																																																			
D0-0-2070	Compilation of Exist Tide, avail Grd data, Land Use Maps	5	05-Dec-17	11-Dec-17	Compilation of Exist Tide, avail Grd data, Land Use Maps																																																			
D0-0-2090	Data Integration and Hydrodynam Model GEP and Grid Integration	25	06-Feb-18	12-Mar-18	Data Integration and Hydrodynam Model GEP and Grid Integration																																																			
D0-0-2080	Receipt of survey/bathometry data	0	06-Feb-18		Receipt of survey/bathometry data																																																			
D0-0-2110	Receipt of prop bridge and west wall	0		12-Mar-18	Receipt of prop bridge and west wall																																																			
D0-0-2100	Develop 2D Hydrodynamic Model	20	13-Mar-18	09-Apr-18	Develop 2D Hydrodynamic Model																																																			
D0-0-2120	Internal Review	5	03-Apr-18	09-Apr-18	Internal Review																																																			
D0-0-7731	Develop Interim Scour Depth Calcs	5	10-Apr-18	16-Apr-18	Develop Interim Scour Depth Calcs																																																			
D0-0-7741	Internal Review	2	13-Apr-18	16-Apr-18	Internal Review																																																			
D0-0-7761	Prep Hydraulic Rpt and Recommend	5	17-Apr-18	23-Apr-18	Prep Hydraulic Rpt and Recommend																																																			
D0-0-2130	Internal Review	5	24-Apr-18	30-Apr-18	Internal Review																																																			
D0-0-7751	Rev 2D Hydrodynam model and re-calculate scour	5	24-Apr-18	30-Apr-18	Rev 2D Hydrodynam model and re-calculate scour																																																			
D0-0-2160	Submit DCR	0		30-Apr-18	Submit DCR																																																			
D0-0-2170	DCR Review	40	01-May-18	26-Jun-18	DCR Review																																																			
D0-0-2150	VDOT Review and Approval	21	01-May-18	21-May-18	VDOT Review and Approval																																																			
D0-0-2180	Address Comments DCR	15	22-May-18	12-Jun-18	Address Comments DCR																																																			
D0-0-2190	River Hydraulic Approval	0		12-Jun-18	River Hydraulic Approval																																																			
Public Information and Communication Plan (PICP) 611 17-Nov-17 30-Jul-21																																																								
D0-0-8220	PICP Development	23	17-Nov-17	21-Dec-17	PICP Development																																																			
D0-0-8230	PICP Internal Review	15	22-Dec-17	15-Jan-18	PICP Internal Review																																																			
D0-0-8250	Submit PICP	0		15-Jan-18	Submit PICP																																																			
D0-0-8240	VDOT Review and Approval	21	16-Jan-18	05-Feb-18	VDOT Review and Approval																																																			
D0-0-8260	Address VDOT Comments on PICP	5	06-Feb-18	12-Feb-18	Address VDOT Comments on PICP																																																			
D0-0-8270	Final PICP	0		12-Feb-18	Final PICP																																																			
D0-0-8280	Implement PICP	881	13-Feb-18	30-Jul-21	Implement PICP																																																			
Final Design 186 17-Nov-17 03-Jan-19																																																								
Pavement Marking Design 112 17-Nov-17 27-Jul-18																																																								
D0-0-2810	Prepare Preliminary Pavement Marking Plans	35	17-Nov-17	10-Jan-18	Prepare Preliminary Pavement Marking Plans																																																			
D0-0-2820	Internal Review	5	04-Jan-18	10-Jan-18	Internal Review																																																			
D0-0-2830	VDOT Review and Approval	21	11-Jan-18	31-Jan-18	VDOT Review and Approval																																																			
D0-0-2840	Prepare Pavement Marking Plans 75%	30	01-Feb-18	14-Mar-18	Prepare Pavement Marking Plans 75%																																																			
D0-0-2850	Internal Review	5	08-Mar-18	14-Mar-18	Internal Review																																																			
D0-0-2870	Incorporate VDOT's review comment and resubmit	21	15-Mar-18	12-Apr-18	Incorporate VDOT's review comment and resubmit																																																			
D0-0-2860	VDOT Review and Approval	21	15-Mar-18	04-Apr-18	VDOT Review and Approval																																																			
D0-0-2880	Internal Review	5	06-Apr-18	12-Apr-18	Internal Review																																																			
D0-0-2890	VDOT Review and Approval	21	13-Apr-18	03-May-18	VDOT Review and Approval																																																			
D0-0-2900	Prepare Pavement Marking Plans 100%	22	04-May-18	05-Jun-18	Prepare Pavement Marking Plans 100%																																																			
D0-0-2910	Internal Review	3	01-Jun-18	05-Jun-18	Internal Review																																																			

█ Remaining Level of Effort
 █ Remaining Work
 █ Actual Work
 █ Critical Remaining Work
 ◆ Milestone

Activity ID	Activity Name	Original Duration	Start	Finish	2017							2018							2019							2020							2021							2022			
					Jun	Jul	A	S	Oct	N	D	Jan	F	M	Apr	M	Jun	Jul	A	S	Oct	N	D	Jan	F	M	Apr	M	Jun	Jul	A	S	Oct	N	D	Jan	F	M	A	M	Jun	Jul	A
Design					606	17-Nov-17	19-Jul-21																																				
Final Design					606	17-Nov-17	19-Jul-21																																				
Roadway Design Segment 1					167	17-Nov-17	19-Nov-18																																				
D0-0-1130	Prepare Field Inspection Roadway Plans, 55% Design	16	17-Nov-17	12-Dec-17	Prepare Field Inspection Roadway Plans, 55% Design																																						
D0-0-1140	Internal Review	5	06-Dec-17	12-Dec-17	Internal Review																																						
D0-0-1150	VDOT Review and Approval	21	13-Dec-17	02-Jan-18	VDOT Review and Approval																																						
D0-0-1160	Prepare Roadway R/W Plans, 75% Design	30	26-Feb-18	06-Apr-18	Prepare Roadway R/W Plans, 75% Design																																						
D0-0-1170	Internal Review	5	02-Apr-18	06-Apr-18	Internal Review																																						
D0-0-1180	VDOT Review and Approval	21	07-Apr-18	27-Apr-18	VDOT Review and Approval																																						
D0-0-1190	Incorporate VDOT's review comment and resubmit	21	30-Apr-18	29-May-18	Incorporate VDOT's review comment and resubmit																																						
D0-0-1200	Internal Review	3	24-May-18	29-May-18	Internal Review																																						
D0-0-1210	VDOT R/W plans Approval	15	30-May-18	19-Jun-18	VDOT R/W plans Approval																																						
D0-0-1220	Prepare Final Roadway Plans 100% Design	22	07-Aug-18	06-Sep-18	Prepare Final Roadway Plans 100% Design																																						
D0-0-1230	Internal Review	3	04-Sep-18	06-Sep-18	Internal Review																																						
D0-0-1240	VDOT Review and Approval	21	07-Sep-18	27-Sep-18	VDOT Review and Approval																																						
D0-0-1260	Prepare RFC Roadway Plans (VDOT Notice to Commence Construction)	22	28-Sep-18	29-Oct-18	Prepare RFC Roadway Plans (VDOT Notice to Commence Construction)																																						
D0-0-1250	Internal Review	3	25-Oct-18	29-Oct-18	Internal Review																																						
D0-0-7501	VDOT Review and Approve EQ-200 NEPA Re-evaluation & EQ-103 NE	21	30-Oct-18	19-Nov-18	VDOT Review and Approve EQ-200 NEPA Re-evaluation & EQ-103 NEPA Cert./Commitments for Construction																																						
D0-0-7491	Submit EQ-200 NEPA Re-evaluation & EQ-103 NEPA Certification/Comr	0	30-Oct-18		Submit EQ-200 NEPA Re-evaluation & EQ-103 NEPA Certification/Commitments for Construction																																						
Prepare Drainage, E&S & SWM Design Segment 1					98	17-Nov-17	27-Jun-18																																				
D0-0-1590	Submit PFI Hydraulic plans	16	17-Nov-17	12-Dec-17	Submit PFI Hydraulic plans																																						
D0-0-1600	Internal Review	5	06-Dec-17	12-Dec-17	Internal Review																																						
D0-0-1610	VDOT Review and Approval	21	13-Dec-17	02-Jan-18	VDOT Review and Approval																																						
D0-0-1620	Prepare 75% Hydraulic Design	30	03-Jan-18	13-Feb-18	Prepare 75% Hydraulic Design																																						
D0-0-1630	Internal Review	5	07-Feb-18	13-Feb-18	Internal Review																																						
D0-0-1640	VDOT Review and Approval	21	14-Feb-18	06-Mar-18	VDOT Review and Approval																																						
D0-0-1650	Incorporate VDOT's review comment and resubmit	21	07-Mar-18	04-Apr-18	Incorporate VDOT's review comment and resubmit																																						
D0-0-1660	Internal Review	5	29-Mar-18	04-Apr-18	Internal Review																																						
D0-0-1680	Submit 100% Hydraulic Design to VDOT	22	05-Apr-18	04-May-18	Submit 100% Hydraulic Design to VDOT																																						
D0-0-1670	VDOT Review and Approval	21	05-Apr-18	25-Apr-18	VDOT Review and Approval																																						
D0-0-1690	Internal Review	3	02-May-18	04-May-18	Internal Review																																						
D0-0-1700	VDOT Review and Approval	21	05-May-18	25-May-18	VDOT Review and Approval																																						
D0-0-1720	Prepare RFC Hydraulic Design	22	29-May-18	27-Jun-18	Prepare RFC Hydraulic Design																																						
D0-0-1710	Internal Review	3	25-Jun-18	27-Jun-18	Internal Review																																						
Traffic Control Design Segment 1					112	17-Nov-17	27-Jul-18																																				
D0-0-2210	Prepare Traffic Control Staging Concepts	35	17-Nov-17	10-Jan-18	Prepare Traffic Control Staging Concepts																																						
D0-0-2220	Internal Review	5	04-Jan-18	10-Jan-18	Internal Review																																						
D0-0-2230	VDOT Review and Approval of Traffic Control Staging Concepts	21	11-Jan-18	31-Jan-18	VDOT Review and Approval of Traffic Control Staging Concepts																																						
D0-0-2240	Prepare Traffic Control Phase Submittals	30	01-Feb-18	14-Mar-18	Prepare Traffic Control Phase Submittals																																						
D0-0-2250	Internal Review	5	08-Mar-18	14-Mar-18	Internal Review																																						
D0-0-2260	VDOT Review and Approval	21	15-Mar-18	04-Apr-18	VDOT Review and Approval																																						
D0-0-2270	Incorporate VDOT's review comment and resubmit	21	05-Apr-18	03-May-18	Incorporate VDOT's review comment and resubmit																																						
D0-0-2280	Internal Review	5	27-Apr-18	03-May-18	Internal Review																																						
D0-0-2300	Submit 100% Traffic Control Plans	22	04-May-18	05-Jun-18	Submit 100% Traffic Control Plans																																						
D0-0-2290	VDOT Review and Approval	21	04-May-18	24-May-18	VDOT Review and Approval																																						
D0-0-2310	Internal Review	3	01-Jun-18	05-Jun-18	Internal Review																																						
D0-0-2320	VDOT Review and Approval	21	06-Jun-18	26-Jun-18	VDOT Review and Approval																																						
D0-0-2340	Prepare RFC Traffic Control Plans	22	27-Jun-18	27-Jul-18	Prepare RFC Traffic Control Plans																																						
D0-0-2330	Internal Review	3	25-Jul-18	27-Jul-18	Internal Review																																						
Bridges - Segment 1					157	03-Jan-18	11-Dec-18																																				
Military Hwy					157	03-Jan-18	11-Dec-18																																				
D0-0-3780	Prepare Preliminary Str Plans	20	03-Jan-18	30-Jan-18	Prepare Preliminary Str Plans																																						
D0-0-3790	Internal Review	5	24-Jan-18	30-Jan-18	Internal Review																																						
D0-0-3810	Prepare Final Girder Package	30	31-Jan-18	13-Mar-18	Prepare Final Girder Package																																						
D0-0-3800	VDOT Review and Approval	21	31-Jan-18	20-Feb-18	VDOT Review and Approval																																						
D0-0-3820	Internal Review	5	07-Mar-18	13-Mar-18	Internal Review																																						
D0-0-3860	Prepare Final Substructure Package	100	14-Mar-18	02-Aug-18	Prepare Final Substructure Package																																						
D0-0-3830	VDOT Review and Approval	21	14-Mar-18	03-Apr-18	VDOT Review and Approval																																						
D0-0-3850	Prepare RFC Final Girder Package	15	04-Apr-18	24-Apr-18	Prepare RFC Final Girder Package																																						
D0-0-3840	Internal Review	5	18-Apr-18	24-Apr-18	Internal Review																																						

█ Remaining Level of Effort
 █ Remaining Work
 ◆ Milestone
█ Actual Work
 █ Critical Remaining Work

I-64 Southside Widening and High Rise Bridge, Phase 1 with Approved ATC's Winter Pour Section 4.7 Proposal Schedule 02-Aug-17

Activity ID	Activity Name	Original Duration	Start	Finish	2017							2018							2019							2020							2021							2022																				
					Jun	Jul	A	S	Oct	N	D	Jan	F	M	Apr	M	Jun	Jul	A	S	Oct	N	D	Jan	F	M	Apr	M	Jun	Jul	A	S	Oct	N	D	Jan	F	M	A		M	Jun	Jul	A	S	Oct	N	D	Jan	F	M	A	M	Jun	Jul	A	S	Oct	N	D
C1A1-1090	Construct Median Barrier, Seg 1A Stg 1 (ATC #2)	75	06-Aug-19	13-Jan-20																																																								
C1A1-1160	Install Sign Structures, Seg 1A Stg 1 (ATC #2)	75	30-Aug-19	06-Feb-20																																																								
C1A1-1170	Install Lighting & ITS, Seg 1A Stg 1 (ATC #2)	75	30-Aug-19	06-Feb-20																																																								
C1A1-1100	AC Paving, Seg 1A Stg 1 (ATC #2)	30	22-Oct-19	09-Mar-20																																																								
C1A1-1110	Install Guardrail, Seg 1A Stg 1 (ATC #2)	10	28-Feb-20	19-Mar-20																																																								
C1A1-1120	Finish Milestone, Seg 1A Stg 1 (ATC #2)	0		19-Mar-20																																																								
Bridge over Yarkin Rd & NSR																																																												
C1A1B1000	Start Milestone, Seg 1A B666/B667 (ATC #2)	0	20-Nov-18																																																									
C1A1B1010	Install MOT, Seg 1A B666/B667 (ATC #2)	4	21-Nov-18	30-Nov-18																																																								
C1A1B1020	Construct Access & Site Prep, Seg 1A B666/B667 (ATC #2)	4	21-Nov-18	30-Nov-18																																																								
C1A1B1030	Construct Retaining Wall A, Seg 1A B666/B667 (ATC #2)	21	03-Jan-19	18-Feb-19																																																								
C1A1B1220	Construct Retaining Wall B, Seg 1A B666/B667 (ATC #2)	21	21-Jan-19	08-Mar-19																																																								
C1A1B1040	Construct Approach Slab, Seg 1A B666/B667 (ATC #2)	10	12-Aug-19	03-Sep-19																																																								
C1A1B1050	Construct Approach Roadway, Seg 1A B666/B667 (ATC #2)	10	05-Sep-19	25-Sep-19																																																								
C1A1B1060	Install Guardrail, Seg 1A B666/B667 (ATC #2)	6	22-Oct-19	31-Oct-19																																																								
C1A1B1070	Finish Milestone, Seg 1A B666/B667 (ATC #2)	0		31-Oct-19																																																								
Substructure																																																												
C1A1B1080	Install Test Piles, Seg 1A B666/B667 (ATC #2)	4	03-Dec-18	10-Dec-18																																																								
C1A1B1090	Install Piles Abutment A, Seg 1A B666/B667 (ATC #2)	8	17-Dec-18	02-Jan-19																																																								
C1A1B1120	Install Piles Abutment B, Seg 1A B666/B667 (ATC #2)	8	03-Jan-19	18-Jan-19																																																								
C1A1B1100	Construct Abutment A, Seg 1A B666/B667 (ATC #2)	20	21-Feb-19	03-Apr-19																																																								
C1A1B1110	Cure Abutment A, Seg 1A B666/B667 (ATC #2)	14	04-Apr-19	17-Apr-19																																																								
C1A1B1130	Construct Abutment B, Seg 1A B666/B667 (ATC #2)	20	05-Apr-19	17-May-19																																																								
C1A1B1140	Cure Abutment B, Seg 1A B666/B667 (ATC #2)	14	18-May-19	31-May-19																																																								
Superstructure																																																												
C1A1B1150	Erect Girders, Seg 1A B666/B667 (ATC #2)	3	03-Jun-19	07-Jun-19																																																								
C1A1B1160	Construct Diaphragms, Seg 1A B666/B667 (ATC #2)	10	10-Jun-19	01-Jul-19																																																								
C1A1B1170	Construct Deck, Seg 1A B666/B667 (ATC #2)	20	02-Jul-19	09-Aug-19																																																								
C1A1B1180	Cure Deck, Seg 1A B666/B667 (ATC #2)	14	10-Aug-19	23-Aug-19																																																								
C1A1B1190	Construct Parapets, Seg 1A B666/B667 (ATC #2)	10	27-Aug-19	17-Sep-19																																																								
C1A1B1210	Groove Deck, Seg 1A B666/B667 (ATC #2)	2	19-Sep-19	20-Sep-19																																																								
Underdeck																																																												
C1A1B1240	Install underdeck MOT, Seg 1A B666/B667 (ATC #2)	2	06-Aug-19	09-Aug-19																																																								
C1A1B1200	Install Underdeck Conduits, Seg 1A B666/B667 (ATC #2)	5	12-Aug-19	21-Aug-19																																																								
C1A1B1250	Install Underdeck Lighting, Seg 1A B666/B667 (ATC #2)	5	12-Aug-19	21-Aug-19																																																								
Bridge over S. Military Hwy																																																												
C1A1C1000	Start Milestone, Seg 1A B664/B665 (ATC #2)	0	20-Nov-18																																																									
C1A1C1010	Install MOT, Seg 1A B664/B665 (ATC #2)	4	21-Nov-18	30-Nov-18																																																								
C1A1C1020	Construct Access & Site Prep, Seg 1A B664/B665 (ATC #2)	5	21-Nov-18	03-Dec-18																																																								
C1A1C1030	Construct Retaining Wall A, Seg 1A B664/B665 (ATC #2)	21	04-Feb-19	22-Mar-19																																																								
C1A1C1220	Construct Retaining Wall B, Seg 1A B664/B665 (ATC #2)	21	22-Feb-19	08-Apr-19																																																								
C1A1C1040	Construct Approach Slab, Seg 1A B664/B665 (ATC #2)	10	19-Sep-19	07-Oct-19																																																								
C1A1C1050	Construct Approach Roadway, Seg 1A B664/B665 (ATC #2)	10	09-Oct-19	25-Oct-19																																																								
C1A1C1060	Install Guardrail, Seg 1A B664/B665 (ATC #2)	6	28-Oct-19	05-Nov-19																																																								
C1A1C1070	Finish Milestone, Seg 1A B664/B665 (ATC #2)	0		05-Nov-19																																																								
Substructure																																																												
C1A1C1080	Install Test Piles, Seg 1A B664/B665 (ATC #2)	4	03-Jan-19	08-Jan-19																																																								
C1A1C1090	Install Piles Abutment A, Seg 1A B664/B665 (ATC #2)	8	14-Jan-19	01-Feb-19																																																								
C1A1C1120	Install Piles Abutment B, Seg 1A B664/B665 (ATC #2)	8	04-Feb-19	21-Feb-19																																																								
C1A1C1100	Construct Abutment A, Seg 1A B664/B665 (ATC #2)	20	25-Mar-19	02-May-19																																																								
C1A1C1110	Cure Abutment A, Seg 1A B664/B665 (ATC #2)	14	03-May-19	16-May-19																																																								
C1A1C1130	Construct Abutment B, Seg 1A B664/B665 (ATC #2)	20	03-May-19	20-Jun-19																																																								
C1A1C1140	Cure Abutment B, Seg 1A B664/B665 (ATC #2)	14	21-Jun-19	04-Jul-19																																																								
Superstructure																																																												
C1A1C1150	Erect Girders, Seg 1A B664/B665 (ATC #2)	3	05-Jul-19	10-Jul-19																																																								
C1A1C1160	Construct Diaphragms, Seg 1A B664/B665 (ATC #2)	10	12-Jul-19	01-Aug-19																																																								
C1A1C1170	Construct Deck, Seg 1A B664/B665 (ATC #2)	20	02-Aug-19	17-Sep-19																																																								
C1A1C1180	Cure Deck, Seg 1A B664/B665 (ATC #2)	14	18-Sep-19	01-Oct-19																																																								
C1A1C1190	Construct Parapets, Seg 1A B664/B665 (ATC #2)	10	02-Oct-19	21-Oct-19																																																								
C1A1C1210	Groove Deck, Seg 1A B664/B665 (ATC #2)	2	22-Oct-19	24-Oct-19																																																								

Remaining Level of Effort
 Remaining Work
 Actual Work
 Critical Remaining Work
 Milestone

Activity ID	Activity Name	Original Duration	Start	Finish	2017												2018												2019												2020												2021												2022
					Jun	Jul	A	S	Oct	N	D	Jan	F	M	Apr	M	Jun	Jul	A	S	Oct	N	D	Jan	F	M	Apr	M	Jun	Jul	A	S	Oct	N	D	Jan	F	M	A	M	Jun	Jul	A	S	Oct	N	D	Jan	F	M	A	M	Jun	Jul	A	S	Oct	N	D	Jan					
Underdeck					7	16-Sep-19	27-Sep-19																																																										
C1A1C1250	Install Underdeck MOT, Seg 1A B664/B665 (ATC #2)	2	16-Sep-19	17-Sep-19																																																													
C1A1C1200	Install Underdeck Conduits, Seg 1A B664/B665 (ATC #2)	5	19-Sep-19	27-Sep-19																																																													
C1A1C1240	Install Underdeck Lighting, Seg 1A B664/B665 (ATC #2)	5	19-Sep-19	27-Sep-19																																																													
Toll Gantries in Median					74	08-Apr-19	18-Jul-19																																																										
C1A2E1080	Site Prep, Seg 1A Med Toll Gantries (ATC #2)	5	08-Apr-19	12-Apr-19																																																													
C1A2E1090	Start Milestone, Seg 1A Med Toll Gantries (ATC #2)	0	08-Apr-19																																																														
C1A2E1060	Install Elect / Comm Conduits, Seg 1A Med Toll Gantries (ATC #2)	15	15-Apr-19	03-May-19																																																													
C1A2E1040	Install Gantry Foundation, Seg 1A Med Toll Gantries (ATC #2)	30	06-May-19	14-Jun-19																																																													
C1A2E1050	Construct Tech Shelters, Seg 1A Med Toll Gantries (ATC #2)	3	06-May-19	08-May-19																																																													
C1A2E1010	Install ITS Structures & Roadside Equipment, Seg 1A Med Toll Gantries	10	09-May-19	22-May-19																																																													
C1A2E1020	Install Back-Up Generators, Seg 1A Med Toll Gantries (ATC #2)	2	09-May-19	10-May-19																																																													
C1A2E1030	Install Gantry Structure, Seg 1A Med Toll Gantries (ATC #2)	10	17-Jun-19	28-Jun-19																																																													
C1A2E1000	Pull Wire & Terminates, Seg 1A Med Toll Gantries (ATC #2)	10	05-Jul-19	18-Jul-19																																																													
C1A2E1070	Finish Milestone, Seg 1A Med Toll Gantries (ATC #2)	0		18-Jul-19																																																													
Stage 2 (ATC #2)					181	20-Mar-20	21-Apr-21																																																										
C1A3-1020	Install MOT / Temp Barrier Wall, Seg 1A Stg 2 (ATC #2)	14	20-Mar-20	17-Apr-20																																																													
C1A3-1000	Start Milestone, Seg 1A Stg 2 (ATC #2)	0	20-Mar-20																																																														
C1A3-1010	Install E&S, Seg 1A Stg 2 (ATC #2)	4	25-Mar-20	02-Apr-20																																																													
C1A3-1030	Shift Traffic, Seg 1A Stg 2 (ATC #2)	2	20-Apr-20	21-Apr-20																																																													
C1A3-1040		4	24-Apr-20	30-Apr-20																																																													
C1A3-1060	Construct Sound Barrier Foundation, Seg 1A Stg 2 (ATC #2)	60	01-May-20	14-Sep-20																																																													
C1A3-1050	Install Lighting & ITS Conduits, and Sign Foundations, Seg 1A Stg 2 (ATC #2)	80	13-May-20	02-Nov-20																																																													
C1A3-1070	Install Drainage, Seg 1A Stg 2 (ATC #2)	60	28-May-20	02-Oct-20																																																													
C1A3-1090	Erect Sound Barrier Panels, Seg 1A Stg 2 (ATC #2)	60	10-Jul-20	11-Nov-20																																																													
C1A3-1100	Install Sign Structures, Seg 1A Stg 2 (ATC #2)	80	21-Aug-20	12-Feb-21																																																													
C1A3-1080	Install Lighting & ITS, Seg 1A Stg 2 (ATC #2)	80	21-Aug-20	12-Feb-21																																																													
C1A3-1120	Site Restoration and Landscape, Seg 1A Stg 2 (ATC #2)	30	13-Nov-20	21-Jan-21																																																													
C1A3-1160	Backfill and Construct Asphalt Curb, Seg 1A Stg 2 (ATC #2) (ATC #1)	15	01-Mar-21	31-Mar-21																																																													
C1A3-1110	Install Guardrail, Seg 1A Stg 2 (ATC #1)	10	01-Apr-21	21-Apr-21																																																													
C1A3-1130	Finish Milestone, Seg 1A Stg 2 (ATC #2)	0		21-Apr-21																																																													
Segment 1B - Route 17 to HRB Approach					423	08-Aug-18	22-Feb-21																																																										
C1B0-1000	Start Construction Milestone, Seg 1B	0	20-Nov-18																																																														
C1B0-1010	Finish Construction Milestone, Seg 1B	0		22-Feb-21																																																													
Stage 1					176	20-Nov-18	13-Dec-19																																																										
C1B1-1000	Start Milestone, Seg 1B Stg 1	0	20-Nov-18																																																														
C1B1-1010	Install E&S (Outside Shoulder), Seg 1B Stg 1	5	21-Nov-18	03-Dec-18																																																													
C1B1-1020	Construct 1' Widening (Night Shift), Seg 1B Stg 1	6	30-Nov-18	12-Dec-18																																																													
C1B1-1040	Temp Strip & Shift Traffic, Seg 1B Stg 1	4	14-Dec-18	20-Dec-18																																																													
C1B2-1020	Install MOT / Temp Barrier Wall, Seg 1B Stg 1	6	18-Dec-18	31-Dec-18																																																													
C1B2-1010	Install E&S (Median), Seg 1B Stg 1	1	24-Dec-18	24-Dec-18																																																													
C1B2-1030	Stripe and Export, Seg 1B Stg 1	8	26-Dec-18	08-Jan-19																																																													
C1B2-1040	Demo Exist Rdwy, Seg 1B Stg 1	3	09-Jan-19	14-Jan-19																																																													
C1B2-1050	Excavate and Embank, Seg 1B Stg 1	20	18-Jan-19	04-Mar-19																																																													
C1B2-1060	Install Drainage, Seg 1B Stg 1	75	11-Feb-19	22-Jul-19																																																													
C1B2-1070	Construct Median Barrier Wall Footer, Seg 1B Stg 1	15	15-Jul-19	15-Aug-19																																																													
C1B2-1080	Construct CTA & OGD, Seg 1B Stg 1	8	16-Aug-19	03-Sep-19																																																													
C1B2-1110	Install Underdrain, Seg 1B Stg 1	6	29-Aug-19	09-Sep-19																																																													
C1B2-1090	AC Paving and Temp Striping, Seg 1B Stg 1	12	13-Sep-19	04-Oct-19																																																													
C1A0-1030	Construct Median Barrier, Seg 1B Stg 1	30	25-Sep-19	21-Nov-19																																																													
C1B2-1100	Finish Milestone, Seg 1B Stg 1	0		13-Dec-19																																																													
Bridge B668 / B669 (Shell Rd) (ATC #5)					163	21-Dec-18	13-Dec-19																																																										
C1B2A1000	Start Milestone, Seg 1B B668 / B669	0	21-Dec-18																																																														
C1B2A1250	Finish Milestone, Seg 1B B668 / B669	0		13-Dec-19																																																													
Approach					160	24-Dec-18	06-Dec-19																																																										
Approach B-668					160	24-Dec-18	06-Dec-19																																																										
C1B2A1	Site Prep, Seg 1B B668	5	24-Dec-18	02-Jan-19																																																													
C1B2A1	Install Deck MOT, Seg 1B B668	5	24-Dec-18	02-Jan-19																																																													
C1B2A1	Demo Deck Overhang & Exist Abutment (Partial), Seg 1B B668	20	03-Jan-19	01-Feb-19																																																													
C1B2A1	Embank Approaches, Seg 1B B668	15	18-Feb-19	22-Mar-19																																																													

Activity ID	Activity Name	Original Duration	Start	Finish	2017												2018												2019												2020												2021												2022
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Stage 2					423					08-Aug-18					22-Feb-21																																																		
C1B3-1190	Utility Relocate (Comm & Electric) Permit & Construction, Seg 1B Stg 2	90	08-Aug-18	05-Nov-18																																																													
C1B3-1000	Start Milestone, Seg 1B Stg 2	0	14-Dec-19	27-Dec-19																																																													
C1B3-1030	Shift Traffic, Seg 1B Stg 2	6	16-Dec-19	27-Dec-19																																																													
C1B3-1020	Install MOT / Temp Barrier Wall, Seg 1B Stg 2	6	16-Dec-19	27-Dec-19																																																													
C1B3-1010	Install E&S, Seg 1B Stg 2	2	20-Dec-19	23-Dec-19																																																													
C1B3-1040	Site Prep, Seg 1B Stg 2	10	30-Dec-19	17-Jan-20																																																													
C1B3-1060	Construct Sound Barrier Foundation, Seg 1B Stg 2	83	08-Jan-20	10-Jul-20																																																													
C1B3-1200	Install Sign Foundations, Seg 1B Stg 2	80	20-Jan-20	15-Jul-20																																																													
C1B3-1070	Install Drainage, Seg 1B Stg 2	65	18-Feb-20	10-Jul-20																																																													
C1B3-1090	Erect Sound Barrier Panels, Seg 1B Stg 2	83	06-Mar-20	04-Sep-20																																																													
C1B3-1050	Install Lighting & ITS Conduits, Seg 1B Stg 2	80	13-Mar-20	04-Sep-20																																																													
C1B3-1140	Backfill, Pave, and Construct Asphalt Curb, Seg 1B Stg 2 (ATC #1)	83	17-Mar-20	16-Sep-20																																																													
C1B3-1080	Install Lighting & ITS, Seg 1B Stg 2	80	13-Apr-20	05-Oct-20																																																													
C1B3-1160	Demo Existing Shoulder, Seg 1B Stg 2	14	13-Jul-20	07-Aug-20																																																													
C1B3-1150	Construct SWM Facilities, Seg 1B Stg 2	10	13-Jul-20	31-Jul-20																																																													
C1B3-1210	Cure Sign Foundations, Seg 1B Stg 2	28	16-Jul-20	12-Aug-20																																																													
C1B3-1230	Place Roadway (HSR), Seg 1B Stg 2	24	23-Jul-20	14-Sep-20																																																													
C1B3-1100	Install Sign Structures, Seg 1B Stg 2	76	14-Aug-20	25-Jan-21																																																													
C1B3-1120	Site Restoration and Landscape, Seg 1B Stg 2	12	27-Jan-21	22-Feb-21																																																													
C1B3-1110	Install Guardrail, Seg 1B Stg 2 (ATC #1)	5	27-Jan-21	05-Feb-21																																																													
C1B3-1130	Finish Milestone, Seg 1B Stg 2	0		22-Feb-21																																																													
Bridge B668 (Shell Rd)					11					14-Dec-19					06-Jan-20																																																		
C1B3B1050	Start Milestone, Seg 1B B668	0	14-Dec-19	16-Dec-19																																																													
C1B3B1060	Install Deck MOT, Seg 1B B668	1	16-Dec-19	16-Dec-19																																																													
C1B3B1070	Demo Exist Deck Joint, Seg 1B B668	4	19-Dec-19	26-Dec-19																																																													
C1B3B1080	Construct Elastomeric Expansion Dams (Type F2), Seg 1B B668	4	27-Dec-19	02-Jan-20																																																													
C1B3B1100	Mill and Overlay Bridge Deck, Seg 1B B668	2	03-Jan-20	06-Jan-20																																																													
C1B3B1090	Finish Milestone, Seg 1B B668	0		06-Jan-20																																																													
Bridge B669 (Shell Rd)					11					14-Dec-19					06-Jan-20																																																		
C1B3B1000	Start Milestone, Seg 1B B669	0	14-Dec-19	16-Dec-19																																																													
C1B3B1010	Install Deck MOT, Seg 1B B669	1	16-Dec-19	16-Dec-19																																																													
C1B3B1020	Demo Exist Deck Joint, Seg 1B B669	4	19-Dec-19	26-Dec-19																																																													
C1B3B1030	Construct Elastomeric Expansion Dams (Type F2), Seg 1B B669	4	27-Dec-19	02-Jan-20																																																													
C1B3B1110	Mill and Overlay Bridge Deck, Seg 1B B669	2	03-Jan-20	06-Jan-20																																																													
C1B3B1040	Finish Milestone, Seg 1B B669	0		06-Jan-20																																																													
Tide Gate					20					30-Dec-19					07-Feb-20																																																		
C1B3A1000	Construct Water Bypass, Seg 1B Stg 2 Tide Gate	4	30-Dec-19	03-Jan-20																																																													
C1B3A1020	Construct Box Culvert Extension, Seg 1B Stg 2 Tide Gate	5	06-Jan-20	13-Jan-20																																																													
C1B3A1030	Construct Tide Gate Platform, Seg 1B Stg 2 Tide Gate	2	17-Jan-20	20-Jan-20																																																													
C1B3A1250	Install Tide Gate, Seg 1B Stg 2 Tide Gate	2	24-Jan-20	27-Jan-20																																																													
C1B3A1270	Construct Platform Access, Seg 1B Stg 2 Tide Gate	1	28-Jan-20	28-Jan-20																																																													
C1B3A1260	Install Tide Gate Elect & Mech Components, and Generator, Seg 1B Stg 2 Tide Gate	3	28-Jan-20	31-Jan-20																																																													
C1B3A1280	Test and Accept Gate, Seg 1B Stg 2 Tide Gate	2	03-Feb-20	04-Feb-20																																																													
C1B3A1040	Restore Waterflow, Seg 1B Stg 2 Tide Gate	2	06-Feb-20	07-Feb-20																																																													
Route 17 Underpass					17					30-Dec-19					03-Feb-20																																																		
C1B3A1290	Demo & Re-Construct Outside Lanes, Seg 1B Stg 2 R-17	10	30-Dec-19	17-Jan-20																																																													
C1B3A1300	Shift CD Lane Traffic onto Outside Lanes, Seg 1B Stg 2 R-17	2	20-Jan-20	24-Jan-20																																																													
C1B3A1310	Demo and Re-Construct CD Lanes and Barrier Walls, Seg 1B Stg 2 R-17	5	27-Jan-20	03-Feb-20																																																													
Segment 1C - HRB Approach (Full Depth Pmt)					275					20-Nov-18					21-Jul-20																																																		
C1C0-1000	Start Construction Milestone, Seg 1C	0	20-Nov-18	21-Jul-20																																																													
C1C0-1010	Finish Construction Milestone, Seg 1C	0		21-Jul-20																																																													
Stage 1					121					20-Nov-18					16-Aug-19																																																		
C1C1-1000	Start Milestone, Seg 1C Stg 1	0	20-Nov-18	30-Nov-18																																																													
C1C1-1010	Install E&S (Outside Shoulder), Seg 1C Stg 1	4	21-Nov-18	30-Nov-18																																																													
C1C1-1020	Construct 1' Widening (Night Shift), Seg 1C Stg 1	5	04-Dec-18	12-Dec-18																																																													
C1C1-1040	Temp Strip & Shift Traffic, Seg 1C Stg 1	4	14-Dec-18	20-Dec-18																																																													
C1C2-1020	Install MOT / Temp Barrier Wall, Seg 1C Stg 1	5	24-Dec-18	02-Jan-19																																																													
C1C2-1030	Strip and Export, Seg 1C Stg 1	3	03-Jan-19	07-Jan-19																																																													
C1C2-1040	Demo Exist Rdwy, Seg 1C Stg 1	4	08-Jan-19	14-Jan-19																																																													

Activity ID	Activity Name	Original Duration	Start	Finish	2017												2018												2019												2020												2021												2022																																																																																									
					Jun			Jul			A			S			Oct			N			D			Jan			F			M			Apr			M			Jun			Jul			A			S			Oct			N			D			Jan				F			M			A			M			Jun			Jul			A			S			Oct			N			D			Jan			F			M			A			M			Jun			Jul			A			S			Oct			N			D																						
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Pier 16					<div style="display: flex; justify-content: space-between;"> █ Install Yokes and Precast Soffits Pier 16, Seg 2B Stg 1 B662 (ATC #3) █ Install Yokes and Precast Soffits Pier 16, Seg 2B Stg 1 B662 (ATC #3) </div>																																																																																																																																																					
C2B1L1010	Install Yokes and Precast Soffits Pier 16, Seg 2B Stg 1 B662 (ATC #3)	91	21-Feb-19	06-Sep-19																																																																																																																																																						
C2B1L1000	Install Piles by Barge Pier 16, Seg 2B Stg 1 B662	4	21-Feb-19	28-Feb-19																																																																																																																																																						
C2B1L1020	Construct Pier 16, Seg 2B Stg 1 B662	10	01-Mar-19	18-Mar-19																																																																																																																																																						
C2B1L1030	Cure Pier 16, Seg 2B Stg 1 B662	37	26-Jun-19	23-Aug-19																																																																																																																																																						
Pier 17					<div style="display: flex; justify-content: space-between;"> █ Install Yokes and Precast Soffits Pier 17, Seg 2B Stg 1 B662 (ATC #3) █ Install Yokes and Precast Soffits Pier 17, Seg 2B Stg 1 B662 (ATC #3) </div>																																																																																																																																																					
C2B1M1010	Install Yokes and Precast Soffits Pier 17, Seg 2B Stg 1 B662 (ATC #3)	116	21-Jan-19	03-Oct-19																																																																																																																																																						
C2B1M1000	Install Piles by Barge Pier 17, Seg 2B Stg 1 B662	4	21-Jan-19	31-Jan-19																																																																																																																																																						
C2B1M1020	Construct Pier 17, Seg 2B Stg 1 B662	11	31-Jan-19	18-Feb-19																																																																																																																																																						
C2B1M1030	Cure Pier 17, Seg 2B Stg 1 B662	37	16-Jul-19	12-Sep-19																																																																																																																																																						
Pier 18					<div style="display: flex; justify-content: space-between;"> █ Install Yokes and Precast Soffits Pier 18, Seg 2B Stg 1 B662 (ATC #3) █ Install Yokes and Precast Soffits Pier 18, Seg 2B Stg 1 B662 (ATC #3) </div>																																																																																																																																																					
C2B1N1010	Install Yokes and Precast Soffits Pier 18, Seg 2B Stg 1 B662 (ATC #3)	133	07-Jan-19	24-Oct-19																																																																																																																																																						
C2B1N1000	Install Piles by Barge Pier 18, Seg 2B Stg 1 B662	4	07-Jan-19	11-Jan-19																																																																																																																																																						
C2B1N1020	Construct Pier 18, Seg 2B Stg 1 B662	11	14-Jan-19	29-Jan-19																																																																																																																																																						
C2B1N1030	Cure Pier 18, Seg 2B Stg 1 B662	37	08-Aug-19	03-Oct-19																																																																																																																																																						
Pier 19					<div style="display: flex; justify-content: space-between;"> █ Install Yokes and Precast Soffits Pier 19, Seg 2B Stg 1 B662 (ATC #3) █ Install Yokes and Precast Soffits Pier 19, Seg 2B Stg 1 B662 (ATC #3) </div>																																																																																																																																																					
C2B1O1010	Install Yokes and Precast Soffits Pier 19, Seg 2B Stg 1 B662 (ATC #3)	153	11-Dec-18	08-Nov-19																																																																																																																																																						
C2B1O1000	Install Piles by Barge Pier 19, Seg 2B Stg 1 B662	4	11-Dec-18	18-Dec-18																																																																																																																																																						
C2B1O1020	Construct Pier 19, Seg 2B Stg 1 B662	11	19-Dec-18	04-Jan-19																																																																																																																																																						
C2B1O1030	Cure Pier 19, Seg 2B Stg 1 B662	37	29-Aug-19	25-Oct-19																																																																																																																																																						
Superstructure Span I to S					<div style="display: flex; justify-content: space-between;"> █ Install Standpipe Span G to V, Seg 2B Stg 1 B662 █ Install Standpipe Span G to V, Seg 2B Stg 1 B662 </div>																																																																																																																																																					
C2B1P1000	Install Standpipe Span G to V, Seg 2B Stg 1 B662	226	16-Jul-19	17-Nov-20																																																																																																																																																						
C2B1P1020	Groove Deck Span G to V, Seg 2B Stg 1 B662	16	11-Jun-20	13-Jul-20																																																																																																																																																						
Unit 2 - Span I to P					<div style="display: flex; justify-content: space-between;"> █ Erect Girder Unit 2, Seg 2B Stg 1 B662 █ Erect Girder Unit 2, Seg 2B Stg 1 B662 </div>																																																																																																																																																					
C2B1Q1000	Erect Girder Unit 2, Seg 2B Stg 1 B662	125	15-Aug-19	11-May-20																																																																																																																																																						
C2B1Q1110	Construct Diaphragms Unit 2, Seg 2B Stg 1 B662	8	30-Jun-20	15-Jul-20																																																																																																																																																						
C2B1Q1090	Install Deck Pan Unit 2, Seg 2B Stg 1 B662	28	15-Aug-19	26-Sep-19																																																																																																																																																						
C2B1Q1010	Install Overhang Unit 2, Seg 2B Stg 1 B662	40	22-Aug-19	23-Oct-19																																																																																																																																																						
C2B1Q1030	Construct Deck Unit 2, Seg 2B Stg 1 B662	40	06-Sep-19	06-Nov-19																																																																																																																																																						
C2B1Q1100	Pour Deck Unit 2, Seg 2B Stg 1 B662 (Winter Pour)	40	24-Sep-19	21-Nov-19																																																																																																																																																						
C2B1Q1080	Cure Deck Unit 2, Seg 2B Stg 1 B662	41	15-Oct-19	18-Dec-19																																																																																																																																																						
C2B1Q1040	Install Underdeck Conduits & Maint Access Unit 2, Seg 2B Stg 1 B662	15	08-Jan-20	07-Feb-20																																																																																																																																																						
C2B1Q1070	Construct Parapets Unit 2, Seg 2B Stg 1 B662	7	08-Feb-20	14-Feb-20																																																																																																																																																						
C2B1P1010	Strip Overhang Span G to V, Seg 2B Stg 1 B662	14	10-Feb-20	13-Mar-20																																																																																																																																																						
C2B1Q1050	Install Cable Tray Unit 2, Seg 2B Stg 1 B662	4	17-Feb-20	24-Feb-20																																																																																																																																																						
C2B1Q1060	Install Bridge Lighting & ITS Unit 2, Seg 2B Stg 1 B662	32	17-Feb-20	02-Apr-20																																																																																																																																																						
Unit 3 - Span Q to S					<div style="display: flex; justify-content: space-between;"> █ Install Erection Falsework Towers Unit 3, Seg 2A Stg 1 B662 █ Install Erection Falsework Towers Unit 3, Seg 2A Stg 1 B662 </div>																																																																																																																																																					
C2B1R1090	Install Erection Falsework Towers Unit 3, Seg 2A Stg 1 B662	226	16-Jul-19	17-Nov-20																																																																																																																																																						
C2B1R1000	Erect Girder Unit 3, Seg 2B Stg 1 B662	30	16-Jul-19	30-Aug-19																																																																																																																																																						
C2B1R1100	Install Deck Pan Unit 3, Seg 2B Stg 1 B662	40	19-Sep-19	18-Nov-19																																																																																																																																																						
C2B1R1010	Install Overhang Unit 3, Seg 2B Stg 1 B662	30	19-Nov-19	07-Jan-20																																																																																																																																																						
C2B1R1030	Construct Deck Unit 3, Seg 2B Stg 1 B662	30	05-Dec-19	23-Jan-20																																																																																																																																																						
C3A4-1080	Pour Deck Unit 3, Seg 2B Stg 1 B662	40	31-Dec-19	27-Mar-20																																																																																																																																																						
C2B1R1080	Cure Deck Unit 3, Seg 2B Stg 1 B662	25	30-Mar-20	22-May-20																																																																																																																																																						
C2B1R1040	Install Underdeck Conduits & Maint Access Unit 3, Seg 2B Stg 1 B662	7	23-May-20	29-May-20																																																																																																																																																						
C2B1R1110	Strip Overhang Span G to V, Seg 2B Stg 1 B662	10	26-May-20	15-Jun-20																																																																																																																																																						
C2B1R1070	Construct Parapets Unit 3, Seg 2B Stg 1 B662	15	01-Jun-20	23-Jun-20																																																																																																																																																						
C2B1R1050	Install Cable Tray Unit 3, Seg 2B Stg 1 B662	4	01-Jun-20	08-Jun-20																																																																																																																																																						
C2B1R1060	Install Bridge Lighting & ITS Unit 3, Seg 2B Stg 1 B662	10	11-Jun-20	30-Jun-20																																																																																																																																																						
C2B1R1160	Install Nav Lighting, Seg 2A Stg 1 B662	14	16-Jun-20	15-Jul-20																																																																																																																																																						
Fender System					<div style="display: flex; justify-content: space-between;"> █ Demo Exist Fender System, Seg 2B Stg 1 B662 █ Demo Exist Fender System, Seg 2B Stg 1 B662 </div>																																																																																																																																																					
C2B1S1000	Demo Exist Fender System, Seg 2B Stg 1 B662	11	26-May-20	18-Jun-20																																																																																																																																																						
C2B1S1010	Install FRP Piles, Seg 2B Stg 1 B662	5	26-May-20	02-Jun-20																																																																																																																																																						
C2B1S1020	Install FRP Wales, Seg 2B Stg 1 B662	5	03-Jun-20	10-Jun-20																																																																																																																																																						
Segment 2C - East Approach & Landside Bridge					<div style="display: flex; justify-content: space-between;"> ◆ Start Construction Milestone, Seg 2C B662 ◆ Start Construction Milestone, Seg 2C B662 </div>																																																																																																																																																					
C2C0-1000	Start Construction Milestone, Seg 2C B662	334	22-Nov-18	24-Nov-20																																																																																																																																																						
C2C0-1010	Finish Construction Milestone, Seg 2C B662	0	22-Nov-18	18-Aug-20																																																																																																																																																						
Approach					<div style="display: flex; justify-content: space-between;"> ◆ Start Construction Milestone, Seg 2C Rdwy Stg 1A ◆ Start Construction Milestone, Seg 2C Rdwy Stg 1A </div>																																																																																																																																																					
C2C1T1020	Start Construction Milestone, Seg 2C Rdwy Stg 1A	276	22-Nov-18	24-Jul-20																																																																																																																																																						
Stage 1A																																																																																																																																																										
C2C1T1020	Start Construction Milestone, Seg 2C Rdwy Stg 1A	163	22-Nov-18	15-Nov-19																																																																																																																																																						

█ Remaining Level of Effort
 █ Remaining Work
 ◆ Milestone
█ Actual Work
 █ Critical Remaining Work

Activity ID	Activity Name	Original Duration	Start	Finish	2017							2018							2019							2020							2021							2022						
					Jun	Jul	A	S	Oct	N	D	Jan	F	M	Apr	M	Jun	Jul	A	S	Oct	N	D	Jan	F	M	Apr	M	Jun	Jul	A	S	Oct	N	D	Jan	F	M	A	M	Jun	Jul	A	S	Oct	N
Bridge B-670		76	20-Nov-20	10-May-21																																										
Bascule Bridge		76	20-Nov-20	10-May-21																																										
C2-2-1040	Modify Exist Structural Steel, Seg 2 Stg 2 B670	5	20-Nov-20	02-Dec-20	■ Modify Exist Structural Steel, Seg 2 Stg 2 B670																																									
C2-2-1030	Remove Exist DBTMS (West End), Seg 2 Stg 2 B670	5	20-Nov-20	02-Dec-20	■ Remove Exist DBTMS (West End), Seg 2 Stg 2 B670																																									
C2-2-1050	Install Underdeck Conduits & Maint Access, Seg 2 Stg 2 B670	30	25-Nov-20	04-Feb-21	■ Install Underdeck Conduits & Maint Access, Seg 2 Stg 2 B670																																									
C2-2-1060	Demo Exist Median Barrier, Seg 2 Stg 2 B670 (Addm 6)	2	03-Dec-20	04-Dec-20	■ Demo Exist Median Barrier, Seg 2 Stg 2 B670 (Addm 6)																																									
	Install New Steel Deck & Access Hatches, Seg 2 Stg 2 B670 (Addm 6)	3	07-Dec-20	14-Dec-20	■ Install New Steel Deck & Access Hatches, Seg 2 Stg 2 B670 (Addm 6)																																									
C2-2-1220	Balance Bridge Bascule Leafs, Seg 2 Stg 2 B670 (Addm 6)	3	16-Dec-20	21-Dec-20	■ Balance Bridge Bascule Leafs, Seg 2 Stg 2 B670 (Addm 6)																																									
C2-2-1120	Install Barrier Gate, Seg 2 Stg 2 B670	10	05-Feb-21	26-Feb-21	■ Install Barrier Gate, Seg 2 Stg 2 B670																																									
C2-2-1100	Install CCTV, Seg 2 Stg 2 B670	10	05-Feb-21	26-Feb-21	■ Install CCTV, Seg 2 Stg 2 B670																																									
C2-2-1080	Install OH Sign Structures, Seg 2 Stg 2 B670	15	05-Feb-21	09-Mar-21	■ Install OH Sign Structures, Seg 2 Stg 2 B670																																									
C2-2-1130	Install Warning Gate, Seg 2 Stg 2 B670	10	01-Mar-21	19-Mar-21	■ Install Warning Gate, Seg 2 Stg 2 B670																																									
C2-2-1110	Install Traffic Signals, Seg 2 Stg 2 B670	10	01-Mar-21	19-Mar-21	■ Install Traffic Signals, Seg 2 Stg 2 B670																																									
C2-2-1090	Install OH Signs & Warning Gongs, Seg 2 Stg 2 B670	15	01-Mar-21	31-Mar-21	■ Install OH Signs & Warning Gongs, Seg 2 Stg 2 B670																																									
C2-2-1140	Remove Exist DBTMS (East End) - Night, Seg 2 Stg 2 B670	5	21-Apr-21	29-Apr-21	■ Remove Exist DBTMS (East End) - Night, Seg 2 Stg 2 B670																																									
C2-2-1150	Re-Strip Deck, Seg 2 Stg 2 B670	5	30-Apr-21	10-May-21	■ Re-Strip Deck, Seg 2 Stg 2 B670																																									
Fixed Span Bridge		30	20-Nov-20	29-Jan-21																																										
C2-2-1210	Install Sign / ITS Conduits, Seg 2 Stg 2 B670 (Addm 6)	10	20-Nov-20	14-Dec-20	■ Install Sign / ITS Conduits, Seg 2 Stg 2 B670 (Addm 6)																																									
C2-2-1190	Modify Exist Sign / ITS Sign Structures, Seg 2 Stg 2 B670 (Addm 6)	10	20-Nov-20	14-Dec-20	■ Modify Exist Sign / ITS Sign Structures, Seg 2 Stg 2 B670 (Addm 6)																																									
C2-2-1170	Demo Exist Deck Barrier Wall, Seg 2 Stg 2 B670 (Addm 6)	15	20-Nov-20	28-Dec-20	■ Demo Exist Deck Barrier Wall, Seg 2 Stg 2 B670 (Addm 6)																																									
C2-2-1200	Install Sign / ITS Devices, Seg 2 Stg 2 B670 (Addm 6)	5	16-Dec-20	28-Dec-20	■ Install Sign / ITS Devices, Seg 2 Stg 2 B670 (Addm 6)																																									
C2-2-1180	Pour Latex Conc Overlay on Deck, Seg 2 Stg 2 B670	15	29-Dec-20	29-Jan-21	■ Pour Latex Conc Overlay on Deck, Seg 2 Stg 2 B670																																									
Libertyville Rd		371	09-Aug-18	28-Oct-20																																										
C2-2A1130	Utility Relocate (Electric) Permit & Construction, Seg 2 Stg 2 Libertyville	30	09-Aug-18	12-Oct-18	■ Utility Relocate (Electric) Permit & Construction, Seg 2 Stg 2 Libertyville Rd																																									
C2-2A1000	Start Milestone, Seg 2 Stg 2 Libertyville Rd	0	19-Aug-20		◆ Start Milestone, Seg 2 Stg 2 Libertyville Rd																																									
C2-2A1010	Install MOT, Seg 2 Stg 2 Libertyville Rd	2	20-Aug-20	21-Aug-20	■ Install MOT, Seg 2 Stg 2 Libertyville Rd																																									
C2-2A1020	Excavate and Embank, Seg 2 Stg 2 Libertyville Rd	2	24-Aug-20	28-Aug-20	■ Excavate and Embank, Seg 2 Stg 2 Libertyville Rd																																									
C2-2A1030	Install Drainage, Seg 2 Stg 2 Libertyville Rd	4	31-Aug-20	08-Sep-20	■ Install Drainage, Seg 2 Stg 2 Libertyville Rd																																									
C2-2A1040	Construct CTA & OGD, Seg 2 Stg 2 Libertyville Rd	5	10-Sep-20	18-Sep-20	■ Construct CTA & OGD, Seg 2 Stg 2 Libertyville Rd																																									
C2-2A1060	Construct Barrier Wall, Seg 2 Stg 2 Libertyville Rd	10	21-Sep-20	06-Oct-20	■ Construct Barrier Wall, Seg 2 Stg 2 Libertyville Rd																																									
C2-2A1050	Install Elect Conduits, Seg 2 Stg 2 Libertyville Rd	5	21-Sep-20	28-Sep-20	■ Install Elect Conduits, Seg 2 Stg 2 Libertyville Rd																																									
C2-2A1080	Construct Sidewalk, Seg 2 Stg 2 Libertyville Rd	10	09-Oct-20	28-Oct-20	■ Construct Sidewalk, Seg 2 Stg 2 Libertyville Rd																																									
C2-2A1070	AC Paving and Temp Striping, Seg 2 Stg 2 Libertyville Rd	5	09-Oct-20	16-Oct-20	■ AC Paving and Temp Striping, Seg 2 Stg 2 Libertyville Rd																																									
C2-2A1100	Install Signs, Seg 2 Stg 2 Libertyville Rd	5	19-Oct-20	28-Oct-20	■ Install Signs, Seg 2 Stg 2 Libertyville Rd																																									
C2-2A1090	Install Lighting, Seg 2 Stg 2 Libertyville Rd	5	19-Oct-20	28-Oct-20	■ Install Lighting, Seg 2 Stg 2 Libertyville Rd																																									
C2-2A1110	Finish Milestone, Seg 2 Stg 2 Libertyville Rd	0	28-Oct-20		◆ Finish Milestone, Seg 2 Stg 2 Libertyville Rd																																									
Segment 3		609	17-Nov-17	26-Jul-21																																										
Design		298	17-Nov-17	12-Sep-19																																										
Final Design		298	17-Nov-17	12-Sep-19																																										
Roadway Design Segment 3		163	17-Nov-17	11-Nov-18																																										
D0-0-1430	Prepare Field Inspection Roadway Plans, 55% Design	15	17-Nov-17	11-Dec-17	■ Prepare Field Inspection Roadway Plans, 55% Design																																									
D0-0-1440	Internal Review	5	05-Dec-17	11-Dec-17	■ Internal Review																																									
D0-0-1450	VDOT Review and Approval	21	12-Dec-17	01-Jan-18	■ VDOT Review and Approval																																									
D0-0-1460	Prepare Roadway R/W Plans, 75% Design	30	26-Feb-18	06-Apr-18	■ Prepare Roadway R/W Plans, 75% Design																																									
D0-0-1470	Internal Review	5	02-Apr-18	06-Apr-18	■ Internal Review																																									
D0-0-1480	VDOT Review and Approval	21	07-Apr-18	27-Apr-18	■ VDOT Review and Approval																																									
D0-0-1490	Incorporate VDOT's review comment and resubmit	21	30-Apr-18	29-May-18	■ Incorporate VDOT's review comment and resubmit																																									
D0-0-1500	Internal Review	5	22-May-18	29-May-18	■ Internal Review																																									
D0-0-1510	VDOT R/W plans Approval	15	30-May-18	19-Jun-18	■ VDOT R/W plans Approval																																									
D0-0-1520	Prepare Final Roadway Plans 100% Design	22	31-Jul-18	29-Aug-18	■ Prepare Final Roadway Plans 100% Design																																									
D0-0-1530	Internal Review	3	27-Aug-18	29-Aug-18	■ Internal Review																																									
D0-0-1540	VDOT Review and Approval	21	30-Aug-18	19-Sep-18	■ VDOT Review and Approval																																									
D0-0-1560	Prepare RFC Roadway Plans (VDOT Notice to Commence Constructi	22	20-Sep-18	19-Oct-18	■ Prepare RFC Roadway Plans (VDOT Notice to Commence Constructi																																									
D0-0-1550	Internal Review	3	17-Oct-18	19-Oct-18	■ Internal Review																																									
D0-0-7541	VDOT Review and Approve EQ-200 NEPA Re-evaluation & EQ-103 NE	21	22-Oct-18	11-Nov-18	■ VDOT Review and Approve EQ-200 NEPA Re-evaluation & EQ-103 NEPA Cert./Commitments for Construction																																									
D0-0-7531	Submit EQ-200 NEPA Re-evaluation & EQ-103 NEPA Certification/Comr	0	22-Oct-18		◆ Submit EQ-200 NEPA Re-evaluation & EQ-103 NEPA Certification/Commitments for Construction																																									
Prepare Drainage, E&S & SWM Design Segment 3		98	17-Nov-17	27-Jun-18																																										
D0-0-1890	Submit PFI Hydraulic plans	16	17-Nov-17	12-Dec-17	■ Submit PFI Hydraulic plans																																									
D0-0-1900	Internal Review	5	06-Dec-17	12-Dec-17	■ Internal Review																																									
D0-0-1910	VDOT Review and Approval	21	13-Dec-17	02-Jan-18	■ VDOT Review and Approval																																									

Activity ID	Activity Name	Original Duration	Start	Finish	2017							2018							2019							2020							2021							2022			
					Jun	Jul	A	S	Oct	N	D	Jan	F	M	Apr	M	Jun	Jul	A	S	Oct	N	D	Jan	F	M	Apr	M	Jun	Jul	A	S	Oct	N	D	Jan	F	M	A	M	Jun	Jul	A
Stage 1C		315	08-Aug-18	30-Jun-20																																							
I-64 Re-Alignment		315	08-Aug-18	30-Jun-20																																							
C3A1-1430	Utility Relocate (Electric) Permit & Construction, Seg 3A Stg 1C Re-Align	90	08-Aug-18	05-Nov-18	Utility Relocate (Electric) Permit & Construction, Seg 3A Stg 1C Re-Align																																						
C3A1-1450	Start Milestone, Seg 3A Stg 1C Re-Align	0	16-Oct-19		Start Milestone, Seg 3A Stg 1C Re-Align																																						
C3A1-1440	Install MOT / Temp Barrier Wall, Seg 3A Stg 1C Re-Align	5	17-Oct-19	24-Oct-19	Install MOT / Temp Barrier Wall, Seg 3A Stg 1C Re-Align																																						
C3A1-1460	Clear & Grub, Seg 3A Stg 1C Re-Align	5	25-Oct-19	01-Nov-19	Clear & Grub, Seg 3A Stg 1C Re-Align																																						
C3A1-1470	Demo Exist Rdwy, Seg 3A Stg 1C Re-Align	5	04-Nov-19	13-Nov-19	Demo Exist Rdwy, Seg 3A Stg 1C Re-Align																																						
C3A1-1480	Excavate and Embank, Seg 3A Stg 1C Re-Align	5	15-Nov-19	22-Nov-19	Excavate and Embank, Seg 3A Stg 1C Re-Align																																						
C3A1-1490	Install Sign Foundations, Seg 3A Stg 1C Re-Align	40	25-Nov-19	24-Feb-20	Install Sign Foundations, Seg 3A Stg 1C Re-Align																																						
C3A1-1500	Construct Sound Barrier Foundation, Seg 3A Stg 1C Re-Align	40	25-Nov-19	24-Feb-20	Construct Sound Barrier Foundation, Seg 3A Stg 1C Re-Align																																						
C3A1-1510	Install Drainage, Seg 3A Stg 1C Re-Align	40	25-Nov-19	24-Feb-20	Install Drainage, Seg 3A Stg 1C Re-Align																																						
C3A1-1520	Construct CTA & OGD, Seg 3A Stg 1C Re-Align	5	02-Mar-20	10-Mar-20	Construct CTA & OGD, Seg 3A Stg 1C Re-Align																																						
C3A1-1530	Install Underdrain, Seg 3A Stg 1C Re-Align	3	13-Mar-20	17-Mar-20	Install Underdrain, Seg 3A Stg 1C Re-Align																																						
C3A1-1540	Install Lighting & ITS Conduits, Seg 3A Stg 1C Re-Align	20	13-Mar-20	21-Apr-20	Install Lighting & ITS Conduits, Seg 3A Stg 1C Re-Align																																						
C3A1-1550	Install Sign Structures, Seg 3A Stg 1C Re-Align	30	24-Apr-20	30-Jun-20	Install Sign Structures, Seg 3A Stg 1C Re-Align																																						
C3A1-1560	Install Lighting & ITS, Seg 3A Stg 1C Re-Align	30	24-Apr-20	30-Jun-20	Install Lighting & ITS, Seg 3A Stg 1C Re-Align																																						
C3A1-1570	AC Paving and Temp Striping, Seg 3A Stg 1C Re-Align	4	24-Apr-20	30-Apr-20	AC Paving and Temp Striping, Seg 3A Stg 1C Re-Align																																						
C3A1-1590	Erect Sound Barrier Panels, Seg 3A Stg 1C Re-Align	6	01-May-20	13-May-20	Erect Sound Barrier Panels, Seg 3A Stg 1C Re-Align																																						
C3A1-1600	Backfill, Pave, and Construct Asphalt Curb, Seg 3A Stg 1C Re-Align (AT	5	15-May-20	28-May-20	Backfill, Pave, and Construct Asphalt Curb, Seg 3A Stg 1C Re-Align (ATC #1)																																						
C3A1-1580	Install Guardrail, Seg 3A Stg 1C Re-Align (ATC #1)	5	29-May-20	08-Jun-20	Install Guardrail, Seg 3A Stg 1C Re-Align (ATC #1)																																						
C3A1-1610	Finish Milestone, Seg 3A Stg 1C Re-Align	0		30-Jun-20	Finish Milestone, Seg 3A Stg 1C Re-Align																																						
Box Culvert Extension (EB/WB)		90	18-Dec-18	04-Jul-19																																							
C3A1-1620	Install Dewatering Sys and SOE, Seg 3A Stg 1 Box Cul	5	18-Dec-18	28-Dec-18	Install Dewatering Sys and SOE, Seg 3A Stg 1 Box Cul																																						
C3A1-1630	Demo Exist Head Wall & Wing Wall, Seg 3A Stg 1 Box Cul	10	31-Dec-18	18-Jan-19	Demo Exist Head Wall & Wing Wall, Seg 3A Stg 1 Box Cul																																						
C3A1-1640	Construct 1st Box Culvert Extension (EB & WB), Seg 3A Stg 1 Box Cul	35	21-Jan-19	08-Apr-19	Construct 1st Box Culvert Extension (EB & WB), Seg 3A Stg 1 Box Cul																																						
C3A1-1650	Construct 2nd Box Culvert Extension (EB & WB), Seg 3A Stg 1 Box Cul	35	09-Apr-19	25-Jun-19	Construct 2nd Box Culvert Extension (EB & WB), Seg 3A Stg 1 Box Cul																																						
C3A1-1660	Remove Dewatering Sys and SOE, Seg 3A Stg 1 Box Cul	5	28-Jun-19	04-Jul-19	Remove Dewatering Sys and SOE, Seg 3A Stg 1 Box Cul																																						
Stage 2		315	08-Aug-18	30-Jun-20																																							
C3A2-1310	Utility Relocate (Electric) Permit & Construction, Seg 3A Stg 2	90	08-Aug-18	05-Nov-18	Utility Relocate (Electric) Permit & Construction, Seg 3A Stg 2																																						
C3A2-1000	Start Milestone, Seg 3A Stg 2	0	28-Sep-19		Start Milestone, Seg 3A Stg 2																																						
C3A2-1150	Finish Milestone, Seg 3A Stg 2	0		30-Jun-20	Finish Milestone, Seg 3A Stg 2																																						
Stage 2 - I-64 WB Sta 1371+50 to 1405+50		126	30-Sep-19	30-Jun-20																																							
C3A2-1010	Install MOT / Temp Barrier Wall, Seg 3A Stg 2	5	30-Sep-19	07-Oct-19	Install MOT / Temp Barrier Wall, Seg 3A Stg 2																																						
C3A2-1020	Clear & Grub, Seg 3A Stg 2	5	09-Oct-19	17-Oct-19	Clear & Grub, Seg 3A Stg 2																																						
C3A2-1030	Demo Exist Rdwy, Seg 3A Stg 2	5	18-Oct-19	25-Oct-19	Demo Exist Rdwy, Seg 3A Stg 2																																						
C3A2-1040	Excavate and Embank, Seg 3A Stg 2	5	28-Oct-19	04-Nov-19	Excavate and Embank, Seg 3A Stg 2																																						
C3A2-1320	Install Sign Foundations, Seg 3A Stg 2	40	05-Nov-19	03-Feb-20	Install Sign Foundations, Seg 3A Stg 2																																						
C3A2-1060	Construct Sound Barrier Foundation, Seg 3A Stg 2	40	05-Nov-19	03-Feb-20	Construct Sound Barrier Foundation, Seg 3A Stg 2																																						
C3A2-1050	Install Drainage, Seg 3A Stg 2	40	05-Nov-19	03-Feb-20	Install Drainage, Seg 3A Stg 2																																						
C3A2-1070	Construct CTA & OGD, Seg 3A Stg 2	5	02-Mar-20	10-Mar-20	Construct CTA & OGD, Seg 3A Stg 2																																						
C3A2-1090	Install Underdrain, Seg 3A Stg 2	3	13-Mar-20	17-Mar-20	Install Underdrain, Seg 3A Stg 2																																						
C3A2-1080	Install Lighting & ITS Conduits, Seg 3A Stg 2	20	13-Mar-20	21-Apr-20	Install Lighting & ITS Conduits, Seg 3A Stg 2																																						
C3A2-1130	Install Sign Structures, Seg 3A Stg 2	30	24-Apr-20	30-Jun-20	Install Sign Structures, Seg 3A Stg 2																																						
C3A2-1110	Install Lighting & ITS, Seg 3A Stg 2	30	24-Apr-20	30-Jun-20	Install Lighting & ITS, Seg 3A Stg 2																																						
C3A2-1100	AC Paving and Temp Striping, Seg 3A Stg 2	4	24-Apr-20	30-Apr-20	AC Paving and Temp Striping, Seg 3A Stg 2																																						
C3A2-1120	Erect Sound Barrier Panels, Seg 3A Stg 2	6	01-May-20	13-May-20	Erect Sound Barrier Panels, Seg 3A Stg 2																																						
C3A2-1140	Backfill, Pave, and Construct Asphalt Curb, Seg 3A Stg 2 (ATC #2)	5	15-May-20	28-May-20	Backfill, Pave, and Construct Asphalt Curb, Seg 3A Stg 2 (ATC #2)																																						
C3A2-1300	Install Guardrail, Seg 3A Stg 2	5	29-May-20	08-Jun-20	Install Guardrail, Seg 3A Stg 2																																						
Stage 2 - I-64 WB Ramp to Great Bridge Bld - Outside		18	28-Sep-19	31-Oct-19																																							
C3A2-1160	Start Milestone, Seg 3A Stg 2 Ramp	0	28-Sep-19		Start Milestone, Seg 3A Stg 2 Ramp																																						
C3A2-1170	Install MOT / Temp Barrier Wall, Seg 3A Stg 2 Ramp	2	30-Sep-19	01-Oct-19	Install MOT / Temp Barrier Wall, Seg 3A Stg 2 Ramp																																						
C3A2-1190	Demo Exist Rdwy, Seg 3A Stg 2 Ramp	2	02-Oct-19	04-Oct-19	Demo Exist Rdwy, Seg 3A Stg 2 Ramp																																						
C3A2-1200	Excavate and Embank, Seg 3A Stg 2 Ramp	2	07-Oct-19	09-Oct-19	Excavate and Embank, Seg 3A Stg 2 Ramp																																						
C3A2-1220	Construct CTA & OGD, Seg 3A Stg 2 Ramp	4	11-Oct-19	17-Oct-19	Construct CTA & OGD, Seg 3A Stg 2 Ramp																																						
C3A2-1240	Install Underdrain, Seg 3A Stg 2 Ramp	2	18-Oct-19	21-Oct-19	Install Underdrain, Seg 3A Stg 2 Ramp																																						
C3A2-1250	AC Paving and Temp Striping, Seg 3A Stg 2 Ramp	4	22-Oct-19	28-Oct-19	AC Paving and Temp Striping, Seg 3A Stg 2 Ramp																																						
C3A2-1280	Install Guardrail, Seg 3A Stg 2 Ramp	2	30-Oct-19	31-Oct-19	Install Guardrail, Seg 3A Stg 2 Ramp																																						
C3A2-1290	Finish Milestone, Seg 3A Stg 2 Ramp	0		31-Oct-19	Finish Milestone, Seg 3A Stg 2 Ramp																																						
Stage 2 - I-64 EB Shoulders and Ramps		83	30-Sep-19	25-Mar-20																																							
C3A2-1330	Install MOT / Temp Barrier Wall, Seg 3A Stg 2 Shldr & Ramps	4	30-Sep-19	04-Oct-19	Install MOT / Temp Barrier Wall, Seg 3A Stg 2 Shldr & Ramps																																						

█ Remaining Level of Effort
 █ Remaining Work
 █ Actual Work
 █ Critical Remaining Work
 ◆ Milestone





Attachment 4.0.1.1

**Technical Proposal
Checklist and Contents**

ATTACHMENT 4.0.1.1 (REV 1)

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE 1

TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

Offerors shall furnish a copy of this Technical Proposal Checklist, with the page references added, with the Technical Proposal.

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Technical Proposal Checklist and Contents	Attachment 4.0.1.1	Section 4.0.1.1	no	Appendix
Acknowledgement of RFP, Revisions, and/or Addenda	Attachment 3.7 (Form C-78-RFP)	Sections 3.7, 4.0.1.1	no	Appendix
List of Approved ATCs form	Attachment 3.6.7	Sections 3.6.7	no	Appendix
Letter of Submittal	NA	Sections 4.1		
Letter of Submittal on Offeror's letterhead	NA	Section 4.1.1	yes	1
Identify the full legal name and address of Offeror	NA	Section 4.1.1	yes	1
Authorized representative's original signature	NA	Section 4.1.1	yes	2
Declaration of intent	NA	Section 4.1.2	yes	1
120 day declaration	NA	Section 4.1.3	yes	1
Point of Contact information	NA	Section 4.1.4	yes	2
Principal Officer information	NA	Section 4.1.5	yes	2
Final Completion Date(s)	NA	Section 4.1.6	yes	2
Provide any Unique Milestone dates	NA	Section 4.1.7	yes	2
Proposal Payment Agreement or Waiver of Proposal Payment	Attachment 9.3.1 or 9.3.2	Section 4.1.8	no	Appendix
Certification Regarding Debarment Forms	Attachment 11.8.6(a) Attachment 11.8.6(b)	Section 4.1.9	no	Appendix

ATTACHMENT 4.0.1.1 (REV 1)

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE 1

TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Offeror's Qualifications	NA	Section 4.2		
Confirmation that the information provided in the SOQ submittal remains true and accurate or indicates that any requested changes were previously approved by VDOT	NA	Section 4.2.1	yes	3
Organizational chart with any updates since the SOQ submittal clearly identified	NA	Section 4.2.2	yes	4
Revised narrative when organizational chart includes updates since the SOQ submittal	NA	Section 4.2.2	yes	3
Design Concept	NA	Section 4.3		
Conceptual Roadway Plans and description	NA	Section 4.3.1	yes	5-13, Vol. II: 63-148
Conceptual Bridge Plans and description - B662, I-64 (WB) over Southern Branch of the Elizabeth River, NPBL RR, and Route 166 (High Rise Bridge)	NA	Section 4.3.2	yes	14-18, Vol. II: 149-163
Narrative for New High Rise Bridge addressing ease of maintenance.	NA	Section 4.3.2	yes	14-18
Conceptual Bridge Plans and description -Existing Bridge Modification Conceptual Plans – B670, I-64 (EB) over Southern Branch Elizabeth River, NPBL RR, and Route 166	NA	Section 4.3.3	yes	18-19, Vol. II: 164-165
Conceptual Bridge Replacement Plans - B663, Route 190	NA	Section 4.3.4	yes	19-20, Vol.

ATTACHMENT 4.0.1.1 (REV 1)

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE 1

TECHNICAL PROPOSAL CHECKLIST AND CONTENTS


Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
(Great Bridge Blvd.) over I-64				II: 166-167
Conceptual Bridge Plans and description – For Bridge Widening	NA	Section 4.3.5	yes	20-22, Vol. II: 168-174
Conceptual Plans – Tide Gate at Gilmerton Canal	NA	Section 4.3.6	yes	22, Vol. II: 175
Project Approach	NA	Section 4.4		23-42
Environmental Management	NA	Section 4.4.1	yes	24-27
Utilities	NA	Section 4.4.2	yes	27-30
Geotechnical	NA	Section 4.4.3	yes	30-36
Quality Assurance/ Quality Control (QA/QC)	NA	Section 4.4.4	yes	36-42
Construction of Project	NA	Section 4.5		43-61
Sequence of Construction	NA	Section 4.5.1	yes	44-57
Transportation Management Plan	NA	Section 4.5.2	yes	57-61
Disadvantaged Business Enterprises (DBE)	NA	Section 4.6		
Written statement of 8% DBE participation goal	NA	Section 4.6	yes	62

ATTACHMENT 4.0.1.1 (REV 1)

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE 1

TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Proposal Schedule	NA	Section 4.7		S-1 – S-39
Proposal Schedule	NA	Section 4.7	no	S-12 - S-39
Proposal Schedule Narrative	NA	Section 4.7	no	S-1 – S-11
Proposal Schedule in electronic format (CD-ROM)	NA	Section 4.7	no	N/A



Attachment 3.6 (Form C-78-RFP)
**Acknowledgement of RFP,
Revisions, and/or Addenda**

ATTACHMENT 3.7**COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION**

RFP NO. C00106692DB93
 PROJECT NO.: 0064-131-811, P101, R201, C501, B662-B670, D637, D638

ACKNOWLEDGEMENT OF RFP, REVISION AND/OR ADDENDA

Acknowledgement shall be made of receipt of the Request for Proposals (RFP) and/or any and all revisions and/or addenda pertaining to the above designated project which are issued by the Department prior to the Letter of Submittal submission date shown herein. Failure to include this acknowledgement in the Letter of Submittal may result in the rejection of your proposal.

By signing this Attachment 3.6, the Offeror acknowledges receipt of the RFP and/or following revisions and/or addenda to the RFP for the above designated project which were issued under cover letter(s) of the date(s) shown hereon:

1. Cover letter of **RFP – December 14, 2016**
2. Cover letter of **Jan. 10, 2017 – Addendum No. 1**
3. Cover letter of **Feb. 8, 2017 – Addendum No. 2**
4. Cover letter of **March 17, 2017 – Addendum No. 3**
5. Cover letter of **April 24, 2017 – Addendum No. 4**
6. Cover letter of **May 23, 2017 – Addendum No. 5**
7. Cover letter of **June 19, 2017 – Addendum No. 6**
8. Cover letter of **July 10, 2017 – Addendum No. 7**
8. Cover letter of **August 4, 2017 – Addendum No. 8**



 SIGNATURE

8/4/2017


 DATE

John Havel, Jr., PE

PRINTED NAME

Authorized Representative

TITLE



Attachment 9.3.1
**Proposal Payment
Agreement**

ATTACHMENT 9.3.1
PROPOSAL PAYMENT AGREEMENT

THIS PROPOSAL PAYMENT AGREEMENT (this "Agreement") is made and entered into as of this 8 day of August, 2017, by and between the Virginia Department of Transportation ("VDOT"), and LMB Constructors ("Offeror").

WITNESSETH:

WHEREAS, Offeror is one of the entities who submitted Statements of Qualifications ("SOQs") pursuant to VDOT's August 16, 2016 Request for Qualifications ("RFQ") and was invited to submit proposals in response to a Request for Proposals ("RFP") for the **I-64 Southside Widening and High Rise Bridge, Phase 1, Project No. 0064-131-811, P101, R201, C501, B662-B670, D637, D638** ("Project"), under a design-build contract with VDOT ("Design-Build Contract"); and

WHEREAS, as part of the procurement process for the Project, Offeror has already provided and/or furnished to VDOT, and may continue to provide and/or furnish to VDOT, certain intellectual property, materials, information and ideas, including, but not limited to, such matters that are: (a) conveyed verbally or in writing during proprietary meetings or interviews; (b) contained in, related to or associated with Offeror's Proposal, including, but not limited to, written correspondence, designs, drawings, plans, exhibits, photographs, reports, printed material, tapes, electronic disks, or other graphic and visual aids; and (c) conveyed verbally or in writing as Alternative Technical Concepts, as such term is defined in the RFP, that are made known to VDOT through (a) and (b) above, regardless of whether the Alternative Technical Concept has been approved by VDOT or included as part of Offeror's Proposal (collectively "Offeror's Intellectual Property"); and

WHEREAS, VDOT is willing to provide a payment to Offeror, subject to the express conditions stated in this Agreement, to obtain certain rights in Offeror's Intellectual Property, provided that Offeror submits a proposal that VDOT determines to be responsive to the RFP ("Offeror's Proposal"), and either (a) Offeror is not awarded the Design-Build Contract; or (b) VDOT cancels the procurement or decides not to award the Design-Build Contract to any Offeror; and

WHEREAS, Offeror wishes to receive the payment offered by VDOT, in exchange for granting VDOT the rights set forth in this Agreement.

NOW, THEREFORE, in consideration of the mutual covenants and agreements set forth in this Agreement and other good and valuable consideration, the receipt and adequacy of which are acknowledged by the parties, the parties agree as follows:

1. **VDOT's Rights in Offeror's Intellectual Property.** Offeror hereby conveys to VDOT all rights, title and interest, free and clear of all liens, claims and encumbrances, in Offeror's Intellectual Property, which includes, without restriction or limitation, the right of VDOT, and anyone contracting with VDOT, to incorporate any ideas or information from Offeror's Intellectual Property into: (a) the Design-Build Contract and the Project; (b) any other contract awarded in reference to the Project; or (c) any subsequent procurement by VDOT. In receiving all rights, title and interest in Offeror's Intellectual Property, VDOT is deemed to own all intellectual property rights, copyrights, patents, trade secrets, trademarks, and service marks in Offeror's Intellectual Property, and Offeror agrees that it shall, at the request of VDOT, execute all papers and perform all other acts that may be necessary to ensure that VDOT's rights, title and interest in Offeror's Intellectual Property are protected. The rights conferred herein to VDOT include, without limitation, VDOT's ability to use Offeror's Intellectual Property without the obligation to notify or seek permission from Offeror.

2. **Exclusions from Offeror's Intellectual Property.** Notwithstanding Section 1 above, it is understood and agreed that Offeror's Intellectual Property is not intended to include, and Offeror does not convey any rights to, the Escrow Proposal Documents submitted by Offeror in accordance with the RFP.

3. **Proposal Payment.** VDOT agrees to pay Offeror the lump sum amount of **four hundred and seventy five thousand dollars (\$400,000~~475,000~~)** ("Proposal Payment"), which payment constitutes payment in full to Offeror for the conveyance of Offeror's Intellectual Property to VDOT in accordance with this Agreement. Payment of the Proposal Payment is conditioned upon: (a) Offeror's Proposal being, in the sole discretion of VDOT, responsive to the RFP; (b) Offeror complying with all other terms and conditions of this Agreement; and (c) either (i) Offeror is not awarded the Design-Build Contract, or (ii) VDOT cancels the procurement or decides not to award the Design-Build Contract to any Offeror.

4. **Payment Due Date.** Subject to the conditions set forth in this Agreement, VDOT will make payment of the Proposal Payment to the Offeror within forty-five (45) days after the later of: (a) notice from VDOT that it has awarded the Design-Build Contract to another Offeror; or (b) notice from VDOT that the procurement for the Project has been cancelled and that there will be no Contract Award.

5. **Effective Date of this Agreement.** The rights and obligations of VDOT and Offeror under this Agreement, including VDOT's ownership rights in Offeror's Intellectual Property, vests upon the date that Offeror's Proposal is submitted to VDOT. Notwithstanding the above, if Offeror's Proposal is determined by VDOT, in its sole discretion, to be nonresponsive to the RFP, then Offeror is deemed to have waived its right to obtain the Proposal Payment, and VDOT shall have no obligations under this Agreement.

6. **Indemnity.** Subject to the limitation contained below, Offeror shall, at its own expense, indemnify, protect and hold harmless VDOT and its agents, directors, officers, employees, representatives and contractors from all claims, costs, expenses, liabilities, demands, or suits at law or equity ("Claims") of, by or in favor of or awarded to any third party arising in whole or in part from: (a) the negligence or wilful misconduct of Offeror or any of its agents, officers, employees, representatives or subcontractors; or (b) breach of any of Offeror's obligations under this Agreement, including its representation and warranty under Section 8 hereof. This indemnity shall not apply with respect to any Claims caused by or resulting from the sole negligence or wilful misconduct of VDOT, or its agents, directors, officers, employees, representatives or contractors.

7. **Assignment.** Offeror shall not assign this Agreement, without VDOT's prior written consent, which consent may be given or withheld in VDOT's sole discretion. Any assignment of this Agreement without such consent shall be null and void.

8. **Authority to Enter into this Agreement.** By executing this Agreement, Offeror specifically represents and warrants that it has the authority to convey to VDOT all rights, title, and interest in Offeror's Intellectual Property, including, but not limited to, those any rights that might have been vested in team members, subcontractors, consultants or anyone else who may have contributed to the development of Offeror's Intellectual Property, free and clear of all liens, claims and encumbrances.

9. **Miscellaneous.**

a. Offeror and VDOT agree that Offeror, its team members, and their respective employees are not agents of VDOT as a result of this Agreement.

b. Any capitalized term used herein but not otherwise defined shall have the meanings set forth in the RFP.

c. This Agreement, together with the RFP, embodies the entire agreement of the parties with respect to the subject matter hereof. There are no promises, terms, conditions, or obligations other than those contained herein or in the RFP, and this Agreement shall supersede all previous communications, representations, or agreements, either verbal or written, between the parties hereto.

d. It is understood and agreed by the parties hereto that if any part, term, or provision of this Agreement is by the courts held to be illegal or in conflict with any law of the Commonwealth of Virginia, validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Agreement did not contain the particular part, term, or provisions to be invalid.

e. This Agreement shall be governed by and construed in accordance with the laws

of the Commonwealth of Virginia.

IN WITNESS WHEREOF, this Agreement has been executed and delivered as of the day and year first above written.

VIRGINIA DEPARTMENT OF TRANSPORTATION

By: _____

Name: _____

Title: _____

LMB Constructors

By:  _____

Name: John Havel, Jr., PE

Title: Authorized Representative



Attachment 3.6.7
**List of Approved ATCs
Included in Technical
Proposal**

ATTACHMENT 3.6.7
LIST OF APPROVED ATCs INCLUDED IN TECHNICAL PROPOSAL


OFFEROR: LMB Constructors

List all approved ATCs included in the Technical Proposal along with the page number references from Technical Proposal.

ATC ID Number	ATC Name Description	Date ATC Approved	Technical Proposal Reference Page(s) #
LMB-1	Sound Wall Protection	5-17-2017	6, 11, 64, 65, 66, 68, 86-110 (even pages), 121, 124, 127, 129, 134, 143, 147, 148
LMB-2	Managed Lane Realignment	5-17-2017	6, 13, 20, 21, 30, 46, 65, 78-97, 168-172, S-5
LMB-3	Special Design Precast Footing Soffits	5-17-2017	6, 15, 26, 149, 150, 155, 156, S-5, S-7
LMB-5	Shell Road Substructure	5-17-2017	6, 21, 173, S-6

By signing this document, the Offeror hereby confirms that they are agreeing to all conditions that may have accompanied the ATC approval(s). The Offerors shall make a note of RFP Part 4 Section 2.1.10


“If the Contract Documents incorporate any ATCs and Design-Builder, for whatever reason: (a) does not comply with one or more Department conditions of pre-approval for the ATC; (b) does not obtain required third-party approval for the ATC; or (c) fails to implement the ATC, then Design-Builder shall: (1) provide written notice thereof to Department; and (2) comply with the requirements in the Contract Documents that would have applied in the absence of such ATC. Such compliance shall be without any increase in the Contract Price or extension to the Contract Time(s). For the avoidance of doubt, Design-Builder shall not be entitled to any increase in the Contract Price or extension of the Contract Time(s) as a result of any delay, inability or cost associated with the acquisition of any property that may be required to implement any ATC”.


[Signature: Offerors POC or Principal Officer]

John Havel, Jr., PE
[Printed Name]

Authorized Representative
[Title]

DATE: 8/4/2017



Attachment 11.8.6(a)
**Certification Regarding
Debarment Primary Covered
Transactions**

ATTACHMENT 11.8.6(a)
CERTIFICATION REGARDING DEBARMENT
PRIMARY COVERED TRANSACTIONS

Project No.: 0064-131-811, P101, R201, C501, B662-B670, D637, D638

1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.

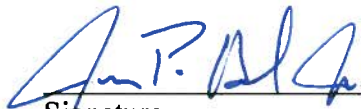
b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; and have not been convicted of any violations of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification, or destruction of records, making false statements, or receiving stolen property;

c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1) b) of this certification; and

d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.


Signature

8/4/17
Date

Authorized Representative
Title

LMB Constructors
Name of Firm

ATTACHMENT 11.8.6(a)
CERTIFICATION REGARDING DEBARMENT
PRIMARY COVERED TRANSACTIONS

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The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.

 8/4/17 Senior District Manager
Signature Date Title

The Lane Construction Corporation
Name of Firm

ATTACHMENT 11.8.6(a)
CERTIFICATION REGARDING DEBARMENT
PRIMARY COVERED TRANSACTIONS

Project No.: 0064-131-811, P101, R201, C501, B662-B670, D637, D638

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 8/01/2017 President & CEO
Signature Date Title

McLean Contracting Company
Name of Firm

ATTACHMENT 11.8.6(a)
CERTIFICATION REGARDING DEBARMENT
PRIMARY COVERED TRANSACTIONS

Project No.: 0064-131-811, P101, R201, C501, B662-B670, D637, D638

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The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.

	<u>8-1-2017</u>	<u>S.R. VICE PRESIDENT</u>
Signature	Date	Title
<u>BRANCH CIVIL, INC.</u>		
Name of Firm		



Attachment 11.8.6(b)
**Certification Regarding
Debarment Lower Tier
Covered Transactions**

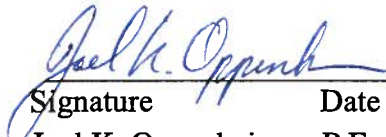
ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0064-131-811, P101, R201, C501, B662-B670, D637, D638

- 1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

- 2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.

	August 4, 2017	Senior Vice President
Signature	Date	Title
Joel K. Oppenheimer, P.E.		

STV Incorporated dba STV Group Incorporated
Name of Firm


ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0064-131-811, P101, R201, C501, B662-B670, D637, D638

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The undersigned makes the foregoing statements to be filed with the proposal submitted on behalf of the Offeror for contracts to be let by the Commonwealth Transportation Board.

	8/7/2017	Vice President
Signature	Date	Title

Johnson, Mirmiran & Thompson, Inc.
Name of Firm

ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0064-131-811, P101, R201, C501, B662-B670, D637, D638

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	8/4/17	President
_____ Signature	_____ Date	_____ Title

Alvi Associates, Inc.

Name of Firm

ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0064-131-811, P101, R201, C501, B662-B670, D637, D638

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VP 7/31/17 VP/SRVICE MANAGER
Signature Date Title

ECS MID-ATLANTIC, LLC
Name of Firm


ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0064-131-811, P101, R201, C501, B662-B670, D637, D638

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 Signature	8/3/2017 Date	President Title
---	------------------	--------------------

FROEHLING & ROBERTSON, INC.
Name of Firm


ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0064-131-811, P101, R201, C501, B662-B670, D637, D638

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	08/03/2017	President
Signature	Date	Title

Geotechnical Engineering and Testing Solutions, Inc., dba G E T Solutions, Inc.
Name of Firm

ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0064-131-811, P101, R201, C501, B662-B670, D637, D638

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	8/4/2017	President
Signature	Date	Title

Hassan Water Resources, PLC
Name of Firm

ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0064-131-811, P101, R201, C501, B662-B670, D637, D638

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J. Dasink 8/4/2017 COO
Signature Date Title

HMMH, Inc.
Name of Firm

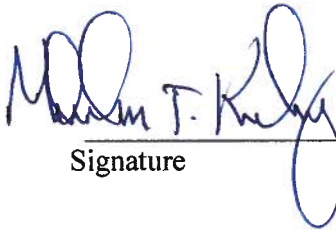
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Signature

August 2, 2017

Date

Malcolm T. Kerley, PE, President

Title

NXL Construction Services, Inc

Name of Firm

ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0064-131-811, P101, R201, C501, B662-B670, D637, D638

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John Polizosi 8/1/2017 President
Signature Date Title

Polizosi Company Communications
Name of Firm

ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

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 08/04/2017
Signature Date

President
Title

Precision Measurements, Inc.
Name of Firm



Volume II: Conceptual Plans

AUGUST 8, 2017

ELECTRONIC COPY



City of Chesapeake, VA
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE
PHASE 1

STATE PROJECT NO.
0064-131-811, P101, R201,
C501, B662-B670, D637, D638

FEDERAL PROJECT NO.
NHPP-064-3(488)

CONTRACT ID NO.
C00106692DB93

LMB Constructors



4.3.1 - CONCEPTUAL ROADWAY PLANS

STATE	FEDERAL AID PROJECT	ROUTE	STATE PROJECT	SHEET NO.
VA.		64	0064-131-811	1



COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION

FHWA-534 DATA 41103

PLAN AND PROFILE OF PROPOSED STATE HIGHWAY

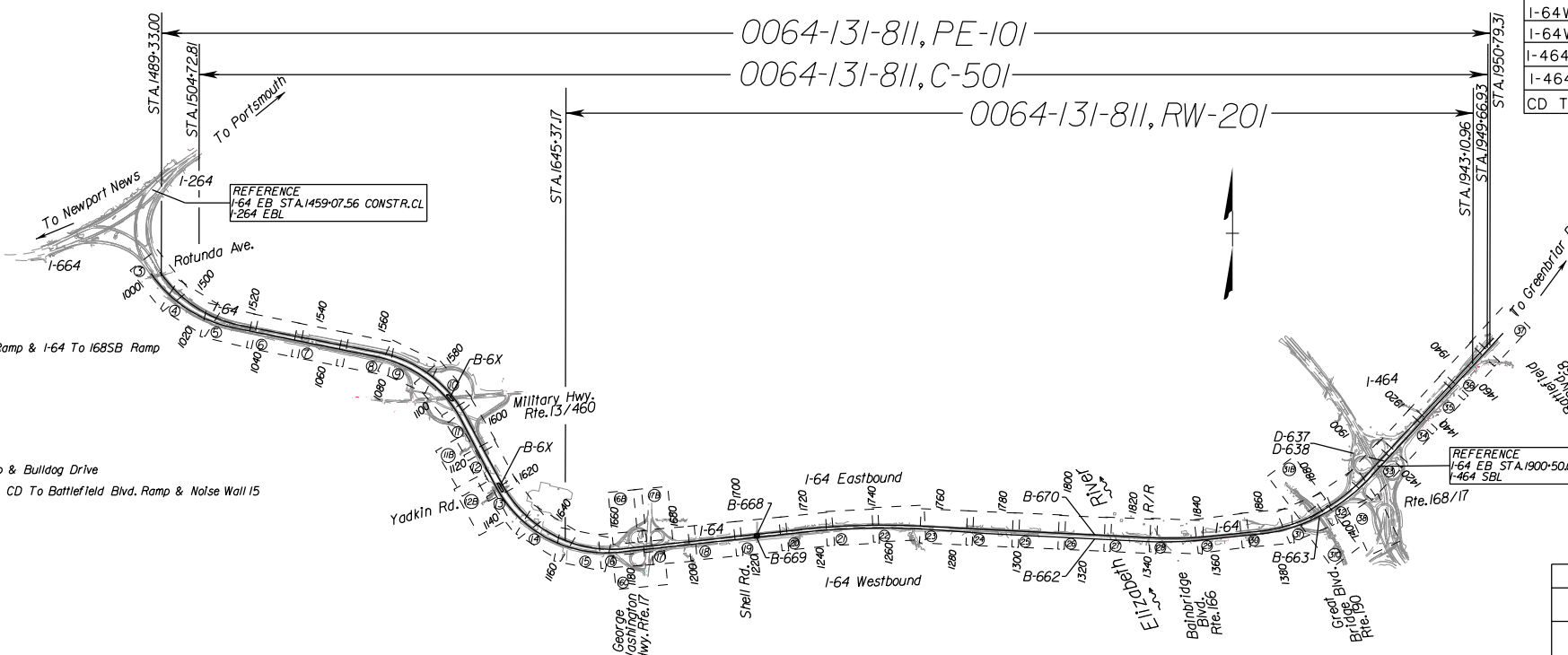
CITY OF CHESAPEAKE

FROM: 0.573 MILES EAST OF I-264
TO: 0.953 MILES EAST OF I-464

FUNCTIONAL CLASSIFICATION AND TRAFFIC DATA			
	MAINLINE		
From:	0.573Mi. East of I-264		
To:	0.953Mi. East of I-464		
FUNCTIONAL CLASSIFICATION	Urban Principal Arterial		
MIN. DESIGN SPEED	70mph		
ADT (Current Year)	(2016) 93,900		
ADT (Design Year)	(2040) 135,600		
DHV	11,295		
D (%) (design hour)	50%		
T (%) (design hour)	7%		
V (MPH)	70mph		
TC STD.	TC-5.11R (Level)		
GEOMETRIC STD.	GS-5		

ROADWAY	VPD	MIN. DESIGN SPEED	CLASSIFICATION	TC STD.
Great Bridge Blvd.	9,500	40mph	Urban Minor Arterial GS-6	TC-5.11U (Level)
Libertyville Rd.	1,300	30mph	Urban Local GS-8	TC-5.11ULS (Level)
Bulldog Dr.	840	25mph	Urban Local GS-8	TC-5.11ULS (Level)

SHEET NO.	DESCRIPTION	STATIONS
1	TITLE SHEET	
	TYPICAL SECTIONS	
3,3A	PLAN AND PROFILE SHEET	1495+00 to 1496+00 EB
4,4A	PLAN AND PROFILE SHEET	1496+00 to 1508+00 EB
5,5A	PLAN AND PROFILE SHEET	1508+00 to 1522+00 EB
6,6A	PLAN AND PROFILE SHEET	1522+00 to 1536+00 EB
7,7A	PLAN AND PROFILE SHEET	1536+00 to 1550+00 EB
8,8A	PLAN AND PROFILE SHEET	1550+00 to 1564+00 EB
9,9A	PLAN AND PROFILE SHEET	1564+00 to 1578+00 EB
10,10A	PLAN AND PROFILE SHEET	1578+00 to 1592+00 EB
11,11A	PLAN AND PROFILE SHEET	1592+00 to 1606+00 EB
12,12A	PLAN AND PROFILE SHEET	1606+00 to 1620+00 EB
13,13A	PLAN AND PROFILE SHEET	1620+00 to 1633+00 EB
14,14A	PLAN AND PROFILE SHEET	1633+00 to 1644+00 EB
15,15A	PLAN AND PROFILE SHEET	1644+00 to 1657+00 EB
16,16A	PLAN AND PROFILE SHEET	1657+00 to 1670+00 EB
17,17A	PLAN AND PROFILE SHEET	1670+00 to 1684+00 EB
18,18A	PLAN AND PROFILE SHEET	1684+00 to 1698+00 EB
19,19A	PLAN AND PROFILE SHEET	1698+00 to 1712+00 EB
20,20A	PLAN AND PROFILE SHEET	1712+00 to 1726+00 EB
21,21A	PLAN AND PROFILE SHEET	1726+00 to 1740+00 EB
22,22A	PLAN AND PROFILE SHEET	1740+00 to 1754+50 EB
23,23A	PLAN AND PROFILE SHEET	1754+50 to 1769+00 EB
24,24A	PLAN AND PROFILE SHEET	1769+00 to 1783+00 EB
25	PLAN SHEET	1783+00 to 1797+00 EB
25A	PROFILE SHEET	1783+00 to 1825+00 EB
25B	PROFILE SHEET	1298+00 to 1312+00 WB
26	PLAN SHEET	1797+00 to 1811+00 EB
26B	PROFILE SHEET	1312+00 to 1326+00 WB
27	PLAN SHEET	1811+00 to 1825+00 EB
27B	PROFILE SHEET	1326+00 to 1340+00 WB
28	PLAN SHEET	1825+00 to 1853+00 EB
28A	PROFILE SHEET	1825+00 to 1853+00 EB
28B	PROFILE SHEET	1340+00 to 1354+50 WB
29	PLAN SHEET	1839+00 to 1853+00 EB
29A	PROFILE SHEET	1354+50 to 1368+50 WB
29B	PROFILE SHEET	Libertyville Road & I-64WB To GBB Ramp
30,30A	PLAN AND PROFILE SHEET	1853+00 to 1866+00 EB
31,31A	PLAN AND PROFILE SHEET	1866+00 to 1879+00 EB
31B	PLAN SHEET	120+00 To 133+00 Great Bridge Blvd.
31C	PLAN SHEET	138+00 To 151+00 Great Bridge Blvd.
31D	PROFILE SHEET	Great Bridge Blvd.
32,32A	PLAN AND PROFILE SHEET	1879+00 to 1892+00 EB
33,33A	PLAN AND PROFILE SHEET	1892+00 to 1905+00 EB
33B	PROFILE SHEET	I-464SB To I-64EB Ramp, I-464 To WB CD Ramp & I-64 To I68SB Ramp
34,34A	PLAN SHEET	1905+00 to 1919+00 EB
35,35A	PLAN SHEET	1919+00 to 1933+00 EB
36	PLAN SHEET	1933+00 to 1947+00 EB
36A	PROFILE SHEET	1933+00 to 1954+26.39 EB
36B	PROFILE SHEET	CD Road
36C	PROFILE SHEET	CD Road To Battlefield Blvd. Ramp & Bulldog Drive
37	PLAN SHEET	1947+00 to 1954+26.39 EB, I-64WB CD To Battlefield Blvd. Ramp & Naise Wall I5
38	PLAN SHEET	Naise Barrier Walls II & I2



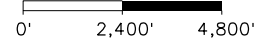
CONCEPTUAL PLANS
PRELIMINARY PLANS

Chesapeake Population 222,209 (2010 Census)

STATE PROJECT NO.	SECTION	FEDERAL AID PROJECT NO.	TYPE CODE	UPC NO.	EQUALITIES		LENGTH INCLUDING BRIDGE(S)		LENGTH EXCLUDING BRIDGE(S)		BRIDGE PLAN NO.	TYPE PROJECT	DESCRIPTION
					FEET		FEET	MILES	FEET	MILES			
0064-131-811	PE-101	NHPP-064-3(488)		106692		46,46.31	8.740	38,619.55	7.314		Prel. Engr.	FR:0.573MI.EAST OF I-264 TO:0.953MI.EAST OF I-464	
	RW-201			106692		29,773.79	5.639	22,723.92	4.304		Right of Way	FR:3.528MI.EAST OF I-264 TO:0.807MI.EAST OF I-464	
	C-501		1000	106692		44,494.12	8.427	36,967.36	7.001		Construction	FR:0.865MI.EAST OF I-264 TO:0.931MI.EAST OF I-464	
	B-670		X946	106692		4,846.08	.918				Bridge	EXISTING I-64 OVER ELIZABETH RIVER	
	B-662			106692		6,340	1.201				Bridge	I-64 WB OVER ELIZABETH RIVER	
	B-663		X281	106692		302.00	.057				Bridge	RTE.190 (GREAT BRIDGE BLVD) OVER I-64	
	B-66X		X271								Bridge	I-64 HOT LANE OVER RTE.13/460 (MILITARY HWY.)	
	B-66X		X581								Bridge	I-64 HOT LANE OVER YADKIN RD.AND NSRR	
	B-668		X281	106692		121.50	.023			174-10A	Bridge	I-64 EB OVER SHELL ROAD	
	B-669		X281	106692		121.50	.023			174-10A	Bridge	I-64 WB OVER SHELL ROAD	
	D-637			106692							Drainage	I-64 EB OVER NEWTON CREEK	
	D-638			106692							Drainage	I-64 WB OVER NEWTON CREEK	

DESIGN EXCEPTIONS			
	Design Speed	Reason for Exception	Approval Date
I-64 (GP Lanes)	70mph	Substandard Shoulder Width Lt. of GP Lanes and Rt. of Managed Lanes	12/12/16
I-64 B-664 & B-665	70mph	Substandard Vert. Clearance on I-64 over Rte.13 & 460	10/3/16
I-64 B-666 & B-667	70mph	Substandard Shoulder Width on I-64WB over Yadkin Road	10/3/16
I-64 (GP Lanes)	70mph	Substandard Superelevation	4/20/17
I-64 (Shoulder Lanes)	70mph	Substandard Shoulder Width Rt. of Shoulder Lanes	Pending
I-64 B-670	70mph	Substandard Shoulder Width	Pending
I-64 B-670 & B-669	70mph	Substandard Shoulder Width	Pending

Project Lengths are based on I-64 Eastbound Construction Baseline.



STRUCTURE PLANS:
 S-1 THRU S-3 High Rise Bridge - Plan and Developed Section
 S-4 THRU S-5 High Rise Bridge - Transverse Sections
 S-6 High Rise Bridge - Abutment Details
 S-7 THRU S-10 High Rise Bridge - Pier Details
 S-11 High Rise Bridge - Fender & Navigational Lighting Plan
 S-12 THRU S-15 High Rise Bridge - Retaining Walls
 S-16 THRU S-17 Existing High Rise Bridge Modifications
 S-18 THRU S-19 Great Bridge Blvd. Over I-64
 S-20 THRU S-21 I-64 HOT Lanes Over Rtes.13 And 460 (Military Hwy.)
 S-22 THRU S-23 I-64 HOT Lanes Over Yadkin Rd. & NSRR
 S-24 ATC-2 Accommodations For Future Improvements
 S-25 THRU S-26 I-64 EB And I-64 WB over Rte.648 (Shell Rd.)
 S-27 Tide Gate At Gilmerton Canal

TOTAL SHEETS (ROADWAY AND STRUCTURES) 113

THIS PROJECT WAS DEVELOPED UTILIZING THE DEPARTMENT'S CURRENT ENGINEERING DESIGN PACKAGE (OPENROADS) BENTLEY GEOPAK SUITE (SELECTSERIES 4)

THIS PROJECT IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT'S 2016 ROAD AND BRIDGE SPECIFICATIONS, 2016 ROAD AND BRIDGE STANDARDS, 2009 MUTCD, 2011 VIRGINIA SUPPLEMENT TO THE MUTCD, 2011 VIRGINIA WORK AREA PROTECTION MANUAL AND AS AMENDED BY CONTRACT PROVISIONS AND THE COMPLETE ELECTRONIC PDF VERSION OF THE PLAN ASSEMBLY.

ALL CURVES ARE TO BE SUPERELEVATED, TRANSITIONED AND WIDENED IN ACCORDANCE WITH STANDARD TC-5.11R EXCEPT WHERE OTHERWISE NOTED.

01/04/2016
 01/12/16 PM
 01/21/2017

DESIGN BUILDER

DESIGNED BY

STATE PROJECT

0064-131-811, P101, P201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION

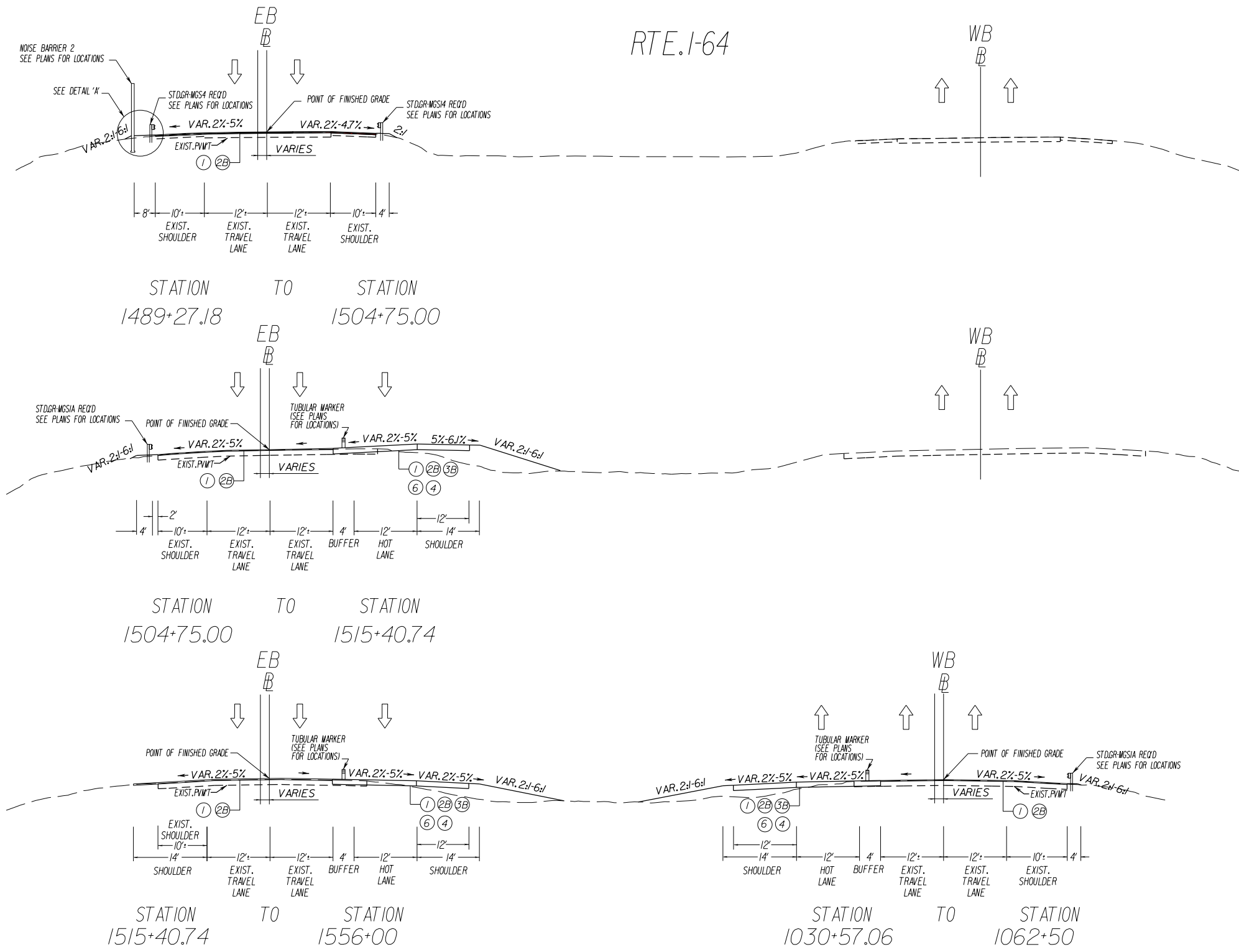
I-64 SOUTH SIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO. 1

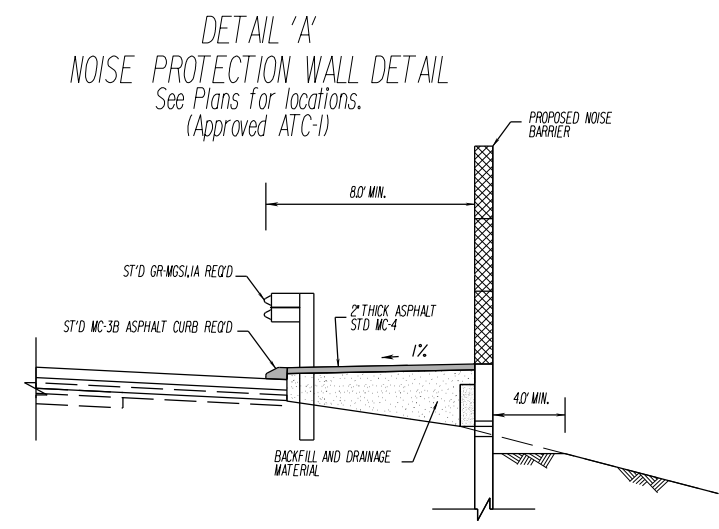
PAGE NO. 63

TYPICAL SECTIONS

RTE. I-64



- ① 2" Asphalt Concrete, Type SMA-12.5 @ 220 Lbs/Sq.Yd.
- ①A 2" Asphalt Concrete, Type SMA-12.5A @ 220 Lbs/Sq.Yd.
- ①B 1.5" Asphalt Concrete, Type SMA-12.5A @ 165 Lbs/Sq.Yd.
- ② 3" Asphalt Concrete Intermediate Course, Type SMA-19.0 @ 330 Lbs/Sq.Yd.
- ②A 3" Asphalt Concrete Intermediate Course, Type SMA-19.0A @ 330 Lbs/Sq.Yd.
- ②B 2" Asphalt Concrete Intermediate Course, Type SMA-19.0 @ 220 Lbs/Sq.Yd.
- ②C 2" Asphalt Concrete Intermediate Course, Type SMA-19.0A @ 220 Lbs/Sq.Yd.
- ③ 3" Asphalt Concrete, Type BM-25.0D
- ③A 4" Asphalt Concrete, Type BM-25.0D
- ③B 5" Asphalt Concrete, Type BM-25.0D
- ③C 7.5" Asphalt Concrete, Type BM-25.0D
- ④ 6" Cement Treated Aggregate
- ⑤ 7" Aggregate Base Material, Type I, No. 21B
- ⑤A 6" Aggregate Base Material, Type I, No. 21B
- ⑥ 2" Open Graded Drainage Layer
- ⑦ High Friction Roadway Surface Treatment



ATC-1 Provides MASH-Tested Systems That Improve Safety And Meet Standards

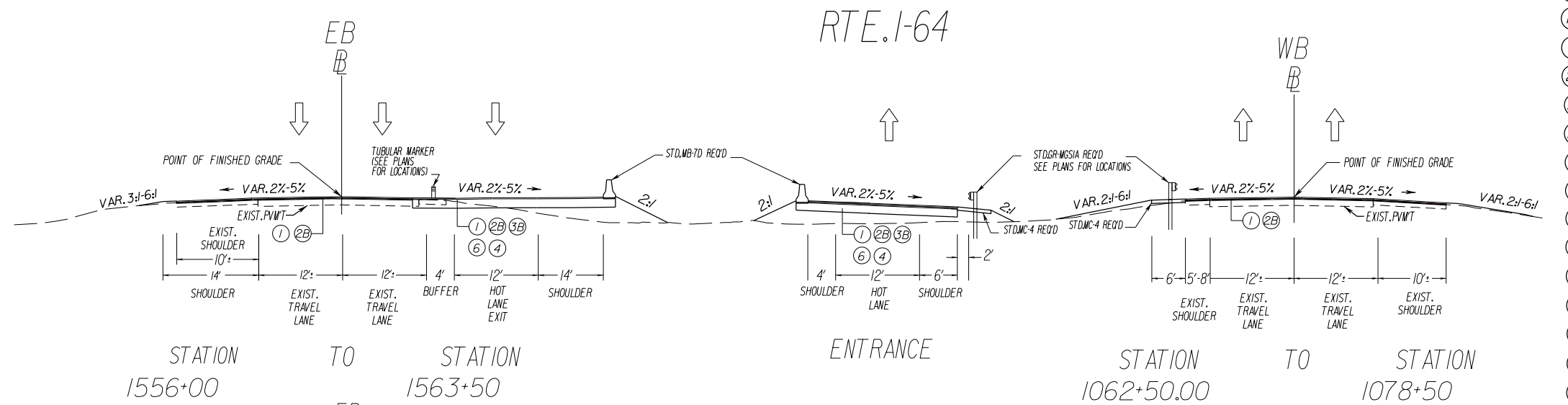
The Area Between Guardrail And Noise Barrier is Paved To Reduce Mowing Requirements

CONCEPTUAL PLANS

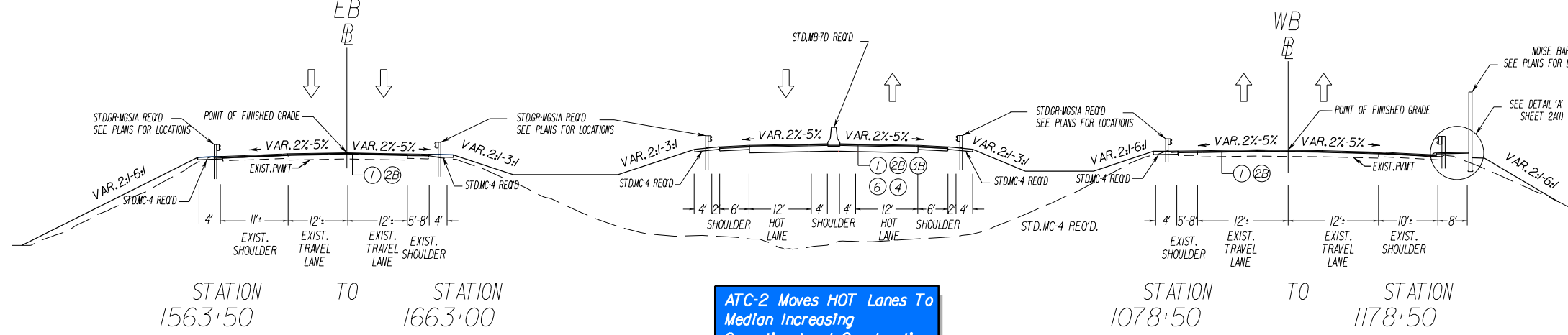
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B/2/2017
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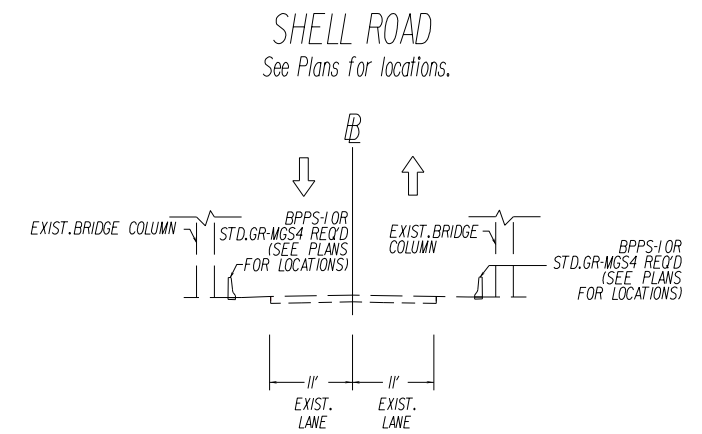
TYPICAL SECTIONS



- ① 2" Asphalt Concrete, Type SMA-12.5 @ 220 Lbs/Sq.Yd.
- ①A 2" Asphalt Concrete, Type SMA-12.5A @ 220 Lbs/Sq.Yd.
- ①B 1.5" Asphalt Concrete, Type SMA-12.5A @ 165 Lbs/Sq.Yd.
- ② 3" Asphalt Concrete Intermediate Course, Type SMA-19.0 @ 330 Lbs/Sq.Yd.
- ②A 3" Asphalt Concrete Intermediate Course, Type SMA-19.0A @ 330 Lbs/Sq.Yd.
- ②B 2" Asphalt Concrete Intermediate Course, Type SMA-19.0 @ 220 Lbs/Sq.Yd.
- ②C 2" Asphalt Concrete Intermediate Course, Type SMA-19.0A @ 220 Lbs/Sq.Yd.
- ③ 3" Asphalt Concrete, Type BM-25.0D
- ③A 4" Asphalt Concrete, Type BM-25.0D
- ③B 5" Asphalt Concrete, Type BM-25.0D
- ③C 7.5" Asphalt Concrete, Type BM-25.0D
- ④ 6" Cement Treated Aggregate
- ⑤ 7" Aggregate Base Material, Type I, No. 21B
- ⑤A 6" Aggregate Base Material, Type I, No. 21B
- ⑥ 2" Open Graded Drainage Layer
- ⑦ High Friction Roadway Surface Treatment



ATC-2 Moves HOT Lanes To Median Increasing Operational and Construction Safety - Reduces Future Widening Impacts

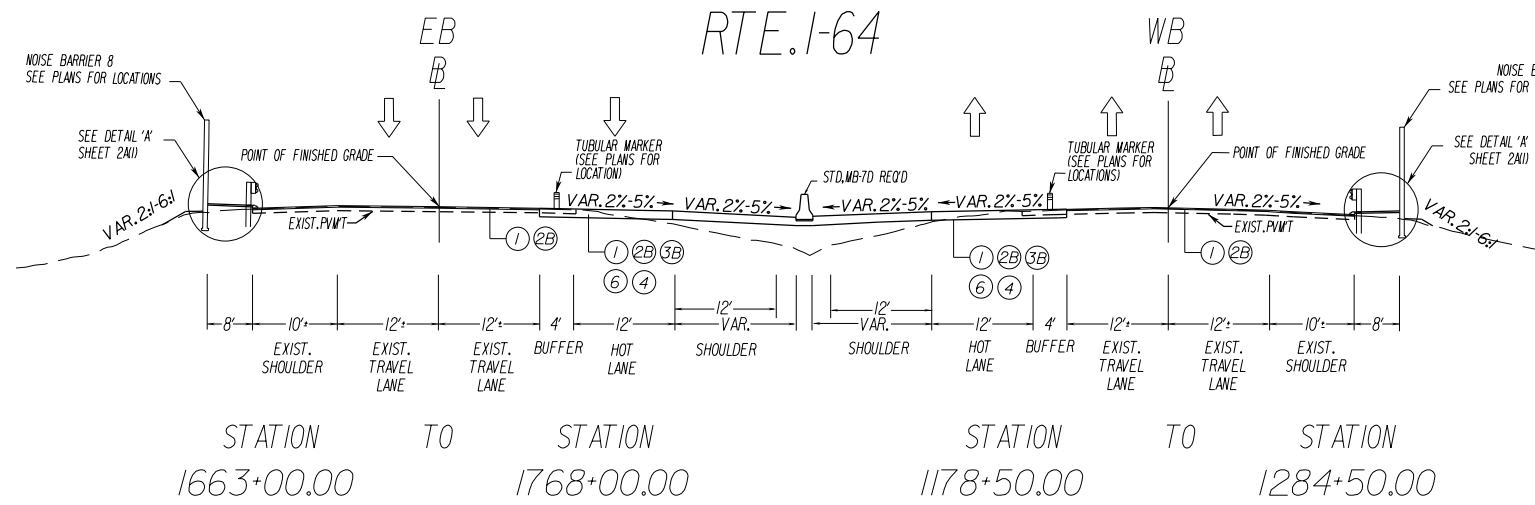


CONCEPTUAL PLANS

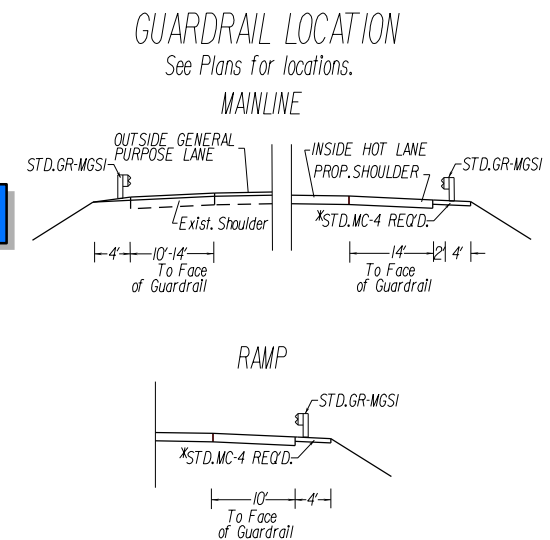
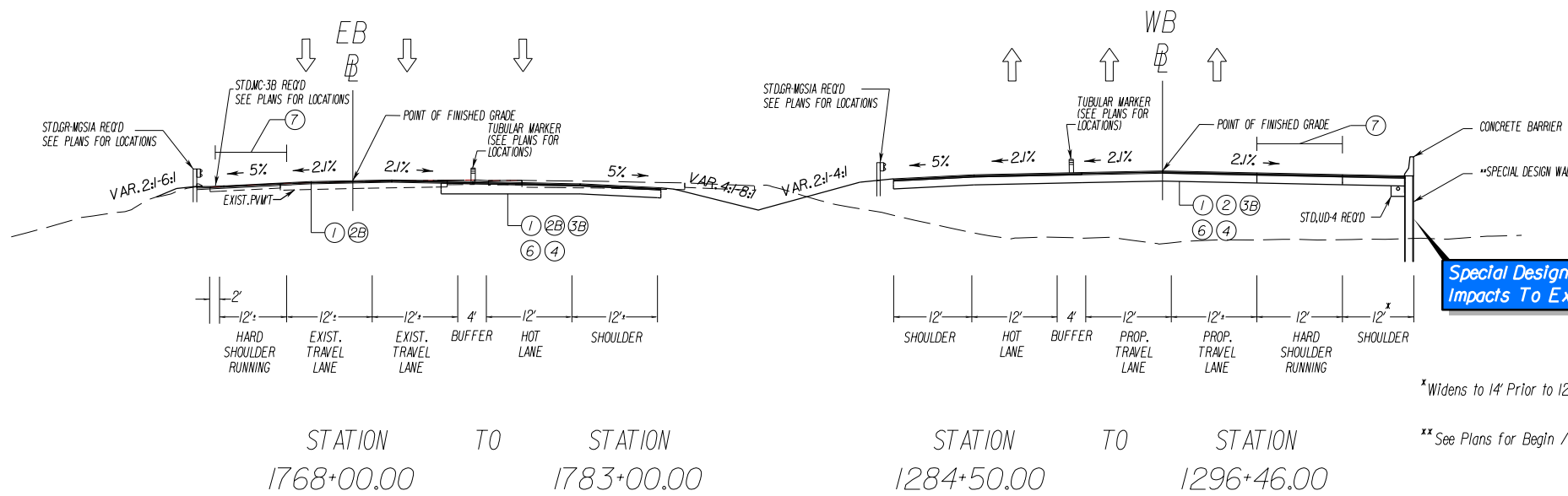
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TYPICAL SECTIONS



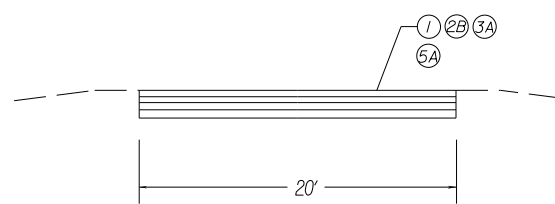
- ① 2" Asphalt Concrete, Type SMA-12.5 @ 220 Lbs/Sq.Yd.
- ①A 2" Asphalt Concrete, Type SMA-12.5A @ 220 Lbs/Sq.Yd.
- ①B 1.5" Asphalt Concrete, Type SMA-12.5A @ 165 Lbs/Sq.Yd.
- ② 3" Asphalt Concrete Intermediate Course, Type SMA-19.0 @ 330 Lbs/Sq.Yd.
- ②A 3" Asphalt Concrete Intermediate Course, Type SMA-19.0A @ 330 Lbs/Sq.Yd.
- ②B 2" Asphalt Concrete Intermediate Course, Type SMA-19.0 @ 220 Lbs/Sq.Yd.
- ②C 2" Asphalt Concrete Intermediate Course, Type SMA-19.0A @ 220 Lbs/Sq.Yd.
- ③ 3" Asphalt Concrete, Type BM-25.0D
- ③A 4" Asphalt Concrete, Type BM-25.0D
- ③B 5" Asphalt Concrete, Type BM-25.0D
- ③C 7.5" Asphalt Concrete, Type BM-25.0D
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- ⑤A 6" Aggregate Base Material, Type I, No. 21B
- ⑥ 2" Open Graded Drainage Layer
- ⑦ High Friction Roadway Surface Treatment



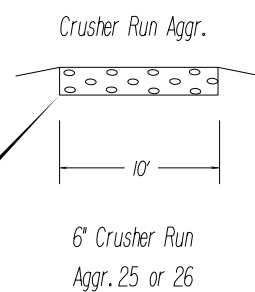
* Widens to 14' Prior to 1296+46

** See Plans for Begin / End Stations

CROSSOVER
See Plans for locations.

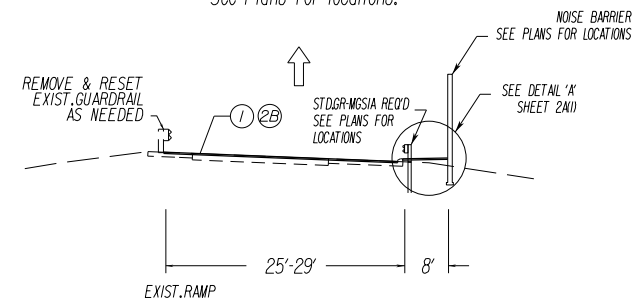


STORM WATER MANAGEMENT
MAINTENANCE ACCESS PATH



All Wet Ponds Are Surrounded
By Maintenance Paths With
Locking Gates

GEORGE WASHINGTON HWY (ROUTE 17)
NB OFF RAMP
See Plans for locations.



CONCEPTUAL PLANS

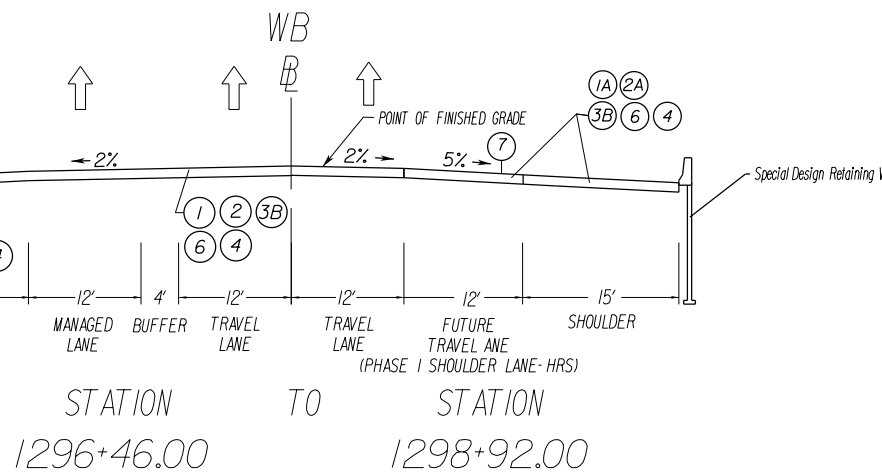
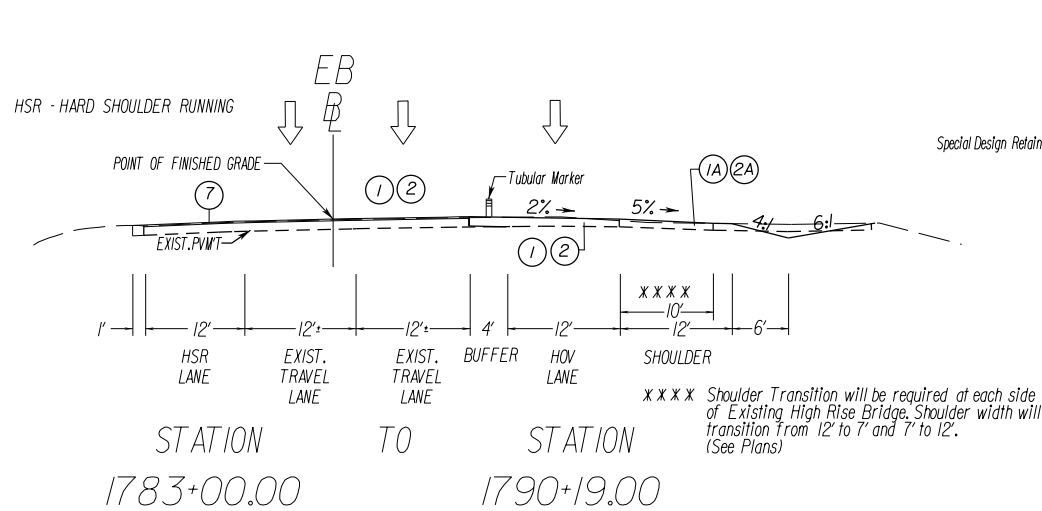
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NOT TO SCALE



CONCEPTUAL PLANS

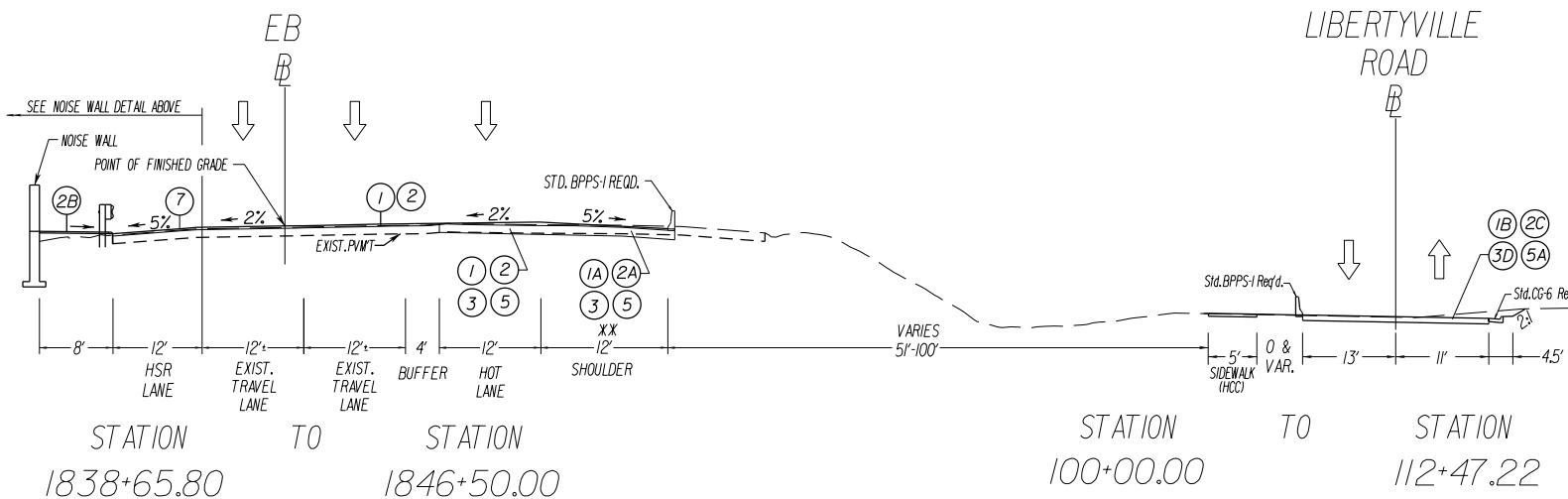
PRELIMINARY

TYPICAL SECTIONS

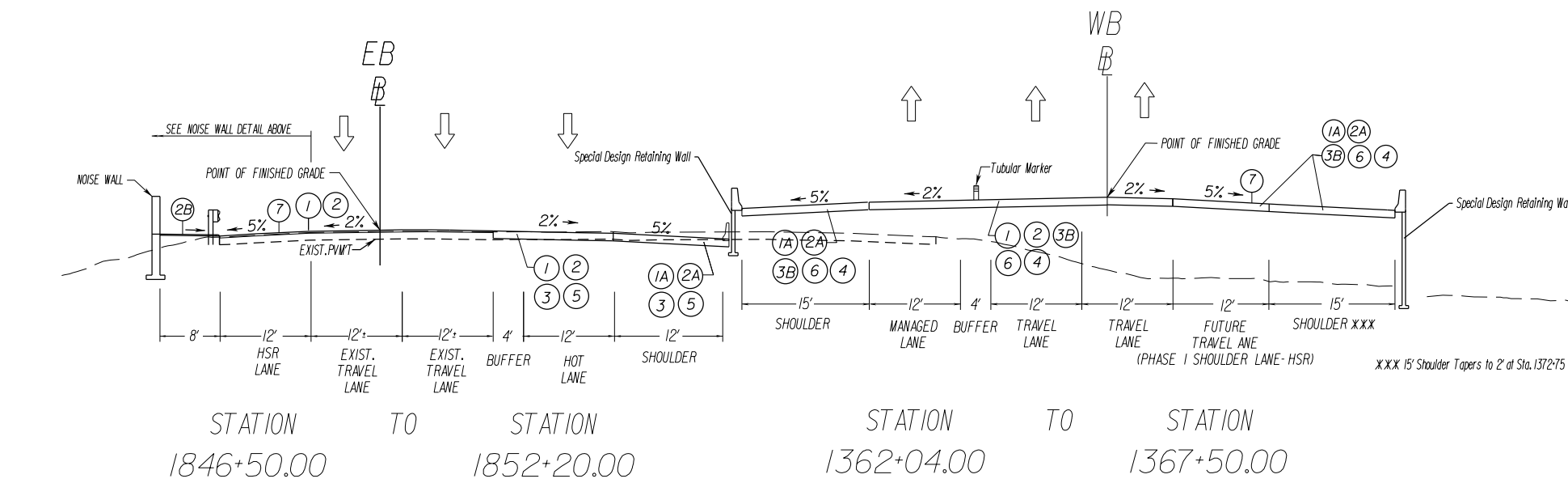


- ① 2" Asphalt Concrete, Type SMA-12.5 @ 220 Lbs/Sq.Yd.
- ①A 2" Asphalt Concrete, Type SMA-12.5A @ 220 Lbs/Sq.Yd.
- ② 3" Asphalt Concrete Intermediate Course, Type SMA-19.0 @ 330 Lbs/Sq.Yd.
- ②A 3" Asphalt Concrete Intermediate Course, Type SMA-19.0A @ 330 Lbs/Sq.Yd.
- ②B 2" Asphalt Concrete Intermediate Course, Type SMA-19.0 @ 220 Lbs/Sq.Yd.
- ③ 3" Asphalt Concrete, Type BM-25.0D
- ③A 4" Asphalt Concrete, Type BM-25.0D
- ③B 5" Asphalt Concrete, Type BM-25.0D
- ④ 6" Cement Treated Aggregate
- ⑤ 7" Aggregate Base Material, Type I, No. 21B
- ⑥ 2" Open Graded Drainage Layer
- ⑦ High Friction Roadway Surface Treatment

NOTE:
"Rolling" shoulder cross slopes (variable slopes) are to be considered to attain approximately 0.3% minimum (0.5% desirable) effective longitudinal grades along the median concrete barrier "gutter" line to minimize/eliminate potential surface water ponding.

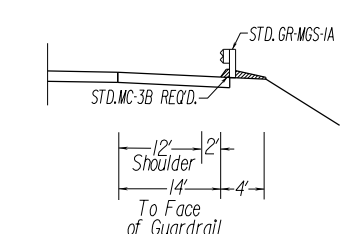


XX Shoulder Width varies from Station 1838+50.00 to approximately Station 1846+50.00

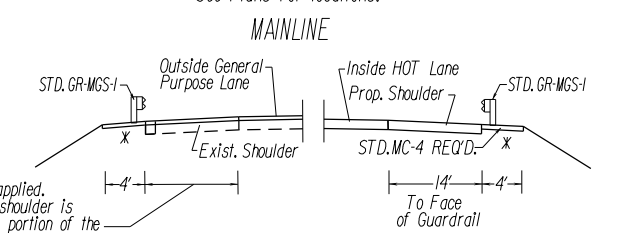


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STD.MC-3B DETAIL
(See Plans for Locations)

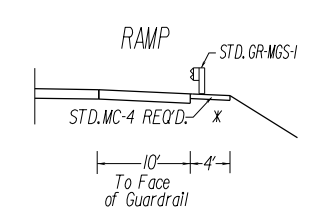


GUARDRAIL LOCATION
See Plans for locations.



Shoulder Lane Only: 14' when barrier is applied, 13' when no barrier is applied. When the shoulder is not considered a shoulder lane the paved portion of the shoulder will match the existing width.

x Std.MC-4 Req'd. where new or replacement shoulder is full depth pavement



x Std.MC-4 Req'd. where new or replacement shoulder is full depth pavement

NOT TO SCALE

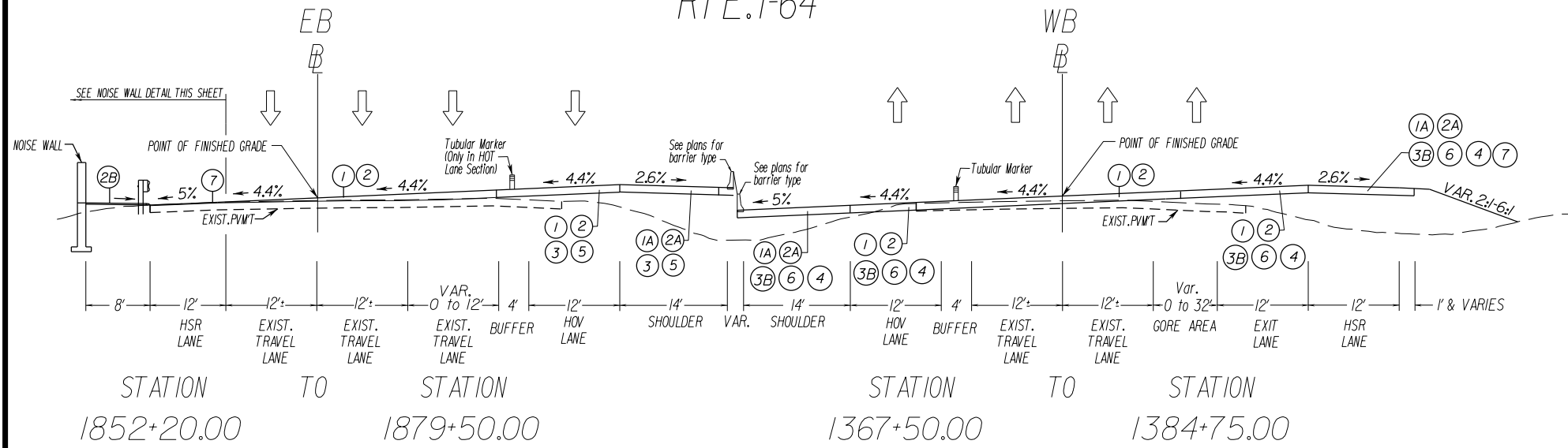
DESIGN BUILDER
LMB
 DESIGNED BY
JMT.
STV Incorporated
 STATE PROJECT
 0064-131-811, P101, R201, C501
 B662-B670, D637, D638
 VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTH SIDE WIDENING AND HIGH RISE BRIDGE, PHASE I
 SHEET NO.
2B(1)
 PAGE NO.
67

CONCEPTUAL PLANS

TYPICAL SECTIONS

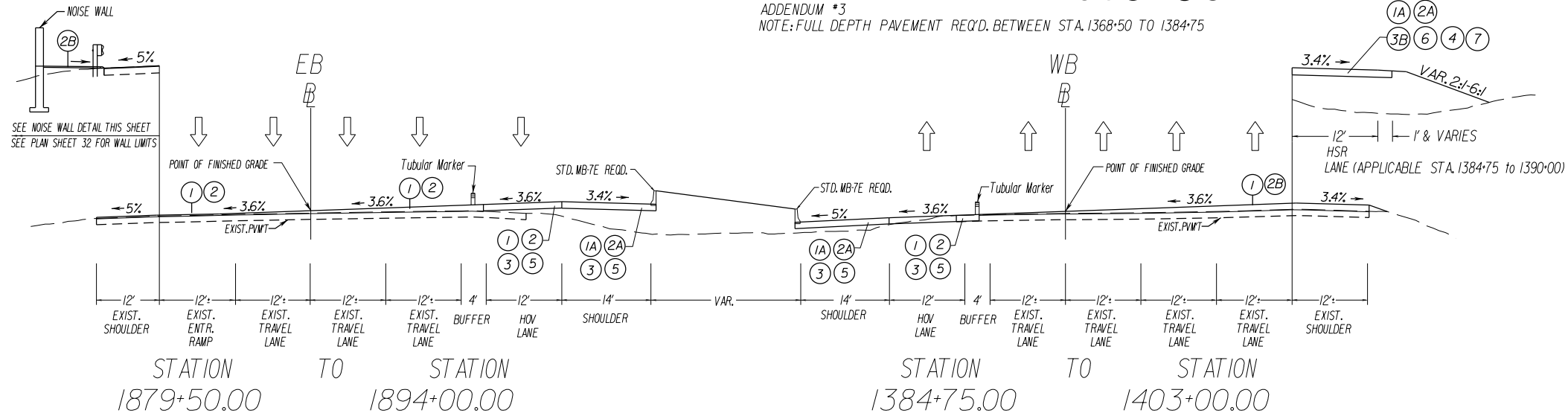
PRELIMINARY

RTE. I-64

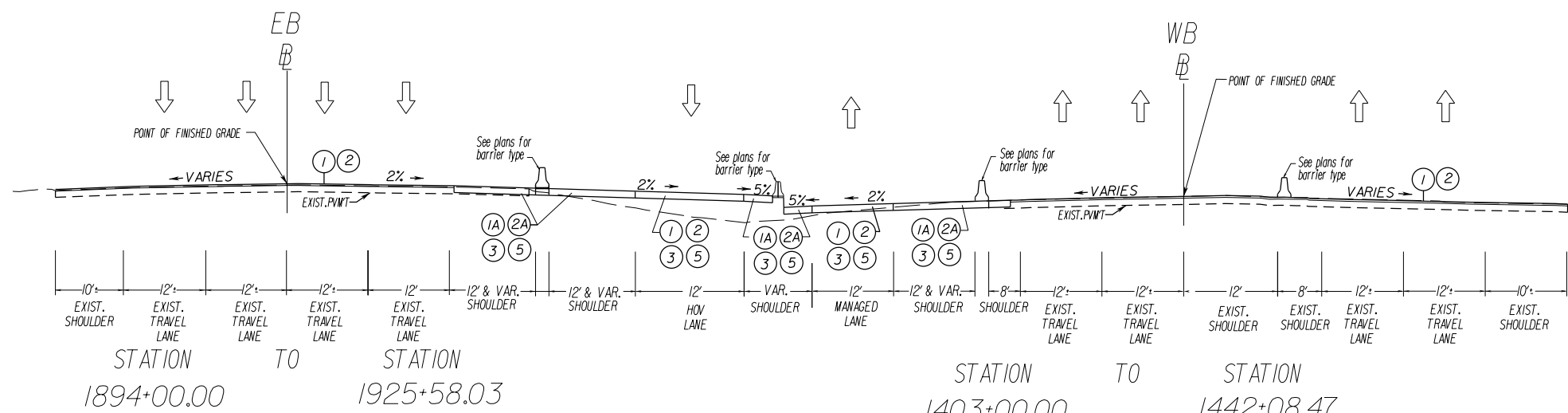


- ① 2" Asphalt Concrete, Type SMA-12.5 @ 220 Lbs/Sq.Yd.
- ①A 2" Asphalt Concrete, Type SMA-12.5A @ 220 Lbs/Sq.Yd.
- ①B 1.5" Asphalt Concrete, Type SMA-12.5A @ 165 Lbs/Sq.Yd.
- ② 3" Asphalt Concrete Intermediate Course, Type SMA-19.0 @ 330 Lbs/Sq.Yd.
- ②A 3" Asphalt Concrete Intermediate Course, Type SMA-19.0A @ 330 Lbs/Sq.Yd.
- ②B 2" Asphalt Concrete Intermediate Course, Type SMA-19.0 @ 220 Lbs/Sq.Yd.
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- ③ 3" Asphalt Concrete, Type BM-25.0D
- ③A 4" Asphalt Concrete, Type BM-25.0D
- ③B 5" Asphalt Concrete, Type BM-25.0D
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- ④ 6" Cement Treated Aggregate
- ⑤ 7" Aggregate Base Material, Type I, No. 21B
- ⑤A 6" Aggregate Base Material, Type I, No. 21B
- ⑥ 2" Open Graded Drainage Layer
- ⑦ High Friction Roadway Surface Treatment

PAVEMENT DESIGN FROM STA. 1381+75 TO 1384+75 ① ②B ③B ⑥ ④ ⑦
 ADDENDUM *3
 NOTE: FULL DEPTH PAVEMENT REQ'D. BETWEEN STA. 1368+50 TO 1384+75



NOTE:
 *Rolling shoulder cross slopes (variable slopes) are to be considered to attain approximately 0.3% minimum (0.5% desirable) effective longitudinal grades along the median concrete barrier "gutter" line to minimize/eliminate potential surface water ponding.



NOTE: PAVEMENT DESIGN FROM STA. 1899+00 TO 1903+75 ① ②B ③A ⑤
 PAVEMENT BUILD-UP AREA TO BE ① ②B ③C

NOTE: PAVEMENT DESIGN FROM STA. 1415+50 TO 1419+50 ① ②B ③A ⑤
 PAVEMENT BUILD-UP AREA TO BE ① ②B ③C

NOT TO SCALE

B/1/2007 5:23:48 PM Plotted By: turkm D:\04366028\21.dgn

DESIGN BUILDER



DESIGNED BY



STV Incorporated



STATE PROJECT
 0064-131-811, P101, R201, C501
 B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION
 I-64 SOUTH SIDE WIDENING AND
 HIGH RISE BRIDGE, PHASE I

SHEET NO.
2B(2)
 PAGE NO.
68

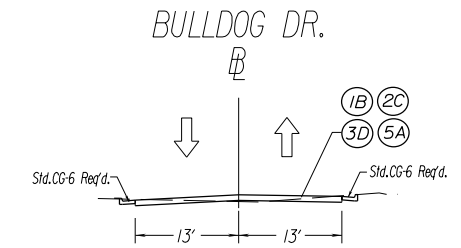
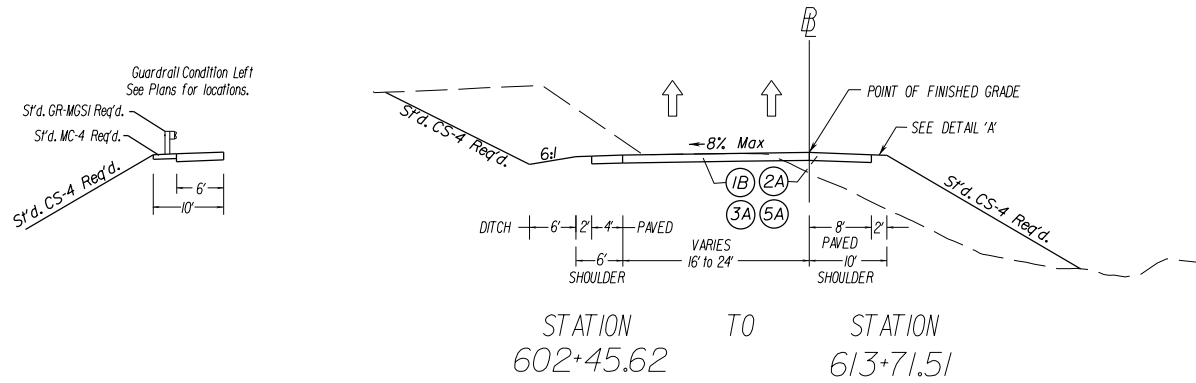
TYPICAL SECTIONS

CONCEPTUAL PLANS

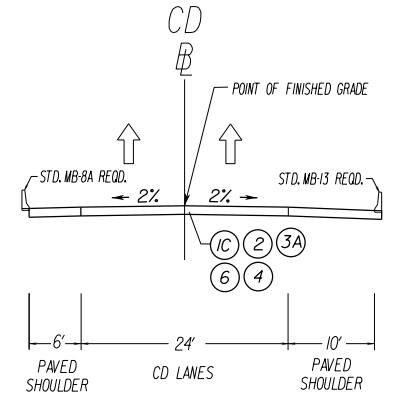
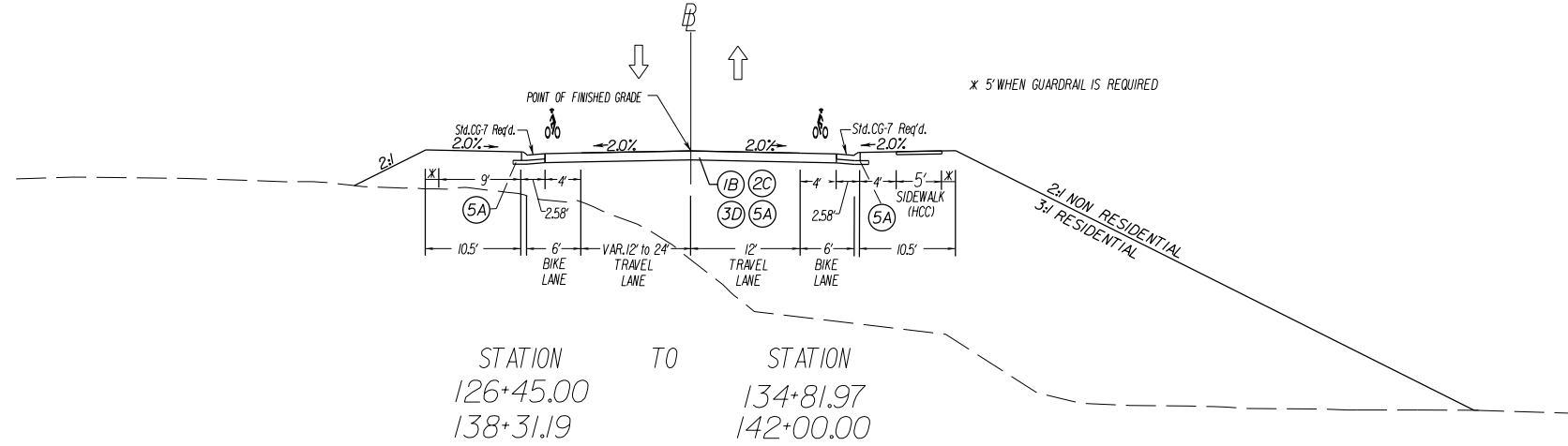
PRELIMINARY

- 1B 1.5" Asphalt Concrete, Type SMA-12.5A @ 165 Lbs/Sq.Yd.
- 1C 1.5" Asphalt Concrete, Type SMA-12.5 @ 165 Lbs/Sq.Yd.
- 2A 3" Asphalt Concrete Intermediate Course, Type SMA-19.0A @ 330 Lbs/Sq.Yd.
- 2C 2" Asphalt Concrete Intermediate Course, Type SMA-19.0A @ 220 Lbs/Sq.Yd.
- 3A 4" Asphalt Concrete, Type BM-25.0D
- 3D 2.5" Asphalt Concrete, Type BM-25.0D
- 4 6" Cement Treated Aggregate
- 5A 6" Aggregate Base Material, Type I, No. 21B
- 6 2" Open Graded Drainage Layer

RTE.1-64
RAMP I-64 WB TO GREAT BRIDGE BLVD.

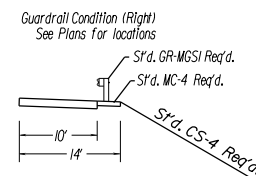
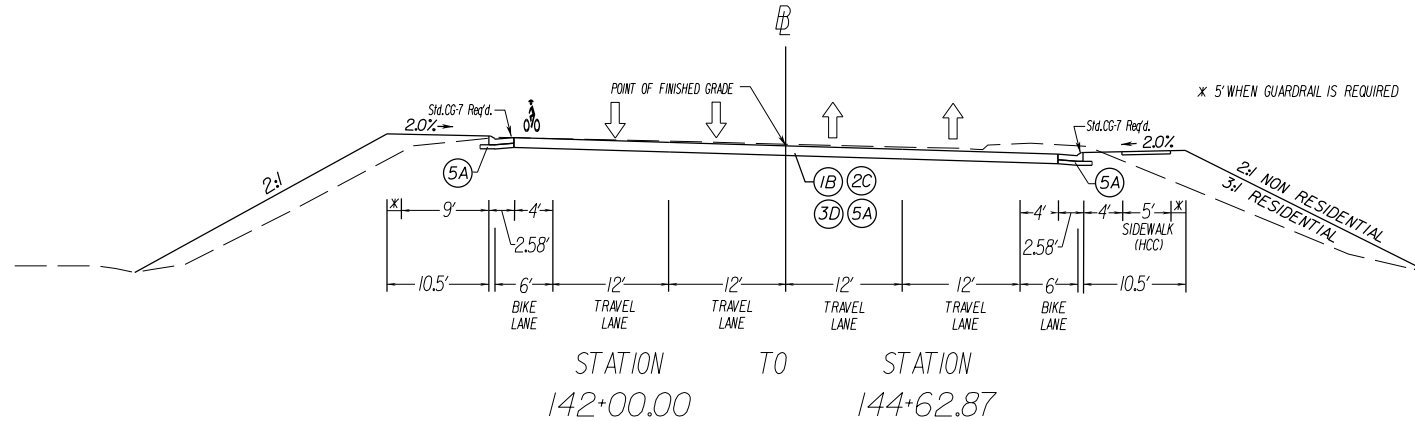


GREAT BRIDGE BLVD.



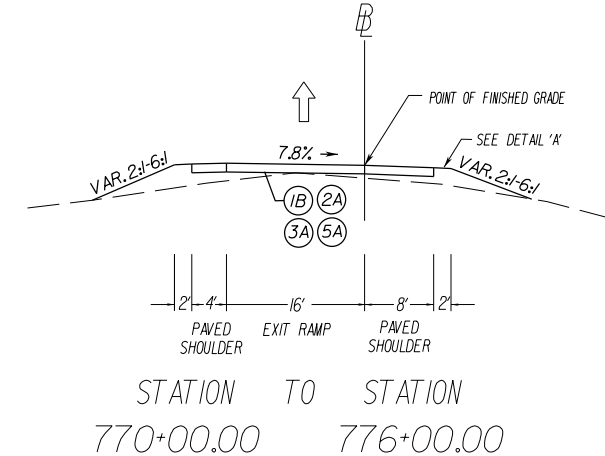
STATION 5000+00.00 TO STATION 5018+00.00

GREAT BRIDGE BLVD.



DETAIL 'A'

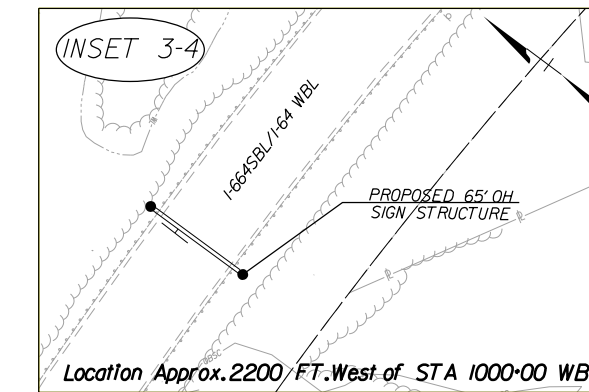
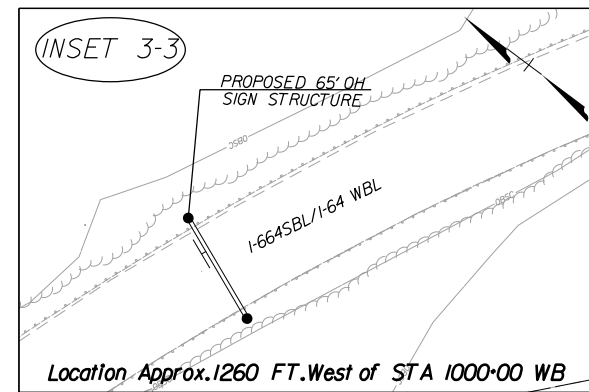
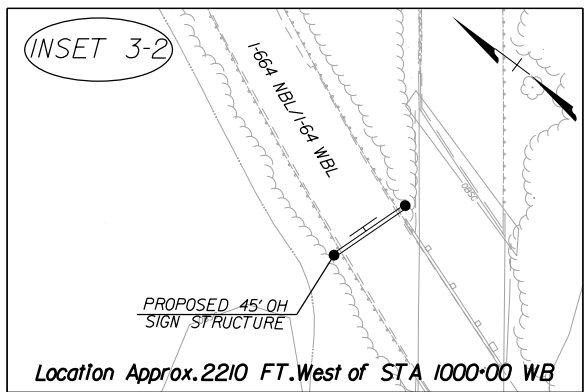
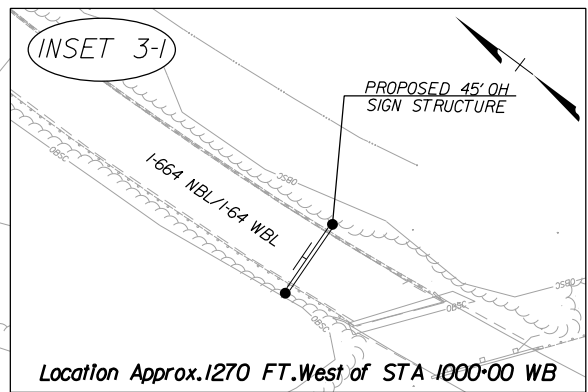
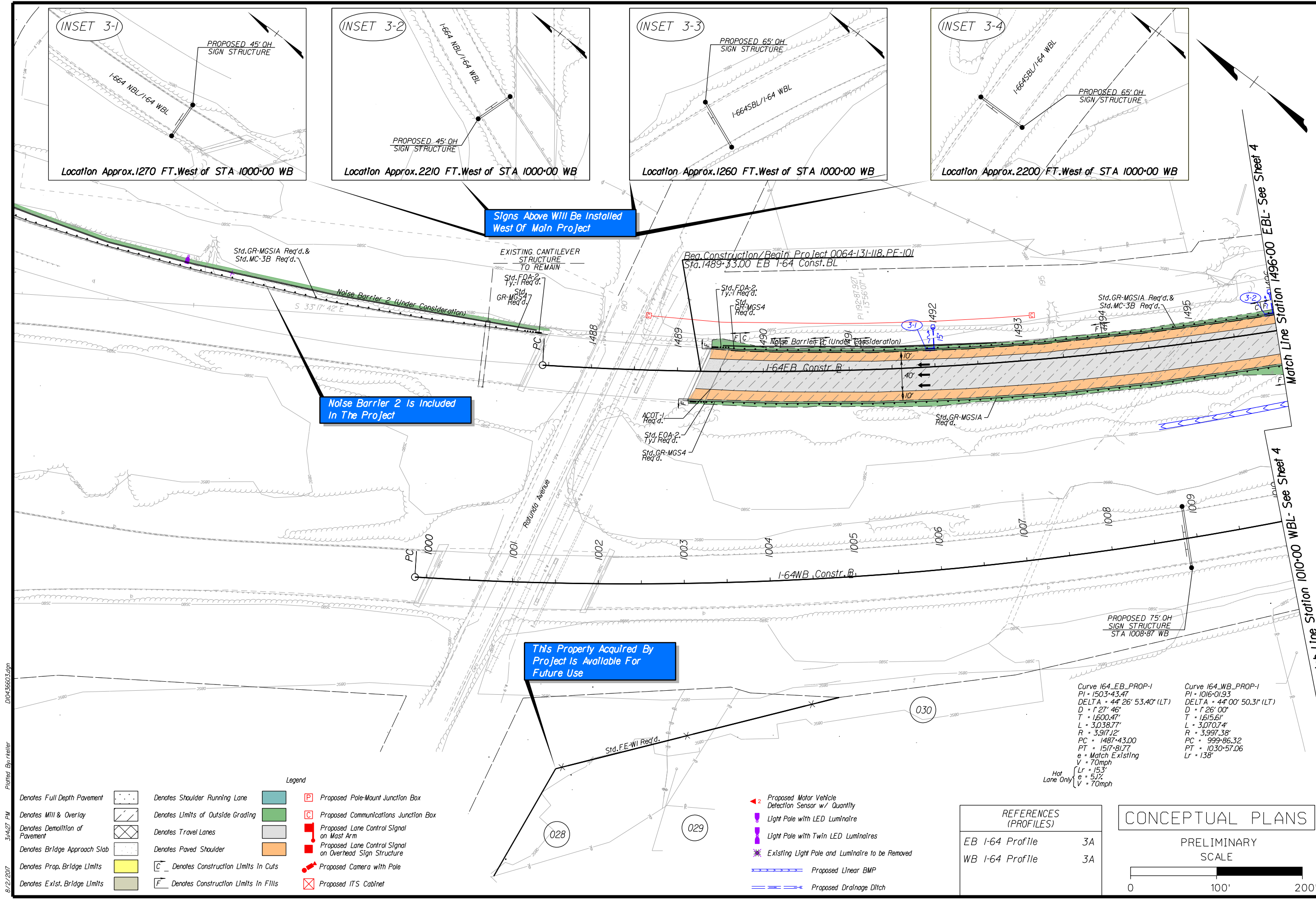
CD TO BATTLEFIELD BLVD. RAMP



NOT TO SCALE

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Signs Above Will Be Installed West Of Main Project

Noise Barrier 2 is Included In The Project

This Property Acquired By Project Is Available For Future Use

Curve 164_EB_PROP-1	Curve 164_WB_PROP-1
PI = 1503+43.47	PI = 1016+01.93
DELTA = 44° 26' 53.40" (LT)	DELTA = 44° 00' 50.31" (LT)
D = 1° 27' 46"	D = 1° 26' 00"
T = 1,600.47'	T = 1,615.61'
L = 3,038.77'	L = 3,070.74'
R = 3,917.12'	R = 3,997.38'
PC = 1487+43.00	PC = 999+86.32
PT = 1517+81.77	PT = 1030+57.06
e = Match Existing	Lr = 138'
V = 70mph	
Hot Lane Only	
Lr = 153'	
e = 5 1/2"	
V = 70mph	

3/14/27 PM
 3/14/27 PM
 B/2/2017
 Plotted By: rreiller
 D:\0436603.dgn

Legend

	Denotes Full Depth Pavement		Proposed Pole-Mount Junction Box
	Denotes Mill & Overlay		Proposed Communications Junction Box
	Denotes Demolition of Pavement		Proposed Lane Control Signal on Mast Arm
	Denotes Bridge Approach Slab		Proposed Lane Control Signal on Overhead Sign Structure
	Denotes Prop. Bridge Limits		Proposed Camera with Pole
	Denotes Exist. Bridge Limits		Proposed ITS Cabinet
	Denotes Shoulder Running Lane		
	Denotes Limits of Outside Grading		
	Denotes Travel Lanes		
	Denotes Paved Shoulder		
	Denotes Construction Limits in Cuts		
	Denotes Construction Limits in Fills		

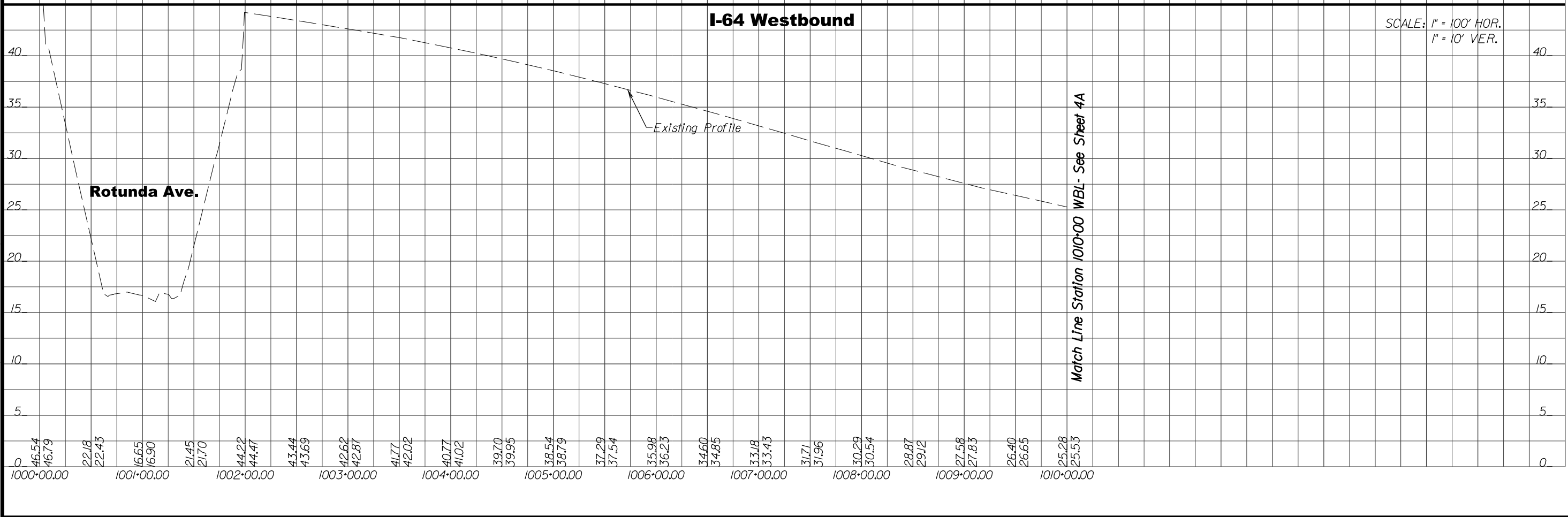
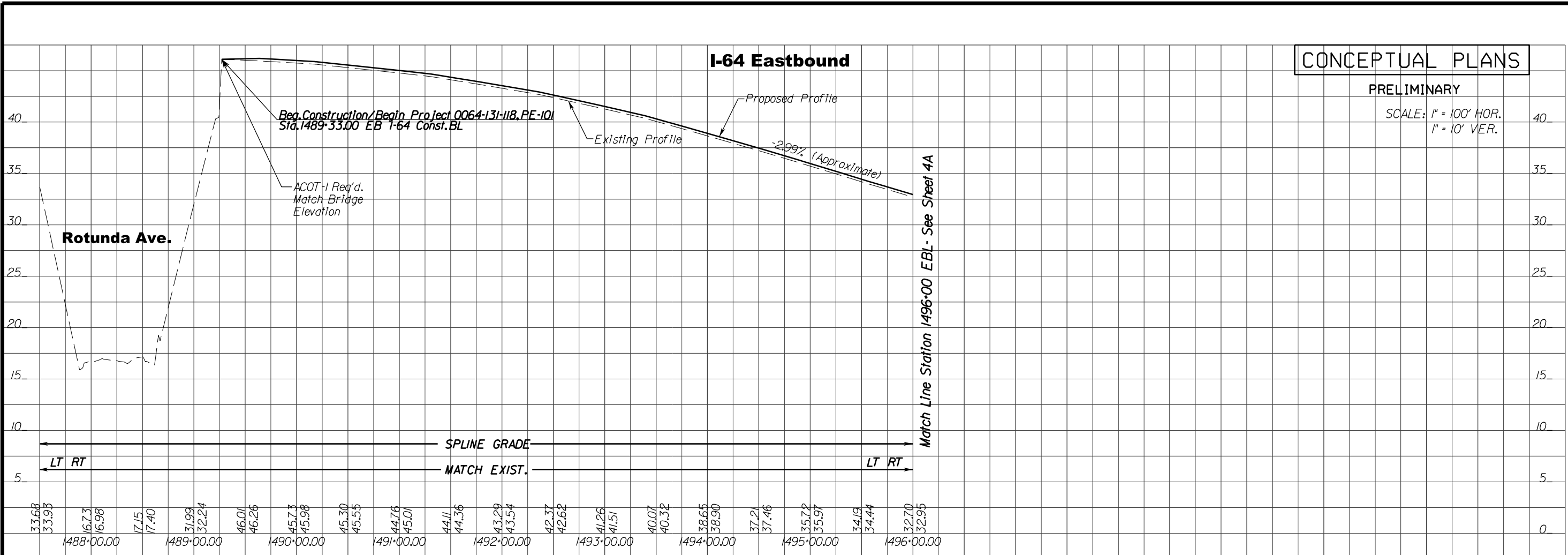
- Proposed Motor Vehicle Detection Sensor w/ Quantity
- Light Pole with LED Luminaire
- Light Pole with Twin LED Luminaires
- Existing Light Pole and Luminaire to be Removed
- Proposed Linear BMP
- Proposed Drainage Ditch

REFERENCES (PROFILES)	
EB I-64 Profile	3A
WB I-64 Profile	3A

CONCEPTUAL PLANS

PRELIMINARY SCALE

8/2/2017 8:36:40 AM Plotted By: rreiler D:\436603\adgn



DESIGN BUILDER

DESIGNED BY

STV Incorporated

VIRGINIA DEPARTMENT OF TRANSPORTATION

0064-131-811, P101, R201, C501
B662-B670, D637, D638

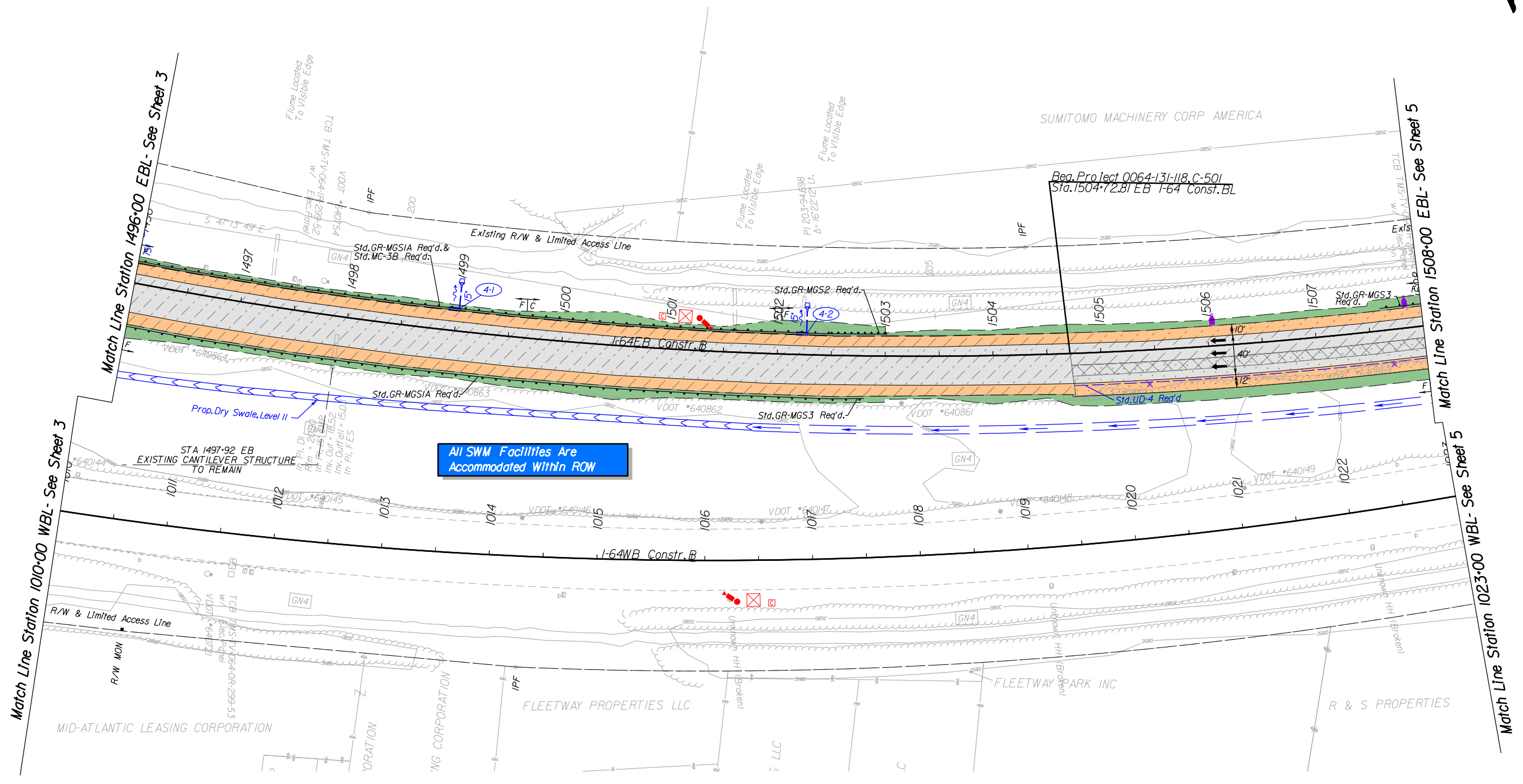
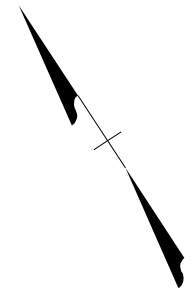
I-64 SOUTHSIDE WIDENING AND
HIGH RISE BRIDGE, PHASE I

SHEET NO.
3A

PAGE NO.
71

Curve 164_EB_PROP
 PI = 1503+43.47
 DELTA = 44° 26' 53.40" (LT)
 D = 127' 46"
 T = 1600.47'
 L = 3,038.77'
 R = 3,917.12'
 PC = 1487+43.00
 PT = 1517+81.77
 e = Match Existing
 V = 70mph
 Hot Lane Only { Lr = 153'
 e = 5 1/2%
 V = 70mph

Curve 164_WB_PROP-1
 PI = 1016+01.93
 DELTA = 44° 00' 50.31" (LT)
 D = 126' 00"
 T = 1615.61'
 L = 3,070.74'
 R = 3,997.38'
 PC = 999+86.32
 PT = 1030+57.06
 Lr = 138'



All SWM Facilities Are Accommodated Within ROW

B/2/2017
 8:37:02 AM
 Plotted By: cteiler
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- Legend**
- | | | | |
|--------------------------------|--------------------------------------|---|---|
| Denotes Full Depth Pavement | Denotes Shoulder Running Lane | Proposed Pole-Mount Junction Box | Proposed Motor Vehicle Detection Sensor w/ Quantity |
| Denotes Mill & Overlay | Denotes Limits of Outside Grading | Proposed Communications Junction Box | Light Pole with LED Luminaire |
| Denotes Demolition of Pavement | Denotes Travel Lanes | Proposed Lane Control Signal on Mast Arm | Light Pole with Twin LED Luminaires |
| Denotes Bridge Approach Slab | Denotes Paved Shoulder | Proposed Lane Control Signal on Overhead Sign Structure | Existing Light Pole and Luminaire to be Removed |
| Denotes Prop. Bridge Limits | Denotes Construction Limits in Cuts | Proposed Camera with Pole | Proposed Linear BMP |
| Denotes Exist. Bridge Limits | Denotes Construction Limits in Fills | Proposed ITS Cabinet | Proposed Drainage Ditch |

REFERENCES (PROFILES)	
EB I-64 Profile	4A
WB I-64 Profile	4A

CONCEPTUAL PLANS

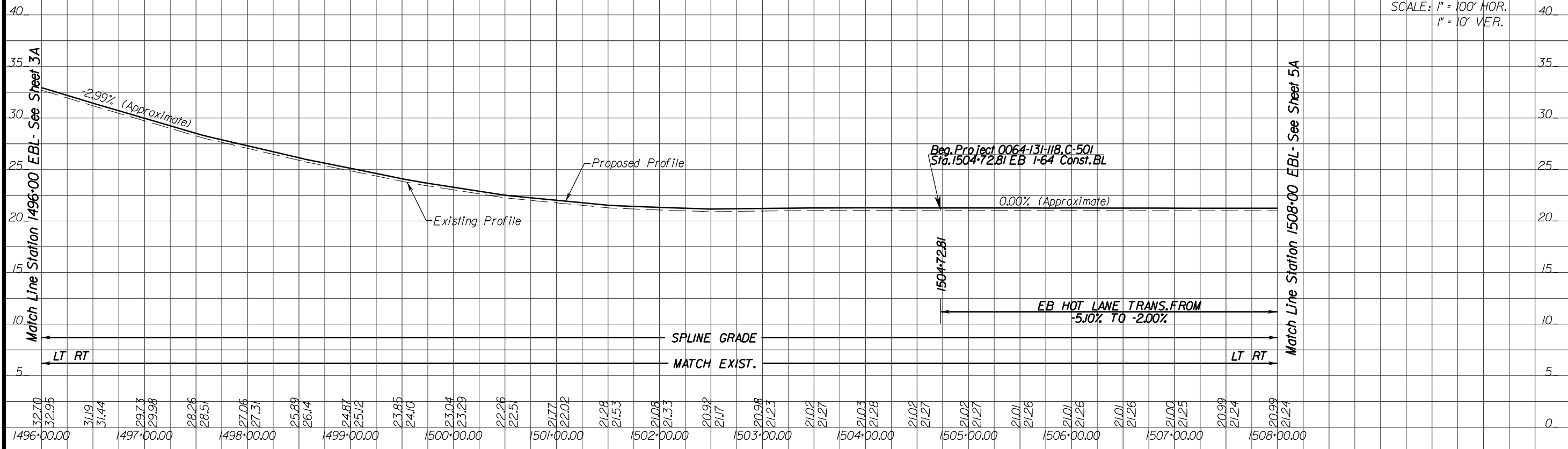
PRELIMINARY SCALE

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I-64 Eastbound

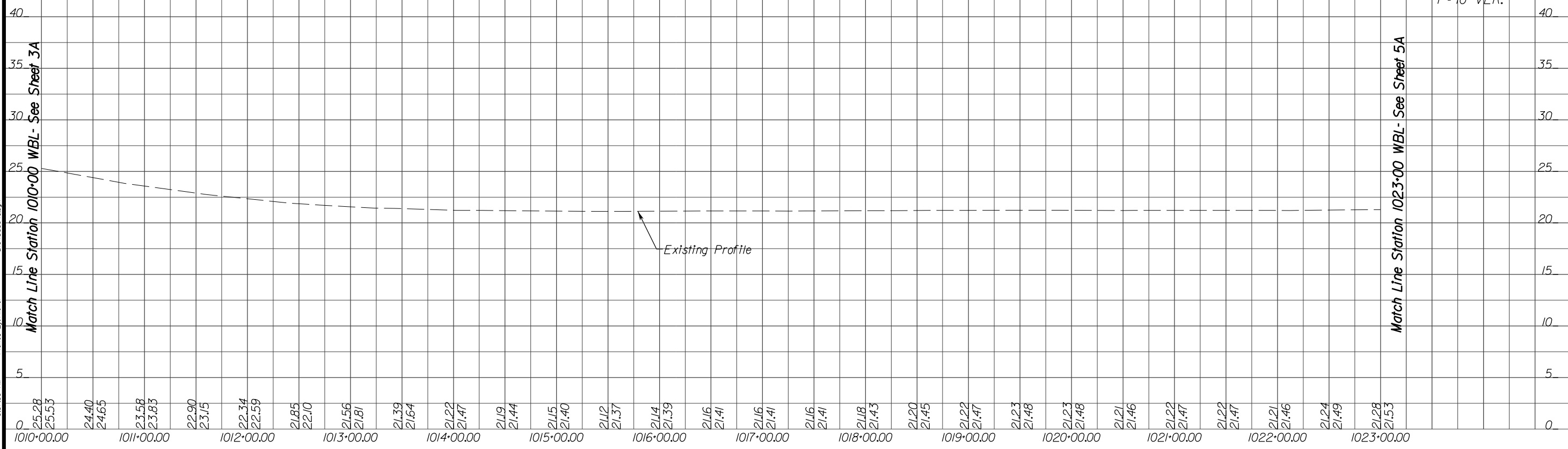
CONCEPTUAL PLANS

PRELIMINARY
SCALE: 1" = 100' HOR.
1" = 10' VER.



I-64 Westbound

SCALE: 1" = 100' HOR.
1" = 10' VER.



DESIGN BUILDER
LMB

DESIGNED BY
JMT

STV Incorporated

STATE PROJECT
0064-131-811, P101, R201, C501
B662-B670, D637, D638

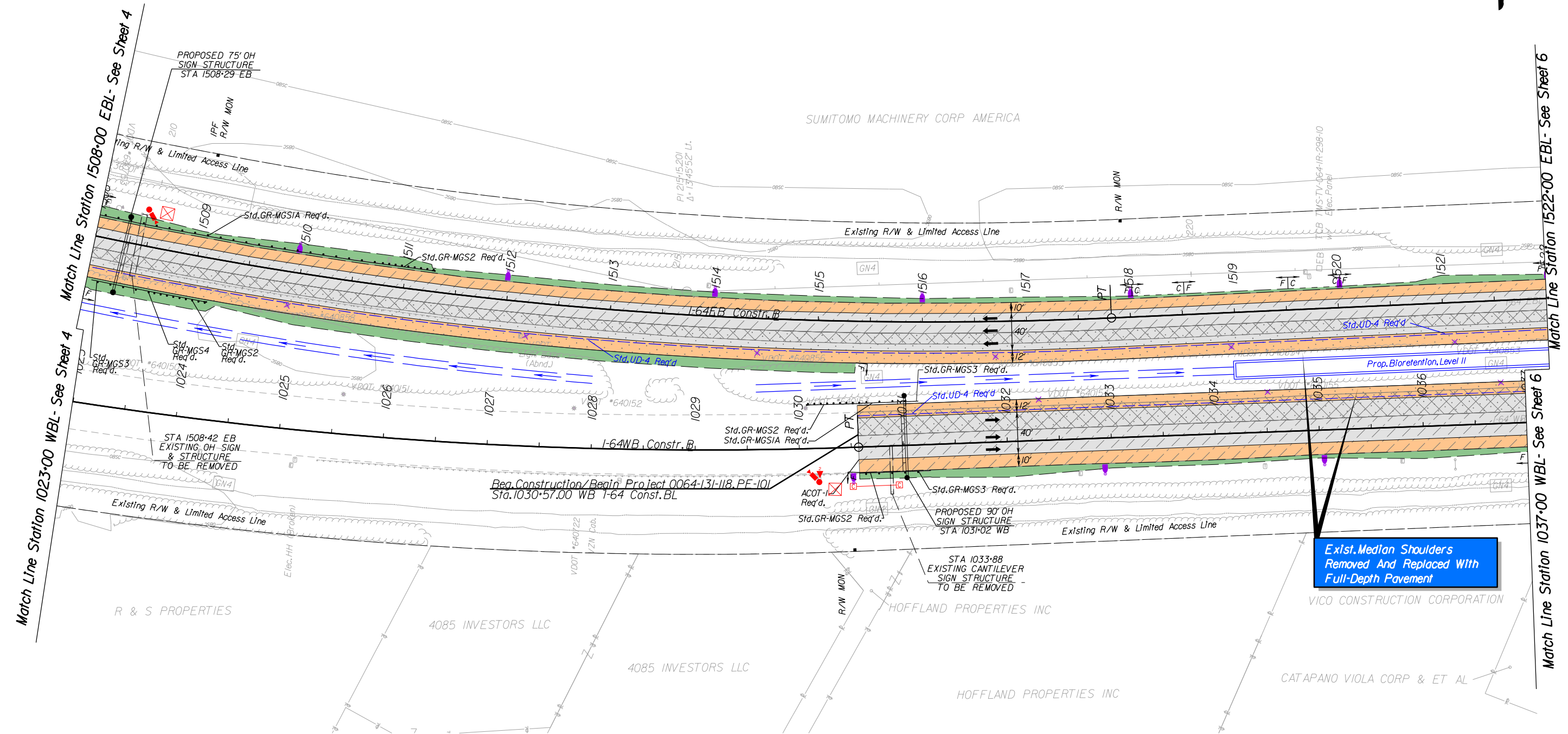
VIRGINIA DEPARTMENT OF TRANSPORTATION
**I-64 SOUTHSIDE WIDENING AND
HIGH RISE BRIDGE, PHASE I**

SHEET NO.
4A

PAGE NO.
73

Curve 164_EB_PROP
 PI = 1503+43.47
 DELTA = 44° 26' 53.40" (LT)
 D = 127' 46"
 T = 1,600.47'
 L = 3,038.77'
 R = 3,917.12'
 PC = 1487+43.00
 PT = 1517+81.77
 e = Match Existing
 V = 70mph
 Lr = 15.3'
 e = 5.12'
 V = 70mph

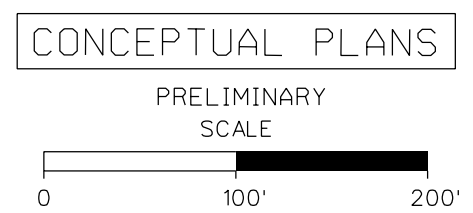
Curve 164_WB_PROP-1
 PI = 1016+01.93
 DELTA = 44° 00' 50.31" (LT)
 D = 126' 00"
 T = 1,615.61'
 L = 3,070.74'
 R = 3,997.38'
 PC = 999+86.32
 PT = 1030+57.06
 Lr = 138'
 e = Match Existing
 V = 70mph



**Exist. Median Shoulders
 Removed And Replaced With
 Full-Depth Pavement**

- Legend**
- Denotes Full Depth Pavement
 - Denotes Mill & Overlay
 - Denotes Demolition of Pavement
 - Denotes Bridge Approach Slab
 - Denotes Prop. Bridge Limits
 - Denotes Exist. Bridge Limits
 - Denotes Shoulder Running Lane
 - Denotes Limits of Outside Grading
 - Denotes Travel Lanes
 - Denotes Paved Shoulder
 - Denotes Construction Limits in Cuts
 - Denotes Construction Limits in Fills
 - Proposed Pole-Mount Junction Box
 - Proposed Communications Junction Box
 - Proposed Lane Control Signal on Mast Arm
 - Proposed Lane Control Signal on Overhead Sign Structure
 - Proposed Camera with Pole
 - Proposed ITS Cabinet
 - Proposed Motor Vehicle Detection Sensor w/ Quantity
 - Light Pole with LED Luminaire
 - Light Pole with Twin LED Luminaires
 - Existing Light Pole and Luminaire to be Removed
 - Proposed Linear BMP
 - Proposed Drainage Ditch

REFERENCES (PROFILES)	
EB I-64 Profile	5A
WB I-64 Profile	5A

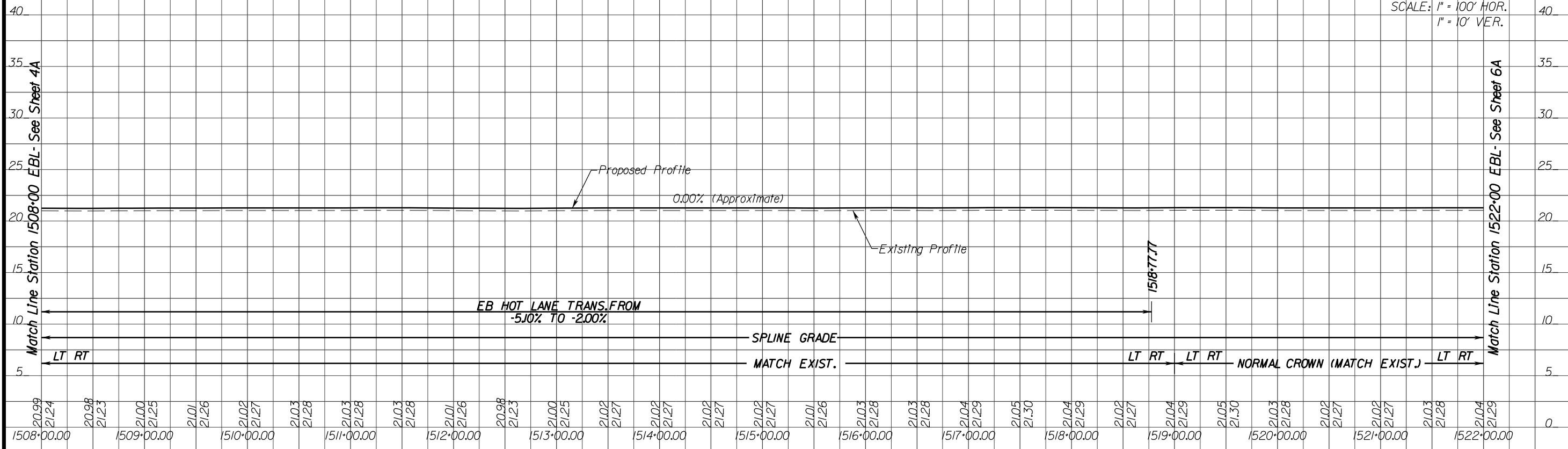


I-64 Eastbound

CONCEPTUAL PLANS

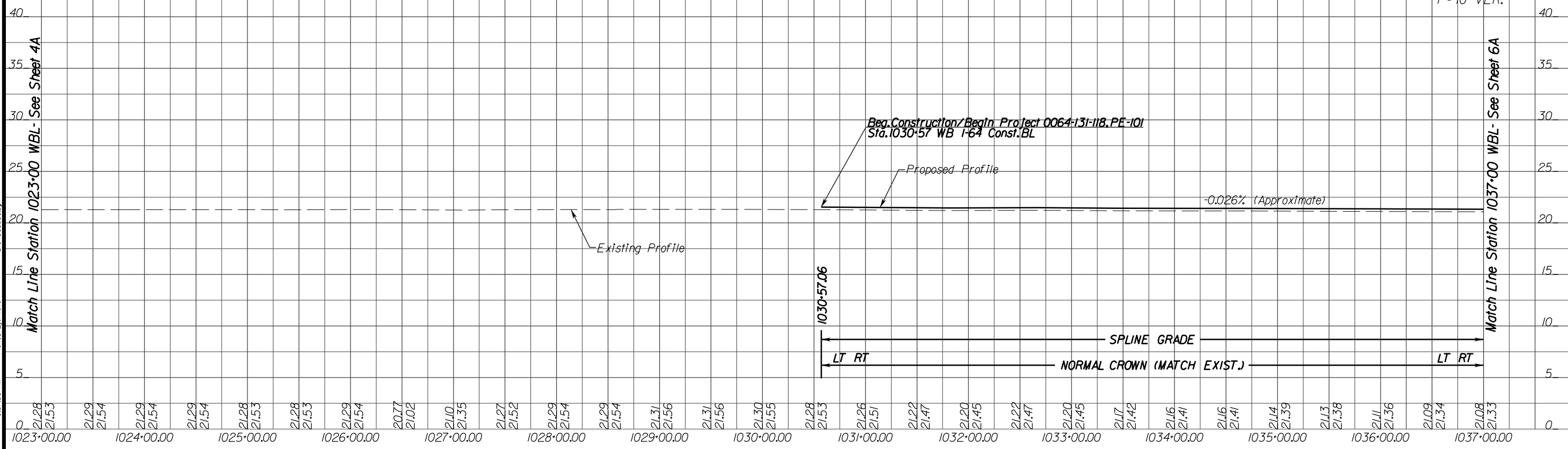
PRELIMINARY

SCALE: 1" = 100' HOR.
1" = 10' VER.



I-64 Westbound

SCALE: 1" = 100' HOR.
1" = 10' VER.



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DESIGNED BY
STV Incorporated

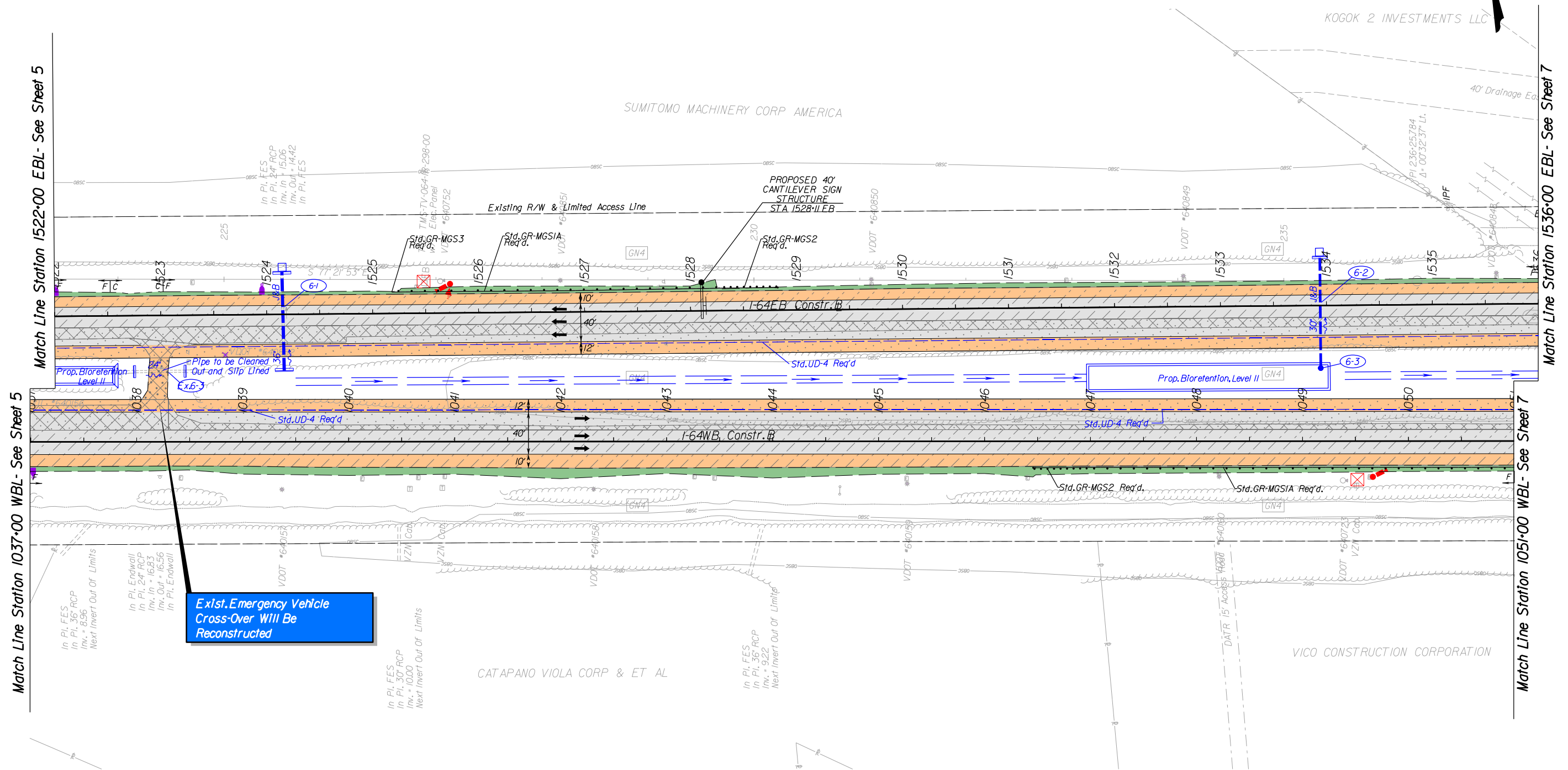
STATE PROJECT
0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND
HIGH RISE BRIDGE, PHASE I

8/2/2017 8:37:58 AM Plotted By: cteiler D:\0436606.dgn

Match Line Station 1037+00 WBL - See Sheet 5

Match Line Station 1536+00 EBL - See Sheet 7

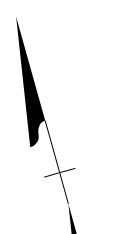


- Legend**
- | | | | |
|--------------------------------|--------------------------------------|---|---|
| Denotes Full Depth Pavement | Denotes Shoulder Running Lane | Proposed Pole-Mount Junction Box | Proposed Motor Vehicle Detection Sensor w/ Quantity |
| Denotes Mill & Overlay | Denotes Limits of Outside Grading | Proposed Communications Junction Box | Light Pole with LED Luminaire |
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| Denotes Exst. Bridge Limits | Denotes Construction Limits in Fills | Proposed ITS Cabinet | Proposed Drainage Ditch |

REFERENCES (PROFILES)	
EB I-64 Profile	6A
WB I-64 Profile	6A

CONCEPTUAL PLANS

PRELIMINARY SCALE



DESIGNED BY

STV Incorporated

DESIGN BUILDER

LMB

STATE PROJECT

0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO.

6

PAGE NO.

76

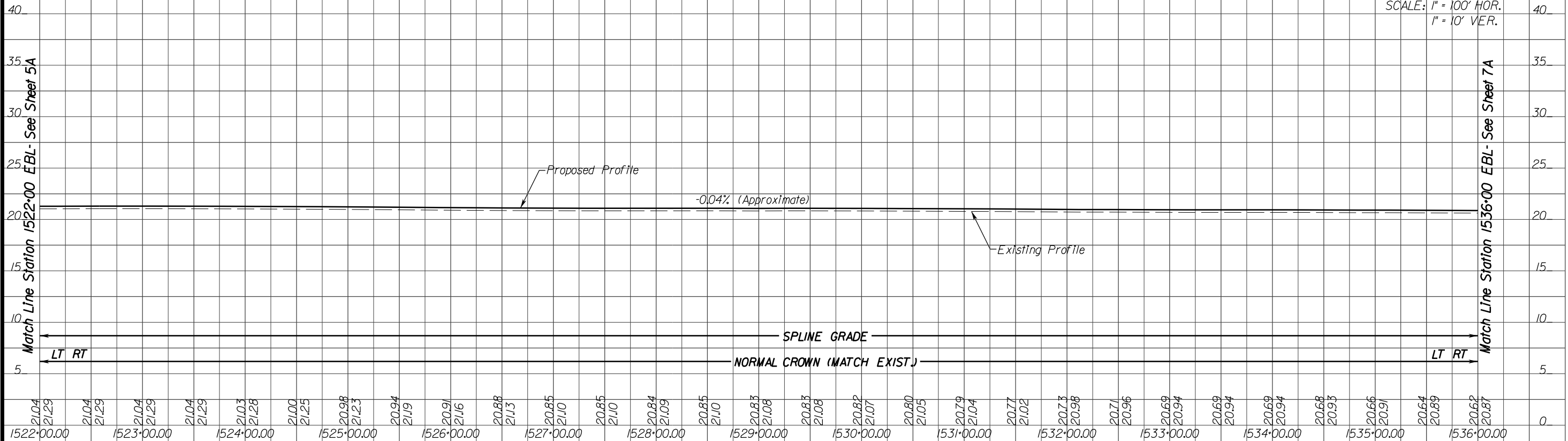
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I-64 Eastbound

CONCEPTUAL PLANS

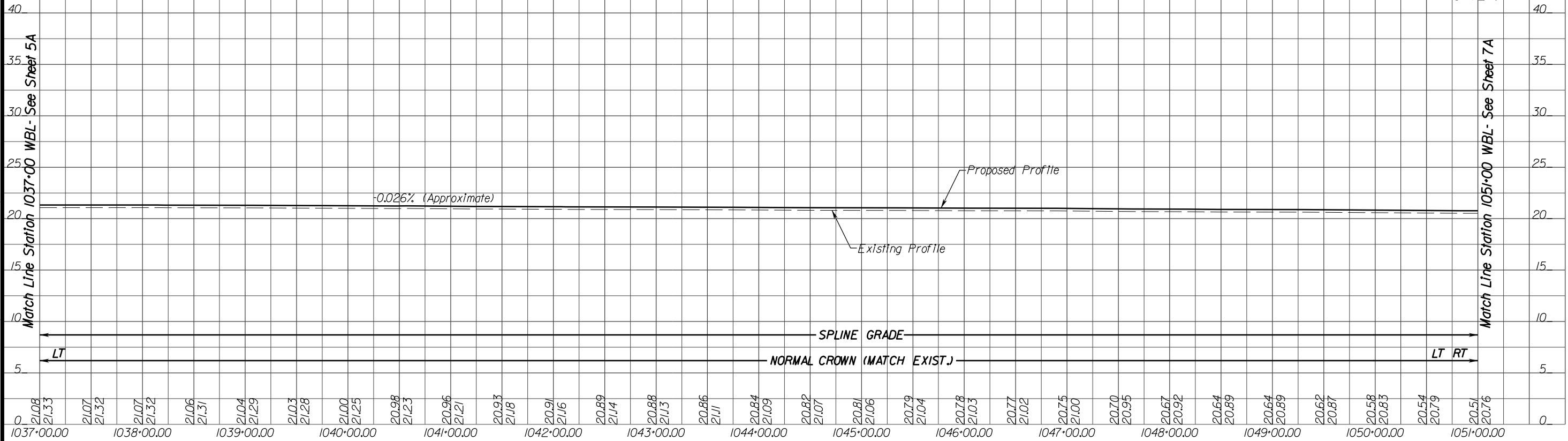
PRELIMINARY

SCALE: 1" = 100' HOR.
1" = 10' VER.



I-64 Westbound

SCALE: 1" = 100' HOR.
1" = 10' VER.



DESIGN BUILDER: **LMB**

DESIGNED BY: **JMT**

STV Incorporated

STATE PROJECT: 0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO. **6A**

PAGE NO. **77**

KOGOK 2 INVESTMENTS LLC

INTERNATIONAL PLAZA L L C

FLEETWAY PROPERTIES LLC

PIERCE REALTY LLC

Curve ATC2_LEGWB_3
 PI - 5006+42.86
 DELTA = 4' 44" 48.25' (LT)
 D = 0' 28" 41"
 T = 496.86'
 L = 993.16'
 R = 11,988.00'
 PC = 5001+45.99
 PRC = 5011+39.15
 Lr = 60'
 e = 2%
 V = 70 MPH

Wetland, Intermediate and Dry
 Conditions Will Receive Special
 Seeding - Tall Fescue Will Not
 Be Used

ATC-2 Begins On This Sheet
 - HOT Lanes Move To Center
 Of Median Increasing
 Operational and Construction
 Safety

Match Line Station 1536+00 EBL- See Sheet 6

Match Line Station 1550+00 EBL- See Sheet 8

Match Line Station 1051+00 WBL- See Sheet 6

Match Line Station 1065+00 WBL- See Sheet 8

B/2/2017
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- Legend**
- Denotes Full Depth Pavement
 - Denotes Mill & Overlay
 - Denotes Demolition of Pavement
 - Denotes Bridge Approach Slab
 - Denotes Prop. Bridge Limits
 - Denotes Exist. Bridge Limits
 - Denotes Shoulder Running Lane
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 - Denotes Travel Lanes
 - Denotes Paved Shoulder
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 - Light Pole with LED Luminaire
 - Light Pole with Twin LED Luminaires
 - Existing Light Pole and Luminaire to be Removed
 - Proposed Linear BMP
 - Proposed Drainage Ditch

REFERENCES (PROFILES)	
EB I-64 Profile	7A
WB I-64 Profile	7A

CONCEPTUAL PLANS

PRELIMINARY SCALE

DESIGN BUILDER

DESIGNED BY

STV Incorporated

STATE PROJECT

0064-131-811, P101, R201, C501
B662-B670, D637, D638

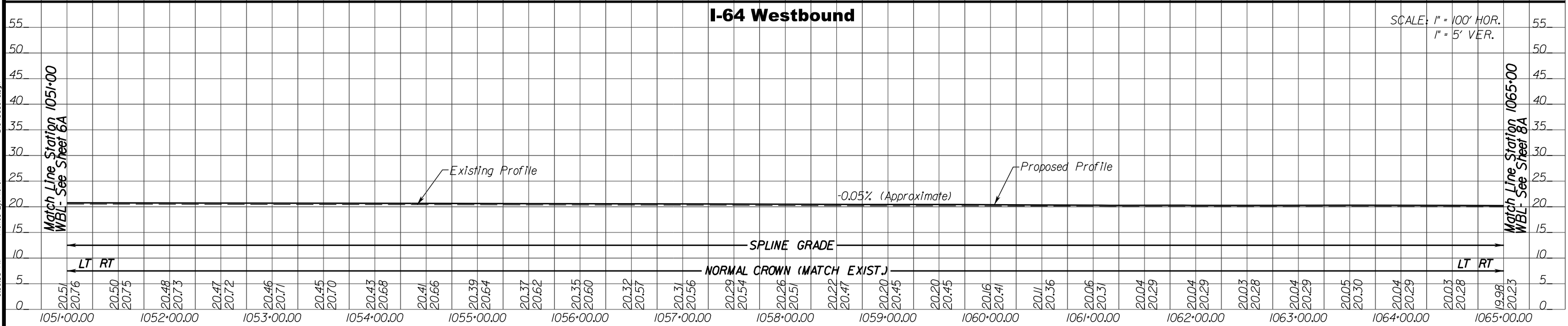
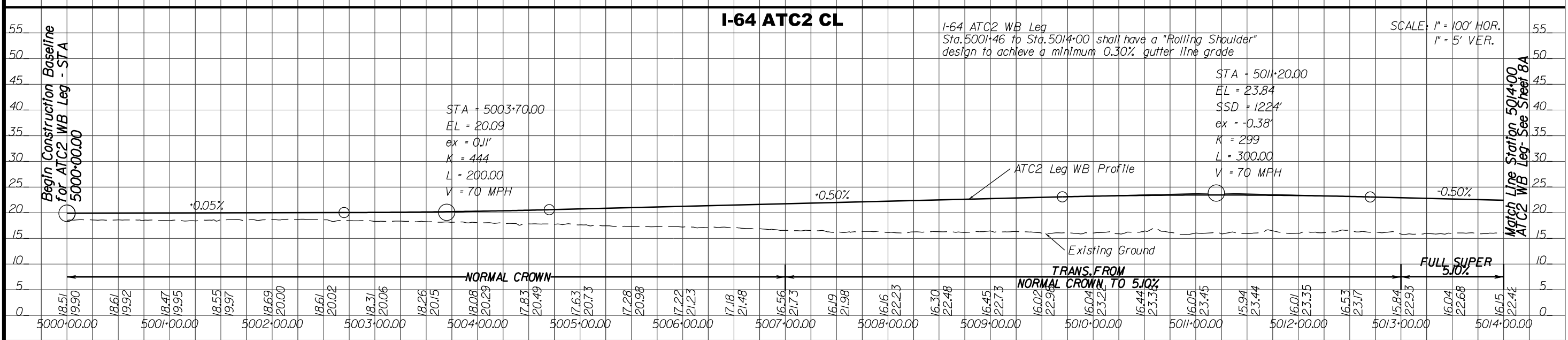
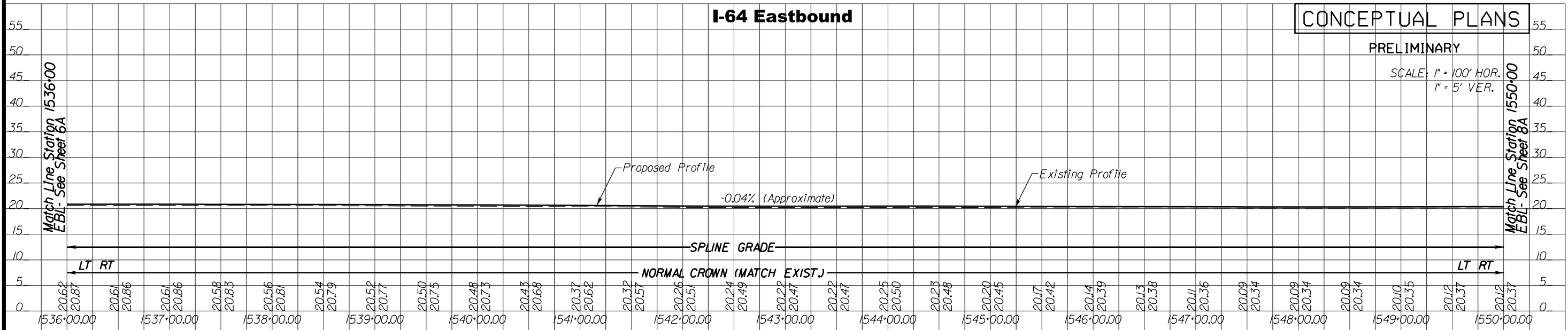
VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO. 7

PAGE NO. 78

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DESIGN BUILDER

LMB

DESIGNED BY

JMT

STV Incorporated

STATE PROJECT

0064-131-811, P101, R201, C501
B662-B670, D637, D638

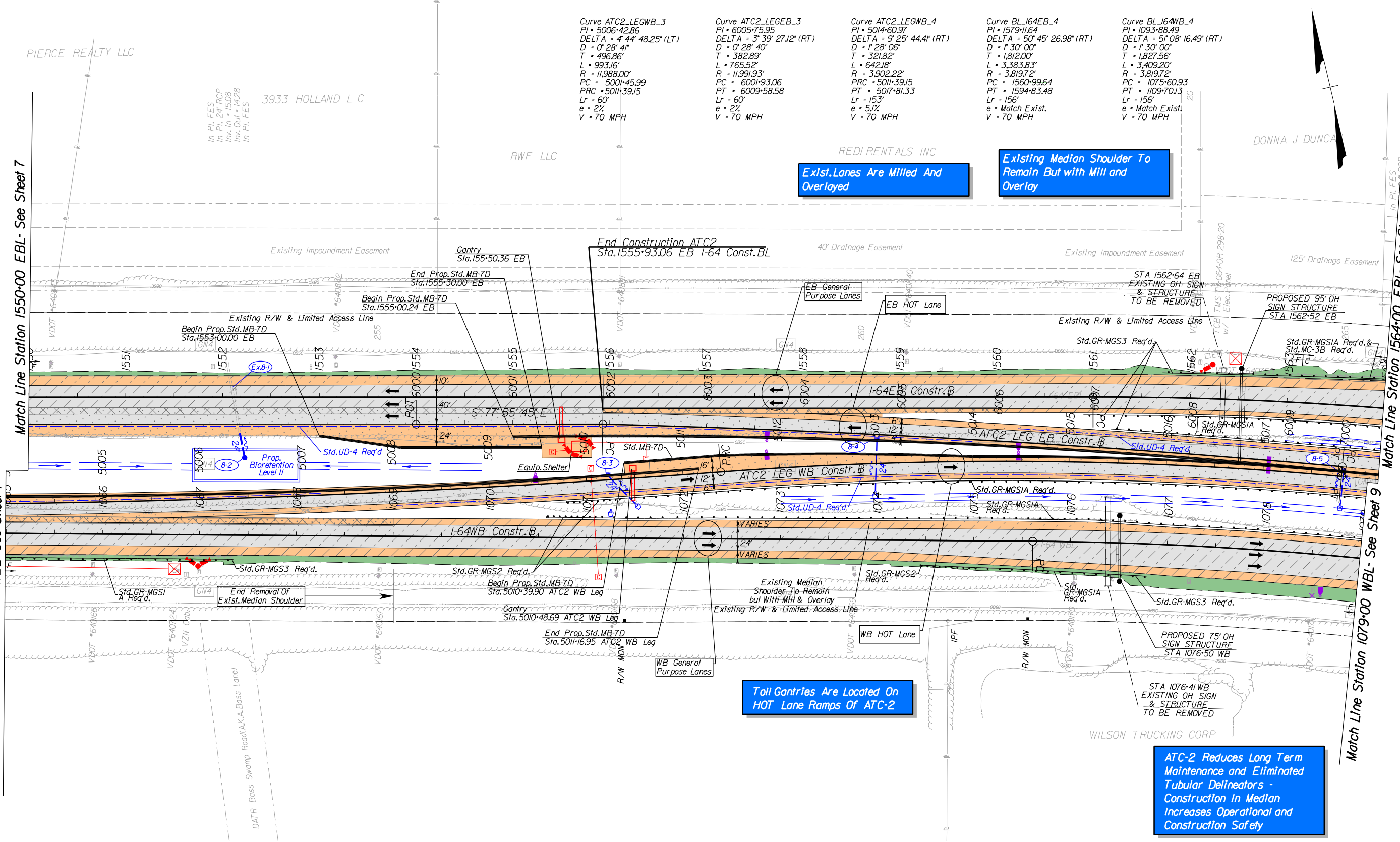
VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTH SIDE WIDENING AND HIGH RISE BRIDGE, PHASE 1

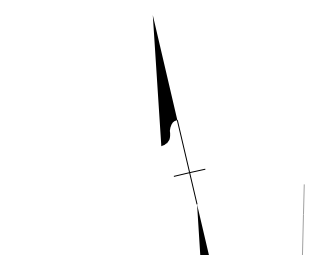
SHEET NO. **7A**

PAGE NO. **79**

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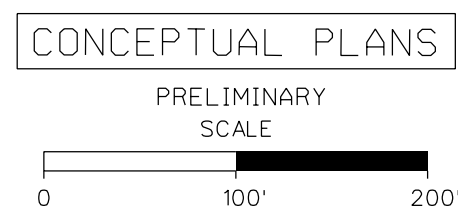


Curve ATC2_LEGWB_3 PI = 5006+42.86 DELTA = 4° 44' 48.25" (LT) D = 0' 28' 41" T = 496.86' L = 993.16' R = 11,988.00' PC = 5001+45.99 PRC = 5011+39.15 Lr = 60' e = 2% V = 70 MPH	Curve ATC2_LEGEB_3 PI = 6005+75.95 DELTA = 3° 39' 27.12" (RT) D = 0' 28' 40" T = 382.89' L = 765.52' R = 11,991.93' PC = 6001+93.06 PT = 6009+58.58 Lr = 60' e = 2% V = 70 MPH	Curve ATC2_LEGWB_4 PI = 5014+60.97 DELTA = 9° 25' 44.41" (RT) D = 0' 28' 06" T = 321.82' L = 642.18' R = 3,902.22' PRC = 5011+39.15 PT = 5017+81.33 Lr = 153' e = 5.1% V = 70 MPH	Curve BLJ64EB_4 PI = 1579+11.64 DELTA = 50° 45' 26.98" (RT) D = 0' 30' 00" T = 1,812.00' L = 3,383.83' R = 3,819.72' PC = 1560+99.64 PT = 1594+83.48 Lr = 156' e = Match Exist. V = 70 MPH	Curve BLJ64WB_4 PI = 1093+88.49 DELTA = 51° 08' 16.49" (RT) D = 0' 30' 00" T = 1,827.56' L = 3,409.20' R = 3,819.72' PC = 1075+60.93 PT = 1109+70.13 Lr = 156' e = Match Exist. V = 70 MPH
--	---	--	---	---



Legend			
Denotes Full Depth Pavement	Denotes Shoulder Running Lane	Proposed Pole-Mount Junction Box	Proposed Motor Vehicle Detection Sensor w/ Quantity
Denotes Mill & Overlay	Denotes Limits of Outside Grading	Proposed Communications Junction Box	Light Pole with LED Luminaire
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Denotes Prop. Bridge Limits	Denotes Construction Limits in Cuts	Proposed Camera with Pole	Proposed Linear BMP
Denotes Exist. Bridge Limits	Denotes Construction Limits in Fills	Proposed ITS Cabinet	Proposed Drainage Ditch

REFERENCES (PROFILES)	
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WB I-64 Profile	8A



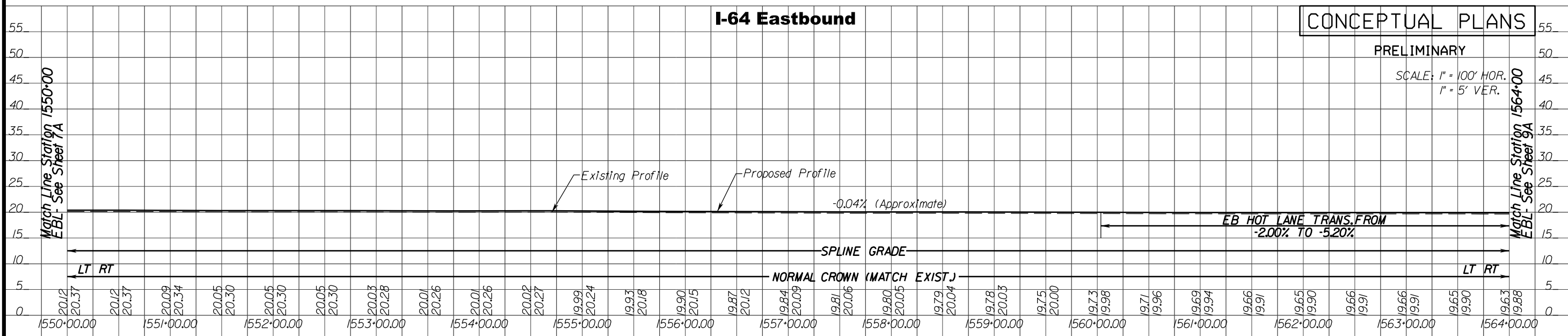
DESIGN BUILDER
LMB
 DESIGNED BY
JMT.
STV Incorporated
 STATE PROJECT
 0064-131-811, P101, R201, C501
 B662-B670, D637, D638
 VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE 1
 SHEET NO. **8**
 PAGE NO. **80**

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I-64 Eastbound

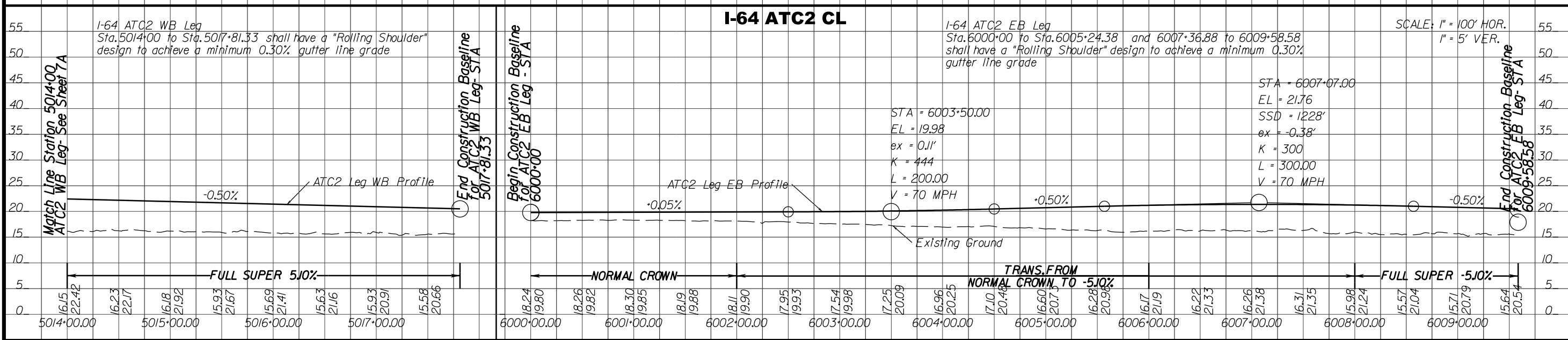
CONCEPTUAL PLANS

PRELIMINARY
SCALE: 1" = 100' HOR.
1" = 5' VER.



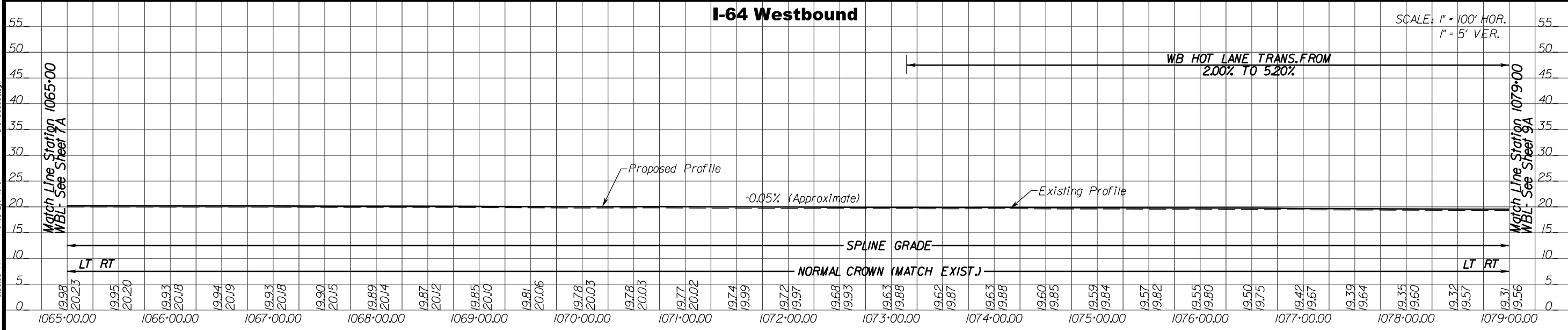
I-64 ATC2 CL

SCALE: 1" = 100' HOR.
1" = 5' VER.



I-64 Westbound

SCALE: 1" = 100' HOR.
1" = 5' VER.



DESIGN BUILDER
LMB

DESIGNED BY
JMT
STV Incorporated

STATE PROJECT
0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTH SIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO.
8A
PAGE NO.
81

The LMB Team is Responsible For Geotechnical Risks Associated With ATC-2 Which Reduces Risk To VDOT

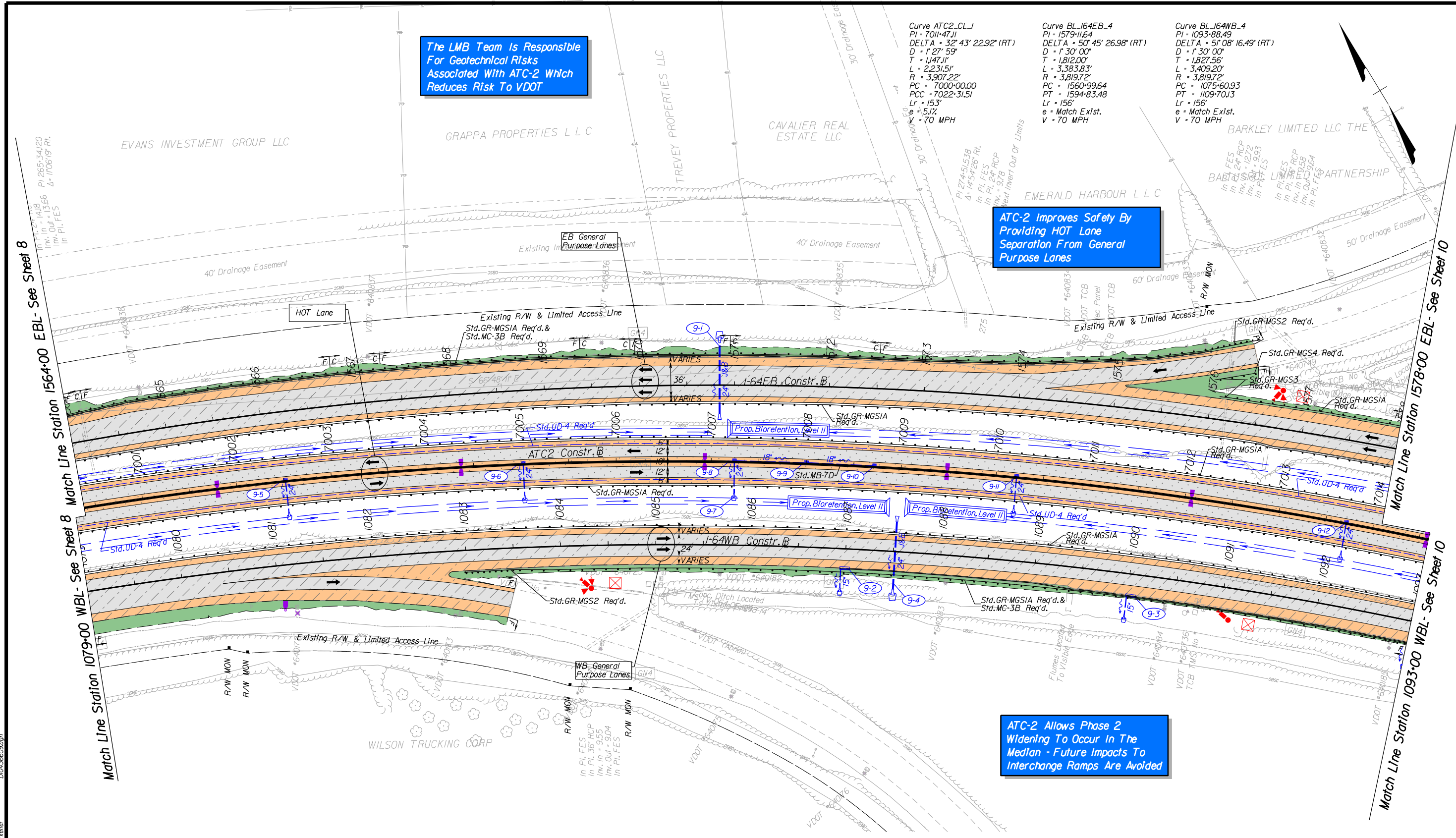
ATC-2 Improves Safety By Providing HOT Lane Separation From General Purpose Lanes

ATC-2 Allows Phase 2 Widening To Occur In The Median - Future Impacts To Interchange Ramps Are Avoided

Curve ATC2_CL1
 PI = 7011+47.11
 DELTA = 32° 43' 22.92" (RT)
 D = 7' 27" 59"
 T = 1147.11'
 L = 2,231.51'
 R = 3,907.22'
 PC = 7000+00.00
 PCC = 7022+31.51
 Lr = 153'
 e = 5.1%
 V = 70 MPH

Curve BL164EB_4
 PI = 1579+11.64
 DELTA = 50° 45' 26.98" (RT)
 D = 7' 30" 00"
 T = 1,812.00'
 L = 3,383.83'
 R = 3,819.72'
 PC = 1560+99.64
 PT = 1594+83.48
 Lr = 156'
 e = Match Exist.
 V = 70 MPH

Curve BL164WB_4
 PI = 1093+88.49
 DELTA = 51° 08' 16.49" (RT)
 D = 7' 30" 00"
 T = 1,827.56'
 L = 3,409.20'
 R = 3,819.72'
 PC = 1075+60.93
 PT = 1109+70.13
 Lr = 156'
 e = Match Exist.
 V = 70 MPH



B/2/2017
 3:44:34 PM
 Plotted By: cteiler
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Legend

Denotes Full Depth Pavement	Denotes Shoulder Running Lane	Proposed Pole-Mount Junction Box	Proposed Motor Vehicle Detection Sensor w/ Quantity
Denotes Mill & Overlay	Denotes Limits of Outside Grading	Proposed Communications Junction Box	Light Pole with LED Luminaire
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Denotes Exist. Bridge Limits	Denotes Construction Limits in Fills	Proposed ITS Cabinet	Proposed Drainage Ditch

REFERENCES (PROFILES)

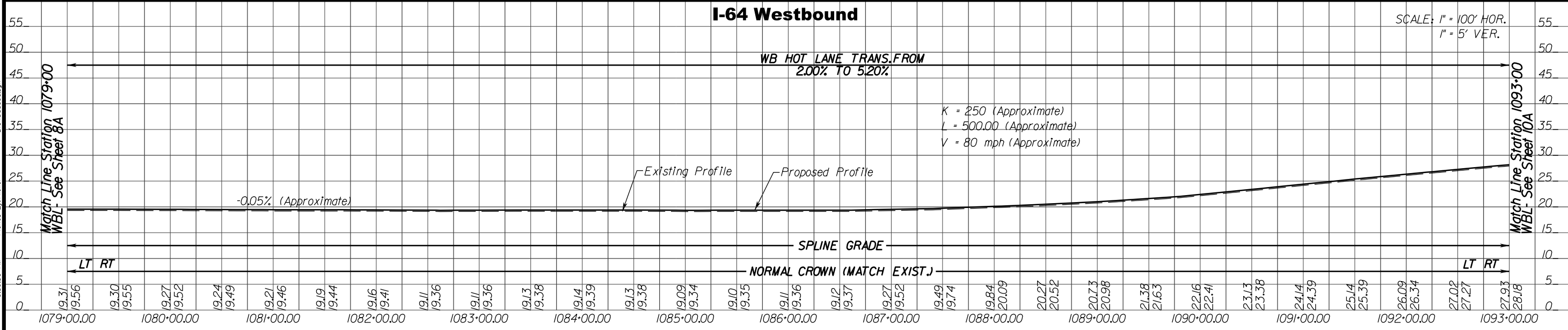
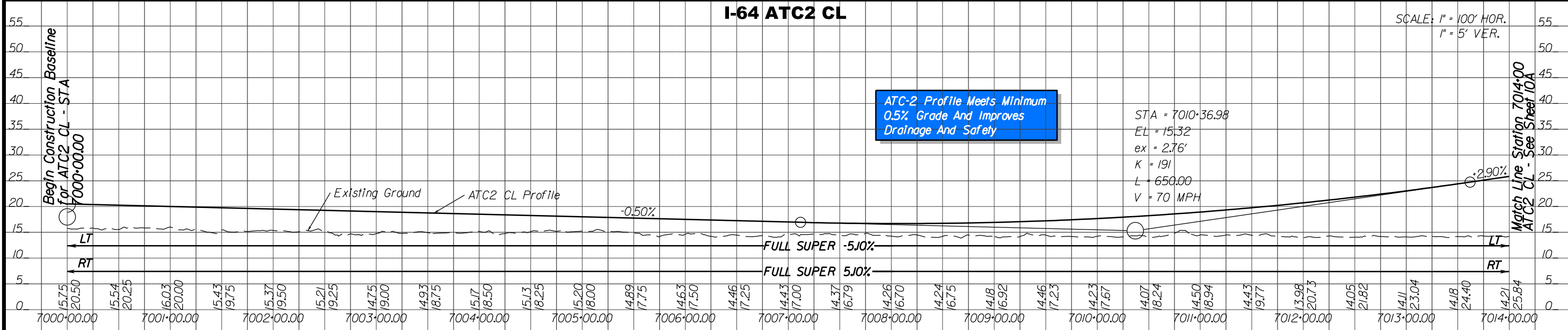
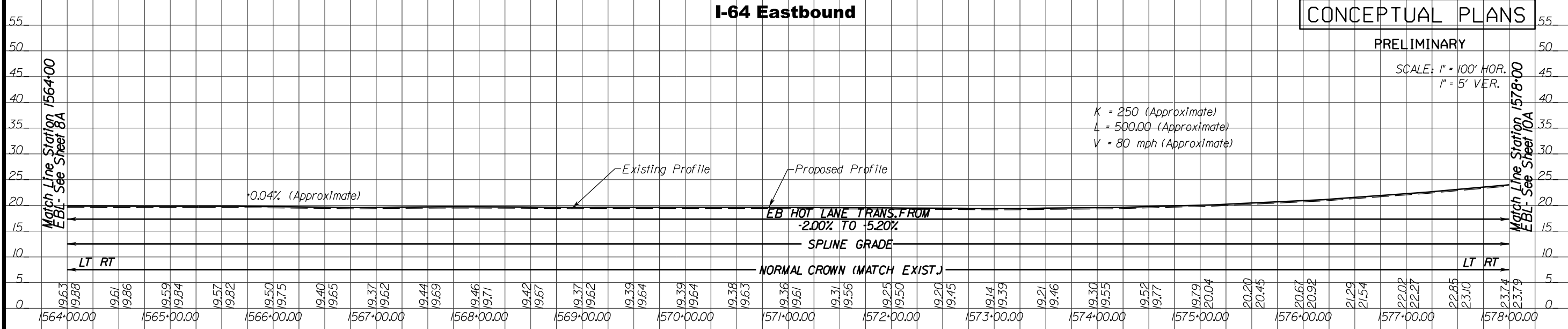
EB I-64 Profile	9A
WB I-64 Profile	9A
ATC2 Accommodations	S-22

CONCEPTUAL PLANS

PRELIMINARY SCALE

DESIGN BUILDER
LMB
 DESIGNED BY
JMT.
 STV Incorporated
 STATE PROJECT
 0064-131-811, P101, R201, C501
 B662-B670, D637, D638
 VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE 1
 SHEET NO.
9
 PAGE NO.
82

8/2/2017 8:39:30 AM Plotted By: reiler D:\0436609\adp



DESIGN BUILDER

DESIGNED BY

STATE PROJECT

VIRGINIA DEPARTMENT OF TRANSPORTATION

SHEET NO.

PAGE NO.

0064-131-811, P101, R201, C501
B662-B670, D637, D638

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

LMB

JMT

STV Incorporated

9A

83

LEY LIMITED LLC THE

ATC-2 Locates A New Bridge In Median That Can Be Widened For Phase 2

ATC-2 Accommodates Future Widening Of Military Highway - See Sheet S-24 For Details

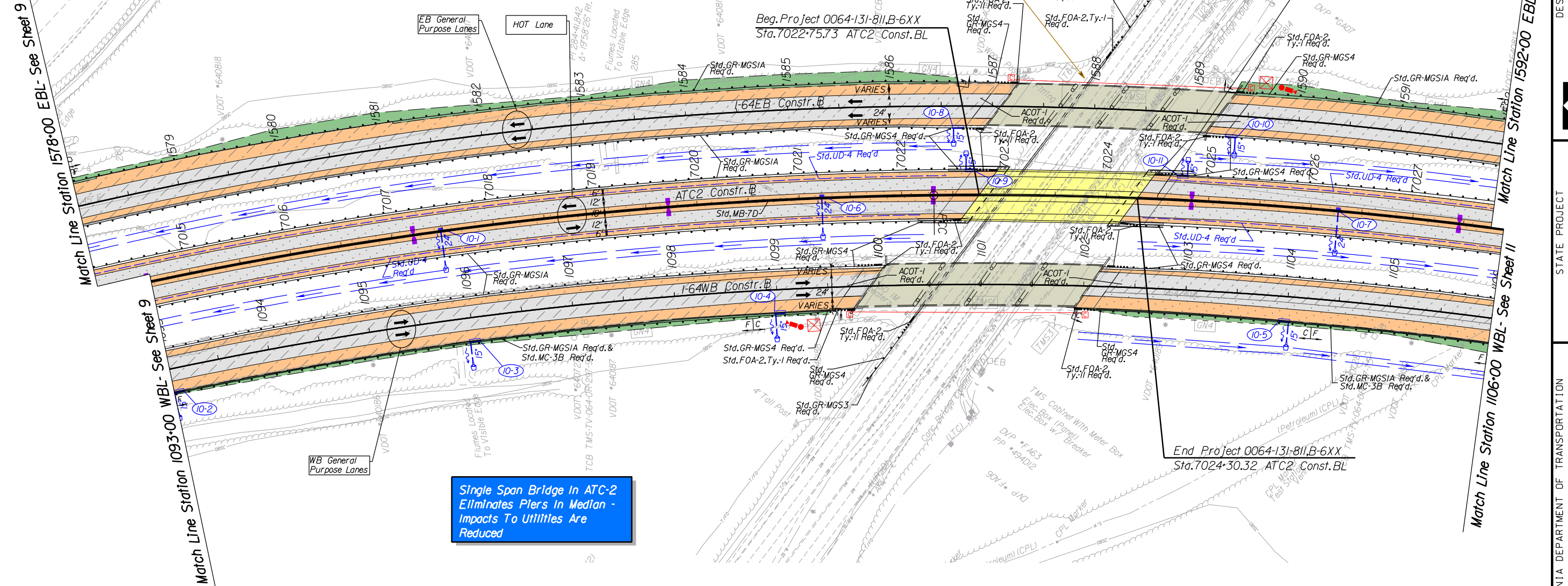
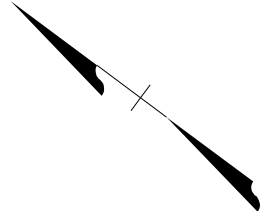
Single Span Bridge In ATC-2 Eliminates Piers In Median - Impacts To Utilities Are Reduced

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 D = 127.59'
 T = 1147.11'
 L = 2,231.51'
 R = 3,907.22'
 PC = 7000.0000
 PCC = 7022.3151
 Lr = 153'
 e = 5.1%
 V = 70 MPH

Curve ATC2_CL2
 PI - 7027.0200
 DELTA = 13° 43' 57.41" (RT)
 D = 127.59'
 T = 470.49'
 L = 936.48'
 R = 3,907.22'
 PCC = 7022.3151
 PT = 7031.6799
 Lr = 153'
 e = 5.1%
 V = 70 MPH

Curve BL164EB_4
 PI - 1579.1164
 DELTA = 50° 45' 26.98" (RT)
 D = 130.00'
 T = 1,812.00'
 L = 3,383.83'
 R = 3,819.72'
 PC = 1560.9964
 PT = 1594.8348
 Lr = 156'
 e = Match Exist.
 V = 70 MPH

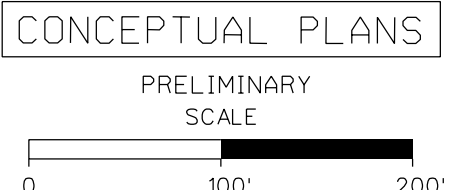
Curve BL164WB_4
 PI - 1093.8849
 DELTA = 51° 08' 16.49" (RT)
 D = 130.00'
 T = 1,827.56'
 L = 3,409.20'
 R = 3,819.72'
 PC = 1075.6093
 PT = 1109.7013
 Lr = 156'
 e = Match Exist.
 V = 70 MPH



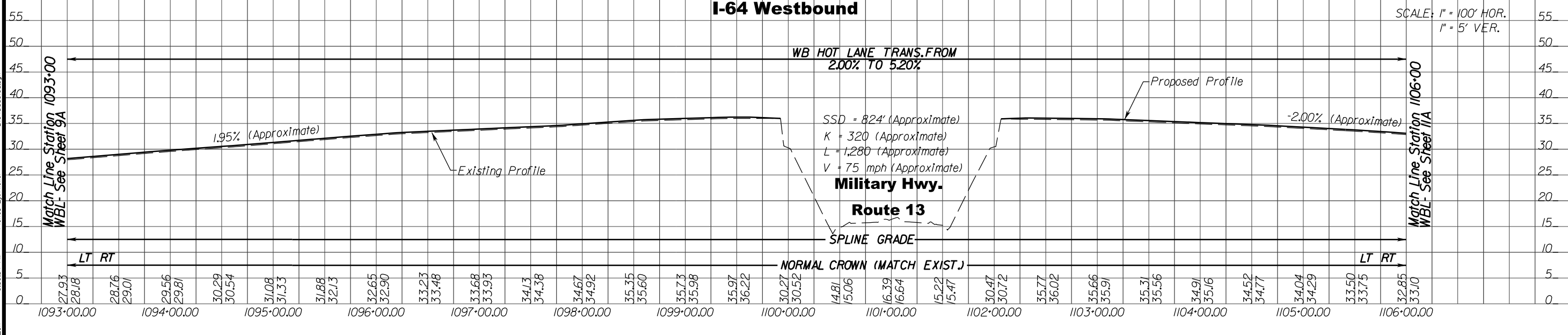
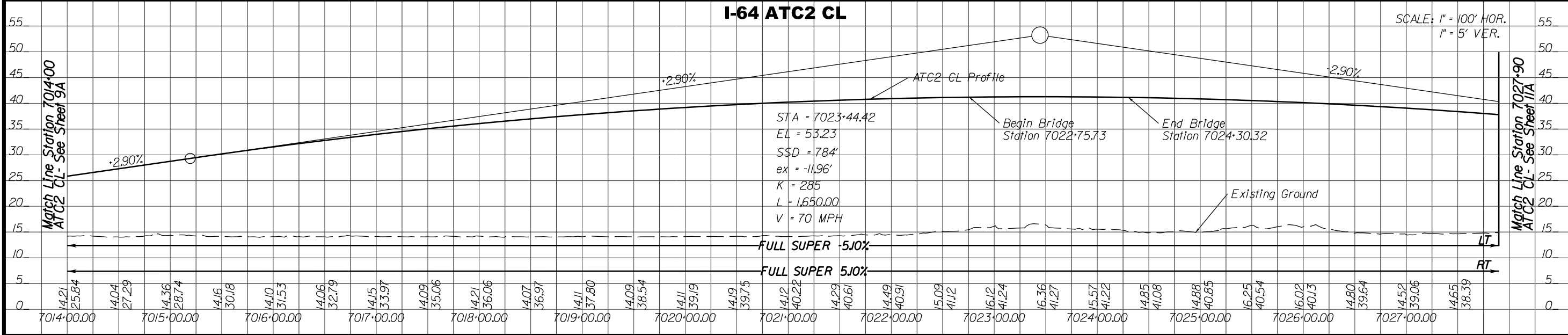
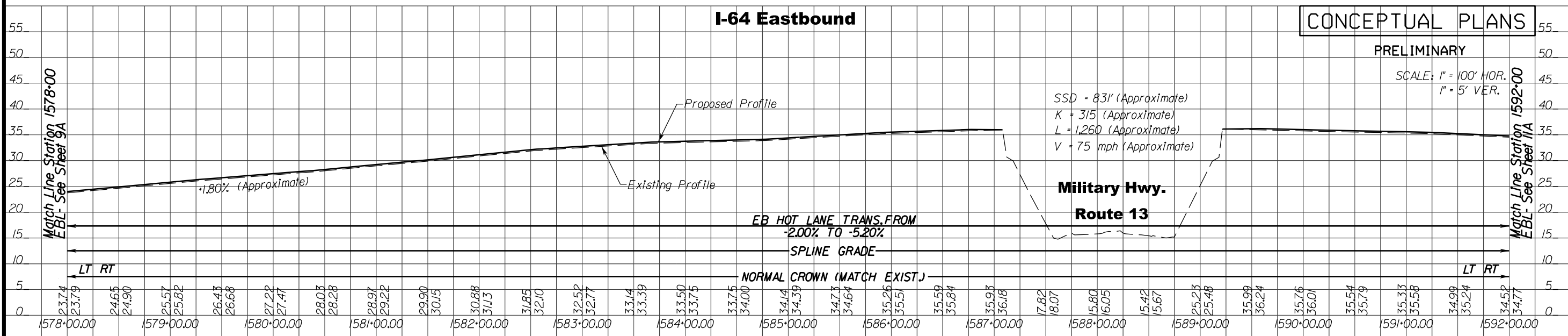
- Legend**
- Denotes Full Depth Pavement
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 - Light Pole with Twin LED Luminaires
 - Existing Light Pole and Luminaire to be Removed
 - Proposed Linear BMP
 - Proposed Drainage Ditch

REFERENCES (PROFILES)

EB I-64 Profile	10A
WB I-64 Profile	10A
ATC2 Accommodations	S-22



8/2/2017 8:39:54 AM Plotted By: reiller D:\43660\0\0\0.dwg



DESIGN BUILDER

DESIGNED BY

STV Incorporated

STATE PROJECT

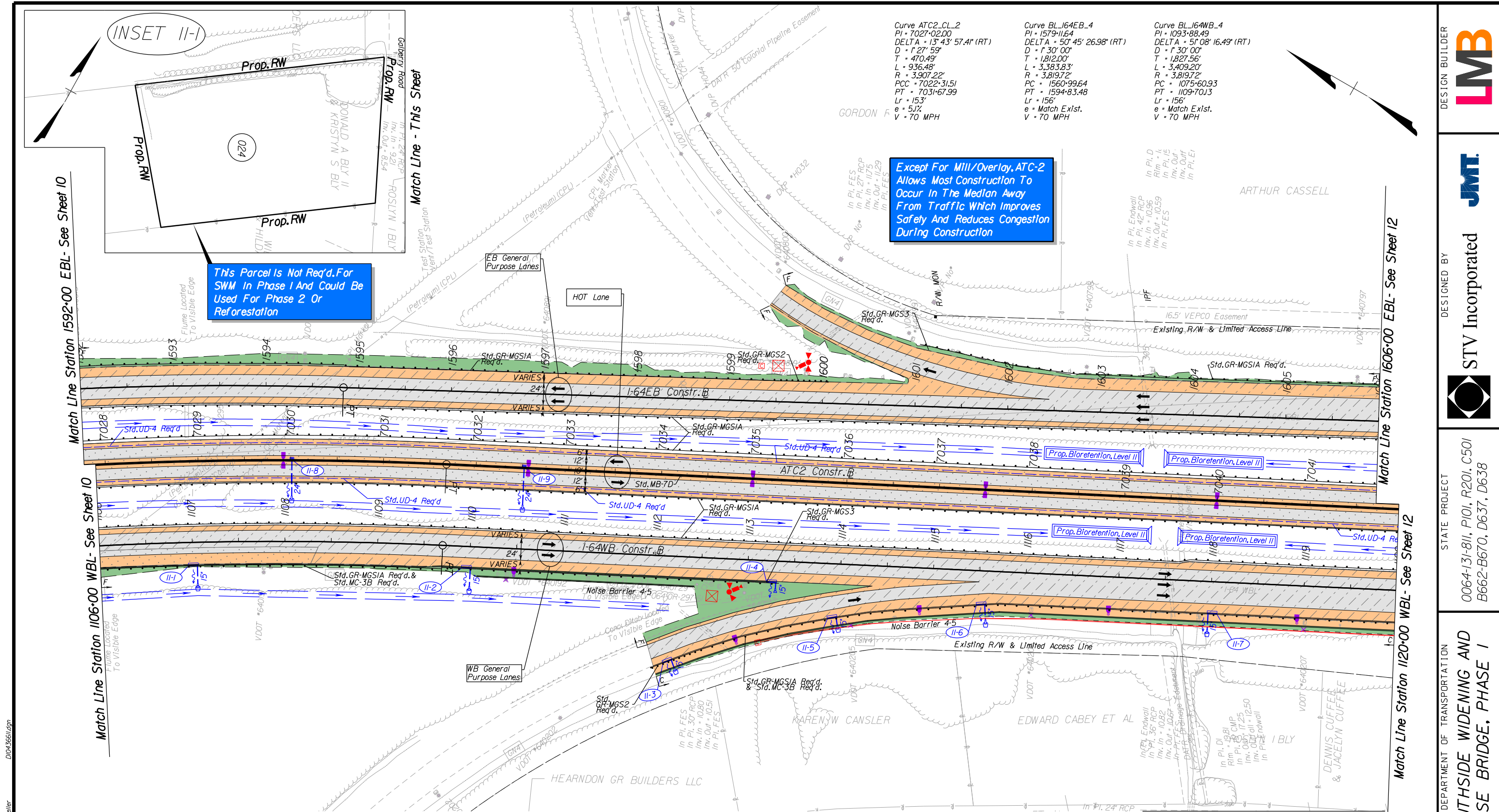
0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTH SIDE WIDENING AND
HIGH RISE BRIDGE, PHASE I

SHEET NO.
10A

PAGE NO.
85



INSET II-1

This Parcel Is Not Req'd. For SWM In Phase 1 And Could Be Used For Phase 2 Or Reforestation

Except For Mill/Overlay, ATC-2 Allows Most Construction To Occur In The Median Away From Traffic Which Improves Safety And Reduces Congestion During Construction

Curve ATC2_CL_2
 PI = 7027+02.00
 DELTA = 13° 43' 57.41" (RT)
 D = 7' 27" 59"
 T = 470.49'
 L = 936.48'
 R = 3,907.22'
 PCC = 7022+31.51
 PT = 7031+67.99
 Lr = 153'
 e = 5.1%
 V = 70 MPH

Curve BL_164EB_4
 PI = 1579+11.64
 DELTA = 50° 45' 26.98" (RT)
 D = 7' 30" 00"
 T = 1,812.00'
 L = 3,383.83'
 R = 3,819.72'
 PC = 1560+99.64
 PT = 1594+83.48
 Lr = 156'
 e = Match Exist.
 V = 70 MPH

Curve BL_164WB_4
 PI = 1093+88.49
 DELTA = 51° 08' 16.49" (RT)
 D = 7' 30" 00"
 T = 1,827.56'
 L = 3,409.20'
 R = 3,819.72'
 PC = 1075+60.93
 PT = 1109+70.13
 Lr = 156'
 e = Match Exist.
 V = 70 MPH

Match Line Station 1592+00 EBL- See Sheet 10

Match Line Station 1106+00 WBL- See Sheet 10

Match Line Station 1606+00 EBL- See Sheet 12

Match Line Station 1120+00 WBL- See Sheet 12

Match Line - This Sheet See Inset II-1

Legend

- | | | | |
|--------------------------------|--------------------------------------|---|---|
| Denotes Full Depth Pavement | Denotes Shoulder Running Lane | Proposed Pole-Mount Junction Box | Proposed Motor Vehicle Detection Sensor w/ Quantity |
| Denotes Mill & Overlay | Denotes Limits of Outside Grading | Proposed Communications Junction Box | Light Pole with LED Luminaire |
| Denotes Demolition of Pavement | Denotes Travel Lanes | Proposed Lane Control Signal on Mast Arm | Light Pole with Twin LED Luminaires |
| Denotes Bridge Approach Slab | Denotes Paved Shoulder | Proposed Lane Control Signal on Overhead Sign Structure | Existing Light Pole and Luminaire to be Removed |
| Denotes Prop. Bridge Limits | Denotes Construction Limits in Cuts | Proposed Camera with Pole | Proposed Linear BMP |
| Denotes Exist. Bridge Limits | Denotes Construction Limits in Fills | Proposed ITS Cabinet | Proposed Drainage Ditch |

REFERENCES (PROFILES)

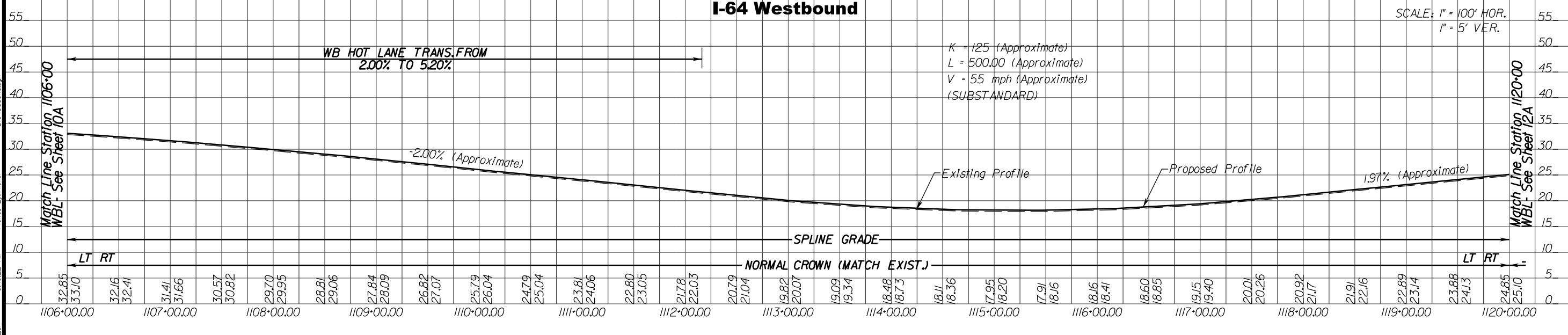
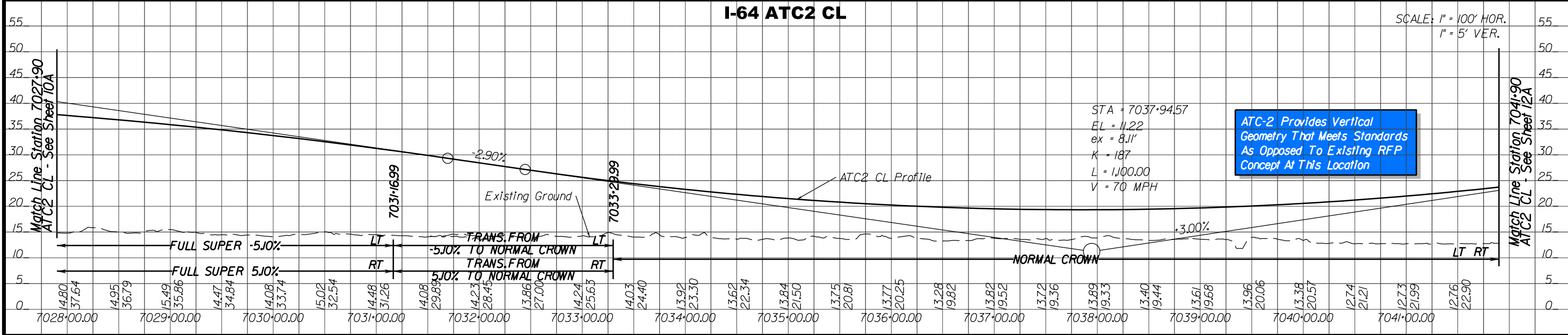
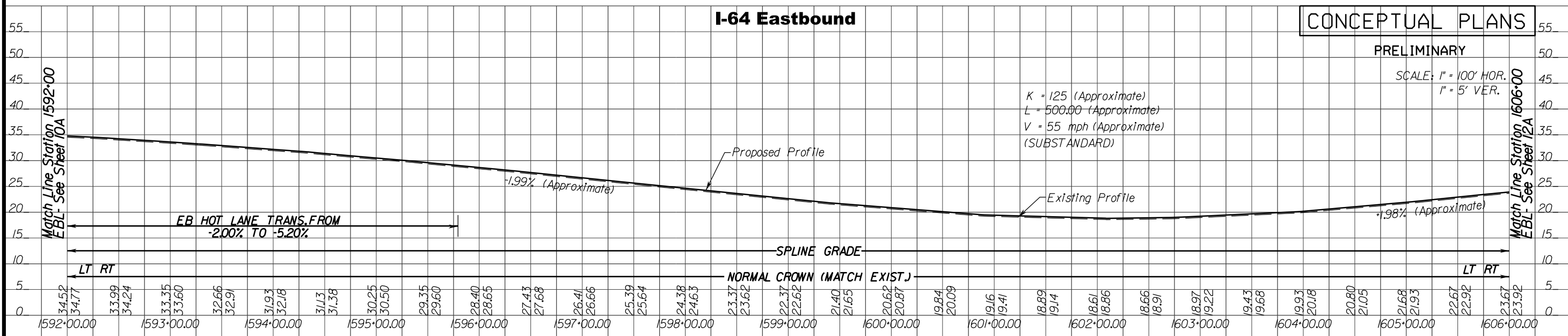
EB I-64 Profile	IIA
WB I-64 Profile	IIA

CONCEPTUAL PLANS

PRELIMINARY SCALE

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8/2/2017 8:40:22 AM Plotted By: reiler D:\43660\load\p



DESIGN BUILDER

DESIGNED BY

STATE PROJECT

VIRGINIA DEPARTMENT OF TRANSPORTATION

SHEET NO.

PAGE NO.

0064-131-811, P101, R201, C501
B662-B670, D637, D638

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

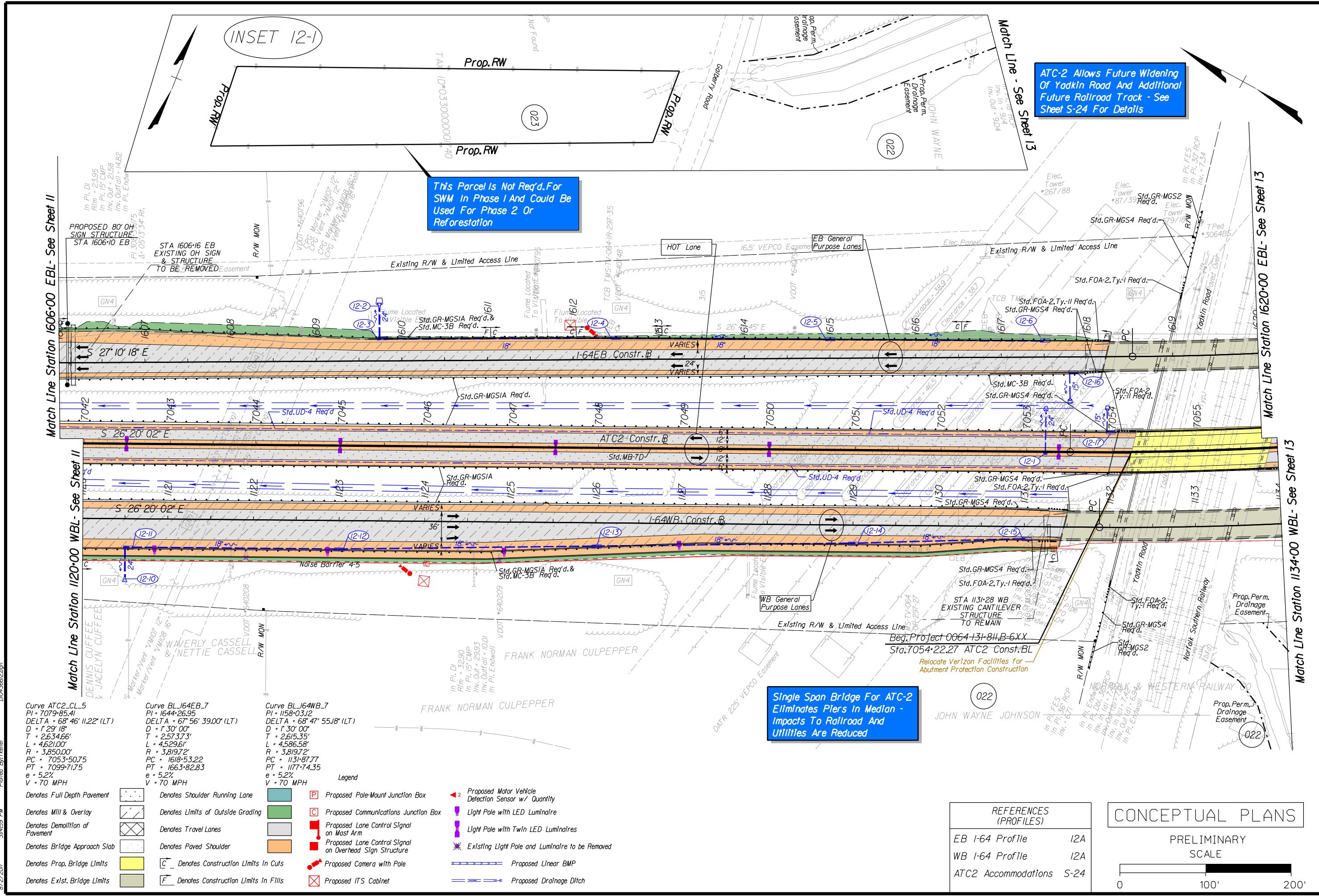
LMB

JMT

STV Incorporated

11A

87



INSET 12-1

ATC-2 Allows Future Widening Of Yadkin Road And Additional Future Railroad Track - See Sheet S-24 For Details

This Parcel Is Not Req'd. For SWM In Phase 1 And Could Be Used For Phase 2 Or Reforestation

Single Span Bridge For ATC-2 Eliminates Piers In Median - Impacts To Railroad And Utilities Are Reduced

Curve ATC2-CL-5 PI = 7079-85.41 DELTA = 68° 46' 11.22" (LT) D = 1' 29' 18" T = 2.634.66' L = 4.621.00' R = 3.850.00' PC = 7053-50.75 PT = 7099-71.75 e = 5.2% V = 70 MPH	Curve BL164EB-7 PI = 1644-26.95 DELTA = 67° 56' 39.00" (LT) D = 1' 30' 00" T = 2.573.73' L = 4.529.61' R = 3.819.72' PC = 1618-53.22 PT = 1663-82.83 e = 5.2% V = 70 MPH	Curve BL164WB-7 PI = 1158-03.12 DELTA = 68° 47' 55.18" (LT) D = 1' 30' 00" T = 2.615.35' L = 4.586.58' R = 3.819.72' PC = 1131-87.77 PT = 1177-74.35 e = 5.2% V = 70 MPH
--	--	--

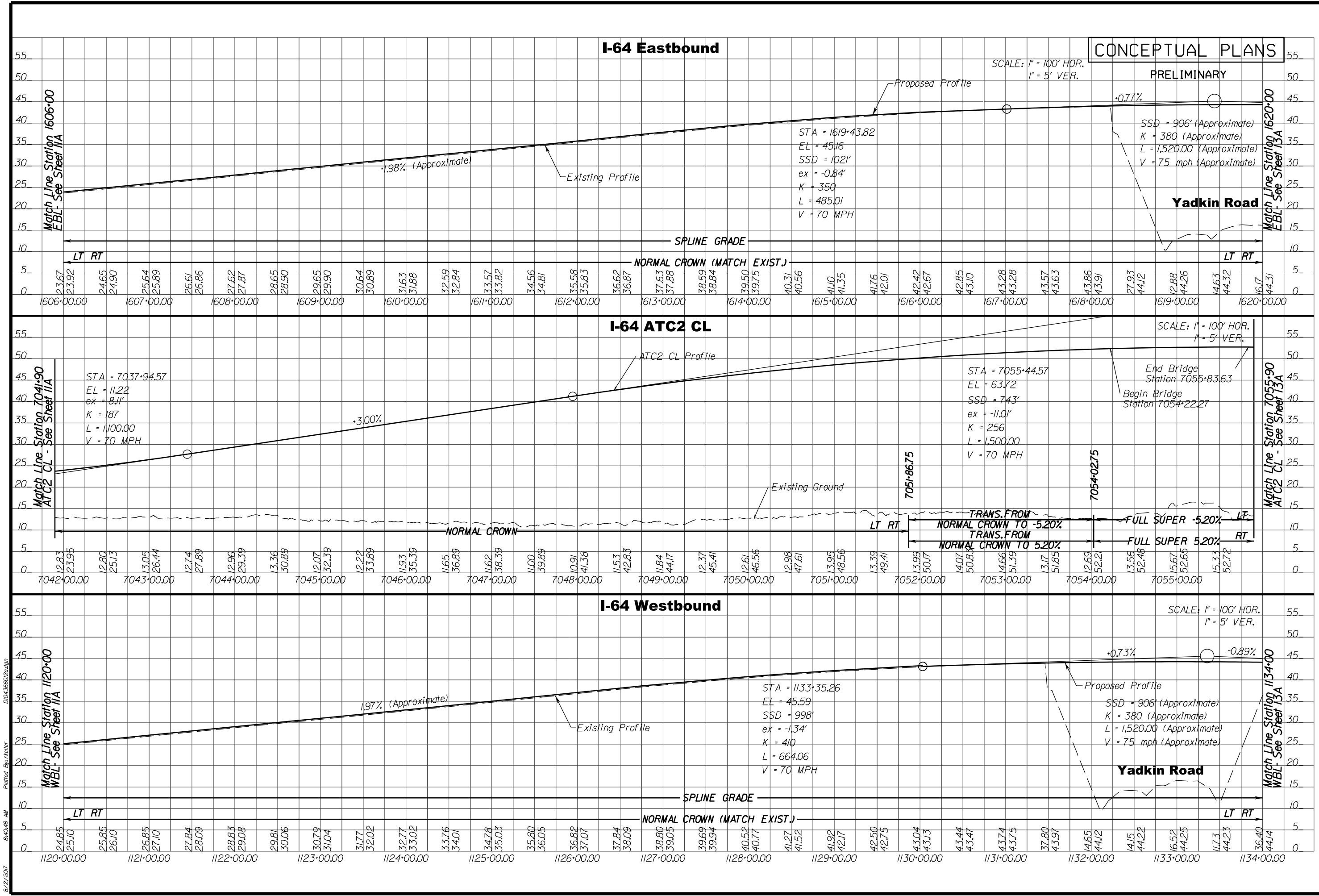
Denotes Full Depth Pavement	Denotes Shoulder Running Lane	Denotes Pole-Mount Junction Box	Proposed Motor Vehicle Detection Sensor w/ Quantity
Denotes Mill & Overlay	Denotes Limits of Outside Grading	Proposed Communications Junction Box	Light Pole with LED Luminaire
Denotes Demolition of Pavement	Denotes Travel Lanes	Proposed Lane Control Signal on Mast Arm	Light Pole with Twin LED Luminaires
Denotes Bridge Approach Slab	Denotes Paved Shoulder	Proposed Lane Control Signal on Overhead Sign Structure	Existing Light Pole and Luminaire to be Removed
Denotes Prop. Bridge Limits	Denotes Construction Limits in Cuts	Proposed Camera with Pole	Proposed Linear BMP
Denotes Exist. Bridge Limits	Denotes Construction Limits in Fills	Proposed ITS Cabinet	Proposed Drainage Ditch

REFERENCES (PROFILES)

EB I-64 Profile	I2A
WB I-64 Profile	I2A
ATC2 Accommodations	S-24

CONCEPTUAL PLANS

PRELIMINARY SCALE



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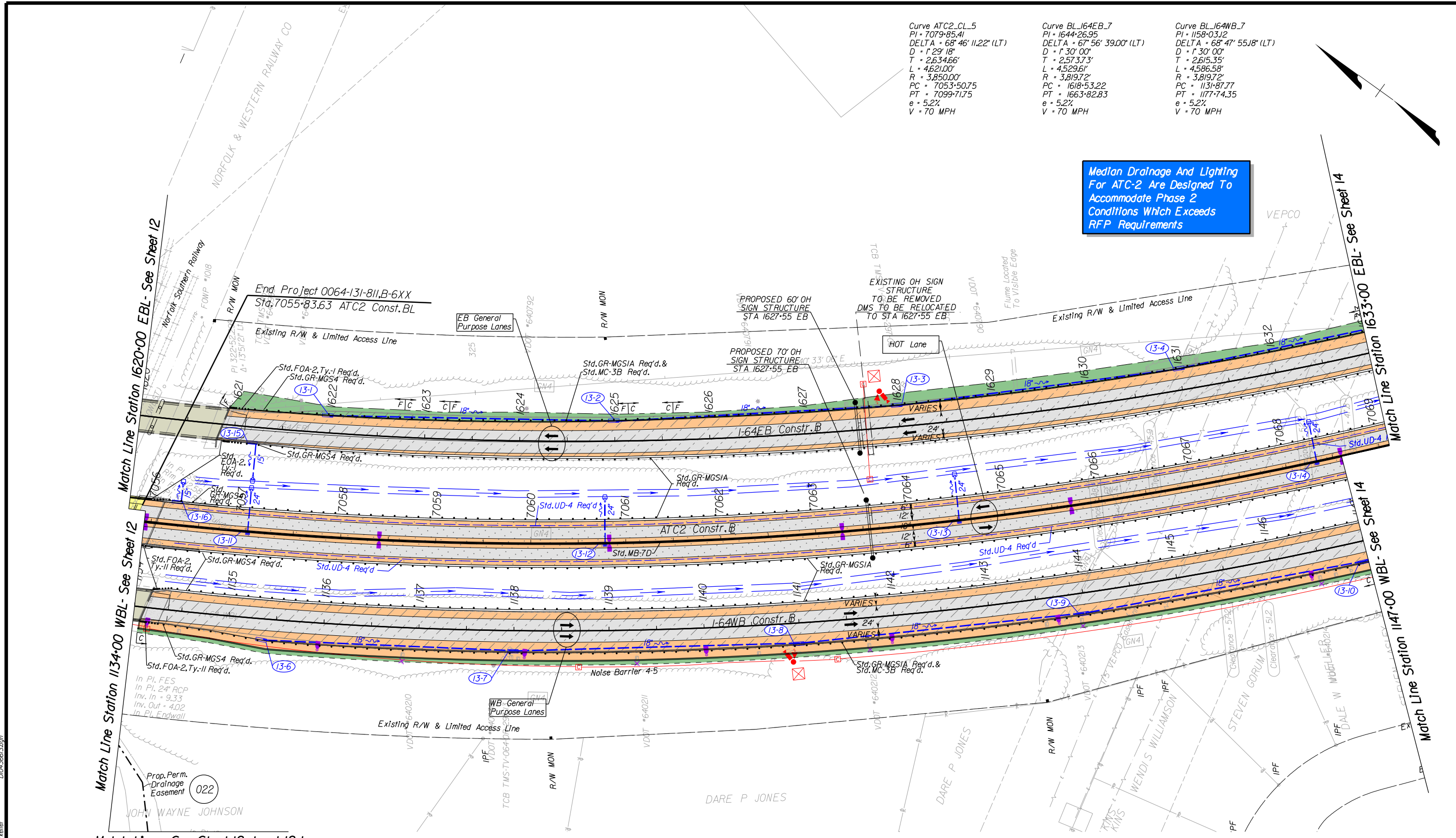
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D = 1' 29' 18"
T = 2,634.66'
L = 4,621.00'
R = 3,850.00'
PC = 7053+50.75
PT = 7099+71.75
e = 5.2%
V = 70 MPH

Curve BL_164EB_7
PI = 1644+26.95
DELTA = 67° 56' 39.00" (LT)
D = 1' 30' 00"
T = 2,573.73'
L = 4,529.61'
R = 3,819.72'
PC = 1618+53.22
PT = 1663+82.83
e = 5.2%
V = 70 MPH

Curve BL_164WB_7
PI = 1158+03.12
DELTA = 68° 47' 55.18" (LT)
D = 1' 30' 00"
T = 2,615.35'
L = 4,586.58'
R = 3,819.72'
PC = 1131+87.77
PT = 1177+74.35
e = 5.2%
V = 70 MPH

Median Drainage And Lighting For ATC-2 Are Designed To Accommodate Phase 2 Conditions Which Exceeds RFP Requirements

ATC-1 Provides MASH-Tested Systems That Improve Safety And Meet Standards



Denotes Full Depth Pavement	Denotes Shoulder Running Lane	Proposed Pole-Mount Junction Box	Proposed Motor Vehicle Detection Sensor w/ Quantity
Denotes Mill & Overlay	Denotes Limits of Outside Grading	Proposed Communications Junction Box	Light Pole with LED Luminaire
Denotes Demolition of Pavement	Denotes Travel Lanes	Proposed Lane Control Signal on Mast Arm	Light Pole with Twin LED Luminaires
Denotes Bridge Approach Slab	Denotes Paved Shoulder	Proposed Lane Control Signal on Overhead Sign Structure	Existing Light Pole and Luminaire to be Removed
Denotes Prop. Bridge Limits	Denotes Construction Limits in Cuts	Proposed Camera with Pole	Proposed Linear BMP
Denotes Exist. Bridge Limits	Denotes Construction Limits in Fills	Proposed ITS Cabinet	Proposed Drainage Ditch

REFERENCES (PROFILES)

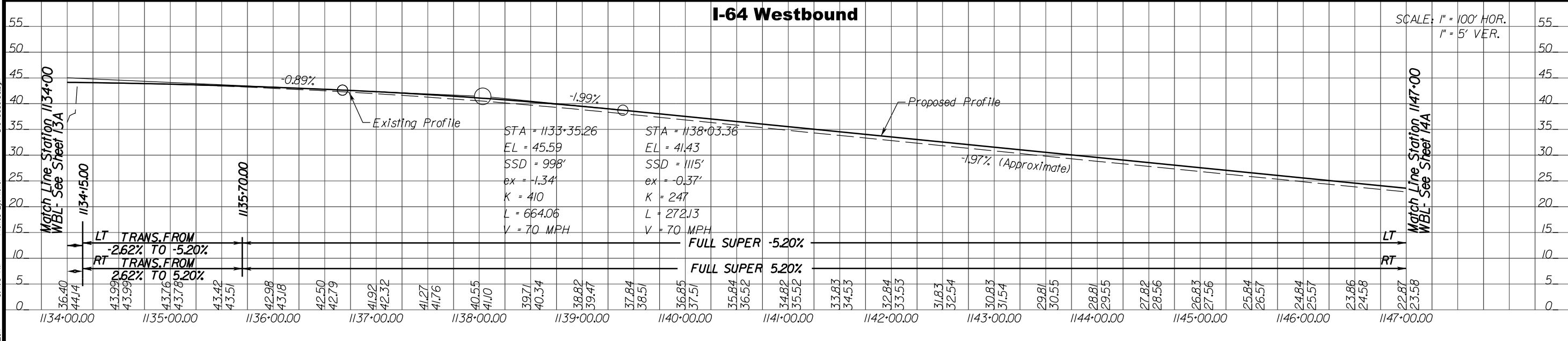
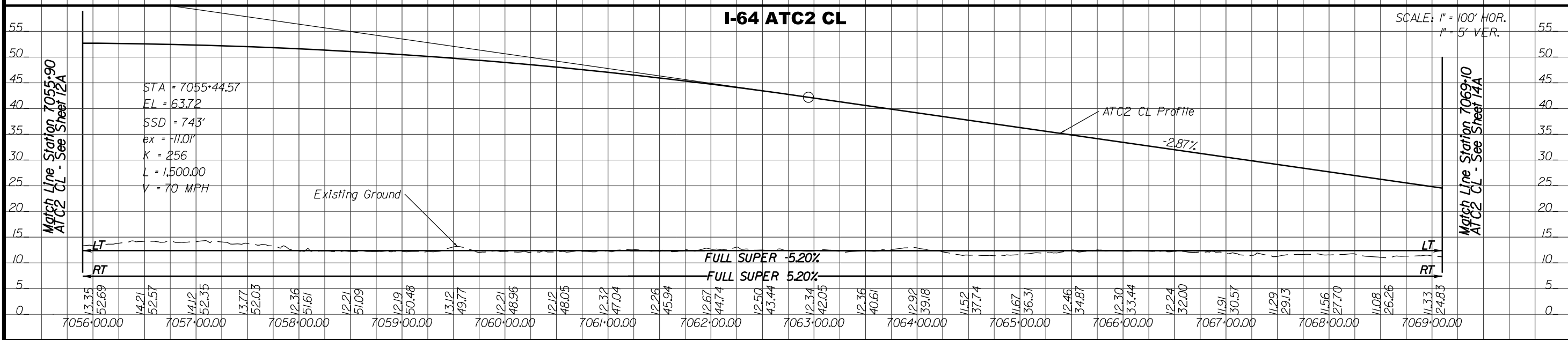
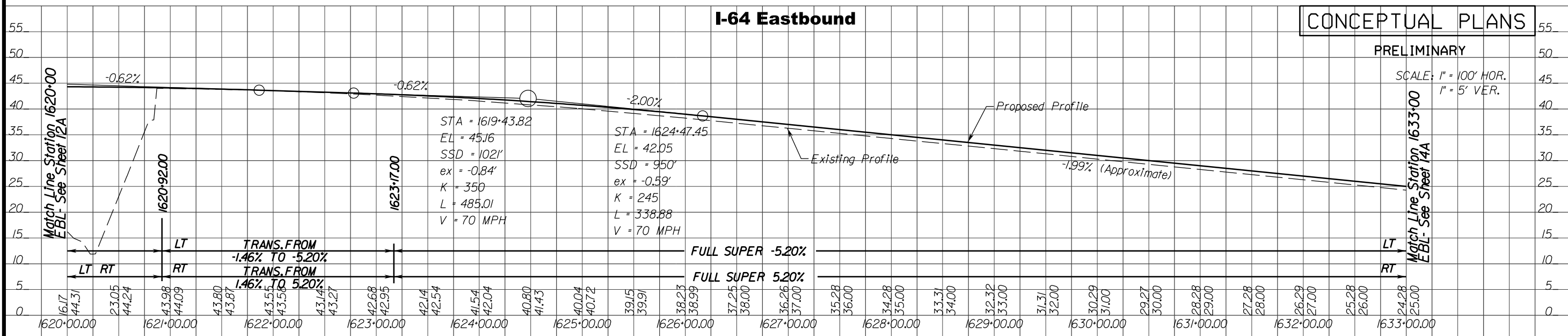
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WB I-64 Profile	13A
ATC2 Accommodations	S-22

CONCEPTUAL PLANS

PRELIMINARY SCALE

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8/2/2017
Plotted By: reiler
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DESIGNED BY
JMT

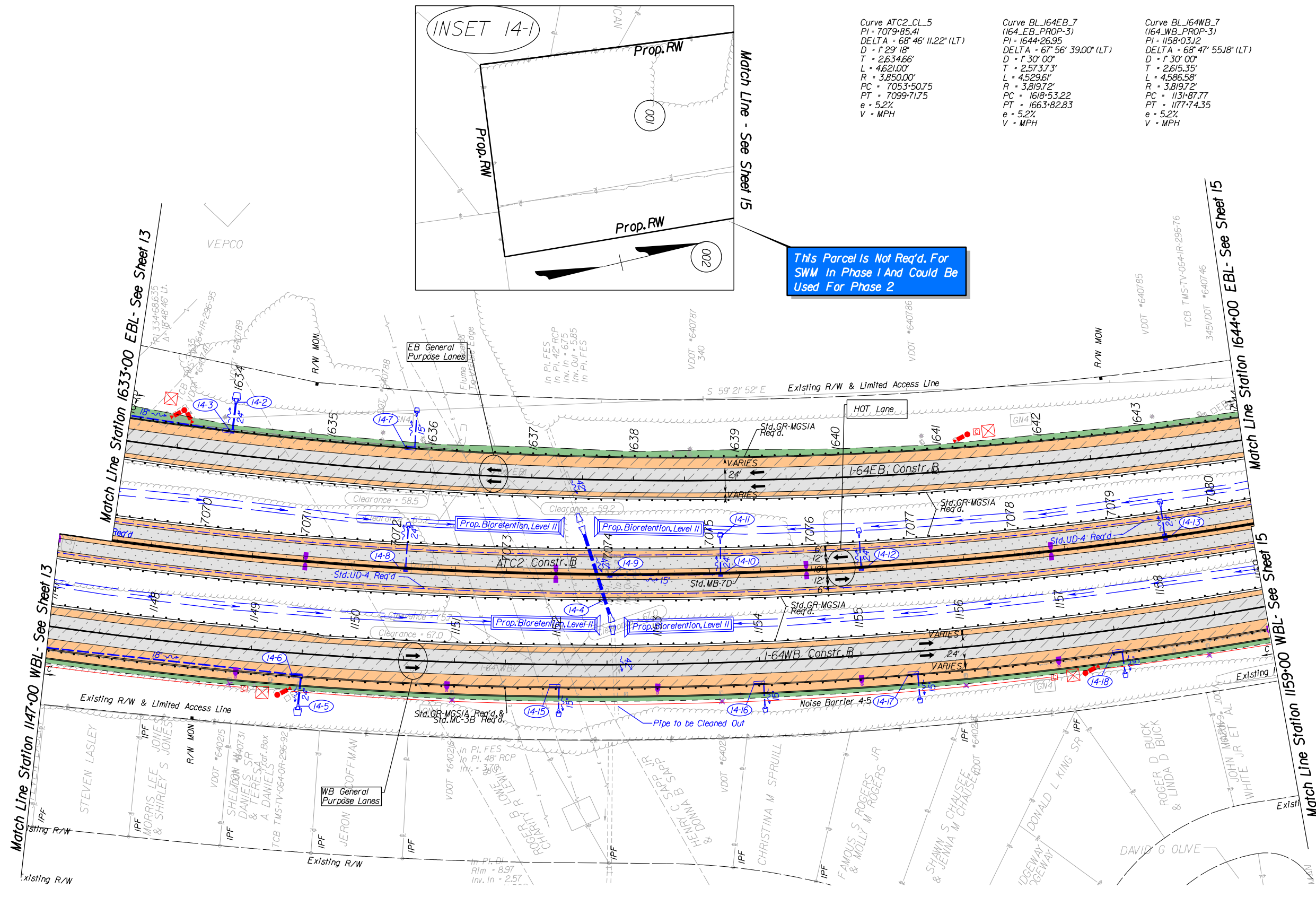
STATE PROJECT
0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO.
13A

PAGE NO.
91

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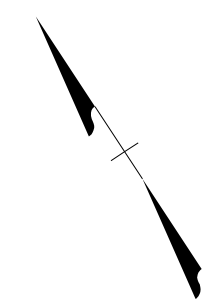


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 DELTA = 68° 46' 11.22" (LT)
 D = 1' 29' 18"
 T = 2,634.66'
 L = 4,621.00'
 R = 3,850.00'
 PC = 7053+50.75
 PT = 7099+71.75
 e = 5.2%
 V = MPH

Curve BL_164EB_7
 (164_EB_PROP-3)
 PI = 1644+26.95
 DELTA = 67° 56' 39.00" (LT)
 D = 1' 30' 00"
 T = 2,573.73'
 L = 4,529.61'
 R = 3,819.72'
 PC = 1618+53.22
 PT = 1663+82.83
 e = 5.2%
 V = MPH

Curve BL_164WB_7
 (164_WB_PROP-3)
 PI = 1158+03.12
 DELTA = 68° 47' 55.18" (LT)
 D = 1' 30' 00"
 T = 2,615.35'
 L = 4,586.58'
 R = 3,819.72'
 PC = 1131+87.77
 PT = 1177+74.35
 e = 5.2%
 V = MPH

This Parcel Is Not Req'd. For SWM in Phase I And Could Be Used For Phase 2



- Legend**
- Denotes Full Depth Pavement
 - Denotes Mill & Overlay
 - Denotes Demolition of Pavement
 - Denotes Bridge Approach Slab
 - Denotes Prop. Bridge Limits
 - Denotes Exist. Bridge Limits
 - Denotes Shoulder Running Lane
 - Denotes Limits of Outside Grading
 - Denotes Travel Lanes
 - Denotes Paved Shoulder
 - Denotes Construction Limits in Cuts
 - Denotes Construction Limits in Fills
 - Proposed Pole-Mount Junction Box
 - Proposed Communications Junction Box
 - Proposed Lane Control Signal on Mast Arm
 - Proposed Lane Control Signal on Overhead Sign Structure
 - Proposed Camera with Pole
 - Proposed ITS Cabinet
 - Proposed Motor Vehicle Detection Sensor w/ Quantity
 - Light Pole with LED Luminaire
 - Light Pole with Twin LED Luminaires
 - Existing Light Pole and Luminaire to be Removed
 - Proposed Linear BMP
 - Proposed Drainage Ditch

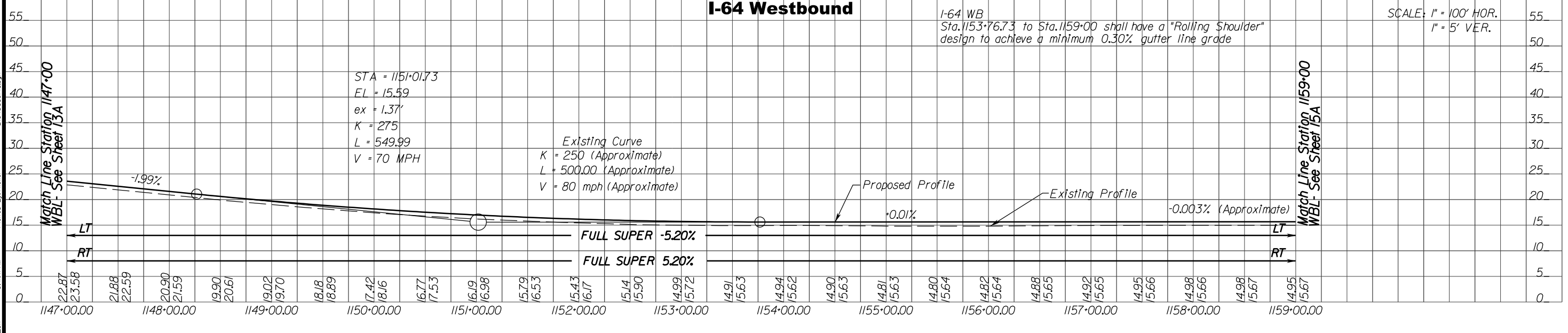
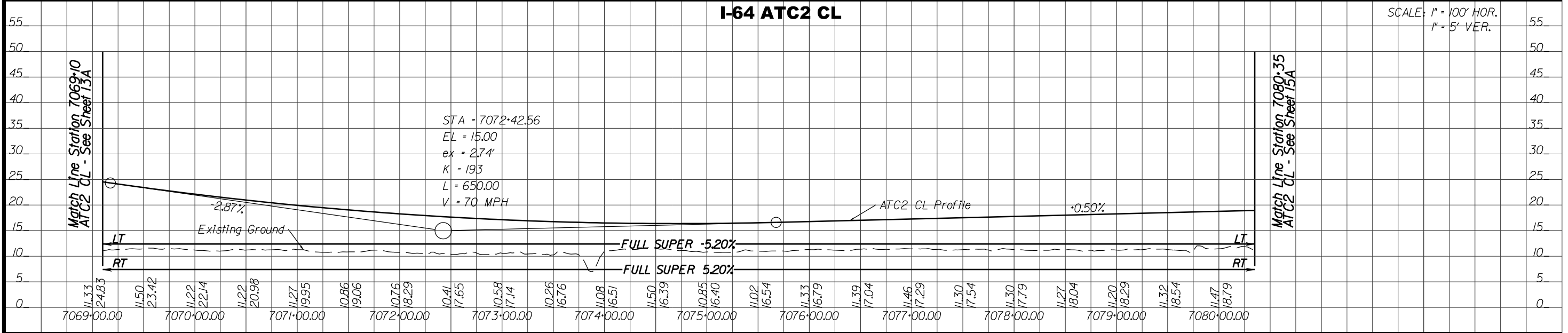
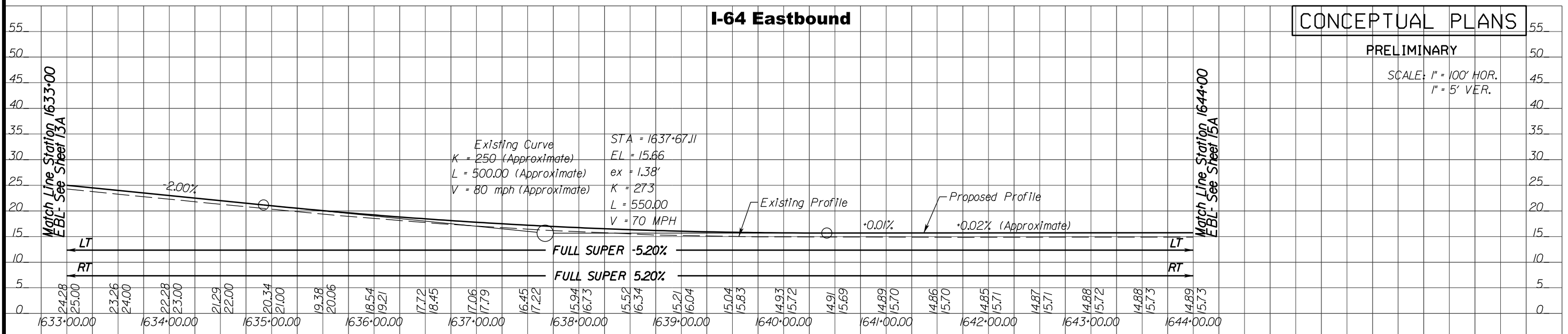
Cross Drainage Pipes For ATC-2 Are Sized For Phase 2 Widening

REFERENCES (PROFILES)	
EB I-64 Profile	14A
WB I-64 Profile	14A

CONCEPTUAL PLANS

PRELIMINARY SCALE

8/2/2017
Plotted By: reiler
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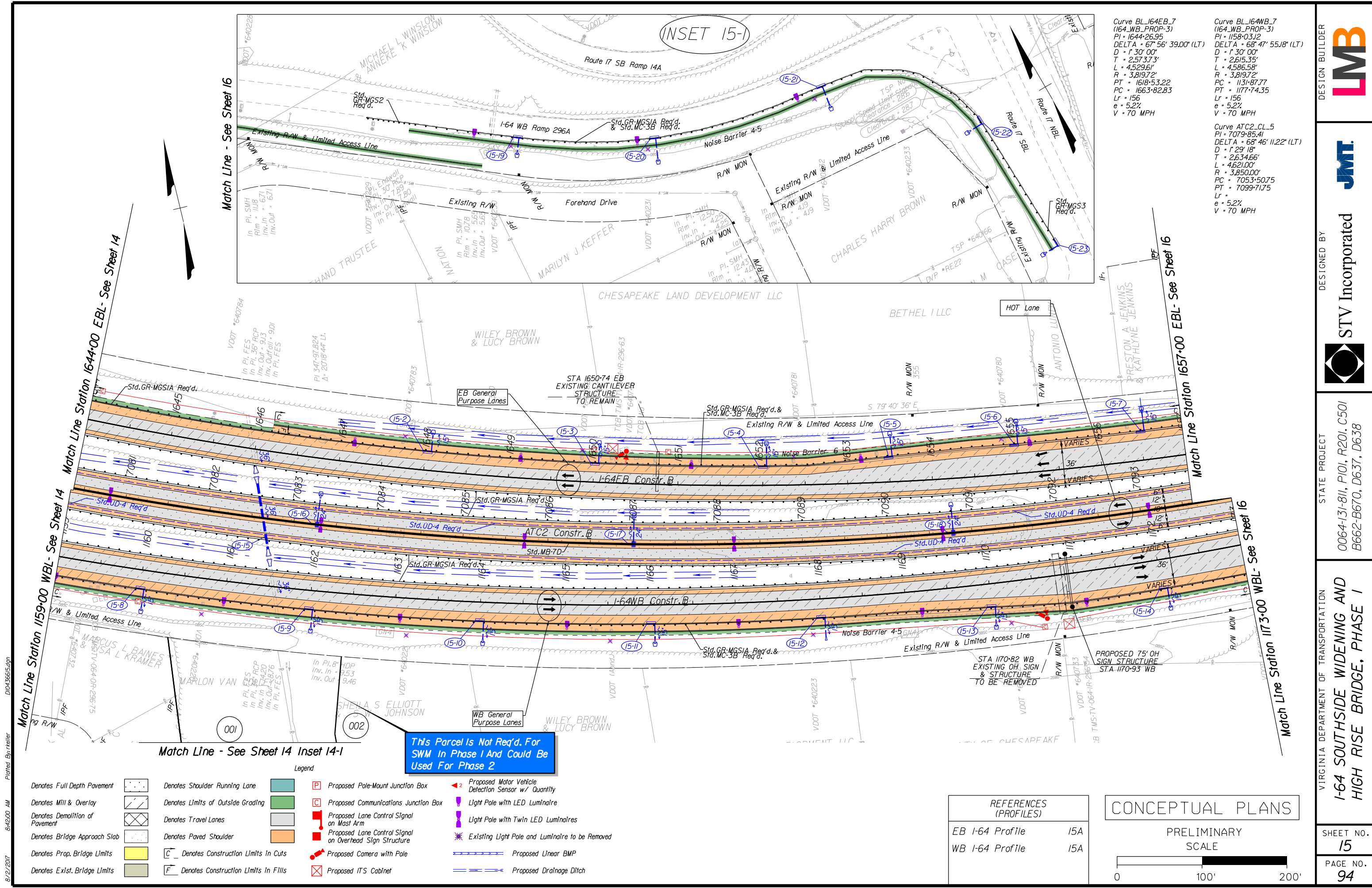
DESIGN BUILDER
LMB

DESIGNED BY
JMT
 STV Incorporated

STATE PROJECT
 0064-131-811, P101, R201, C501
 B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION
**I-64 SOUTHSIDE WIDENING AND
 HIGH RISE BRIDGE, PHASE I**

SHEET NO.
14A
 PAGE NO.
93



(INSET 15-1)

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L = 4,529.61'
R = 3,819.72'
PT = 1618+53.22
PC = 1663+82.83
Lr = 156
e = 5.2%
V = 70 MPH

Curve BL_164WB_7
(164_WB_PROP-3)
PI = 1158+03.12
DELTA = 68° 47' 55.18" (LT)
D = 1' 30' 00"
T = 2,615.35'
L = 4,586.58'
R = 3,819.72'
PC = 1131+87.77
PT = 1177+74.35
Lr = 156
e = 5.2%
V = 70 MPH

Curve ATC2_CL_5
PI = 7079+85.41
DELTA = 68° 46' 11.22" (LT)
D = 1' 29' 18"
T = 2,634.66'
L = 4,621.00'
R = 3,850.00'
PC = 7053+50.75
PT = 7099+71.75
Lr = 156
e = 5.2%
V = 70 MPH

DESIGN BUILDER
LMB

DESIGNED BY
JMT

STV Incorporated



STATE PROJECT
0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION
**I-64 SOUTHSIDE WIDENING AND
HIGH RISE BRIDGE, PHASE 1**

SHEET NO.
15
PAGE NO.
94

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Match Line - See Sheet 14 Inset 14-1

This Parcel Is Not Req'd. For SWM In Phase 1 And Could Be Used For Phase 2

- Legend**
- | | | | |
|--------------------------------|--------------------------------------|---|---|
| Denotes Full Depth Pavement | Denotes Shoulder Running Lane | Proposed Pole-Mount Junction Box | Proposed Motor Vehicle Detection Sensor w/ Quantity |
| Denotes Mill & Overlay | Denotes Limits of Outside Grading | Proposed Communications Junction Box | Light Pole with LED Luminaire |
| Denotes Demolition of Pavement | Denotes Travel Lanes | Proposed Lane Control Signal on Mast Arm | Light Pole with Twin LED Luminaires |
| Denotes Bridge Approach Slab | Denotes Paved Shoulder | Proposed Lane Control Signal on Overhead Sign Structure | Existing Light Pole and Luminaire to be Removed |
| Denotes Prop. Bridge Limits | Denotes Construction Limits In Cuts | Proposed Camera with Pole | Proposed Linear BMP |
| Denotes Exist. Bridge Limits | Denotes Construction Limits In Fills | Proposed ITS Cabinet | Proposed Drainage Ditch |

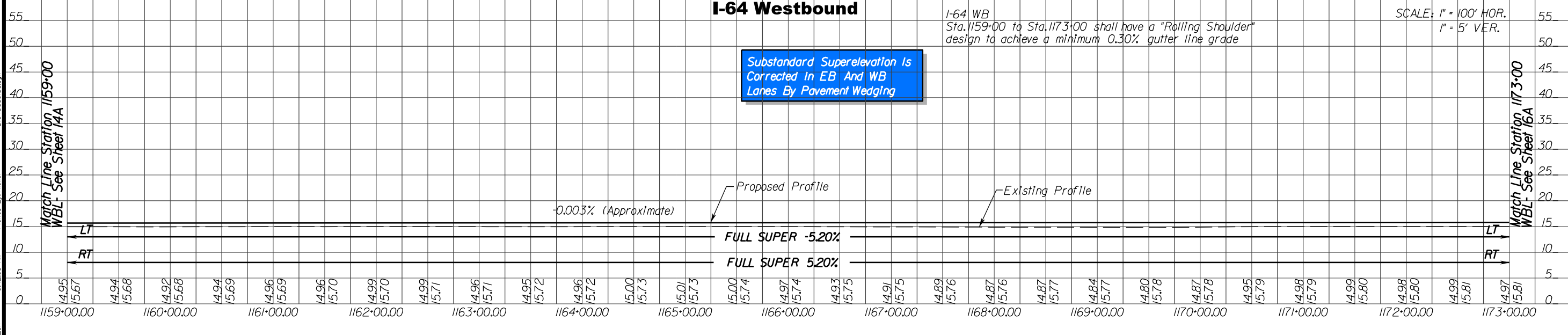
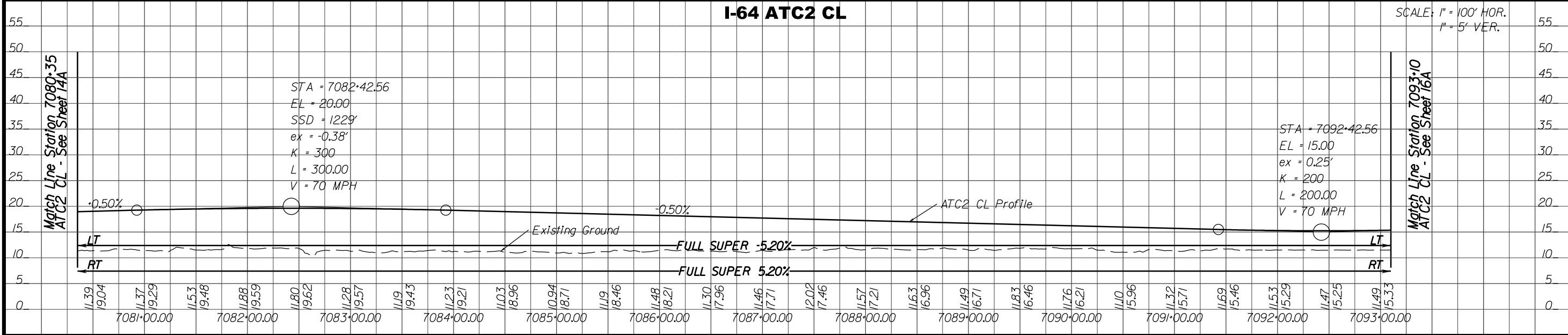
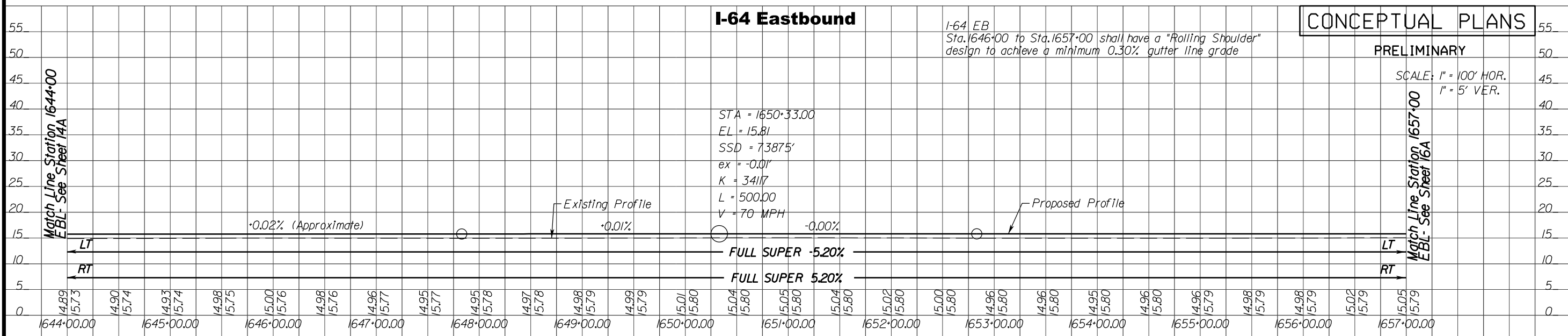
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WB I-64 Profile	15A

CONCEPTUAL PLANS

PRELIMINARY SCALE

8/2/2017 8:42:06 AM Plotted By: reiler D:\43660\5a.dgn



DESIGN BUILDER

DESIGNED BY

STATE PROJECT

VIRGINIA DEPARTMENT OF TRANSPORTATION

SHEET NO.

PAGE NO.

0064-131-811, P101, R201, C501
B662-B670, D637, D638

I-64 SOUTH SIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

15A

95

LMB

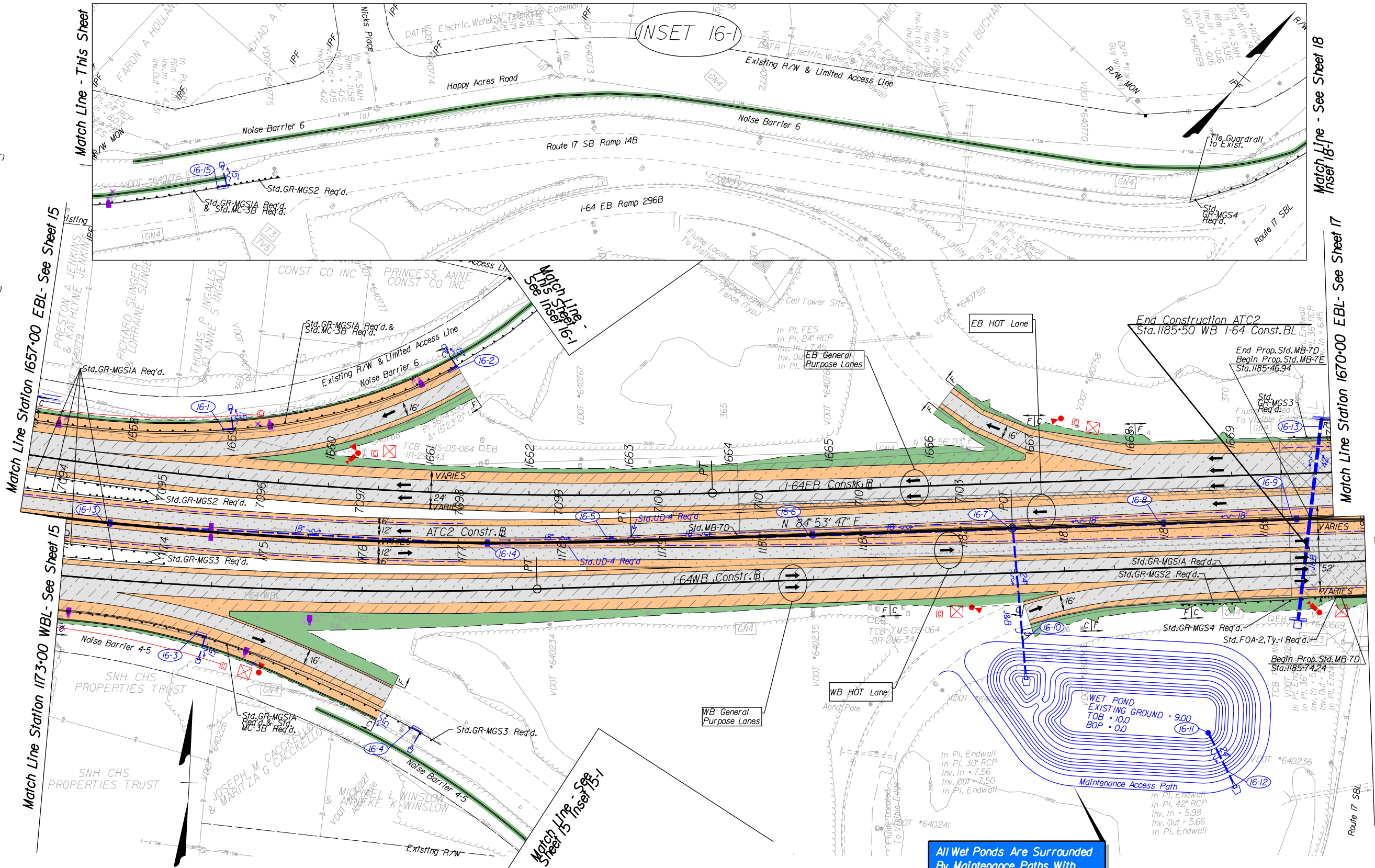
JMT

STV Incorporated

Curve ATC2_CL.5
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 DELTA = 68° 46' 11.22" (LT)
 D = 1' 29' 18"
 T = 2,634.66'
 L = 4,621.00'
 R = 3,850.00'
 PC = 7053.50,75
 PT = 7099.71,75
 e = 5.2%

Curve BL164EB.7
 (I64_EB_PROP-3)
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 PI = 1644.26,95
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 D = 1' 30' 00"
 T = 2,573.73'
 L = 4,529.61'
 R = 3,819.72'
 PC = 1618.53,22
 PT = 1663.82,83
 e = 5.2%

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 (I64_WB_PROP-3)
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 PI = 1158.03,12
 DELTA = 68° 47' 55.18" (LT)
 D = 1' 30' 00"
 T = 2,615.35'
 L = 4,586.58'
 R = 3,819.72'
 PC = 1131.87,77
 PT = 1177.74,35
 e = 5.2%



(INSET 16-1)

Match Line Station 1657+00 EBL - See Sheet 15

Match Line Station 1173+00 WBL - See Sheet 15

Match Line - See Sheet 15 Inset 15-1

Match Line - See Sheet 18

Match Line Station 1670+00 EBL - See Sheet 17

Match Line Station 1186+00 WBL - See Sheet 17

- Legend**
- Denotes Full Depth Pavement
 - Denotes Mill & Overlay
 - Denotes Demolition of Pavement
 - Denotes Bridge Approach Slab
 - Denotes Prop. Bridge Limits
 - Denotes Exist. Bridge Limits
 - Denotes Shoulder Running Lane
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 - Denotes Paved Shoulder
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 - Proposed Camera with Pole
 - Proposed ITS Cabinet
 - Proposed Motor Vehicle Detection Sensor w/ Quantity
 - Light Pole with LED Luminaire
 - Light Pole with Twin LED Luminaires
 - Existing Light Pole and Luminaire to be Removed
 - Proposed Linear BMP
 - Proposed Drainage Ditch

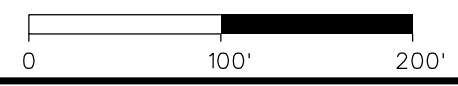
All Wet Ponds Are Surrounded By Maintenance Paths With Locking Gates

REFERENCES (PROFILES)

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WB I-64 Profile	16A

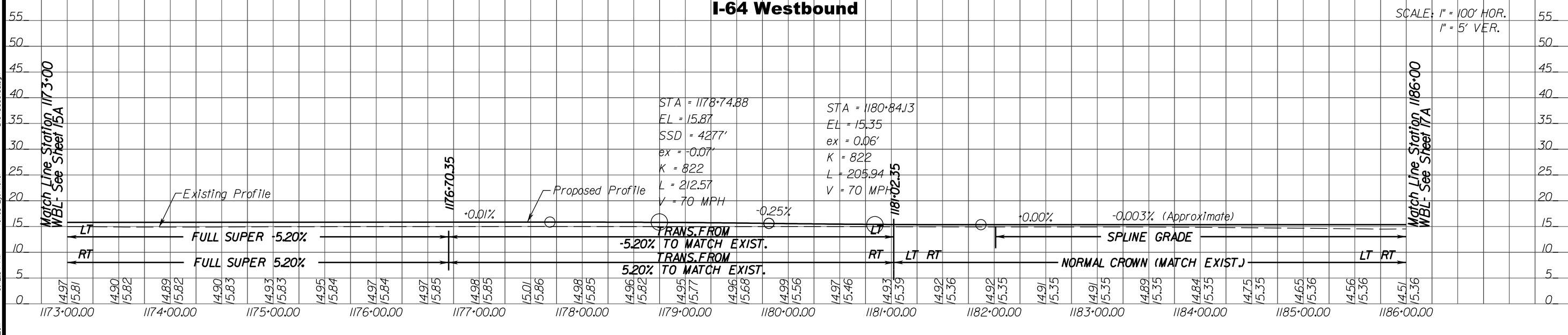
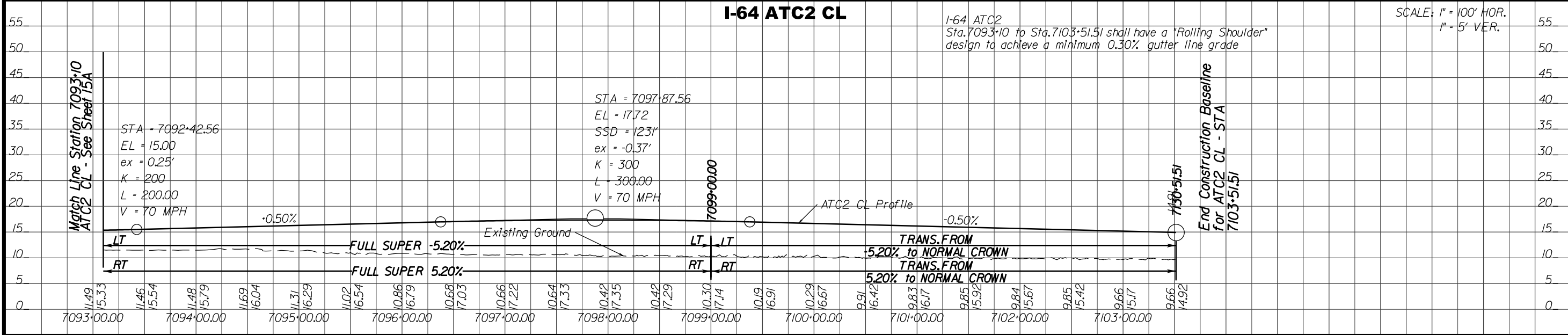
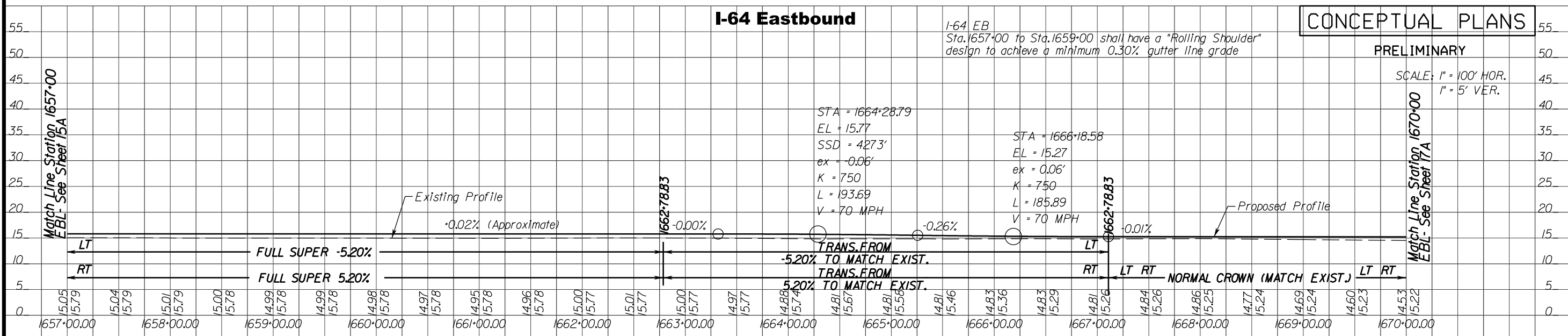
CONCEPTUAL PLANS

PRELIMINARY SCALE



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DESIGNED BY
JMT

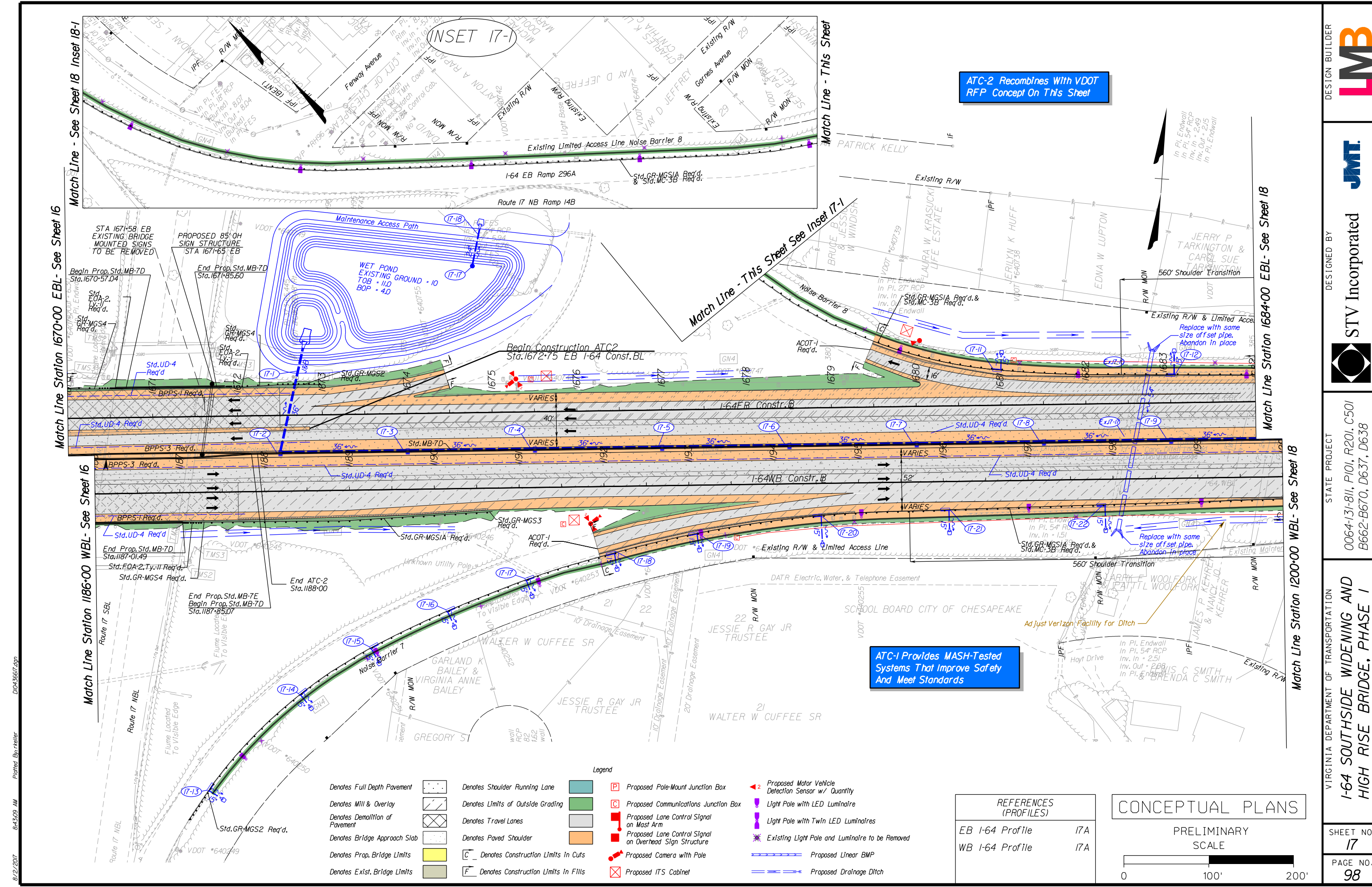
DESIGNED BY
STV Incorporated

STATE PROJECT
0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTH SIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO.
16A

PAGE NO.
97



(INSET 17-1)

ATC-2 Recombines With VDOT
RFP Concept On This Sheet

ATC-1 Provides MASH-Tested
Systems That Improve Safety
And Meet Standards

- Legend**
- Denotes Full Depth Pavement
 - Denotes Mill & Overlay
 - Denotes Demolition of Pavement
 - Denotes Bridge Approach Slab
 - Denotes Prop. Bridge Limits
 - Denotes Exst. Bridge Limits
 - Denotes Shoulder Running Lane
 - Denotes Limits of Outside Grading
 - Denotes Travel Lanes
 - Denotes Paved Shoulder
 - Denotes Construction Limits In Cuts
 - Denotes Construction Limits In Fills
 - Proposed Pole-Mount Junction Box
 - Proposed Communications Junction Box
 - Proposed Lane Control Signal on Mast Arm
 - Proposed Lane Control Signal on Overhead Sign Structure
 - Proposed Camera with Pole
 - Proposed ITS Cabinet
 - Proposed Motor Vehicle Detection Sensor w/ Quantity
 - Light Pole with LED Luminaire
 - Light Pole with Twin LED Luminaires
 - Existing Light Pole and Luminaire to be Removed
 - Proposed Linear BMP
 - Proposed Drainage Ditch

REFERENCES (PROFILES)

EB I-64 Profile	17A
WB I-64 Profile	17A

CONCEPTUAL PLANS

PRELIMINARY SCALE

Match Line Station 1670+00 EBL - See Sheet 16

Match Line Station 1186+00 WBL - See Sheet 16

Match Line Station 1200+00 WBL - See Sheet 18

Match Line Station 1684+00 EBL - See Sheet 18

Match Line - See Sheet 18 Inset 18-1

Match Line - This Sheet

Match Line - This Sheet See Inset 17-1

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DESIGN BUILDER
LMB

DESIGNED BY
JMT

STATE PROJECT
0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE 1

SHEET NO.
17

PAGE NO.
98

8/2/2017 8:43:16 AM Plotted By: rreiler D:\c43667.dwg

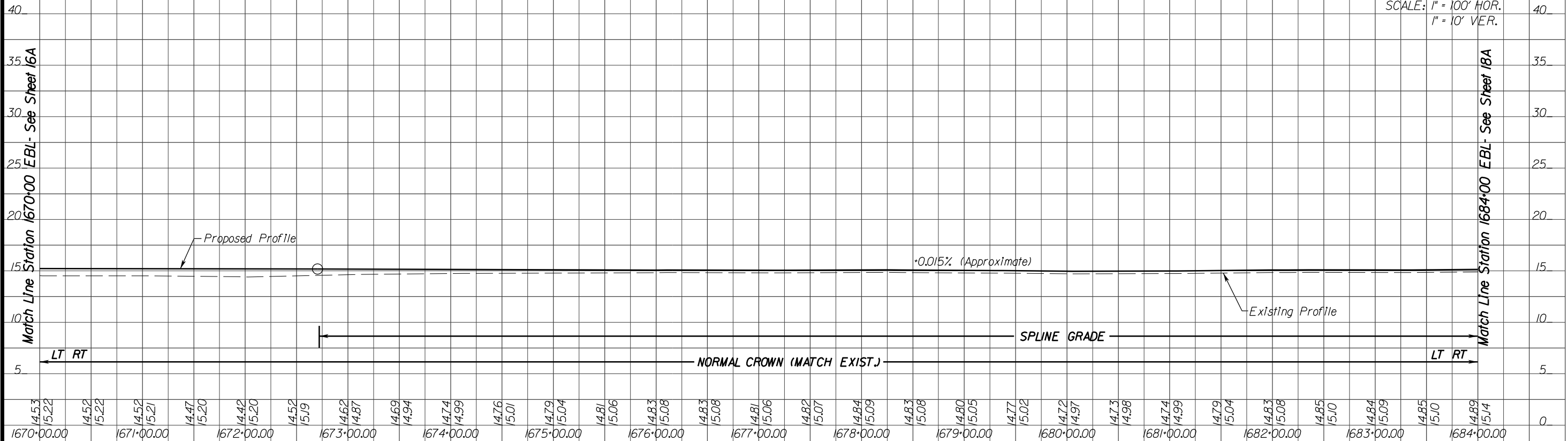
I-64 Eastbound

I-64 EB
Sta.1670+00 to Sta.1684+00 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

CONCEPTUAL PLANS

PRELIMINARY

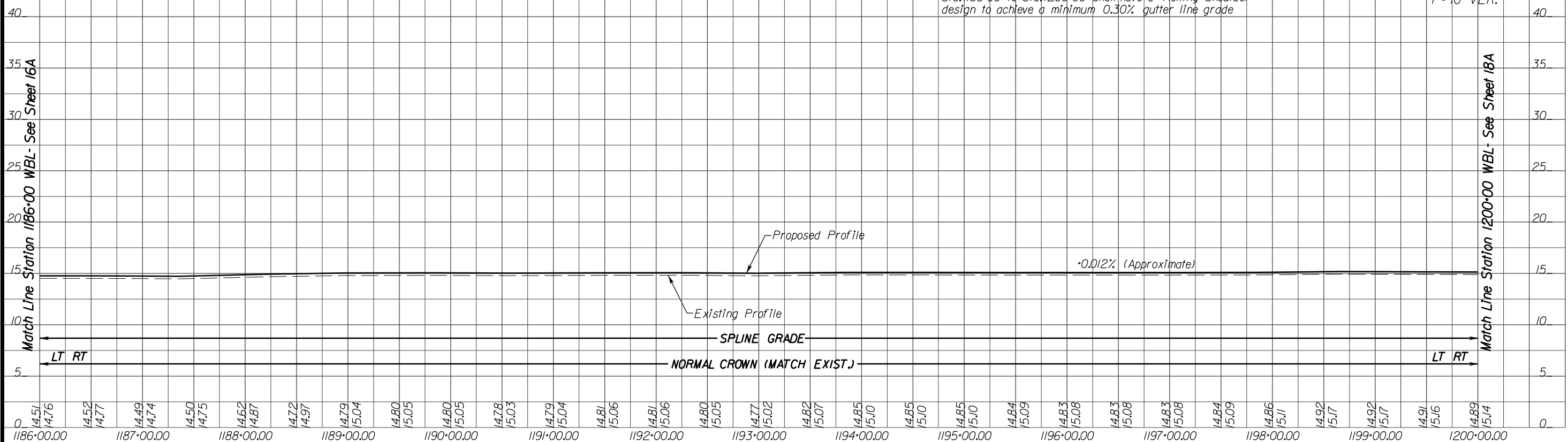
SCALE: 1" = 100' HOR.
1" = 10' VER.



I-64 Westbound

I-64 WB
Sta.1186+00 to Sta.1200+00 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

SCALE: 1" = 100' HOR.
1" = 10' VER.



DESIGN BUILDER

DESIGNED BY

STV Incorporated

STATE PROJECT

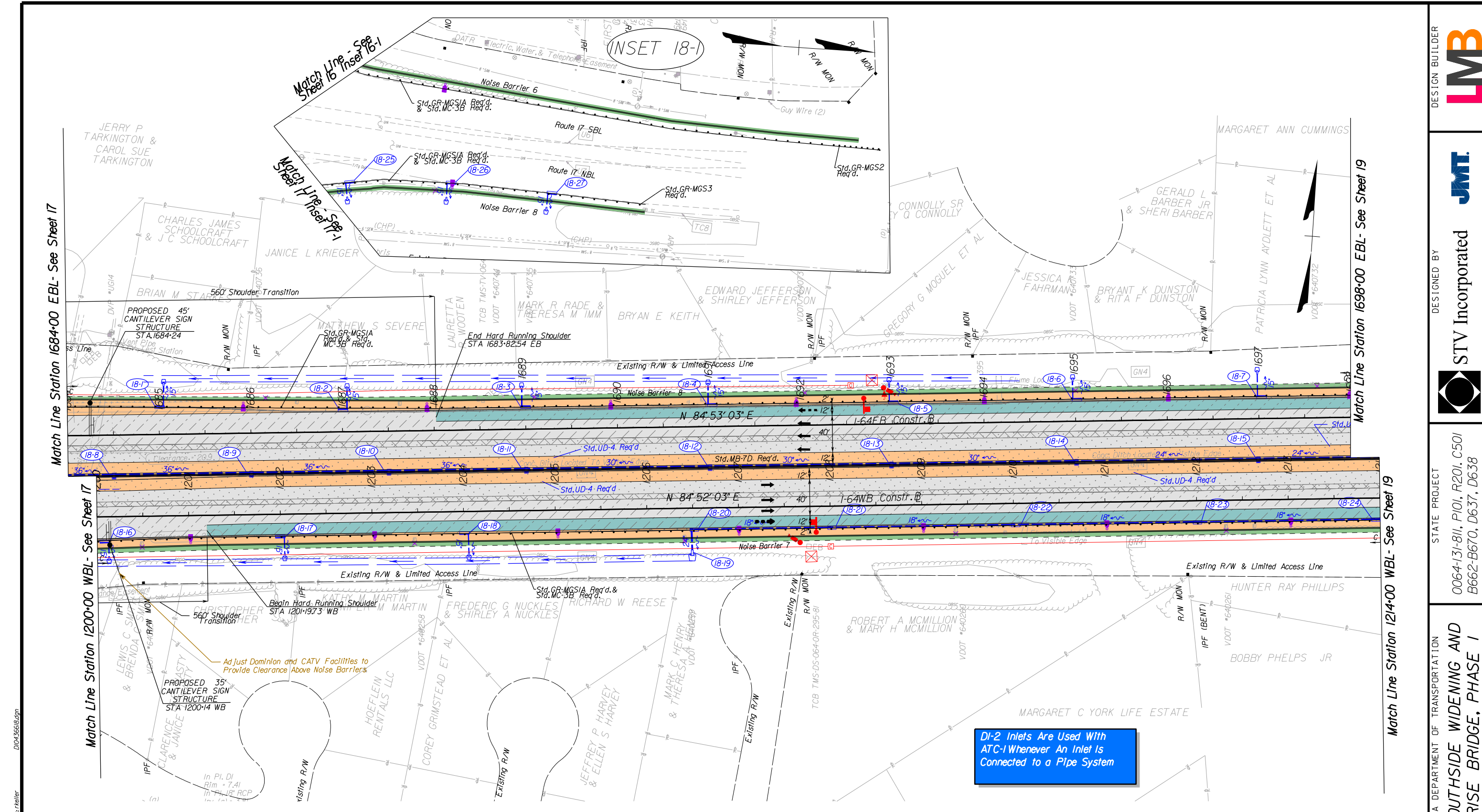
0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO. 17A

PAGE NO. 99



INSET 18-1

Match Line Station 1684+00 EBL - See Sheet 17

Match Line Station 1200+00 WBL - See Sheet 17

Match Line Station 1698+00 EBL - See Sheet 19

Match Line Station 1214+00 WBL - See Sheet 19

Hard Shoulder Running Begins On This Sheet

DI-2 Inlets Are Used With ATC-1 Whenever An Inlet Is Connected to a Pipe System

Legend

- Denotes Full Depth Pavement
- Denotes Mill & Overlay
- Denotes Demolition of Pavement
- Denotes Bridge Approach Slab
- Denotes Prop. Bridge Limits
- Denotes Exist. Bridge Limits
- Denotes Shoulder Running Lane
- Denotes Limits of Outside Grading
- Denotes Travel Lanes
- Denotes Paved Shoulder
- Denotes Construction Limits in Cuts
- Denotes Construction Limits in Fills
- Proposed Pole-Mount Junction Box
- Proposed Communications Junction Box
- Proposed Lane Control Signal on Mast Arm
- Proposed Lane Control Signal on Overhead Sign Structure
- Proposed Camera with Pole
- Proposed ITS Cabinet
- Proposed Motor Vehicle Detection Sensor w/ Quantity
- Light Pole with LED Luminaire
- Light Pole with Twin LED Luminaires
- Existing Light Pole and Luminaire to be Removed
- Proposed Linear BMP
- Proposed Drainage Ditch

REFERENCES (PROFILES)	
EB I-64 Profile	18A
WB I-64 Profile	18A

CONCEPTUAL PLANS

PRELIMINARY SCALE

DESIGN BUILDER

DESIGNED BY

STATE PROJECT

VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTH SIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO. 18

PAGE NO. 100

0064-131-811, P101, R201, C501 B662-B670, D637, D638

LMB

JMT

STV Incorporated

8/2/2017 8:43:43 AM Plotted By: rfeiler D:\4366\out.dgn

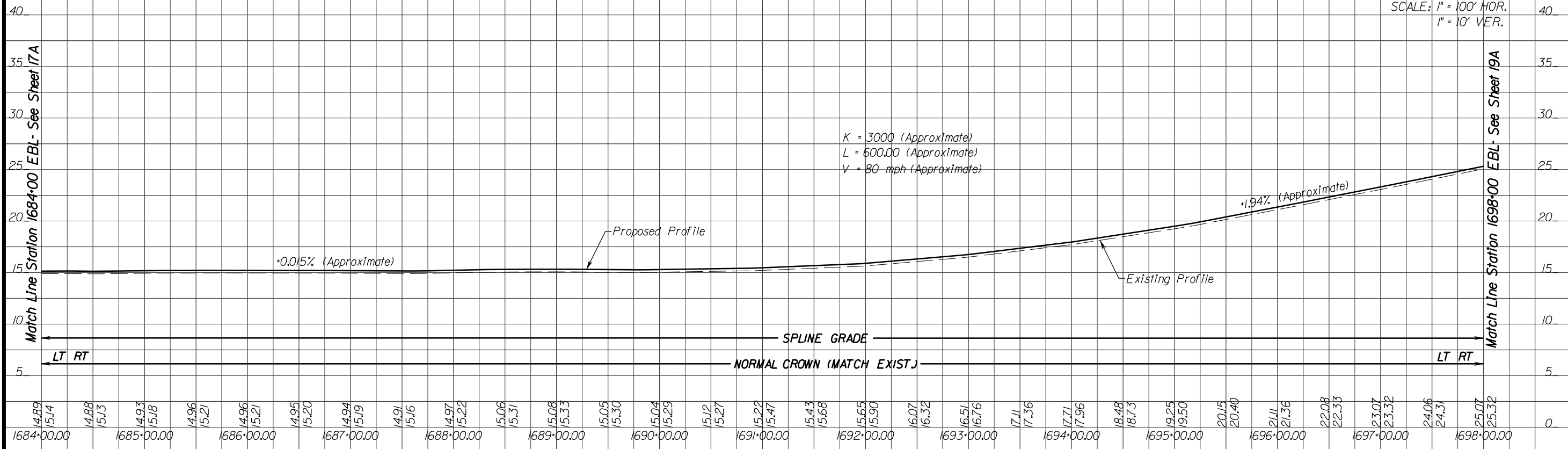
I-64 Eastbound

I-64 EB
Sta. 1684+00 to Sta. 1690+75.77 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

CONCEPTUAL PLANS

PRELIMINARY

SCALE: 1" = 100' HOR.
1" = 10' VER.



K = 3000 (Approximate)
L = 600.00 (Approximate)
V = 80 mph (Approximate)

I-64 Westbound

I-64 WB
Sta. 1200+00 to Sta. 1206+18.73 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

SCALE: 1" = 100' HOR.
1" = 10' VER.



K = 300 (Approximate)
L = 600.00 (Approximate)
V = 80 mph (Approximate)

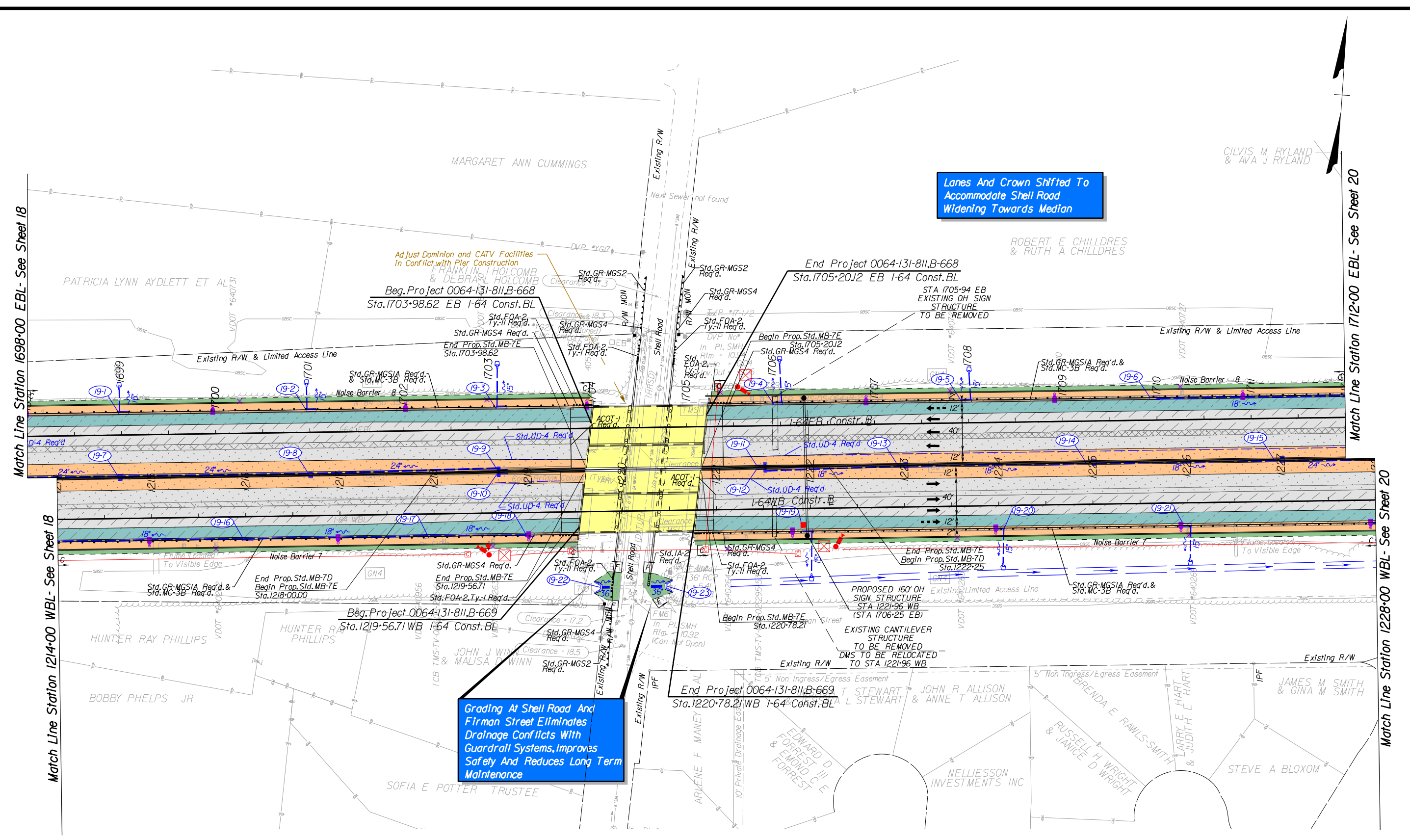
DESIGNED BY: **STV Incorporated**
DESIGN BUILDER: **LMB**

STATE PROJECT: 0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO. **18A**
PAGE NO. **101**

B/2/2017
 9:26:26 AM
 Plotted By: rceller
 D:\0435619.dgn



Lanes And Crown Shifted To Accommodate Shell Road Widening Towards Median

Grading At Shell Road And Firman Street Eliminates Drainage Conflicts With Guardrail Systems, Improves Safety And Reduces Long Term Maintenance

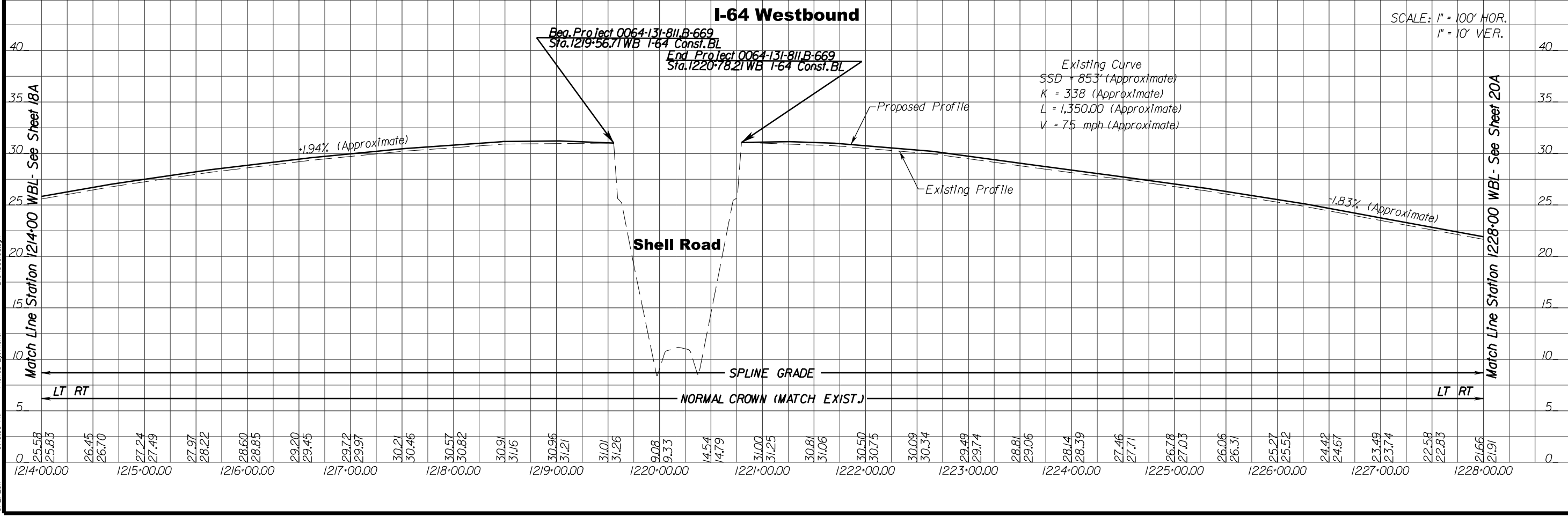
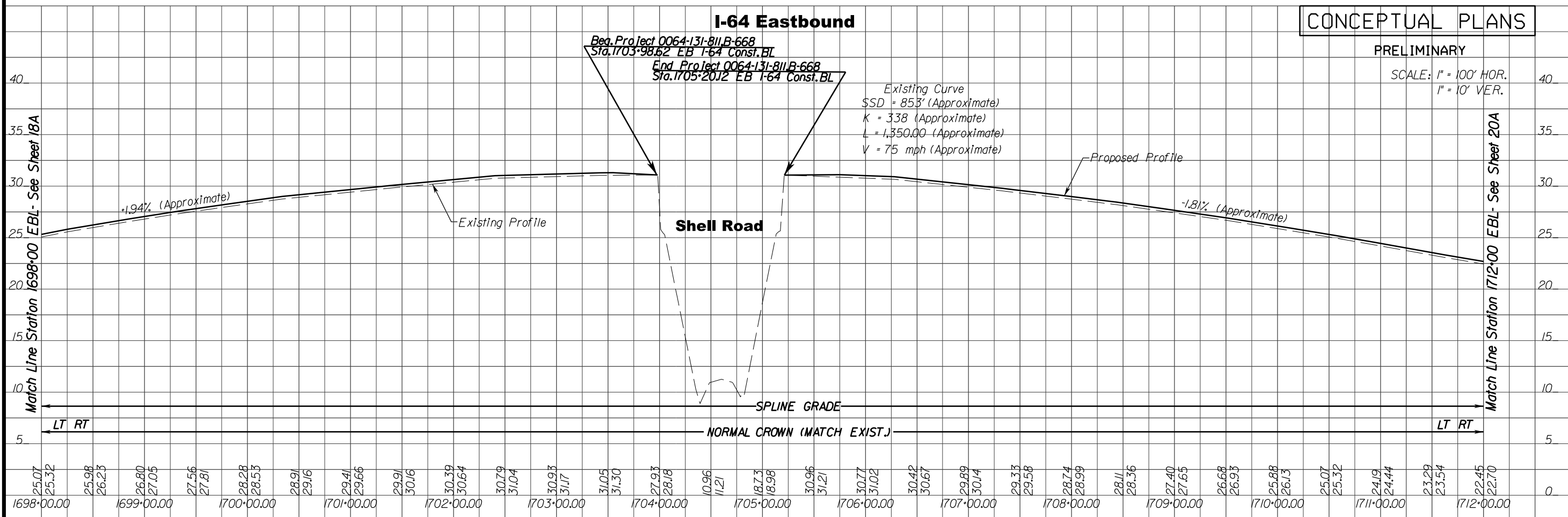
- Legend**
- Denotes Full Depth Pavement
 - Denotes Mill & Overlay
 - Denotes Demolition of Pavement
 - Denotes Bridge Approach Slab
 - Denotes Prop. Bridge Limits
 - Denotes Exist. Bridge Limits
 - Denotes Shoulder Running Lane
 - Denotes Limits of Outside Grading
 - Denotes Travel Lanes
 - Denotes Paved Shoulder
 - Denotes Construction Limits in Cuts
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 - Proposed Communications Junction Box
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 - Proposed Camera with Pole
 - Proposed ITS Cabinet
 - Proposed Motor Vehicle Detection Sensor w/ Quantity
 - Light Pole with LED Luminaire
 - Light Pole with Twin LED Luminaires
 - Existing Light Pole and Luminaire to be Removed
 - Proposed Linear BMP
 - Proposed Drainage Ditch

REFERENCES (PROFILES)	
EB I-64 Profile	19A
WB I-64 Profile	19A

CONCEPTUAL PLANS

PRELIMINARY SCALE

8/2/2017 8:45:06 AM Plotted By: rfeiler D:\43669.dgn



DESIGN BUILDER

DESIGNED BY

STATE PROJECT

VIRGINIA DEPARTMENT OF TRANSPORTATION

SHEET NO.

PAGE NO.

0064-131-811, P101, R201, C501
B662-B670, D637, D638

1-64 SOUTHSIDE WIDENING AND
HIGH RISE BRIDGE, PHASE I

19A

103

LMB

JMT

STV Incorporated

No Runoff From I-64 Is Directed Into The Gilmerton Canal Above The Tide Gate

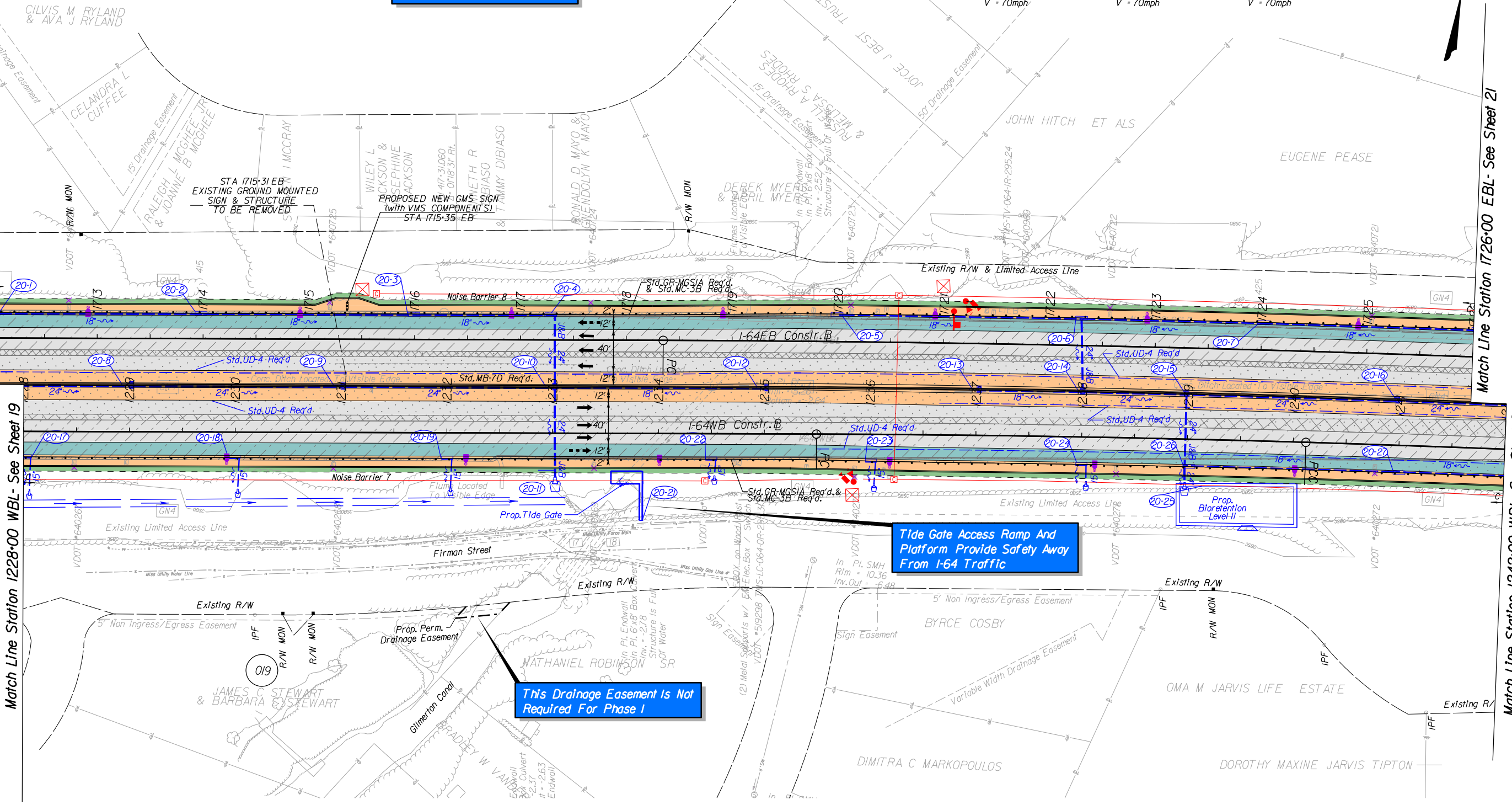
Curve 164_EB_PROP-4
 PI = 1736+42.44
 DELTA = 9° 01' 09.00" (RT)
 D = 0' 15" 00"
 T = 1,807.57'
 L = 3,607.67'
 R = 22,918.31'
 PC = 1718+34.88
 PT = 1754+42.54
 Lr = 0
 e = NC
 V = 70mph

Curve 164_WB_PROP-4
 PI = 1237+80.66
 DELTA = 1° 32' 31.67" (RT)
 D = 0' 20" 00"
 T = 231.33'
 L = 462.64'
 R = 17,188.73'
 PC = 1235+49.32
 PCC = 1240+11.96
 Lr = 0
 e = NC
 V = 70mph

Curve 164_WB_PROP-5
 PI = 1257+37.49
 DELTA = 8° 38' 37.40" (RT)
 D = 0' 15" 03"
 T = 1,725.53'
 L = 3,444.51'
 R = 22,832.31'
 PCC = 1240+11.96
 PT = 1274+56.48
 Lr = 0
 e = NC
 V = 70mph

Match Line Station 1712+00 EBL - See Sheet 19

Match Line Station 1726+00 EBL - See Sheet 21



Tide Gate Access Ramp And Platform Provide Safety Away From I-64 Traffic

This Drainage Easement is Not Required For Phase I

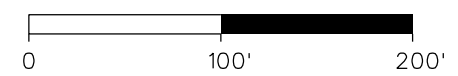
Legend

- Denotes Full Depth Pavement
- Denotes Mill & Overlay
- Denotes Demolition of Pavement
- Denotes Bridge Approach Slab
- Denotes Prop. Bridge Limits
- Denotes Exist. Bridge Limits
- Denotes Shoulder Running Lane
- Denotes Limits of Outside Grading
- Denotes Travel Lanes
- Denotes Paved Shoulder
- Denotes Construction Limits in Cuts
- Denotes Construction Limits in Fills
- Proposed Pole-Mount Junction Box
- Proposed Communications Junction Box
- Proposed Lane Control Signal on Mast Arm
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- Proposed Camera with Pole
- Proposed ITS Cabinet
- Proposed Motor Vehicle Detection Sensor w/ Quantity
- Light Pole with LED Luminaire
- Light Pole with Twin LED Luminaires
- Existing Light Pole and Luminaire to be Removed
- Proposed Linear BMP
- Proposed Drainage Ditch

REFERENCES (PROFILES)	
EB I-64 Profile	20A
WB I-64 Profile	20A
Tide Gate Detail	S-27

CONCEPTUAL PLANS

PRELIMINARY SCALE



B/2/2017 Plotted By: cteiler D:\0436620.dgn 3:16:04 PM



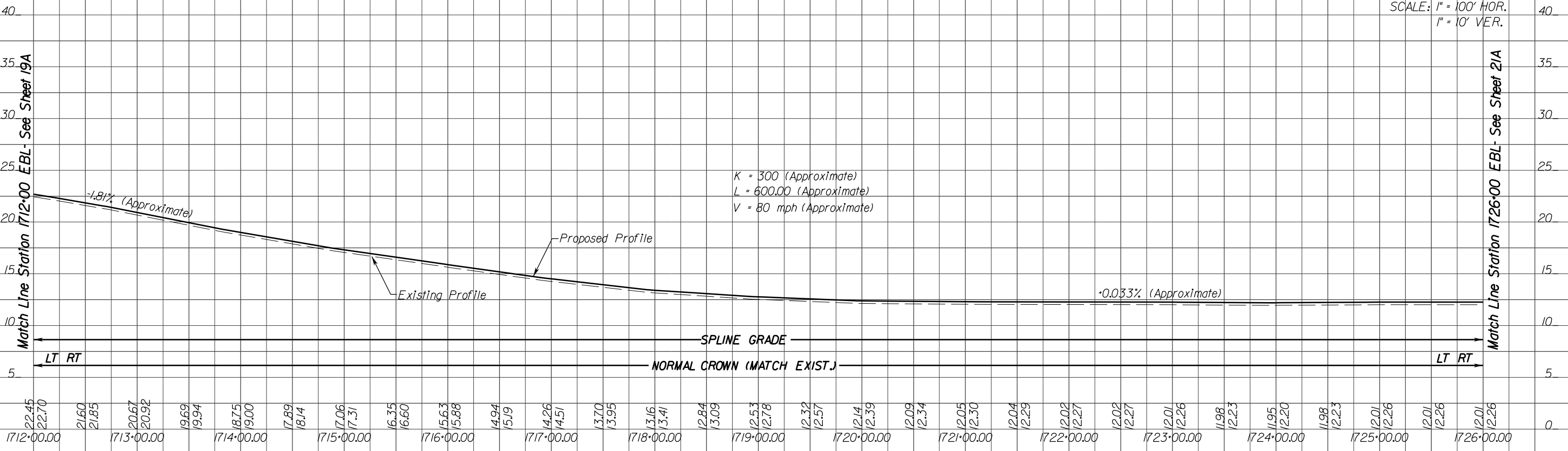
8/2/2017 8:46:22 AM Plotted By: rfeiler D:\436620\adgn

I-64 Eastbound

I-64 EB
Sta. 1719+94.69 to Sta. 1726+00 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

CONCEPTUAL PLANS

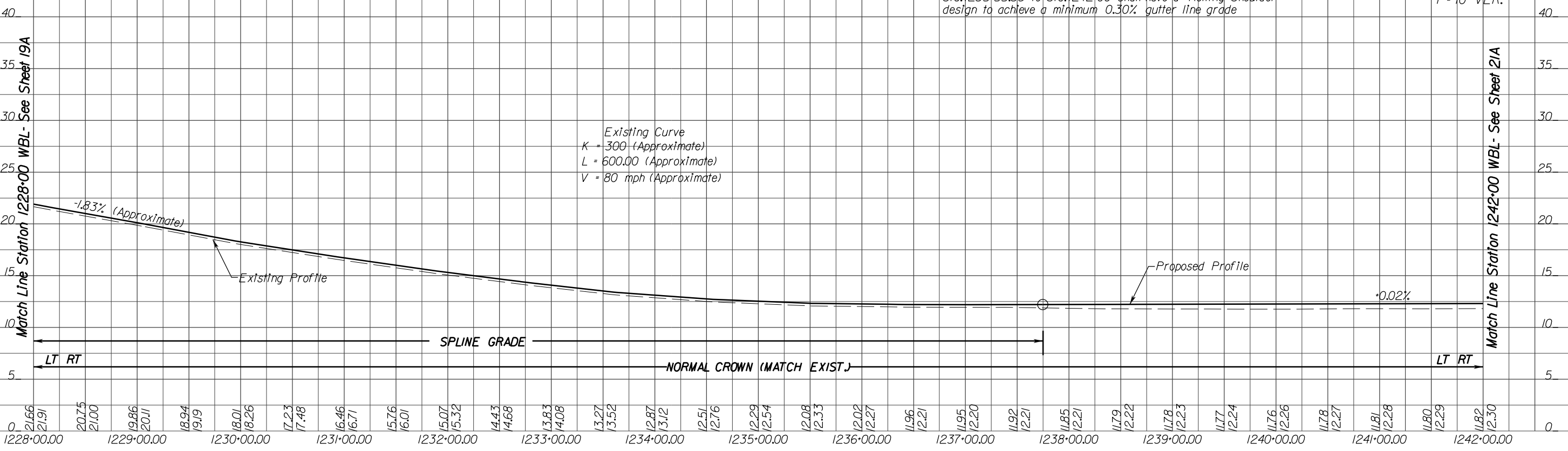
PRELIMINARY
SCALE: 1" = 100' HOR.
1" = 10' VER.



I-64 Westbound

I-64 WB
Sta. 1235+55.38 to Sta. 1242+00 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

SCALE: 1" = 100' HOR.
1" = 10' VER.



DESIGN BUILDER
LMB

DESIGNED BY
JMT

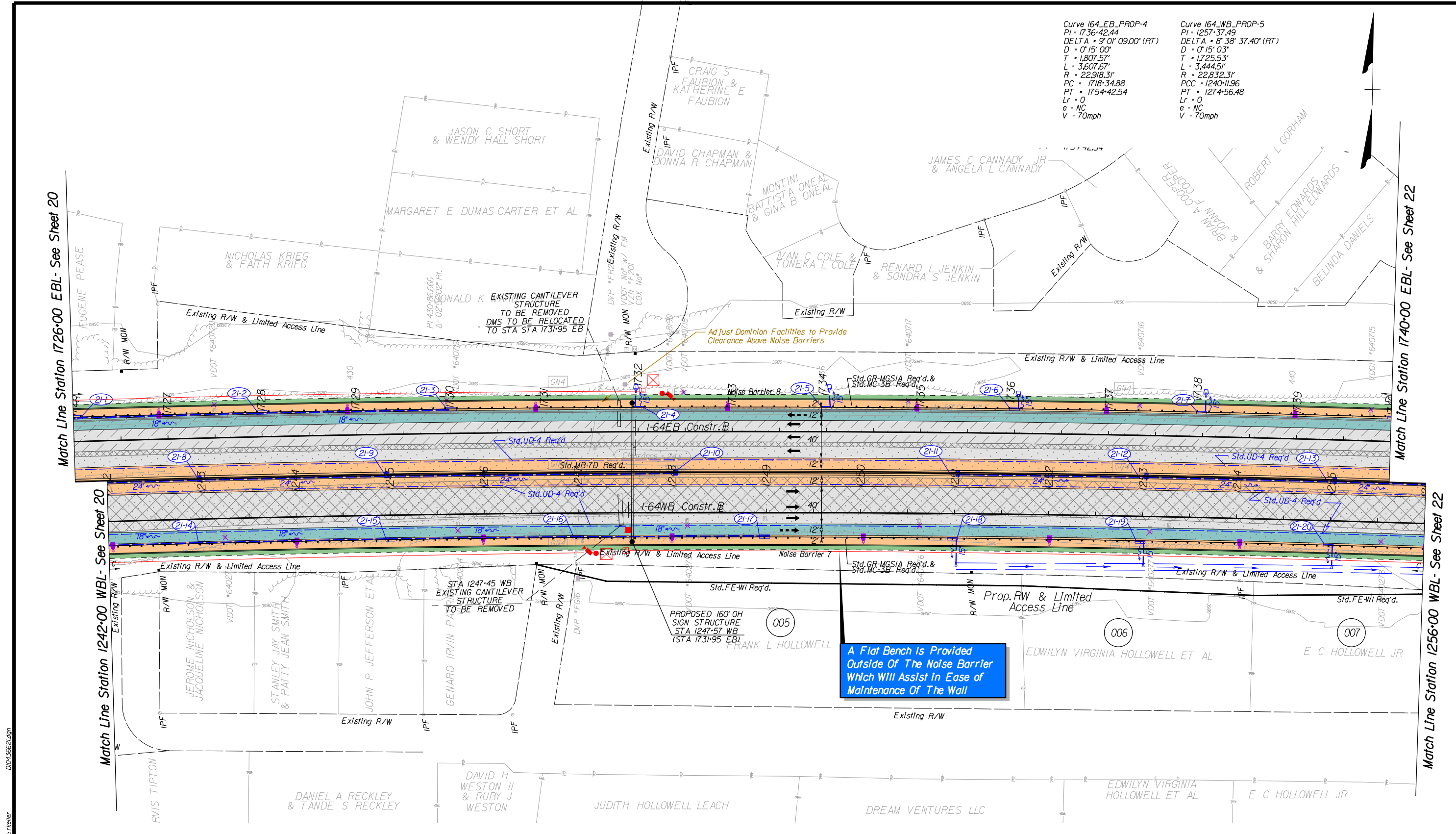
STV Incorporated

STATE PROJECT
0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

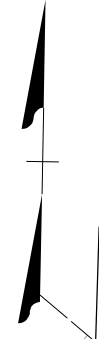
SHEET NO.
20A

PAGE NO.
105



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 D = 0' 15' 00"
 T = 1,807.57'
 L = 3,607.67'
 R = 22,918.31'
 PC = 1718+34.88
 PT = 1754+42.54
 Lr = 0
 e = NC
 V = 70mph

Curve 164_WB_PROP-5
 PI = 1257+37.49
 DELTA = 8° 38' 37.40" (RT)
 D = 0' 15' 03"
 T = 1,725.53'
 L = 3,444.51'
 R = 22,832.31'
 PCC = 1240+11.96
 PT = 1274+56.48
 Lr = 0
 e = NC
 V = 70mph



9/27/23 AM
 8/2/2023
 Plotted By: steller
 D:\043662\dgn

- Legend**
- | | | | |
|--------------------------------|--------------------------------------|---|---|
| Denotes Full Depth Pavement | Denotes Shoulder Running Lane | Proposed Pole-Mount Junction Box | Proposed Motor Vehicle Detection Sensor w/ Quantity |
| Denotes Mill & Overlay | Denotes Limits of Outside Grading | Proposed Communications Junction Box | Light Pole with LED Luminaire |
| Denotes Demolition of Pavement | Denotes Travel Lanes | Proposed Lane Control Signal on Mast Arm | Light Pole with Twin LED Luminaires |
| Denotes Bridge Approach Slab | Denotes Paved Shoulder | Proposed Lane Control Signal on Overhead Sign Structure | Existing Light Pole and Luminaire to be Removed |
| Denotes Prop. Bridge Limits | Denotes Construction Limits in Cuts | Proposed Camera with Pole | Proposed Linear BMP |
| Denotes Exist. Bridge Limits | Denotes Construction Limits in Fills | Proposed ITS Cabinet | Proposed Drainage Ditch |

REFERENCES (PROFILES)	
EB I-64 Profile	21A
WB I-64 Profile	21A

CONCEPTUAL PLANS

PRELIMINARY SCALE

8/2/2017 8:47:39 AM Plotted By: reiler D:\43662\cadgn

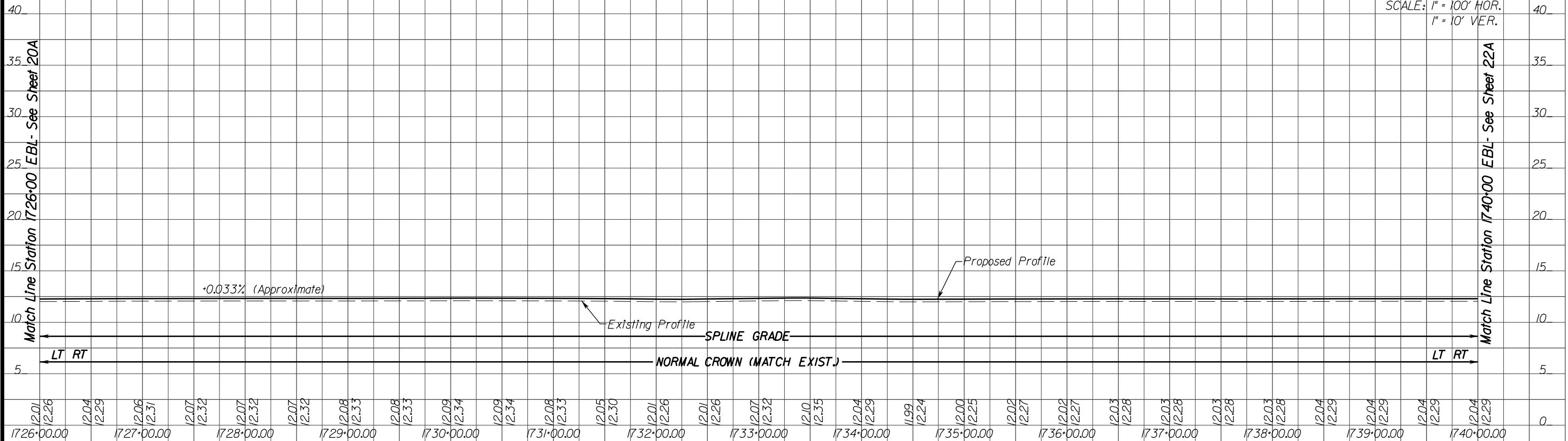
I-64 Eastbound

I-64 EB
Sta.1726+00 to Sta.1740+00 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

CONCEPTUAL PLANS

PRELIMINARY

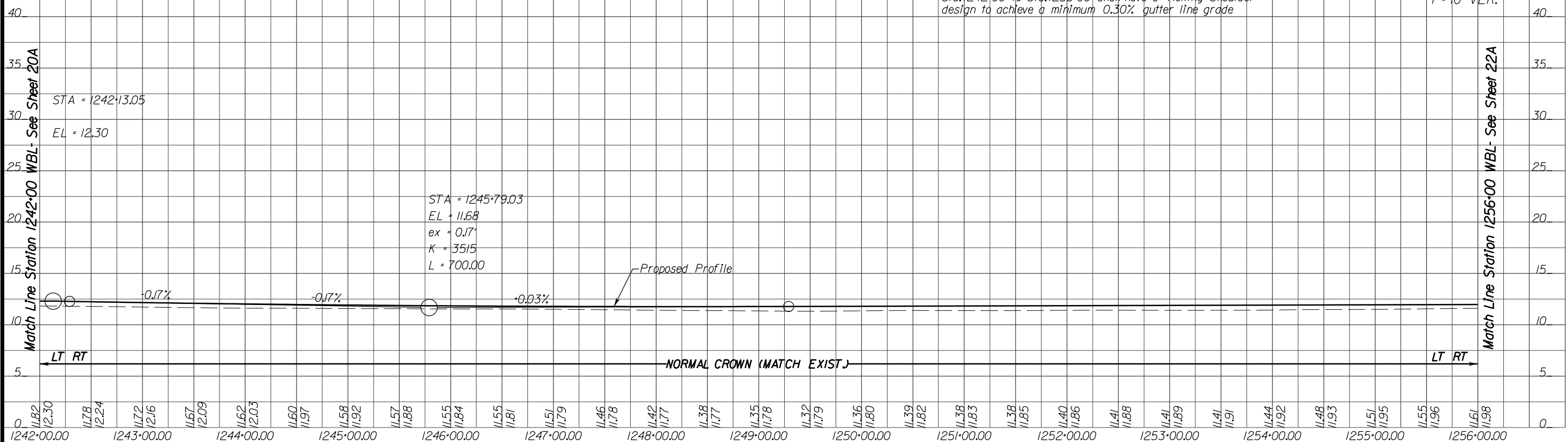
SCALE: 1" = 100' HOR.
1" = 10' VER.



I-64 Westbound

I-64 WB
Sta.1242+00 to Sta.1256+00 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

SCALE: 1" = 100' HOR.
1" = 10' VER.



DESIGN BUILDER

DESIGNED BY

STV Incorporated

STATE PROJECT

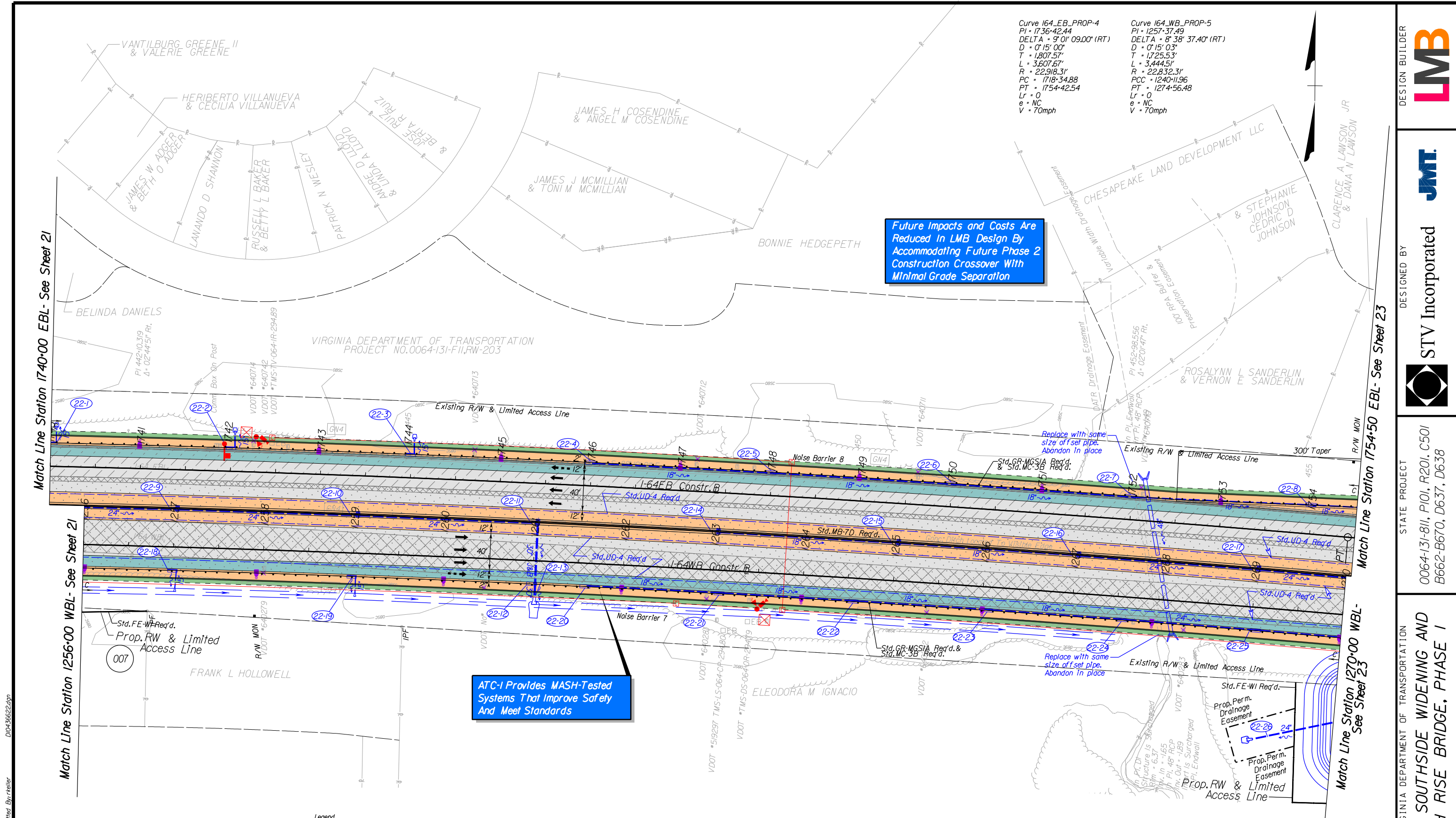
0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO. 21A

PAGE NO. 107



Curve 164_EB_PROP-4
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 D = 0'15"03"
 T = 1,807.57'
 L = 3,607.67'
 R = 22,918.31'
 PC = 1718+34.88
 PT = 1754+42.54
 Lr = 0
 e = NC
 V = 70mph

Curve 164_WB_PROP-5
 PI = 1257+37.49
 DELTA = 8°38'37.40" (RT)
 D = 0'15"03"
 T = 1,725.53'
 L = 3,444.51'
 R = 22,832.31'
 PCC = 1240+11.96
 PT = 1274+56.48
 Lr = 0
 e = NC
 V = 70mph

Future Impacts and Costs Are Reduced In LMB Design By Accommodating Future Phase 2 Construction Crossover With Minimal Grade Separation

ATC-1 Provides MASH-Tested Systems That Improve Safety And Meet Standards

- Legend**
- Denotes Full Depth Pavement
 - Denotes Mill & Overlay
 - Denotes Demolition of Pavement
 - Denotes Bridge Approach Slab
 - Denotes Prop. Bridge Limits
 - Denotes Exist. Bridge Limits
 - Denotes Shoulder Running Lane
 - Denotes Limits of Outside Grading
 - Denotes Travel Lanes
 - Denotes Paved Shoulder
 - Denotes Construction Limits in Cuts
 - Denotes Construction Limits in Fills
 - Proposed Pole-Mount Junction Box
 - Proposed Communications Junction Box
 - Proposed Lane Control Signal on Mast Arm
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 - Proposed Camera with Pole
 - Proposed ITS Cabinet
 - Proposed Motor Vehicle Detection Sensor w/ Quantity
 - Light Pole with LED Luminaire
 - Light Pole with Twin LED Luminaires
 - Existing Light Pole and Luminaire to be Removed
 - Proposed Linear BMP
 - Proposed Drainage Ditch

REFERENCES (PROFILES)	
EB I-64 Profile	22A
WB I-64 Profile	22A

CONCEPTUAL PLANS

PRELIMINARY SCALE

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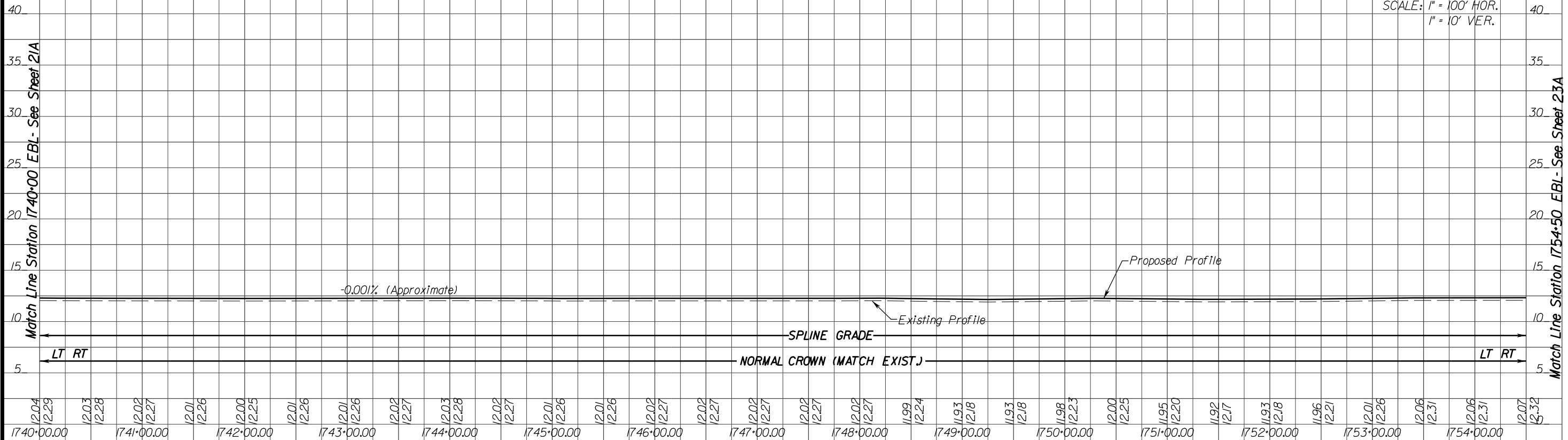
I-64 Eastbound

I-64 EB
Sta. 1740+00 to Sta. 1754+00 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

CONCEPTUAL PLANS

PRELIMINARY

SCALE: 1" = 100' HOR.
1" = 10' VER.



I-64 Westbound

I-64 WB
Sta. 1256+00 to Sta. 1270+00 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

SCALE: 1" = 100' HOR.
1" = 10' VER.



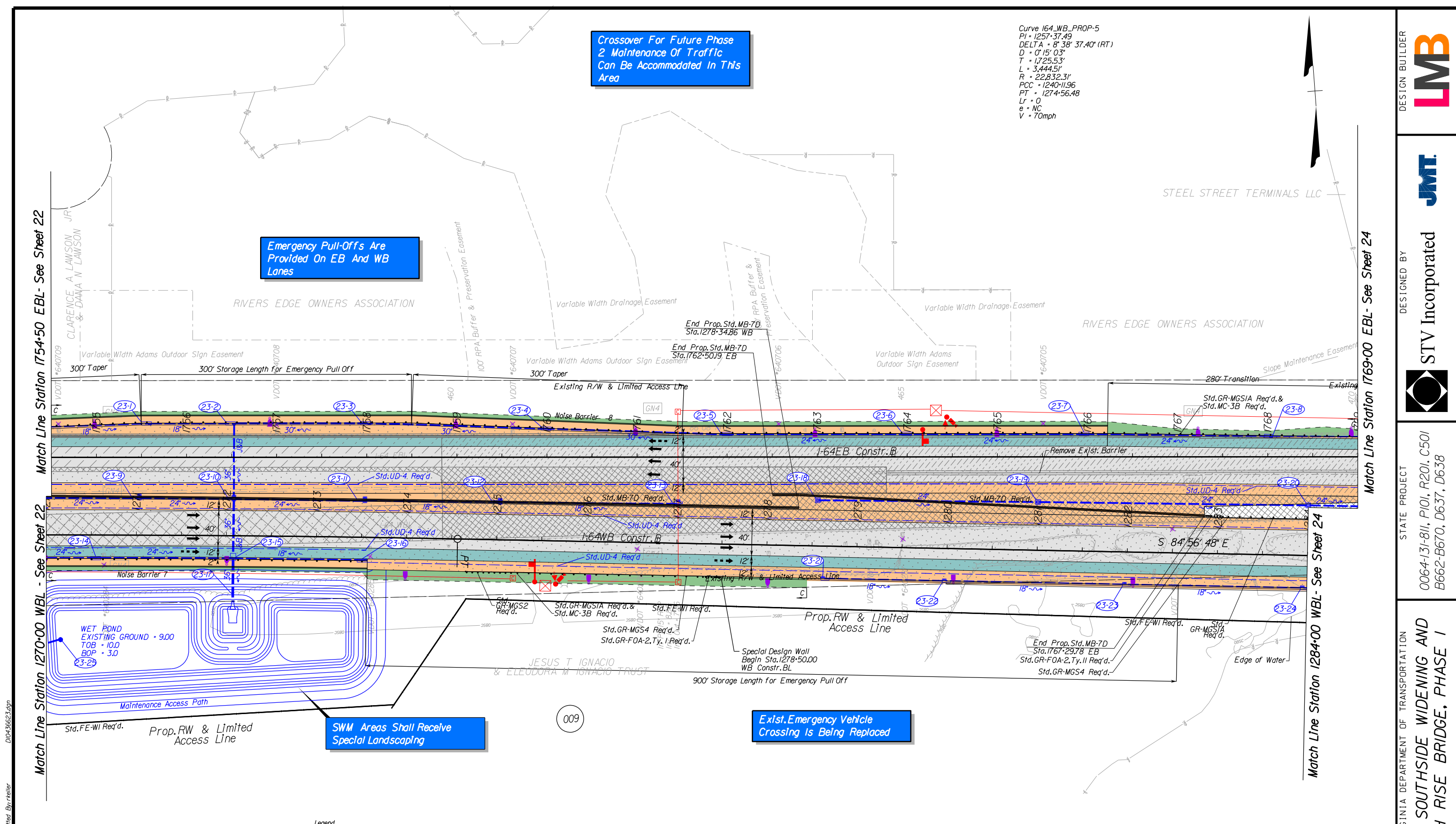
DESIGN BUILDER: **LMB**

DESIGNED BY: **STV Incorporated**

STATE PROJECT: 0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO. **22A**
PAGE NO. **109**



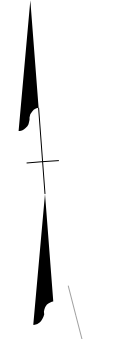
Crossover For Future Phase 2 Maintenance Of Traffic Can Be Accommodated In This Area

Emergency Pull-Offs Are Provided On EB And WB Lanes

SWM Areas Shall Receive Special Landscaping

Exist. Emergency Vehicle Crossing Is Being Replaced

Curve 164_WB_PROP-5
 PI = 1257+37.49
 DELTA = 8° 38' 37.40" (RT)
 D = 0' 15" 03"
 T = 1725.53'
 L = 3,444.51'
 R = 22,832.31'
 PCC = 1240+11.96
 PT = 1274+56.48
 Lr = 0
 e = NC
 V = 70mph

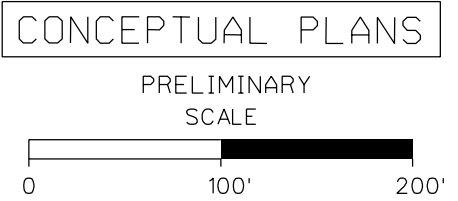


Legend

Denotes Full Depth Pavement	Denotes Shoulder Running Lane	Proposed Pole-Mount Junction Box	Proposed Motor Vehicle Detection Sensor w/ Quantity
Denotes Mill & Overlay	Denotes Limits of Outside Grading	Proposed Communications Junction Box	Light Pole with LED Luminaire
Denotes Demolition of Pavement	Denotes Travel Lanes	Proposed Lane Control Signal on Mast Arm	Light Pole with Twin LED Luminaires
Denotes Bridge Approach Slab	Denotes Paved Shoulder	Proposed Lane Control Signal on Overhead Sign Structure	Existing Light Pole and Luminaire to be Removed
Denotes Prop. Bridge Limits	Denotes Construction Limits in Cuts	Proposed Camera with Pole	Proposed Linear BMP
Denotes Exist. Bridge Limits	Denotes Construction Limits in Fills	Proposed ITS Cabinet	Proposed Drainage Ditch

REFERENCES (PROFILES)

EB I-64 Profile	23A
WB I-64 Profile	23A



DESIGN BUILDER

DESIGNED BY

STV Incorporated

STATE PROJECT

0064-131-811, P101, R201, C501
 B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO. 23

PAGE NO. 110

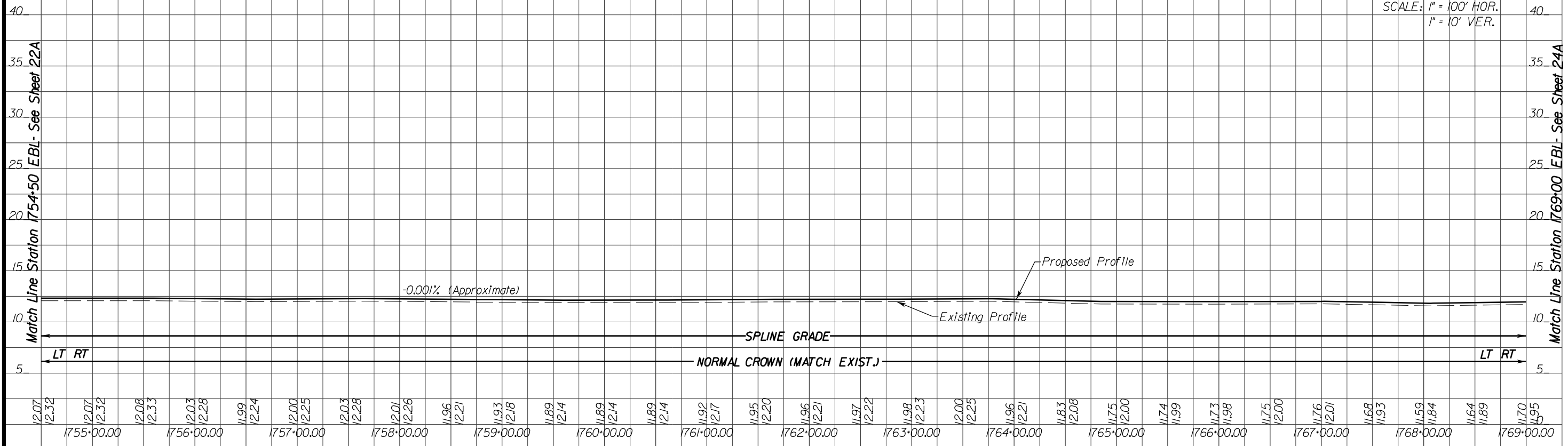
8/2/2017 8:50:16 AM Plotted By: reiler D:\0436623\adgn

I-64 Eastbound

I-64 EB
 Sta.1754+50 to Sta.1769+00 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

CONCEPTUAL PLANS

PRELIMINARY
 SCALE: 1" = 100' HOR.
 1" = 10' VER.



I-64 Westbound

I-64 WB
 Sta.1270+00 to Sta.1284+00 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

SCALE: 1" = 100' HOR.
 1" = 10' VER.



DESIGNED BY: STV Incorporated

DESIGN BUILDER: LMB

STATE PROJECT: 0064-131-811, P101, R201, C501
 B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO. 23A

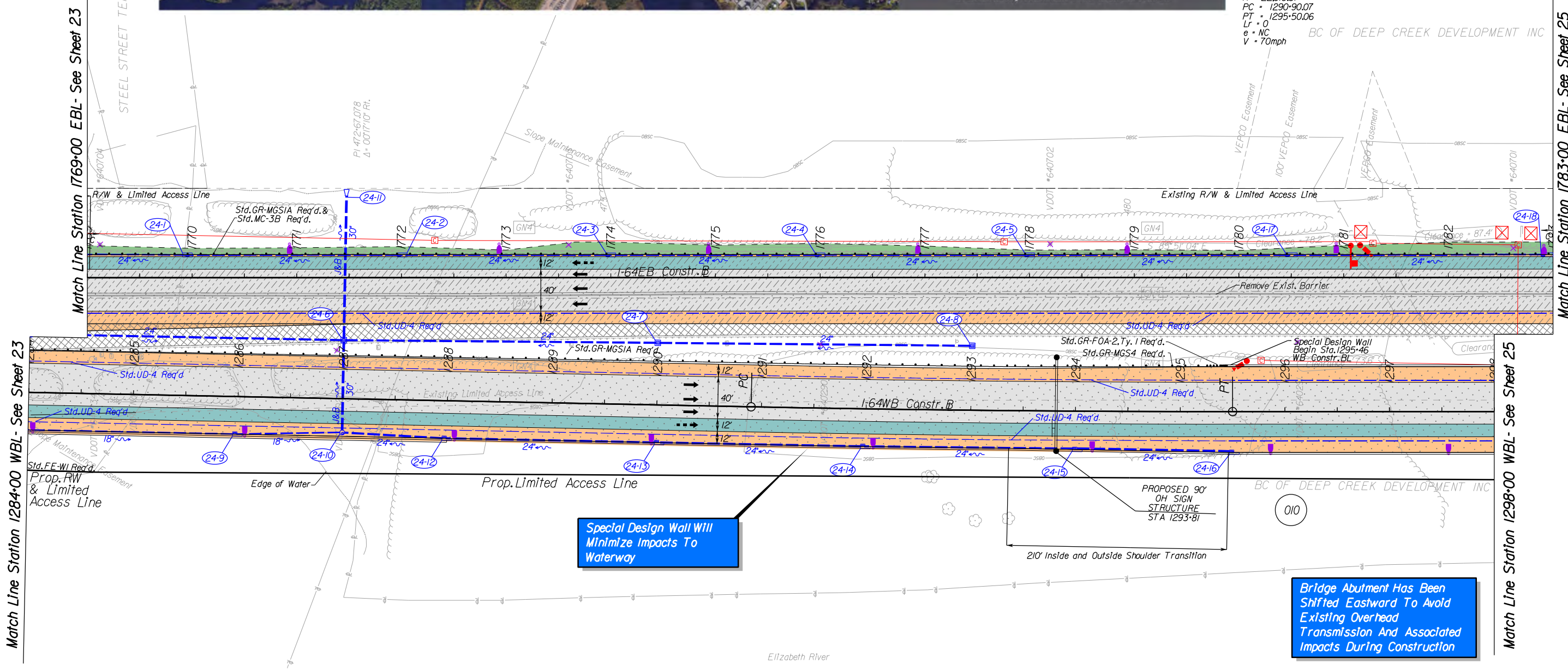
PAGE NO. III

Eastbound Crossover



Temporary Median Crossover Enhances Safety, Quality And Schedule By Transferring All Eastbound Traffic To The Westbound Travel Lanes And New High Rise Bridge, Allowing Construction Of Existing Bridge To Be Completed Outside Of Traffic

Curve I64_WB_PROP-6
 PI = 1293+20.07
 DELTA = 108° 59.90' (LT)
 D = 0' 15' 00"
 T = 230.00'
 L = 459.99'
 R = 22,918.31'
 PC = 1290+90.07
 PT = 1295+50.06
 LR = 0
 e = NC
 V = 70mph
 BC OF DEEP CREEK DEVELOPMENT INC



Special Design Wall Will Minimize Impacts To Waterway

Bridge Abutment Has Been Shifted Eastward To Avoid Existing Overhead Transmission And Associated Impacts During Construction

B/2/2017 Plotted By: rceller D:\0436624.dgn

- Legend**
- Denotes Full Depth Pavement
 - Denotes Mill & Overlay
 - Denotes Demolition of Pavement
 - Denotes Bridge Approach Slab
 - Denotes Prop. Bridge Limits
 - Denotes Exist. Bridge Limits
 - Denotes Shoulder Running Lane
 - Denotes Limits of Outside Grading
 - Denotes Travel Lanes
 - Denotes Paved Shoulder
 - Denotes Construction Limits in Cuts
 - Denotes Construction Limits in Fills
 - Proposed Pole-Mount Junction Box
 - Proposed Communications Junction Box
 - Proposed Lane Control Signal on Mast Arm
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 - Proposed Camera with Pole
 - Proposed ITS Cabinet
 - Proposed Motor Vehicle Detection Sensor w/ Quantity
 - Light Pole with LED Luminaire
 - Light Pole with Twin LED Luminaires
 - Existing Light Pole and Luminaire to be Removed
 - Proposed Linear BMP
 - Proposed Drainage Ditch

REFERENCES (PROFILES)	
EB I-64 Profile	24A
WB I-64 Profile	24A

CONCEPTUAL PLANS

PRELIMINARY SCALE

DESIGN BUILDER

DESIGNED BY

STATE PROJECT

0064-131-81I, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO. **24**

PAGE NO. **112**

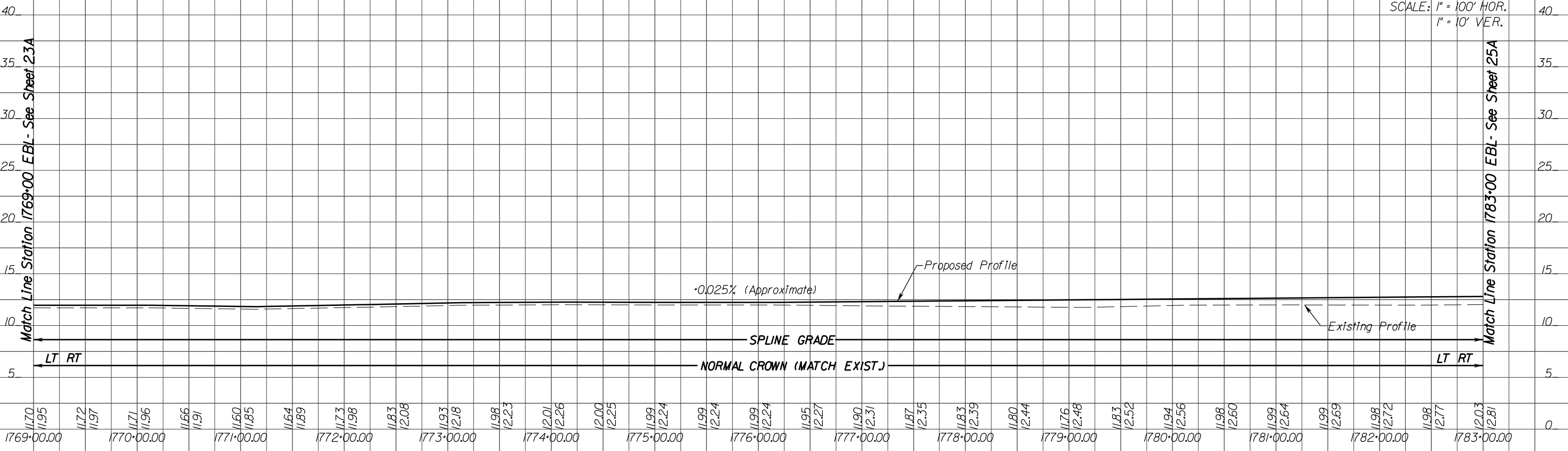
8/2/2017 8:51:31 AM Plotted By: reiler D:\436624\adgn

I-64 Eastbound

I-64 EB
Sta. 1769+00 to Sta. 1783+00 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

CONCEPTUAL PLANS

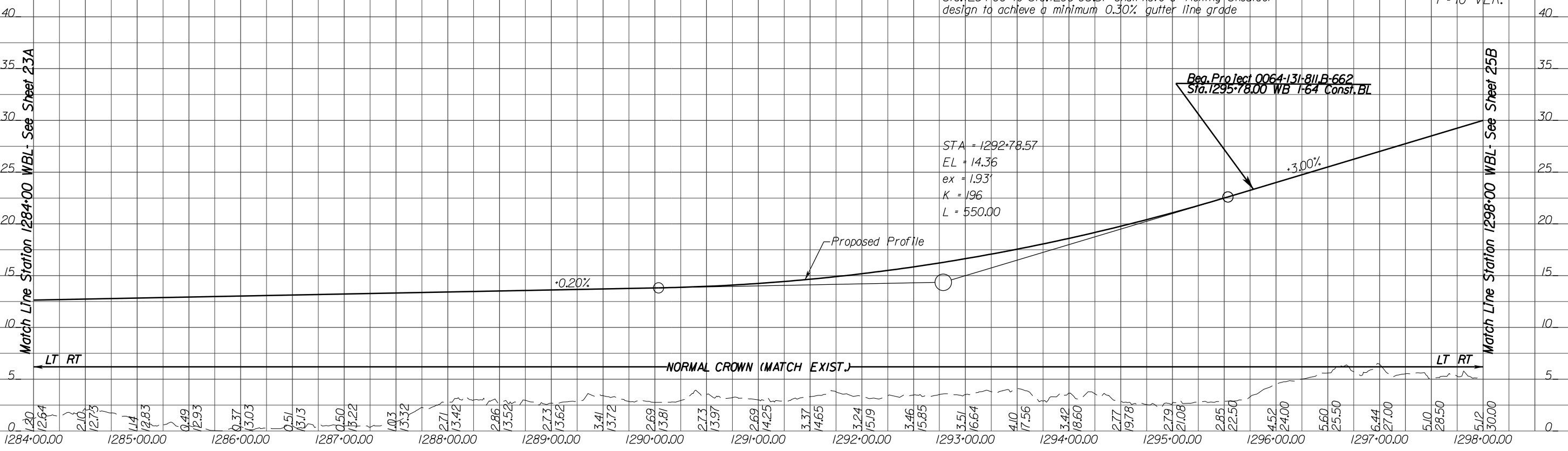
PRELIMINARY
SCALE: 1" = 100' HOR.
1" = 10' VER.



I-64 Westbound

I-64 WB
Sta. 1284+00 to Sta. 1290+03.57 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

SCALE: 1" = 100' HOR.
1" = 10' VER.



DESIGN BUILDER
LMB

DESIGNED BY
JMT

STATE PROJECT
0064-131-811, P101, P201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

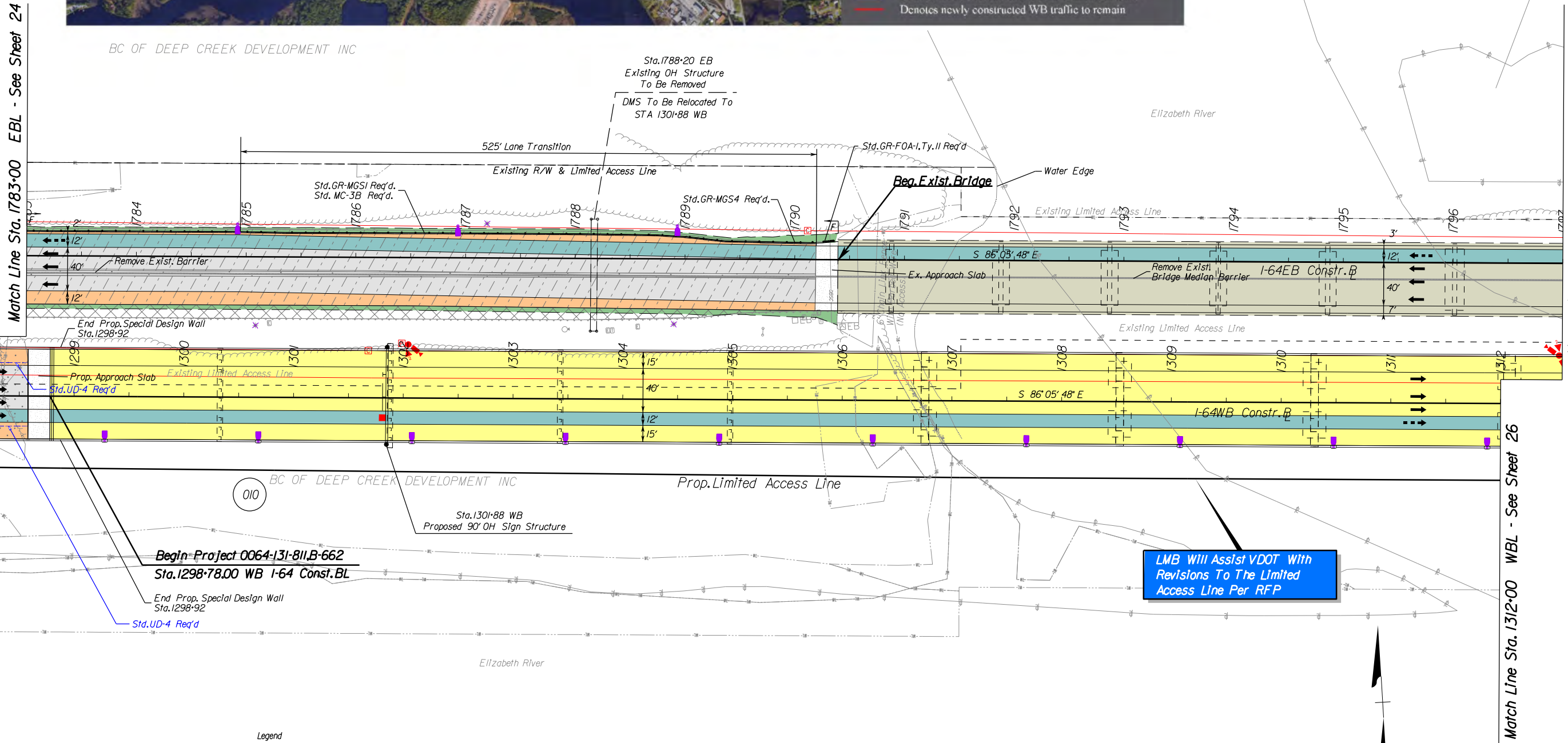
SHEET NO.
24A

PAGE NO.
113

Eastbound Crossover



Temporary Median Crossover Enhances Safety, Quality, and Schedule by Transferring All Eastbound Traffic To The Westbound Travel Lanes And New High Rise Bridge, Allowing Construction Of Existing Bridge To Be Completed Outside Of Traffic



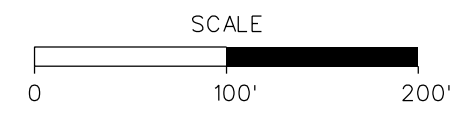
LMB Will Assist VDOT With Revisions To The Limited Access Line Per RFP

- Legend**
- Denotes Full Depth Pavement
 - Denotes Mill & Overlay
 - Denotes Demolition of Pavement
 - Denotes Bridge Approach Slab
 - Denotes Prop. Bridge Limits
 - Denotes Exist. Bridge Limits
 - Denotes Hard Shoulder Running
 - Denotes Limits of Outside Grading
 - Denotes Travel Lanes
 - Denotes Paved Shoulder
 - Denotes Construction Limits in Cuts
 - Denotes Construction Limits in Fills
 - Proposed Pole-Mount Junction Box
 - Proposed Communications Junction Box
 - Proposed Lane Control Signal on Mast Arm
 - Proposed Lane Control Signal on Overhead Sign Structure
 - Proposed Camera with Pole
 - Proposed ITS Cabinet
 - Proposed Motor Vehicle Detection Sensor w/ Quantity
 - Light Pole with LED Luminaire
 - Light Pole with Twin LED Luminaires
 - Existing Light Pole and Luminaire to be Removed
 - Proposed Linear BMP
 - Proposed Drainage Ditch

CONCEPTUAL PLANS
PRELIMINARY

REFERENCES (PROFILES)

EB I-64 Profile	25A
WB I-64 Profile	25B



DESIGN BUILDER
LMB

DESIGNED BY
JMT.

STV Incorporated

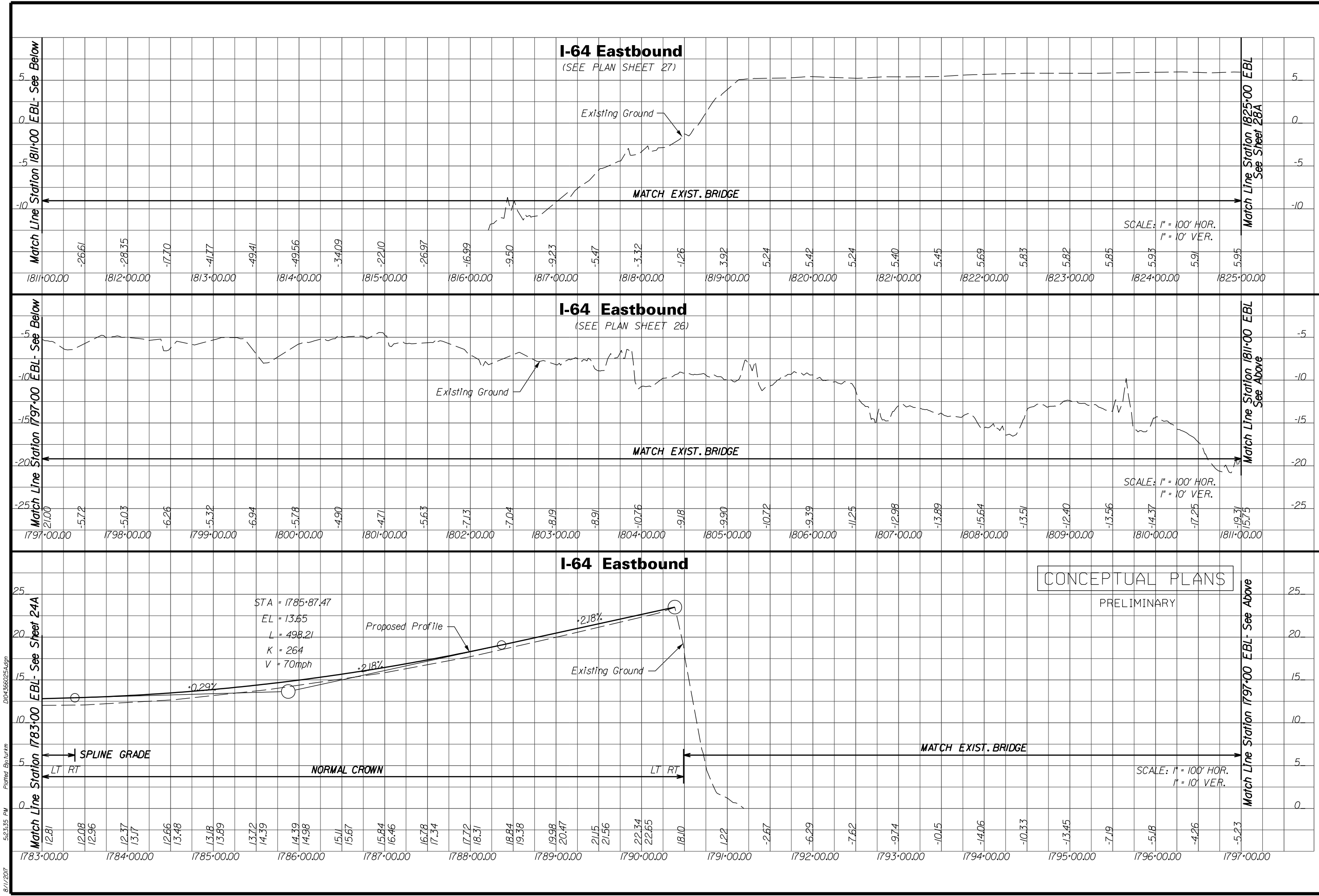
STATE PROJECT
0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO.
25

PAGE NO.
114

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 B:\1207



8/11/2017 5:23:35 PM Plotted By: turkm DIC4366025A.dgn

DESIGNED BY **STV Incorporated**

DESIGN BUILDER **LMB**

STATE PROJECT 0064-131-81I, P101, R201, C501
B662-B670, D637, D638

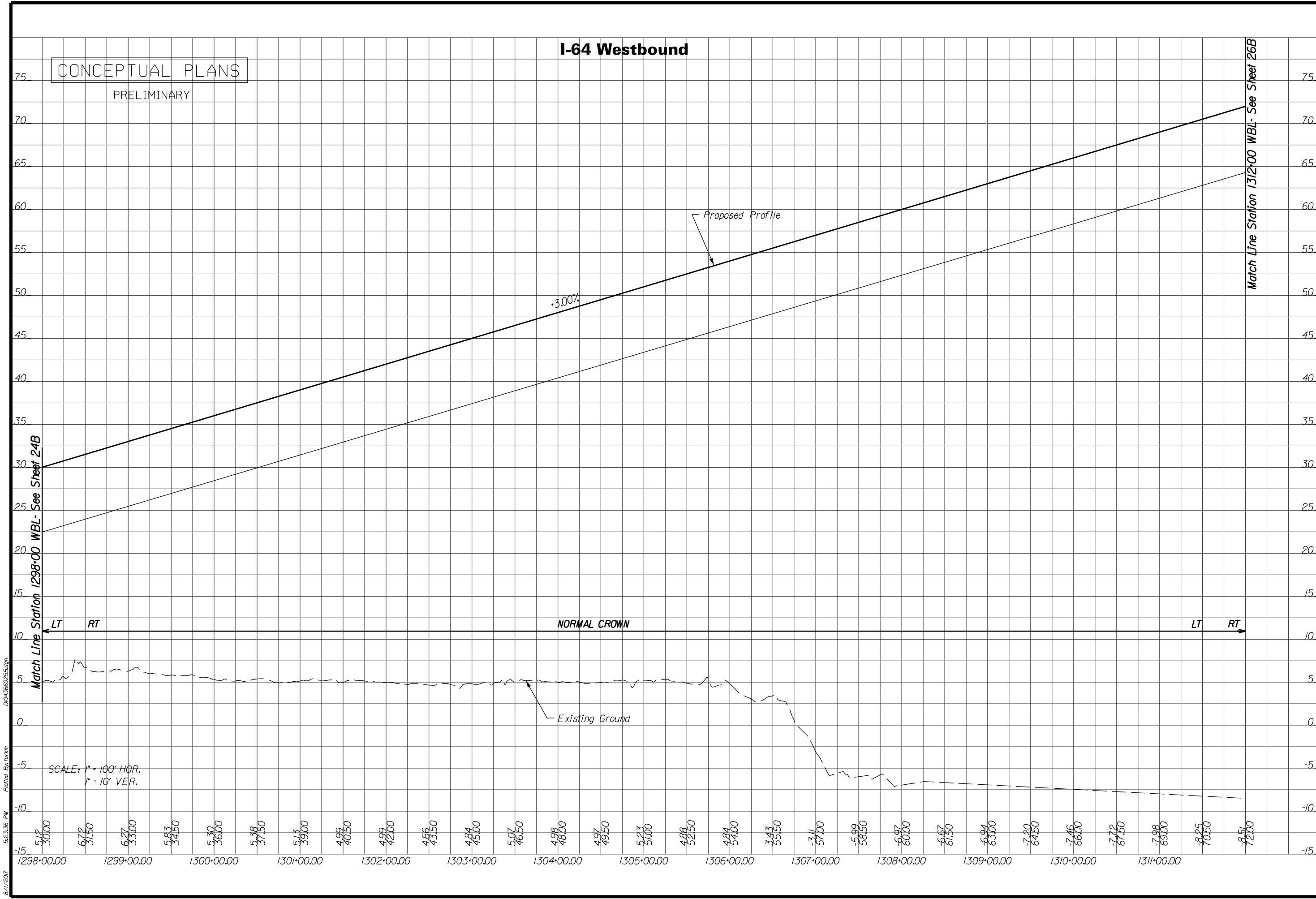
VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO. **25A**
PAGE NO. **115**

I-64 Westbound

CONCEPTUAL PLANS

PRELIMINARY



8/1/2017 5:23:35 PM Plotted By: turkm DIC4366025B.dgn



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STATE PROJECT
 0064-131-811, P101, R201, C501
 B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION
**I-64 SOUTHSIDE WIDENING AND
 HIGH RISE BRIDGE, PHASE I**

Eastbound Crossover

CONCEPTUAL PLANS

PRELIMINARY

DESIGN BUILDER
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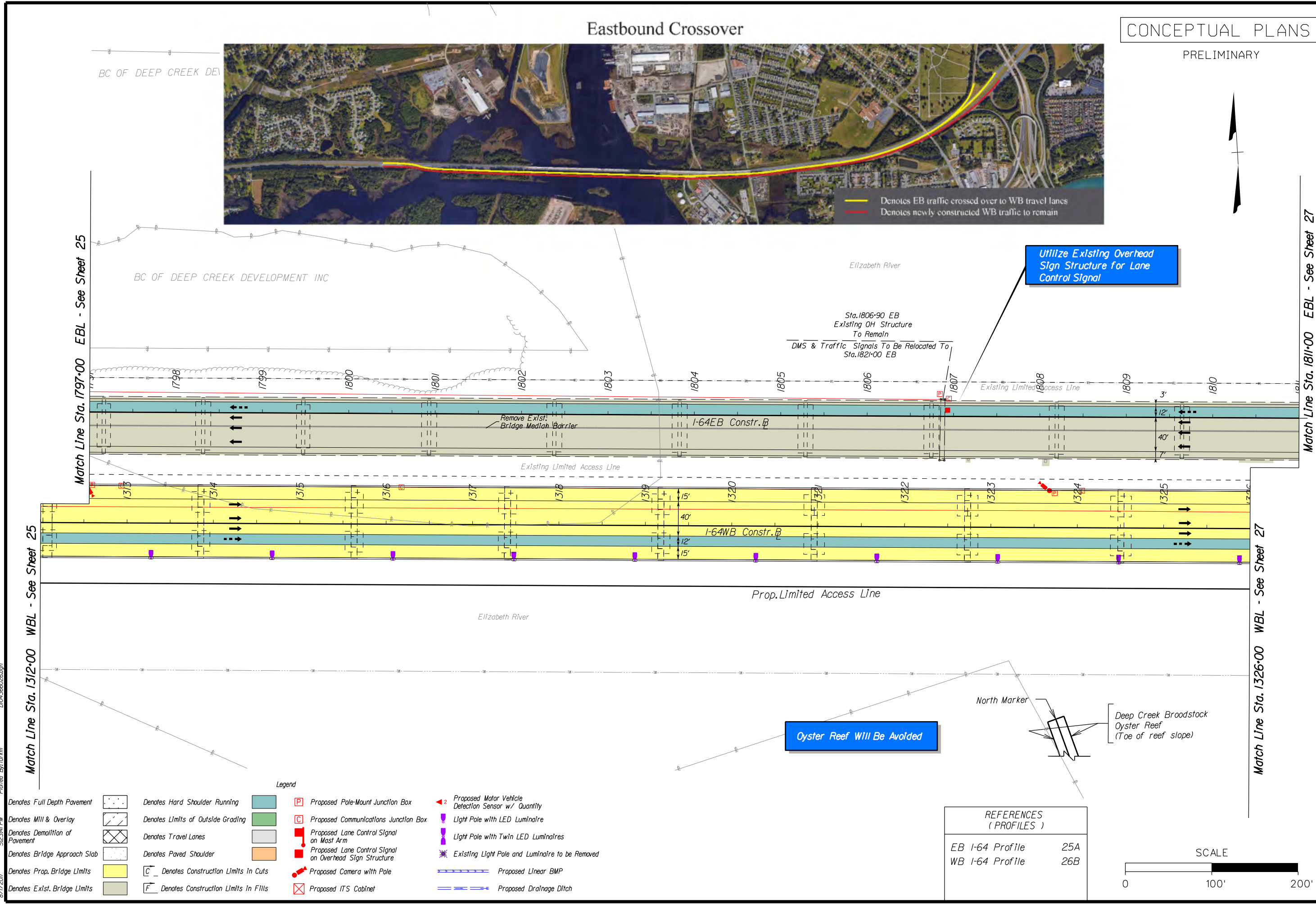
STATE PROJECT
0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION
**I-64 SOUTHSIDE WIDENING AND
HIGH RISE BRIDGE, PHASE 1**

SHEET NO.
26
PAGE NO.
117



Denotes EB traffic crossed over to WB travel lanes
Denotes newly constructed WB traffic to remain



Utilize Existing Overhead Sign Structure for Lane Control Signal

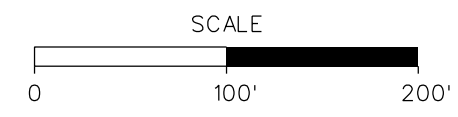
Oyster Reef Will Be Avoided

Legend

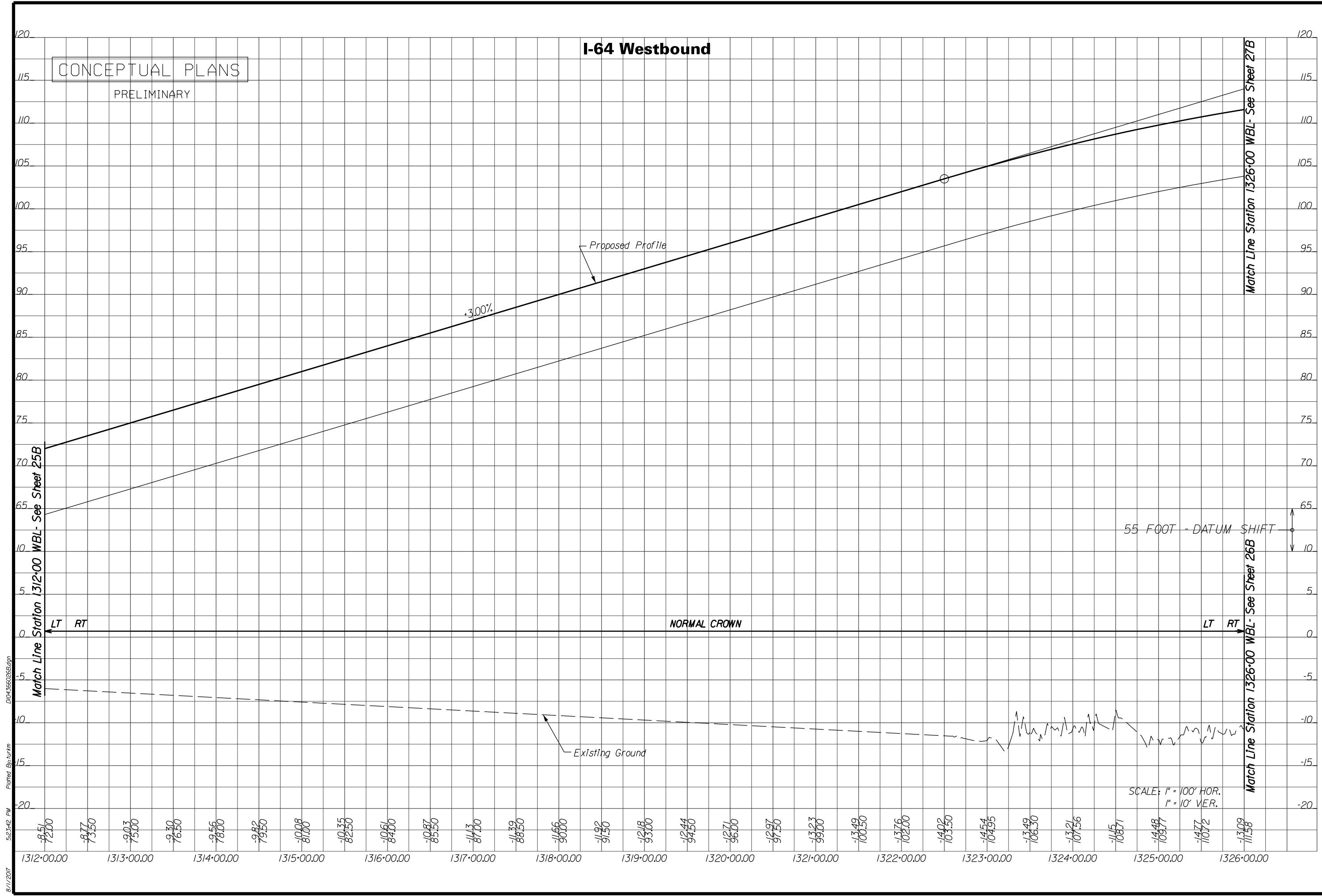
- Denotes Full Depth Pavement
- Denotes Mill & Overlay
- Denotes Demolition of Pavement
- Denotes Bridge Approach Slab
- Denotes Prop. Bridge Limits
- Denotes Exist. Bridge Limits
- Denotes Hard Shoulder Running
- Denotes Limits of Outside Grading
- Denotes Travel Lanes
- Denotes Paved Shoulder
- Denotes Construction Limits in Cuts
- Denotes Construction Limits in Fills
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- Proposed Communications Junction Box
- Proposed Lane Control Signal on Mast Arm
- Proposed Lane Control Signal on Overhead Sign Structure
- Proposed Camera with Pole
- Proposed ITS Cabinet
- Proposed Motor Vehicle Detection Sensor w/ Quantity
- Light Pole with LED Luminaire
- Light Pole with Twin LED Luminaires
- Existing Light Pole and Luminaire to be Removed
- Proposed Linear BMP
- Proposed Drainage Ditch

REFERENCES (PROFILES)

EB I-64 Profile	25A
WB I-64 Profile	26B




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8/11/2017 5:23:42 PM Plotted By: turkm D:\04366026B.dgn

DESIGN BUILDER



DESIGNED BY



STATE PROJECT

0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTHSIDE WIDENING AND
HIGH RISE BRIDGE, PHASE I

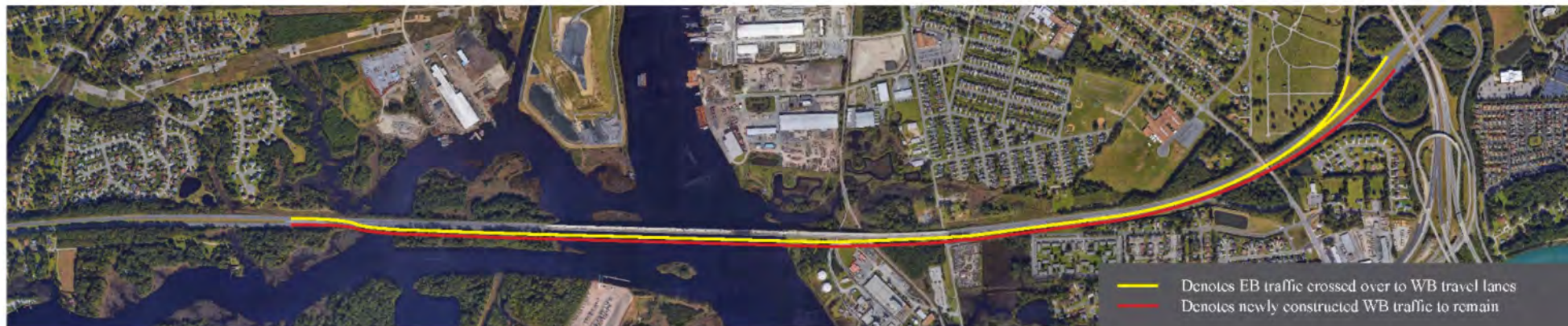
SHEET NO.
26B

PAGE NO.
118

Eastbound Crossover

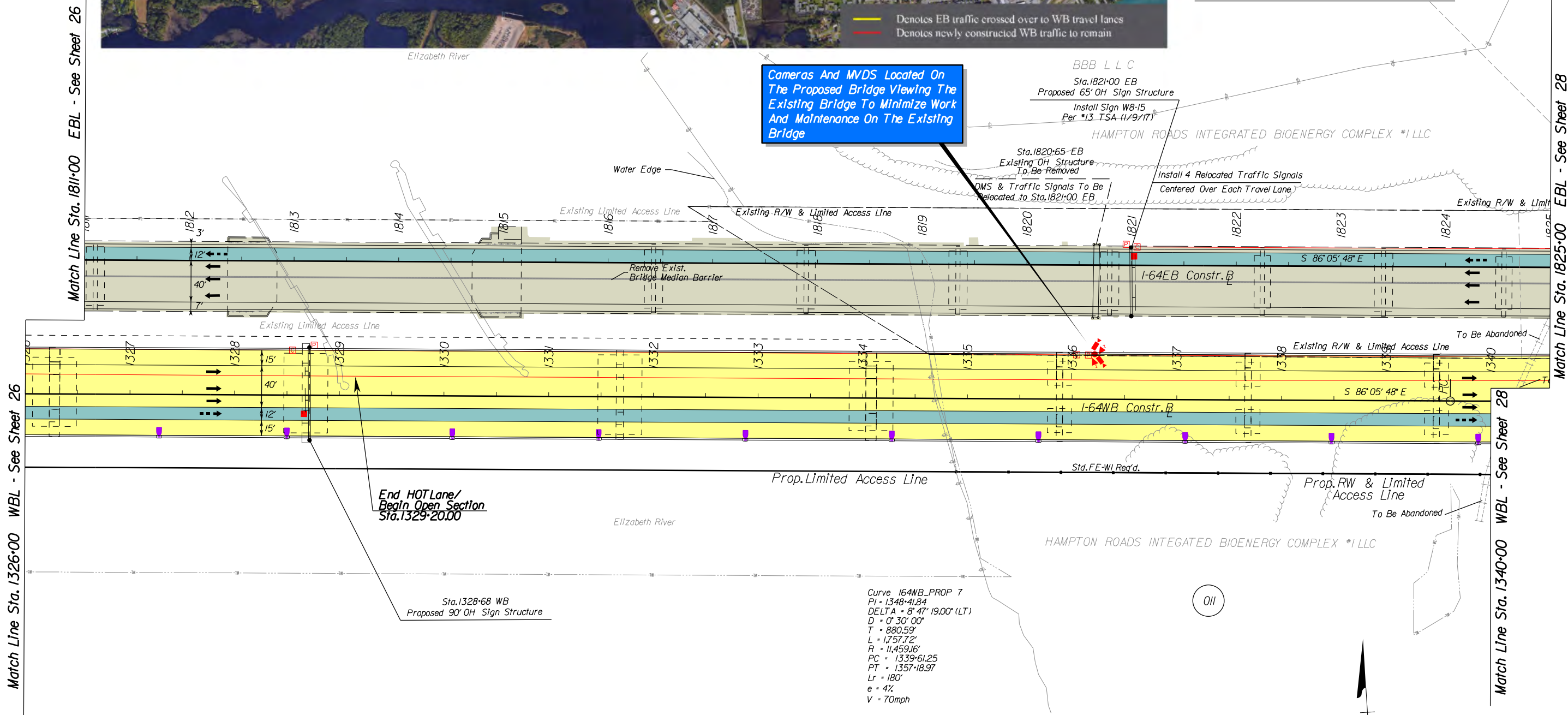
CONCEPTUAL PLANS

PRELIMINARY



Temporary Median Crossover Enhances Safety, Quality, And Schedule By Transferring All Eastbound Traffic To The Westbound Travel Lanes And New High Rise Bridge, Allowing Construction Of Existing Bridge To Be Completed Outside Of Traffic

Cameras And MVDS Located On The Proposed Bridge To Minimize Work And Maintenance On The Existing Bridge

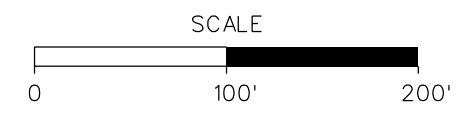


Curve 164WB_PROP 7
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 D = 0° 30' 00"
 T = 880.59'
 L = 1,757.72'
 R = 11,459.16'
 PC = 1339+61.25
 PT = 1357+18.97
 Lr = 180'
 e = 4%
 V = 70mph

- Legend**
- Denotes Full Depth Pavement
 - Denotes Hard Shoulder Running
 - Denotes Mill & Overlay
 - Denotes Limits of Outside Grading
 - Denotes Demolition of Pavement
 - Denotes Travel Lanes
 - Denotes Bridge Approach Slab
 - Denotes Paved Shoulder
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 - Denotes Construction Limits in Cuts
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 - Proposed Camera with Pole
 - Proposed ITS Cabinet
 - Proposed Motor Vehicle Detection Sensor w/ Quantity
 - Light Pole with LED Luminaire
 - Light Pole with Twin LED Luminaires
 - Existing Light Pole and Luminaire to be Removed
 - Proposed Linear BMP
 - Proposed Drainage Ditch

REFERENCES (PROFILES)

EB I-64 Profile	25A
WB I-64 Profile	27B



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 8/1/2017
 Plotted By: turkm

DESIGN BUILDER
LMB
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JMT
STV Incorporated
 STATE PROJECT
 0064-131-811, P101, R201, C501
 B662-B670, D637, D638
 VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE 1
 SHEET NO.
27
 PAGE NO.
119

Eastbound Crossover

CONCEPTUAL PLANS

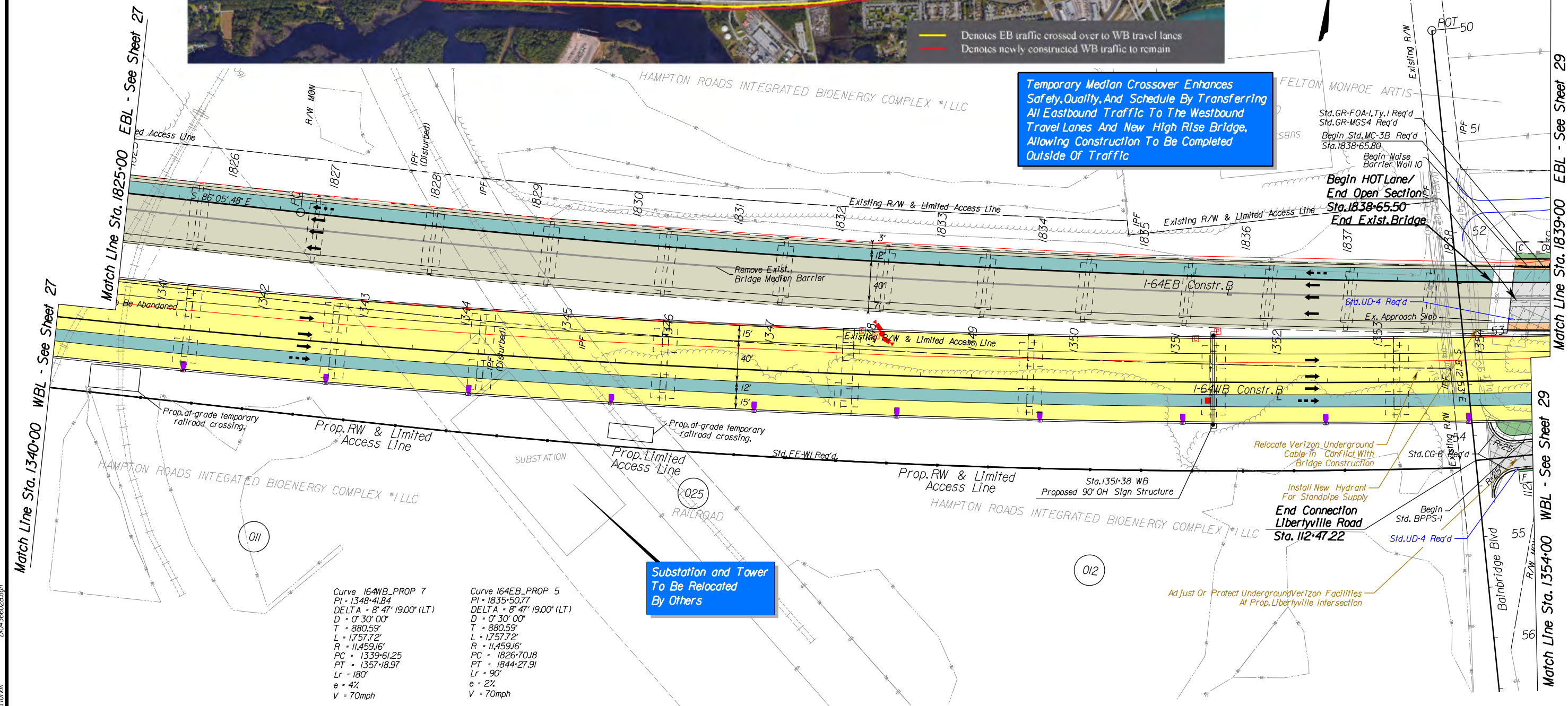
PRELIMINARY



Denotes EB traffic crossed over to WB travel lanes
Denotes newly constructed WB traffic to remain

Temporary Median Crossover Enhances Safety, Quality, and Schedule By Transferring All Eastbound Traffic To The Westbound Travel Lanes And New High Rise Bridge, Allowing Construction To Be Completed Outside Of Traffic

Substation and Tower To Be Relocated By Others



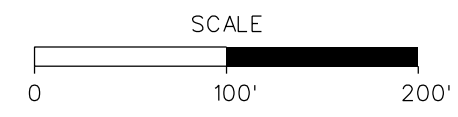
Curve I64WB_PROP 7
PI = 1348+41.84
DELTA = 8° 47' 19.00" (LT)
D = 0° 30' 00"
T = 880.59'
L = 1757.72'
R = 11,459.16'
PC = 1339+61.25
PT = 1357+18.97
Lr = 180'
e = 4%
V = 70mph

Curve I64EB_PROP 5
PI = 1835+50.77
DELTA = 8° 47' 19.00" (LT)
D = 0° 30' 00"
T = 880.59'
L = 1757.72'
R = 11,459.16'
PC = 1826+70.18
PT = 1844+27.91
Lr = 90'
e = 2%
V = 70mph

- Legend**
- Denotes Full Depth Pavement
 - Denotes Mill & Overlay
 - Denotes Demolition of Pavement
 - Denotes Bridge Approach Slab
 - Denotes Prop. Bridge Limits
 - Denotes Exist. Bridge Limits
 - Denotes Hard Shoulder Running
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 - Denotes Travel Lanes
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 - Proposed Camera with Pole
 - Proposed ITS Cabinet
 - Proposed Motor Vehicle Detection Sensor w/ Quantity
 - Light Pole with LED Luminaire
 - Light Pole with Twin LED Luminaires
 - Existing Light Pole and Luminaire to be Removed
 - Proposed Linear BMP
 - Proposed Drainage Ditch

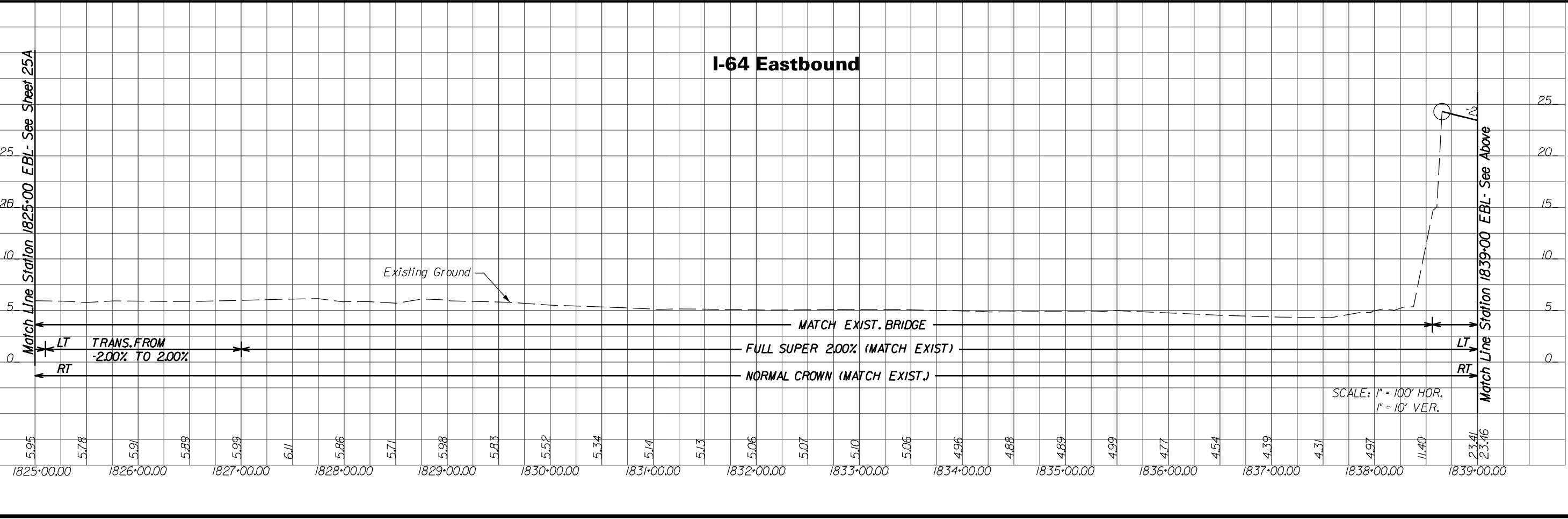
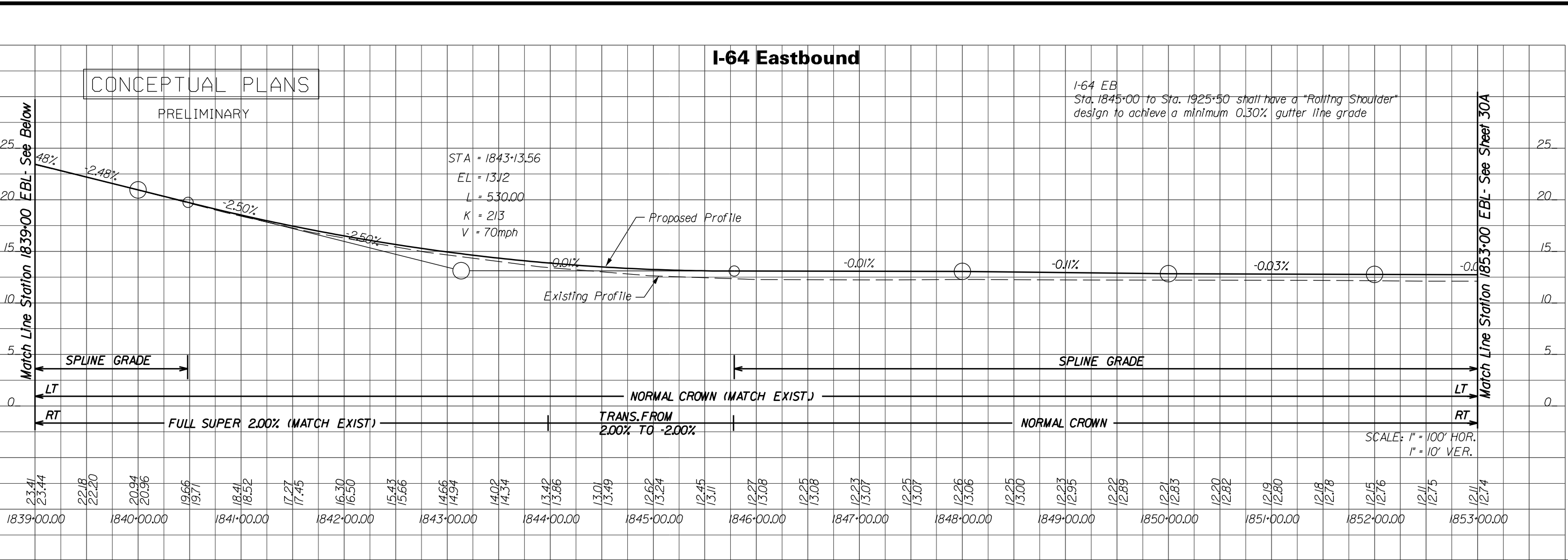
REFERENCES (PROFILES)

EB I-64 Profile	28A
WB I-64 Profile	28B
Libertyville Rd. Profile	29B



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DESIGN BUILDER
LMB
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JMT.
 STATE PROJECT
 0064-131-811, P101, R201, C501
 B662-B670, D637, D638
STV Incorporated
 VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE 1
 SHEET NO.
28
 PAGE NO.
121



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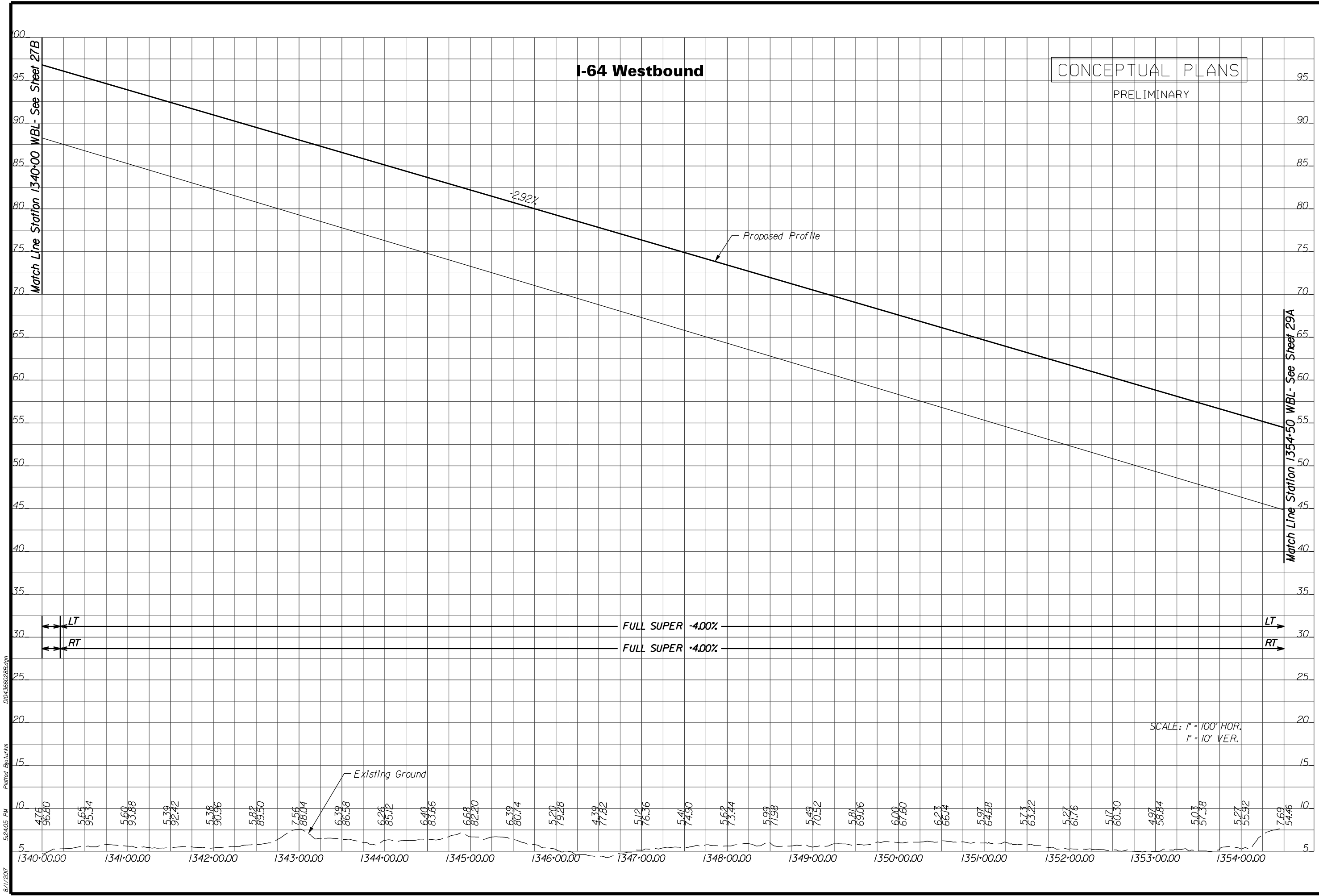
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STATE PROJECT: 0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO. **28A**
PAGE NO. **122**



8/1/2017 5:2:405 PM Plotted By: turkm DIC4366028B.dgn

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VIRGINIA DEPARTMENT OF TRANSPORTATION
**I-64 SOUTHSIDE WIDENING AND
HIGH RISE BRIDGE, PHASE I**

SHEET NO.
28B
PAGE NO.
123

Curve I64WB_PROP 7
 PI = 1348+41.84
 DELTA = 8° 47' 19.00" (LT)
 D = 0° 30' 00"
 T = 880.59'
 L = 1757.72'
 R = 11,459.16'
 PC = 1339+61.25
 PT = 1357+18.97
 Lr = 180'
 e = 4%
 V = 70mph

Curve I64EB_PROP 5
 PI = 1835+50.77
 DELTA = 8° 47' 19.00" (LT)
 D = 0° 30' 00"
 T = 880.59'
 L = 1757.72'
 R = 11,459.16'
 PC = 1826+70.18
 PT = 1844+27.91
 Lr = 90'
 e = 2%
 V = 70mph

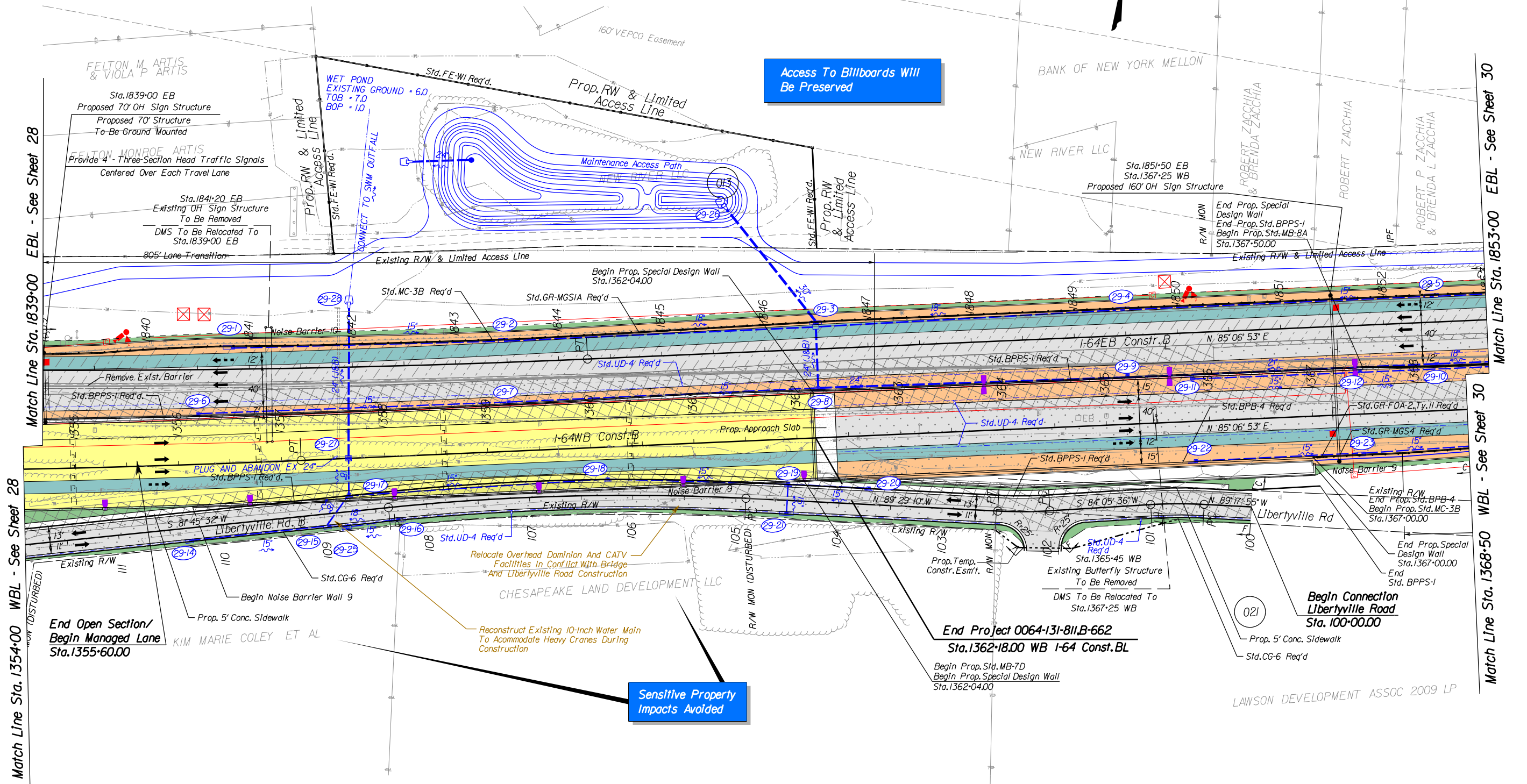
Curve LBVILLE_3
 PI = 106+64.07
 DELTA = 8° 45' 17.74" (LT)
 D = 2° 31' 27"
 T = 173.77'
 L = 346.86'
 R = 2,270.00'
 PC = 104+90.30
 PT = 108+37.16
 e = -2%
 V = 30mph

Curve LBVILLE_2
 PI = 102+20.73
 DELTA = 6° 25' 13.87" (RT)
 D = 12° 43' 57"
 T = 25.24'
 L = 50.43'
 R = 450.00'
 PC = 101+95.49
 PT = 102+45.91
 e = -2%
 V = 30mph

Curve LBVILLE_1
 PI = 100+71.75
 DELTA = 6° 36' 28.56" (LT)
 D = 12° 43' 57"
 T = 25.98'
 L = 51.90'
 R = 450.00'
 PC = 100+45.77
 PT = 100+97.67
 e = -2%
 V = 30mph

CONCEPTUAL PLANS

PRELIMINARY



Access To Billboards Will Be Preserved

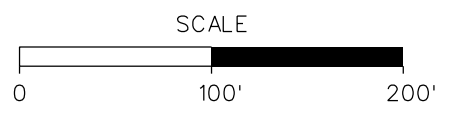
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 8/1/2017

- Legend
- | | | | |
|--------------------------------|--------------------------------------|---|---|
| Denotes Full Depth Pavement | Denotes Hard Shoulder Running | Proposed Pole-Mount Junction Box | Proposed Motor Vehicle Detection Sensor w/ Quantity |
| Denotes Mill & Overlay | Denotes Limits of Outside Grading | Proposed Communications Junction Box | Light Pole with LED Luminaire |
| Denotes Demolition of Pavement | Denotes Travel Lanes | Proposed Lane Control Signal on Mast Arm | Light Pole with Twin LED Luminaires |
| Denotes Bridge Approach Slab | Denotes Paved Shoulder | Proposed Lane Control Signal on Overhead Sign Structure | Existing Light Pole and Luminaire to be Removed |
| Denotes Prop. Bridge Limits | Denotes Construction Limits in Cuts | Proposed Camera with Pole | Proposed Linear BMP |
| Denotes Exist. Bridge Limits | Denotes Construction Limits in Fills | Proposed ITS Cabinet | Proposed Drainage Ditch |

REFERENCES (PROFILES)

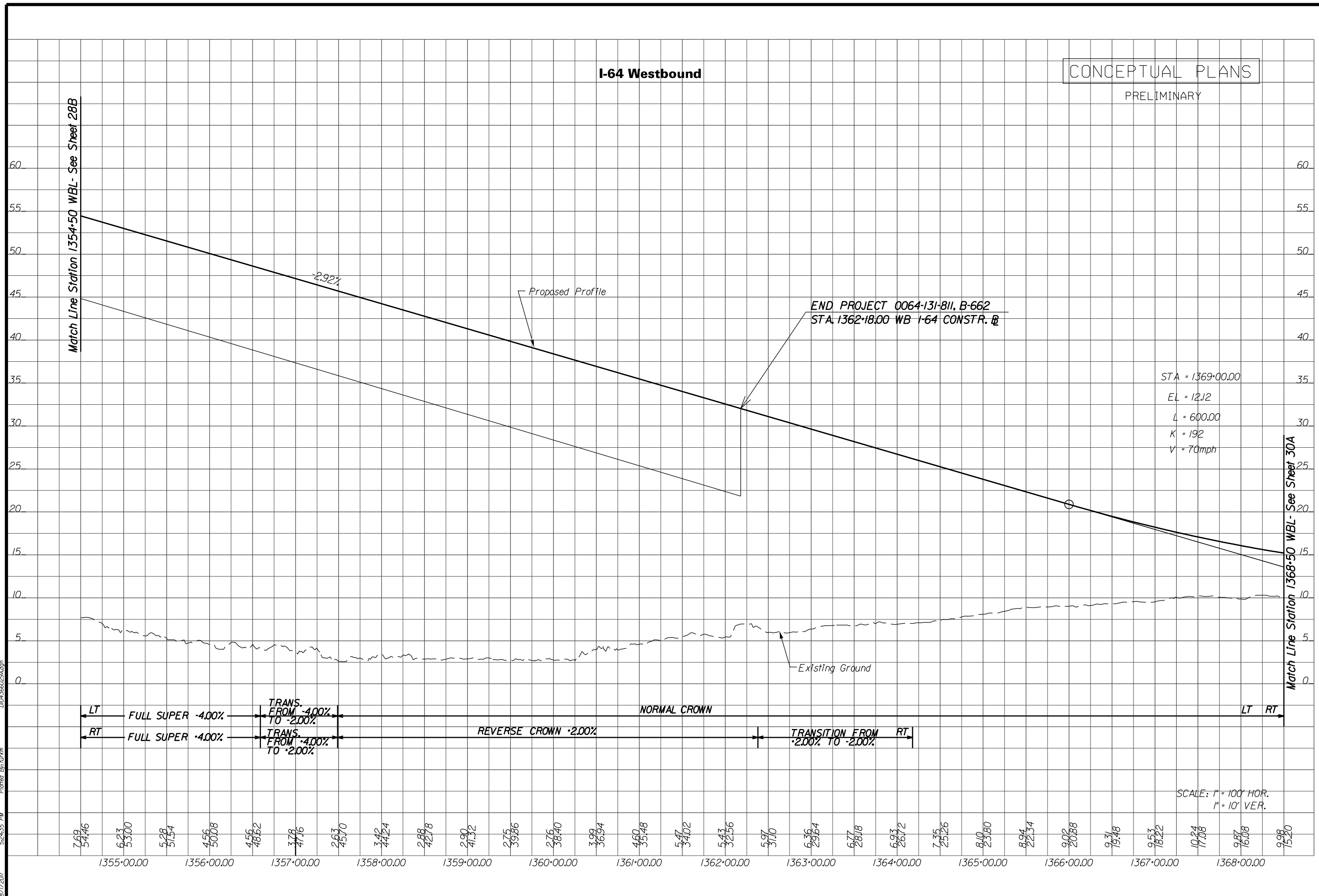
EB I-64 Profile	28A
WB I-64 Profile	29A
Libertyville Rd. Profile	29B



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LMB
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JMT
 STV Incorporated
 STATE PROJECT
 0064-131-811, P101, R201, C501
 B662-B670, D637, D638
 VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE 1
 SHEET NO.
29
 PAGE NO.
124

I-64 Westbound

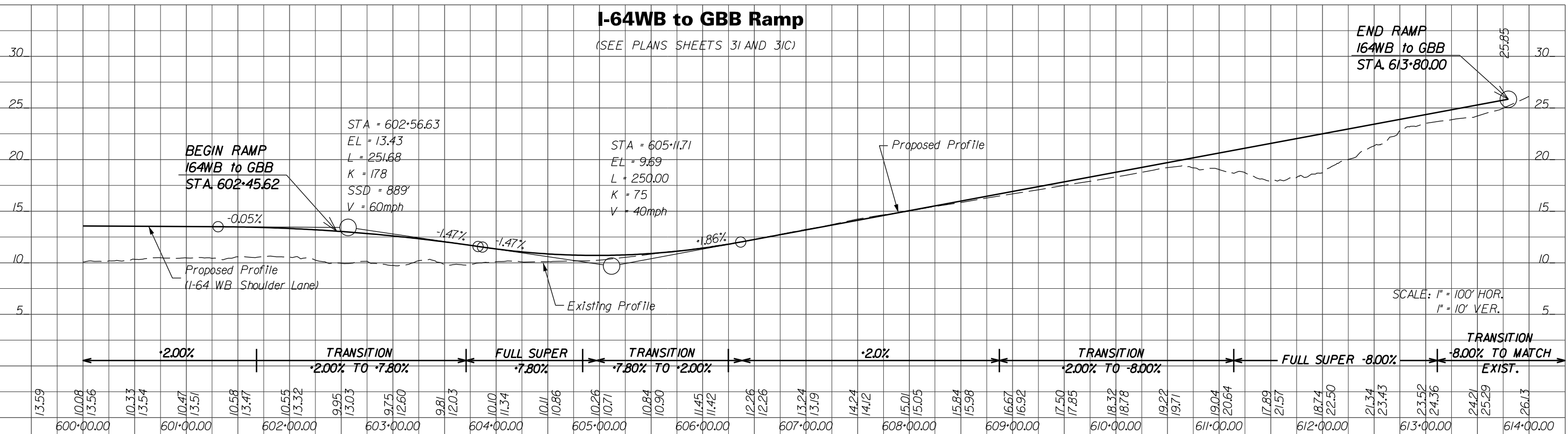
CONCEPTUAL PLANS
PRELIMINARY



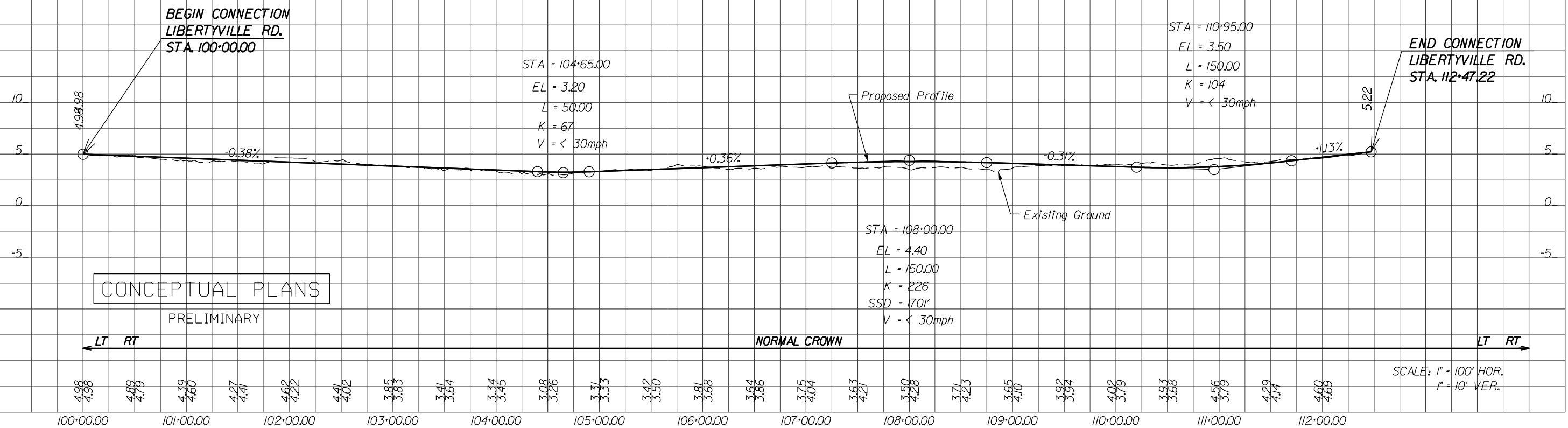
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I-64WB to GBB Ramp

(SEE PLANS SHEETS 31 AND 31C)



Libertyville Road



8/11/2017 5:24:35 PM Plotted By: turkm DIC:\366029B.dgn

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LMB

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STATE PROJECT
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 B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

CONCEPTUAL PLANS

PRELIMINARY

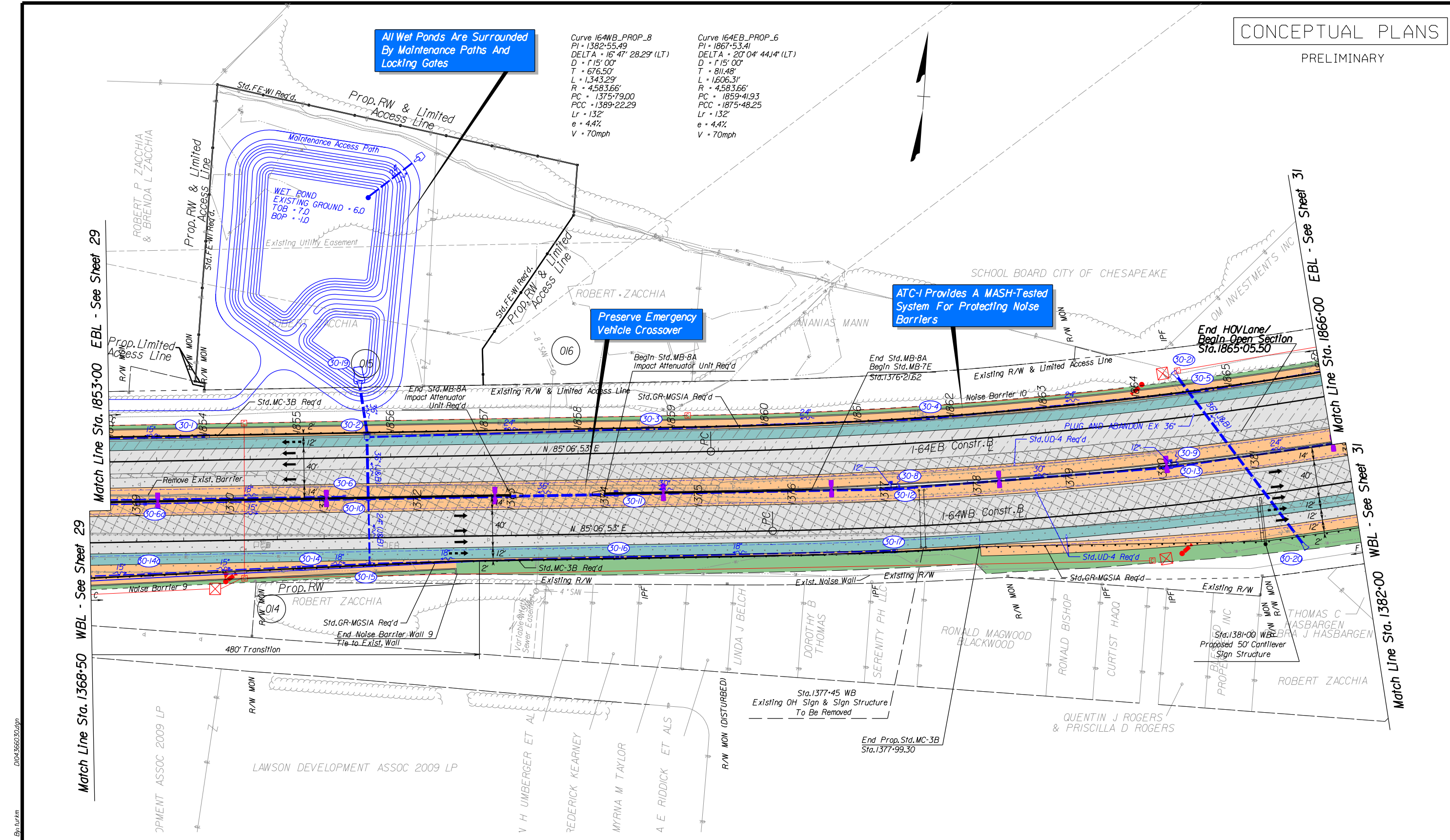
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 PI = 1382+55.49
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 D = 115' 00"
 T = 676.50'
 L = 1,343.29'
 R = 4,583.66'
 PC = 1375+79.00
 PCC = 1389+22.29
 Lr = 132'
 e = 4.4%
 V = 70mph

Curve 164EB_PROP_6
 PI = 1867+53.41
 DELTA = 20° 04' 44.14" (LT)
 D = 115' 00"
 T = 811.48'
 L = 1,606.31'
 R = 4,583.66'
 PC = 1859+41.93
 PCC = 1875+48.25
 Lr = 132'
 e = 4.4%
 V = 70mph

All Wet Ponds Are Surrounded By Maintenance Paths And Locking Gates

Preserve Emergency Vehicle Crossover

ATC-I Provides A MASH-Tested System For Protecting Noise Barriers

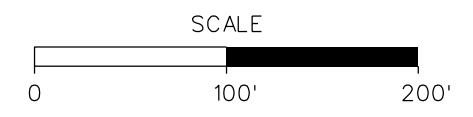


Legend

Denotes Full Depth Pavement	Denotes Hard Shoulder Running	Proposed Pole-Mount Junction Box	Proposed Motor Vehicle Detection Sensor w/ Quantity
Denotes Mill & Overlay	Denotes Limits of Outside Grading	Proposed Communications Junction Box	Light Pole with LED Luminaire
Denotes Demolition of Pavement	Denotes Travel Lanes	Proposed Lane Control Signal on Mast Arm	Light Pole with Twin LED Luminaires
Denotes Bridge Approach Slab	Denotes Paved Shoulder	Proposed Lane Control Signal on Overhead Sign Structure	Existing Light Pole and Luminaire to be Removed
Denotes Prop. Bridge Limits	Denotes Construction Limits in Cuts	Proposed Camera with Pole	Proposed Linear BMP
Denotes Exist. Bridge Limits	Denotes Construction Limits in Fills	Proposed ITS Cabinet	Proposed Drainage Ditch

REFERENCES (PROFILES)

EB I-64 Profile	30A
WB I-64 Profile	30A



DESIGN BUILDER
LMB

DESIGNED BY
JMT

STATE PROJECT
 0064-131-811, P101, R201, C501
 B662-B670, D637, D638

STV Incorporated

VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO.
30
 PAGE NO.
127

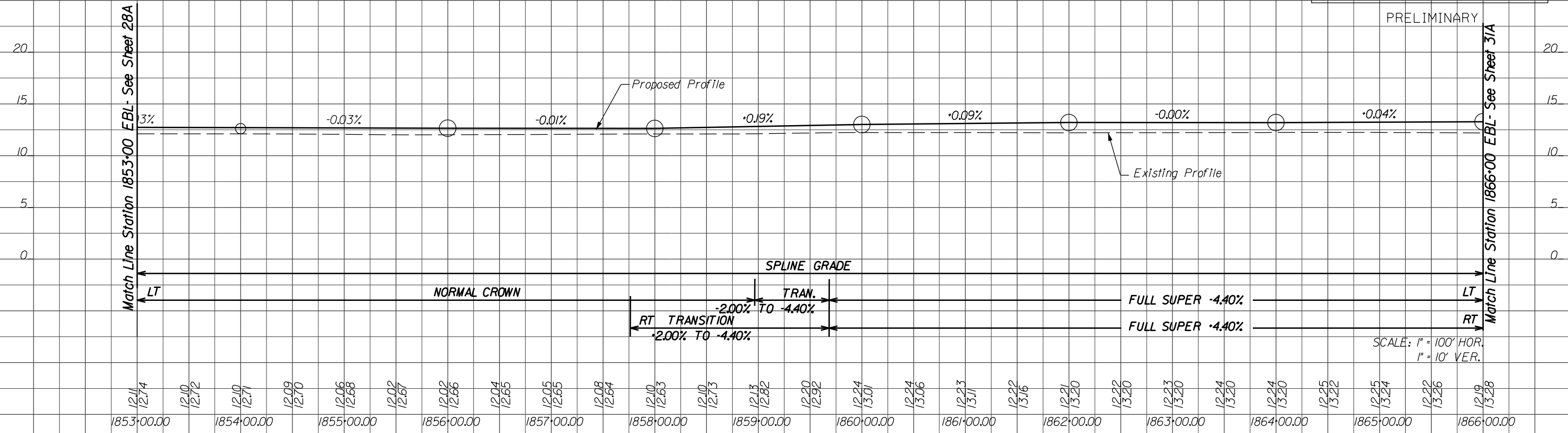
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 8/1/2017
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I-64 Eastbound

I-64 EB
Sta. 1845+00 to Sta. 1925+50 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

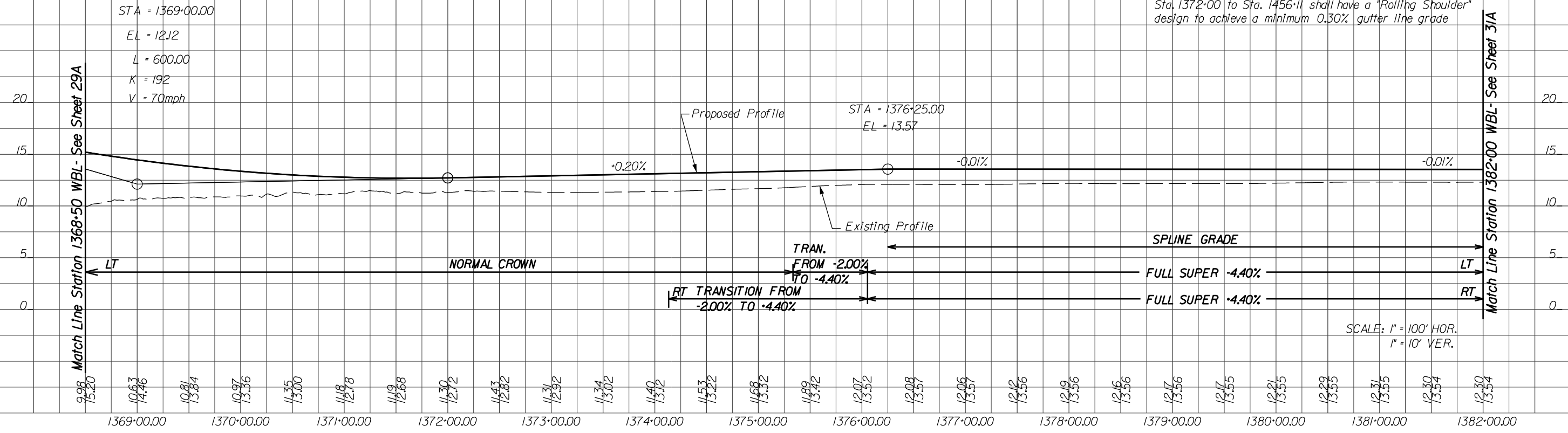
CONCEPTUAL PLANS

PRELIMINARY



I-64 Westbound

I-64 WB
Sta. 1372+00 to Sta. 1456+11 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

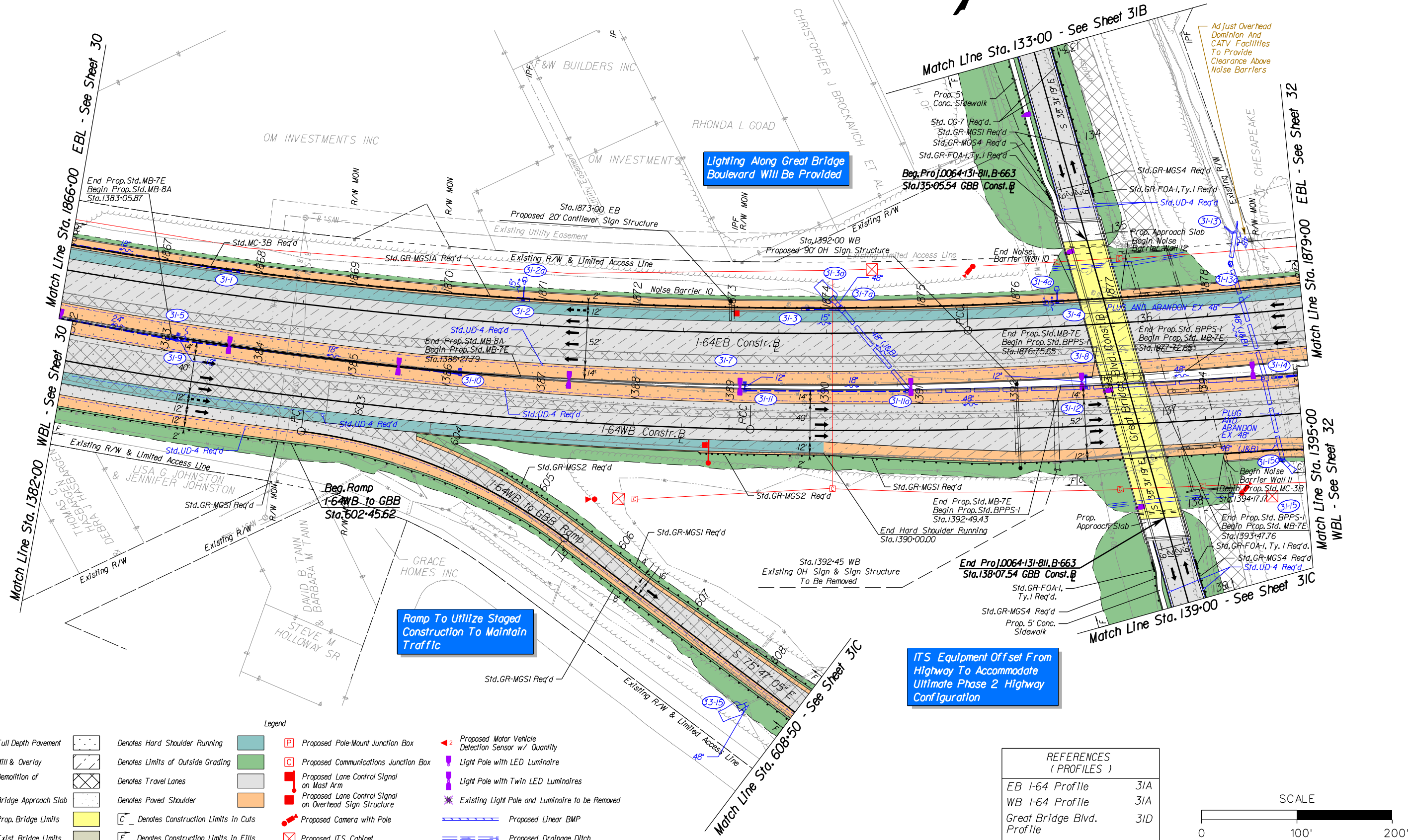


8/11/2017 5:25:03 PM Plotted By: turkm DIC4366030A.dgn

CONCEPTUAL PLANS

PRELIMINARY

Curve I64WB_PROP_8 PI = 1382+55.49 DELTA = 16° 47' 28.29" (LT) D = 1' 15" 00" T = 676.50' L = 1,343.29' R = 4,583.66' PC = 1375+79.00 PCC = 1389+22.29 Lr = 132' e = 4.4% V = 70mph	Curve I64WB_PROP_9 PI = 1401+72.48 DELTA = 24° 37' 04.71" (LT) D = 1' 00" 00" T = 1,250.19' L = 2,461.80' R = 5,729.58' PC = 1389+22.29 PCC = 1413+84.09 Lr = 108' e = 3.6% V = 70mph	Curve I64EB_PROP_6 PI = 1867+53.41 DELTA = 20° 04' 44.14" (LT) D = 1' 15" 00" T = 811.48' L = 1,606.31' R = 4,583.66' PC = 1859+41.93 PCC = 1875+48.25 Lr = 132' e = 4.4% V = 70mph	Curve I64EB_PROP_7 PI = 1886+19.49 DELTA = 21° 10' 48.86" (LT) D = 1' 00" 00" T = 1,071.24' L = 2,118.02' R = 5,729.58' PCC = 1875+48.25 PT = 1896+66.27 Lr = 108' e = 3.6% V = 70mph	Curve I64W_GBB_J PI = 603+99.93 DELTA = 30° 02' 36.22" (RT) D = 9' 57" 52" T = 154.30' L = 301.50' R = 575.00' PC = 602+45.62 PT = 605+47.13 Lr = 190' e = 7.8% V = 40mph
--	--	--	--	--



Adjust Overhead
Dominion And
CATV Facilities
To Provide
Clearance Above
Noise Barriers

Lighting Along Great Bridge
Boulevard Will Be Provided

Ramp To Utilize Staged
Construction To Maintain
Traffic

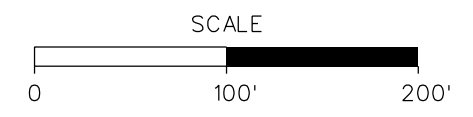
ITS Equipment Offset From
Highway To Accommodate
Ultimate Phase 2 Highway
Configuration

Legend

Denotes Full Depth Pavement	Denotes Hard Shoulder Running	Proposed Pole-Mount Junction Box	Proposed Motor Vehicle Detection Sensor w/ Quantity
Denotes Mill & Overlay	Denotes Limits of Outside Grading	Proposed Communications Junction Box	Light Pole with LED Luminaire
Denotes Demolition of Pavement	Denotes Travel Lanes	Proposed Lane Control Signal on Mast Arm	Light Pole with Twin LED Luminaires
Denotes Bridge Approach Slab	Denotes Paved Shoulder	Proposed Lane Control Signal on Overhead Sign Structure	Existing Light Pole and Luminaire to be Removed
Denotes Prop. Bridge Limits	Denotes Construction Limits in Cuts	Proposed Camera with Pole	Proposed Linear BMP
Denotes Exist. Bridge Limits	Denotes Construction Limits in Fills	Proposed ITS Cabinet	Proposed Drainage Ditch

REFERENCES (PROFILES)

EB I-64 Profile	31A
WB I-64 Profile	31A
Great Bridge Blvd. Profile	31D
I-64WB to GBB Ramp	29B



DESIGN BUILDER

DESIGNED BY

STV Incorporated

STATE PROJECT

0064-131-811, P101, R201, C501
B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO. 31

PAGE NO. 129

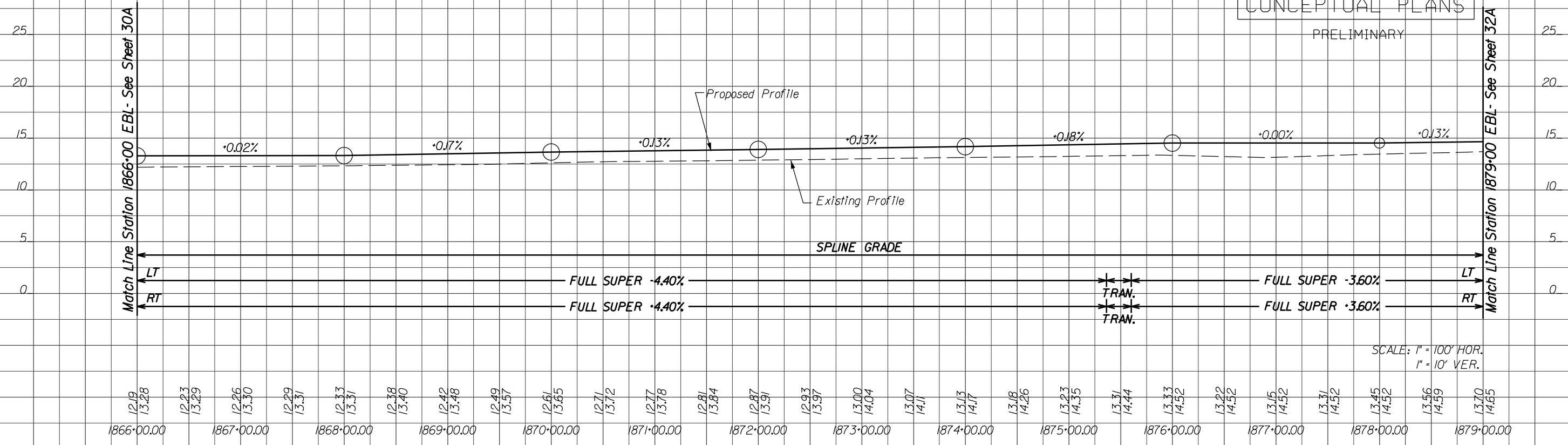
8/1/2017 5:25:57 PM Plotted By: turkm DIC4366031A.dgn

I-64 Eastbound

I-64 EB
Sta. 1845+00 to Sta. 1925+50 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

CONCEPTUAL PLANS

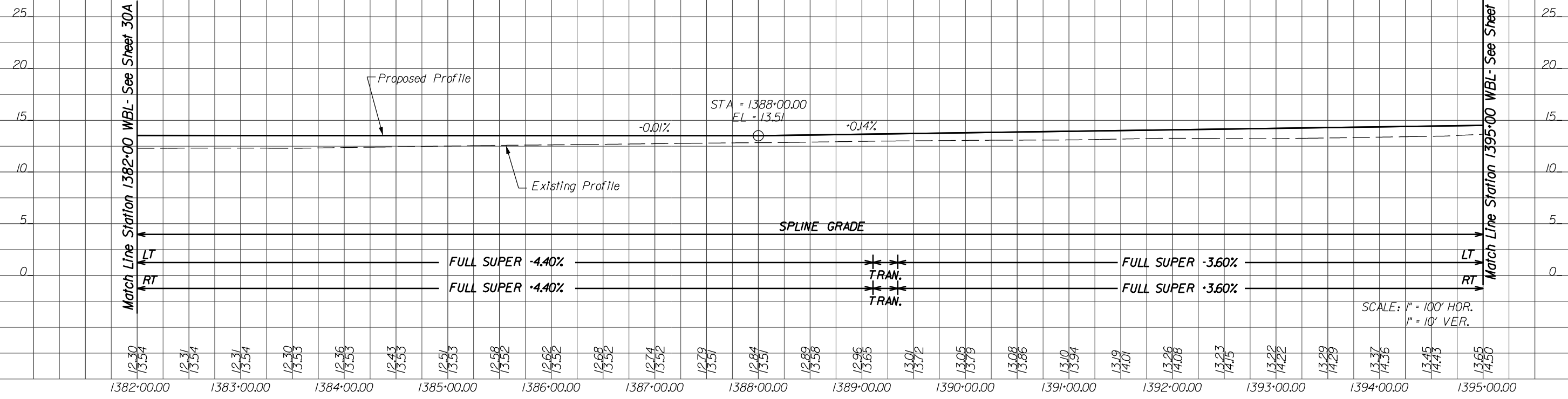
PRELIMINARY



SCALE: 1" = 100' HOR.
1" = 10' VER.

I-64 Westbound

I-64 WB
Sta. 1372+00 to Sta. 1456+11 shall have a "Rolling Shoulder" design to achieve a minimum 0.30% gutter line grade

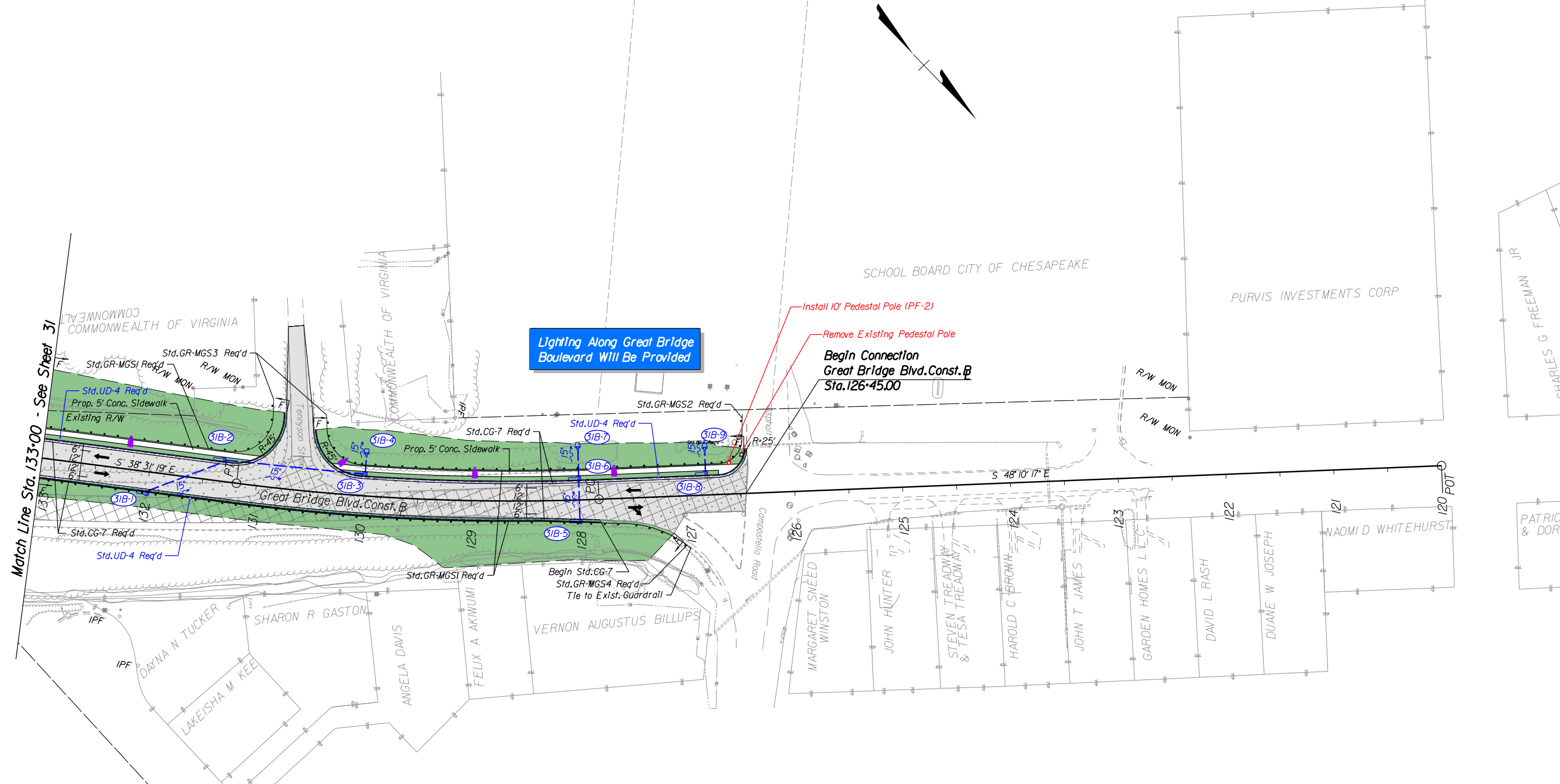


SCALE: 1" = 100' HOR.
1" = 10' VER.

CONCEPTUAL PLANS

PRELIMINARY

Curve GBB-1
 PI = 129+50.55
 DELTA = 9° 38' 57.44" (RT)
 D = 2° 51' 53"
 T = 168.81'
 L = 336.82'
 R = 2,000.00'
 PC = 127+81.74
 PT = 131+18.57
 Lr = 54'
 e = 2.6%
 V = 40mph



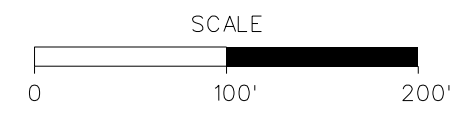
Lighting Along Great Bridge Boulevard Will Be Provided

Install 10' Pedestal Pole (PF-2)
 Remove Existing Pedestal Pole
 Begin Connection Great Bridge Blvd. Const. B Sta. 126+45.00

5:26:57 PM
 Plotted By: burkm
 8/1/2017
 D:\04366031B.dgn

Legend			
Denotes Full Depth Pavement	Denotes Hard Shoulder Running	Proposed Pole-Mount Junction Box	Proposed Motor Vehicle Detection Sensor w/ Quantity
Denotes Mill & Overlay	Denotes Limits of Outside Grading	Proposed Communications Junction Box	Light Pole with LED Luminaire
Denotes Demolition of Pavement	Denotes Travel Lanes	Proposed Lane Control Signal on Mast Arm	Light Pole with Twin LED Luminaires
Denotes Bridge Approach Slab	Denotes Paved Shoulder	Proposed Lane Control Signal on Overhead Sign Structure	Existing Light Pole and Luminaire to be Removed
Denotes Prop. Bridge Limits	Denotes Construction Limits in Cuts	Proposed Camera with Pole	Proposed Linear BMP
Denotes Exist. Bridge Limits	Denotes Construction Limits in Fills	Proposed ITS Cabinet	Proposed Drainage Ditch

REFERENCES (PROFILES)	
Great Bridge Blvd. Profile	31D



DESIGN BUILDER
LMB
 DESIGNED BY
JMT.
STV Incorporated
 STATE PROJECT
 CHARLES G FREEMAN JR
 PATRICIA & DORIS
 0064-131-811, P101, R201, C501
 B662-B670, D637, D638
 VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I
 SHEET NO.
31B
 PAGE NO.
131

CONCEPTUAL PLANS

PRELIMINARY



DESIGNED BY
STV Incorporated



STATE PROJECT
0064-131-811, P101, R201, C501
B662-B670, D637, D638

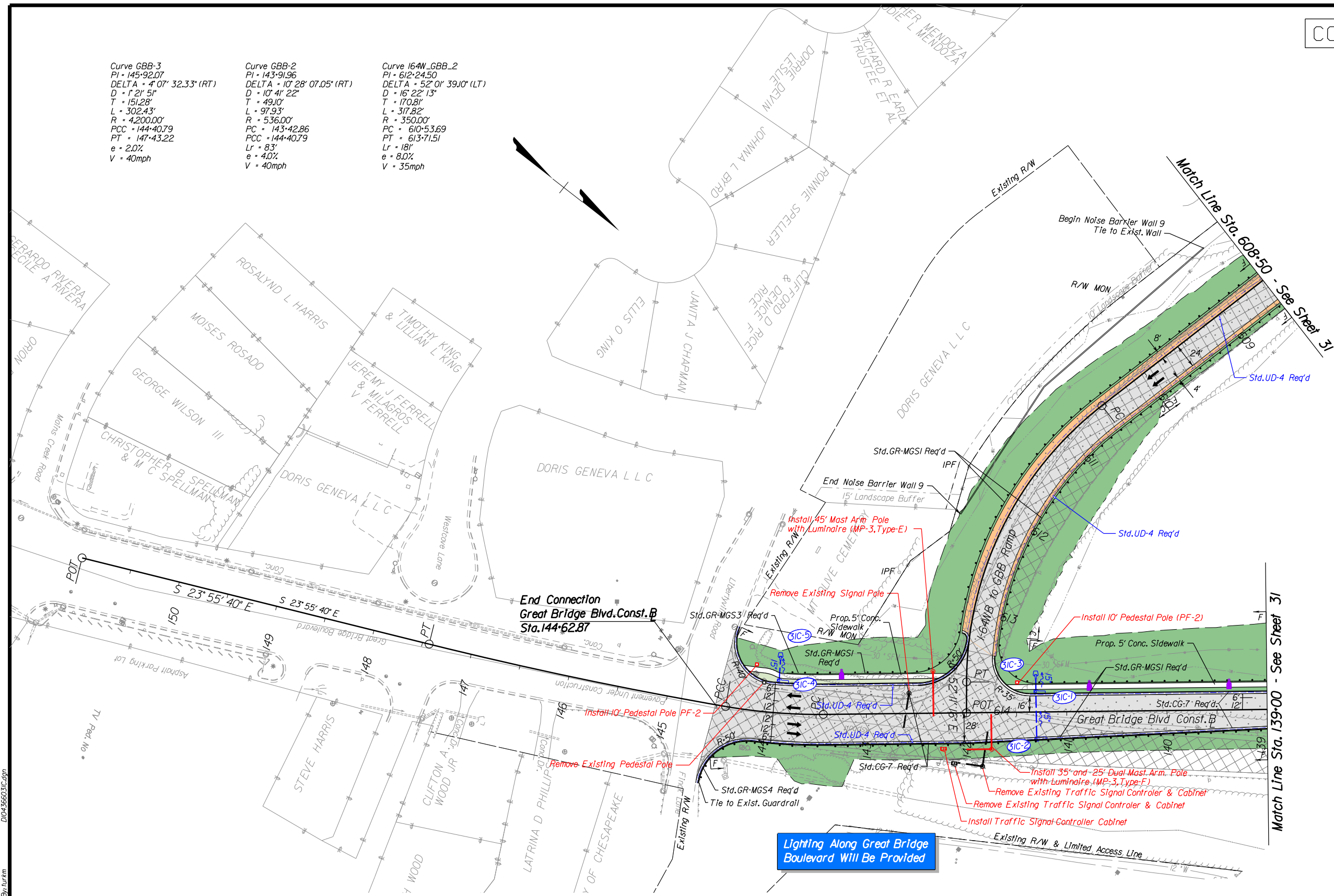
VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND
HIGH RISE BRIDGE, PHASE 1

SHEET NO.
31C
PAGE NO.
132

Curve GBB-3
PI = 145-92.07
DELTA = 4° 07' 32.33" (RT)
D = 121' 51"
T = 151.28'
L = 302.43'
R = 4,200.00'
PCC = 144-40.79
PT = 147-43.22
e = 2.0%
V = 40mph

Curve GBB-2
PI = 143-91.96
DELTA = 10° 28' 07.05" (RT)
D = 10' 41' 22"
T = 49.10'
L = 97.93'
R = 536.00'
PCC = 143-42.86
PT = 144-40.79
Lr = 83'
e = 4.0%
V = 40mph

Curve I64W_GBB_2
PI = 612-24.50
DELTA = 52° 01' 39.10" (LT)
D = 16' 22' 13"
T = 170.81'
L = 317.82'
R = 350.00'
PCC = 610-53.69
PT = 613-71.51
Lr = 181'
e = 8.0%
V = 35mph

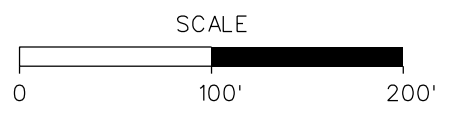


Legend

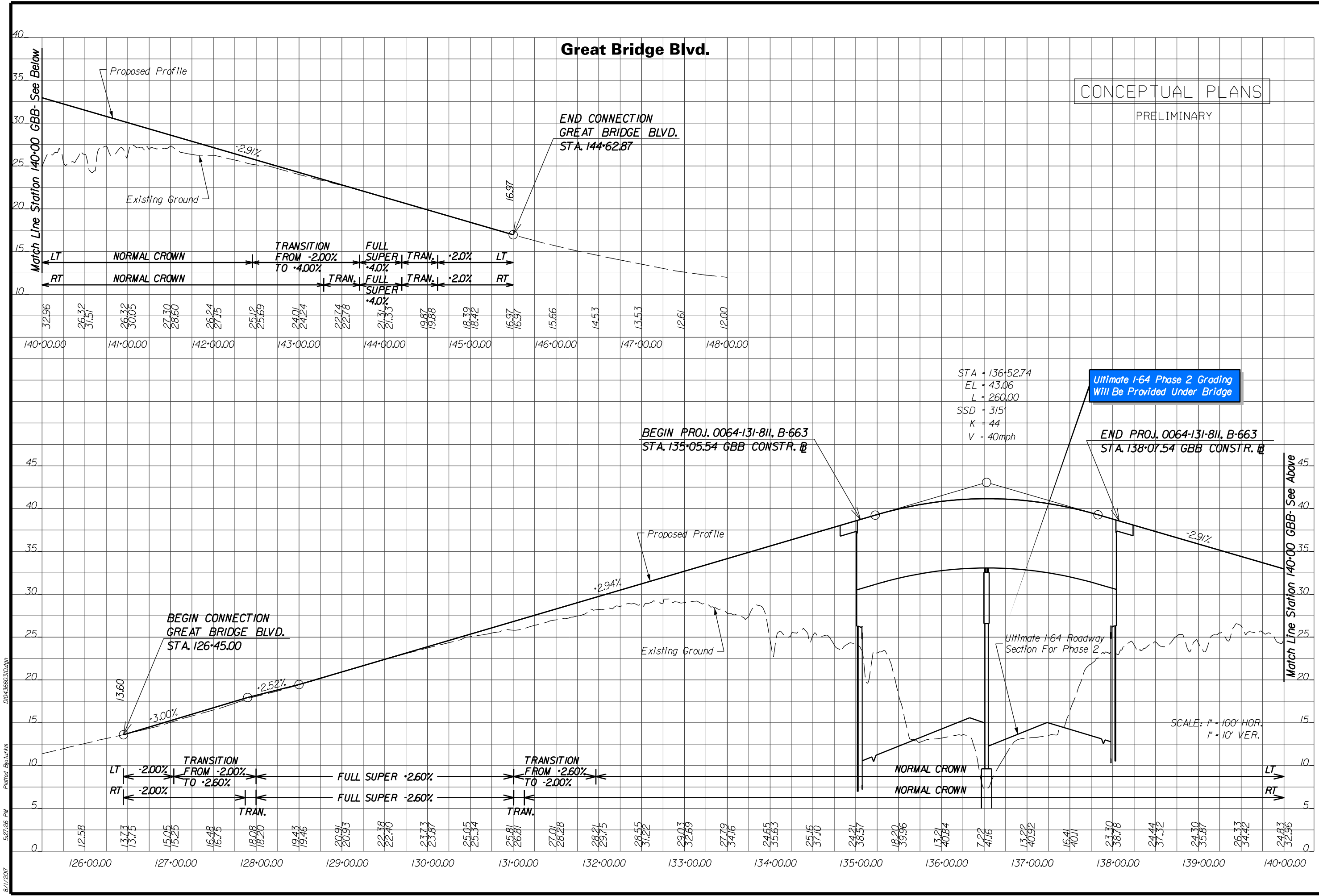
Denotes Full Depth Pavement	Denotes Hard Shoulder Running	Proposed Pole-Mount Junction Box	Proposed Motor Vehicle Detection Sensor w/ Quantity
Denotes Mill & Overlay	Denotes Limits of Outside Grading	Proposed Communications Junction Box	Light Pole with LED Luminaire
Denotes Demolition of Pavement	Denotes Travel Lanes	Proposed Lane Control Signal on Mast Arm	Light Pole with Twin LED Luminaires
Denotes Bridge Approach Slab	Denotes Paved Shoulder	Proposed Lane Control Signal on Overhead Sign Structure	Existing Light Pole and Luminaire to be Removed
Denotes Prop. Bridge Limits	Denotes Construction Limits in Cuts	Proposed Camera with Pole	Proposed Linear BMP
Denotes Exist. Bridge Limits	Denotes Construction Limits in Fills	Proposed ITS Cabinet	Proposed Drainage Ditch

REFERENCES (PROFILES)

Great Bridge Blvd. Profile	31D
I-64WB to GBB Ramp Profile	29B




5:27:23 PM
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 8/1/2017
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8/11/2017 5:27:26 PM Plotted By: turkm DIC436603D.dgn

DESIGN BUILDER




DESIGNED BY



STATE PROJECT

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B662-B670, D637, D638

DESIGNED BY



STV Incorporated

VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

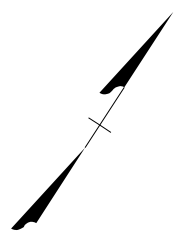
SHEET NO. **31D**

PAGE NO. **133**

CONCEPTUAL PLANS

PRELIMINARY

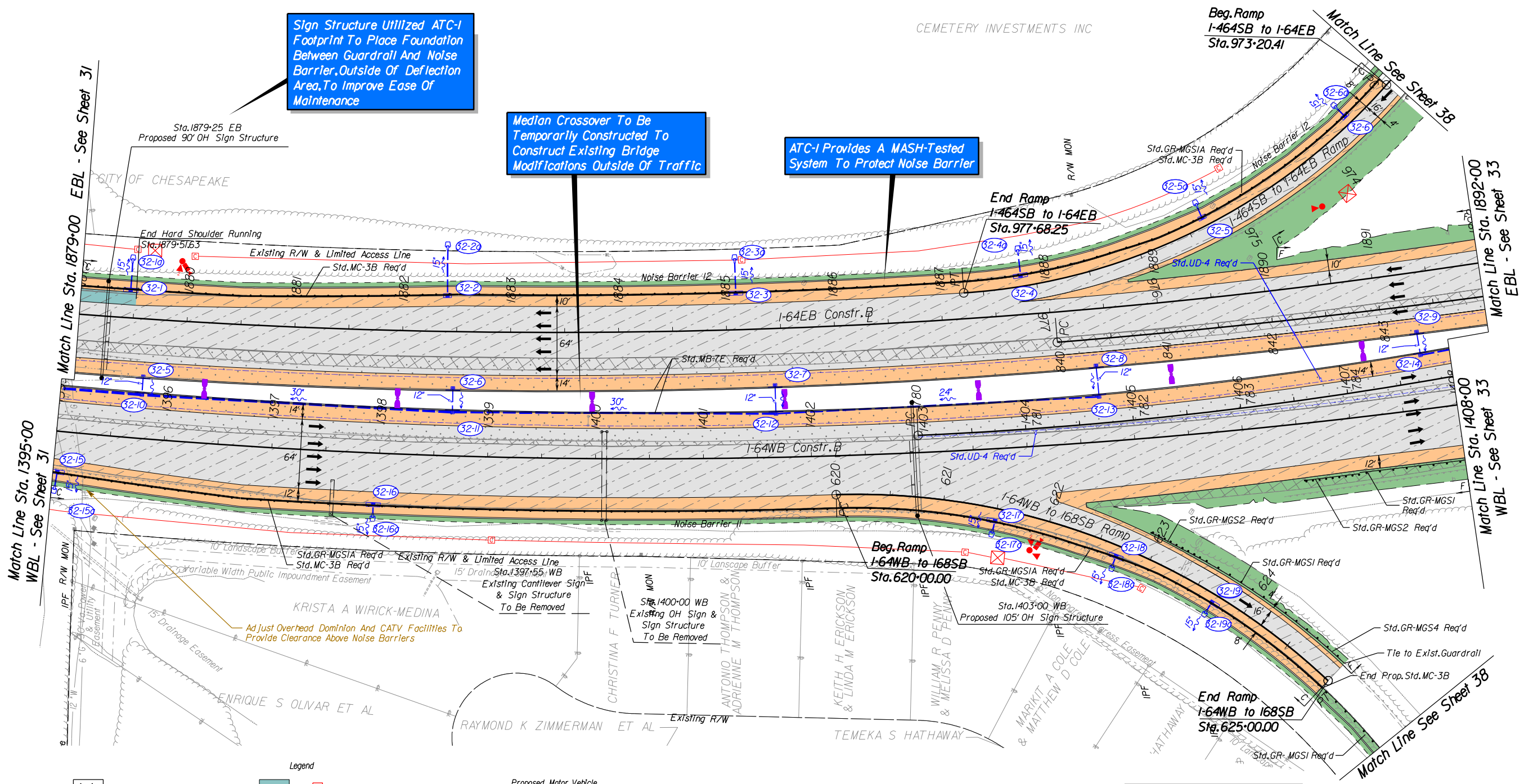
Curve 164WB_PROP_9 PI = 140172.48 DELTA = 24° 37' 04.7" (LT) D = 1'00' 00" T = 1,250.19' L = 2,461.80' R = 5,729.58' PCC = 1389+22.29 PT = 1413+84.09 Lr = 108' e = 3.6% V = 70mph	Curve 164EB_PROP_7 PI = 1886+19.49 DELTA = 21° 10' 48.86" (LT) D = 1'00' 00" T = 1,071.24' L = 2,118.02' R = 5,729.58' PCC = 1875+48.25 PT = 1896+66.27 Lr = 108' e = 3.6% V = 70mph	Curve 464S_64EB_J PI = 975+56.47 DELTA = 44° 47' 00.72" (RT) D = 10'00' 00" T = 236.06' L = 447.84' R = 572.96' PC = 973+20.41 PT = 977+68.25 e = Match Existing V = 40mph	Curve 64WB_I68S_J PI = 622+63.70 DELTA = 45° 00' 00.00" (RT) D = 9'00' 00" T = 263.70' L = 500.00' R = 636.62' PC = 620+00.00 PT = 625+00.00 e = Match Existing V = 40mph	Curve HOVLN_EB_J PI = 845+78.67 DELTA = 8° 39' 32.24" (LT) D = 0'44' 59" T = 578.67' L = 1,155.13' R = 7,643.44' PC = 840+00.00 PT = 851+55.13 e = 2.8% V = 70mph	Curve HOVLN_WB_J PI = 783+58.60 DELTA = 10° 44' 15.48" (LT) D = 1'30' 06" T = 358.60' L = 715.09' R = 3,815.72' PC = 780+00.00 PT = 787+15.09 Lr = 156' e = 5.2% V = 70mph
---	---	--	---	---	---



Sign Structure Utilized ATC-1 Footprint To Place Foundation Between Guardrail And Noise Barrier, Outside Of Deflection Area, To Improve Ease Of Maintenance

Median Crossover To Be Temporarily Constructed To Construct Existing Bridge Modifications Outside Of Traffic

ATC-1 Provides A MASH-Tested System To Protect Noise Barrier



Match Line Sta. 1395+00 WBL - See Sheet 31

Match Line Sta. 1879+00 EBL - See Sheet 31

Match Line Sta. 1892+00 EBL - See Sheet 33

Match Line Sta. 1408+00 WBL - See Sheet 33

Match Line See Sheet 38

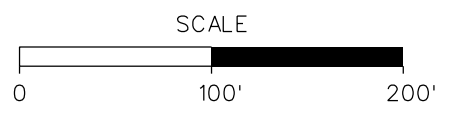
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Legend

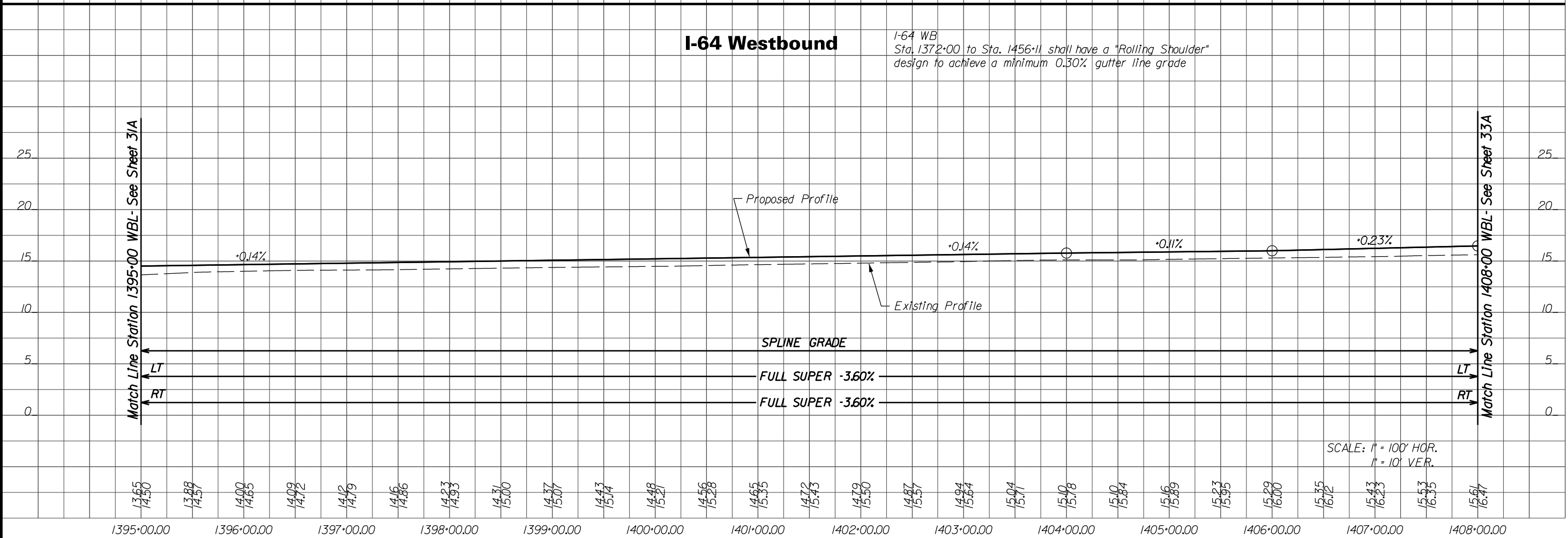
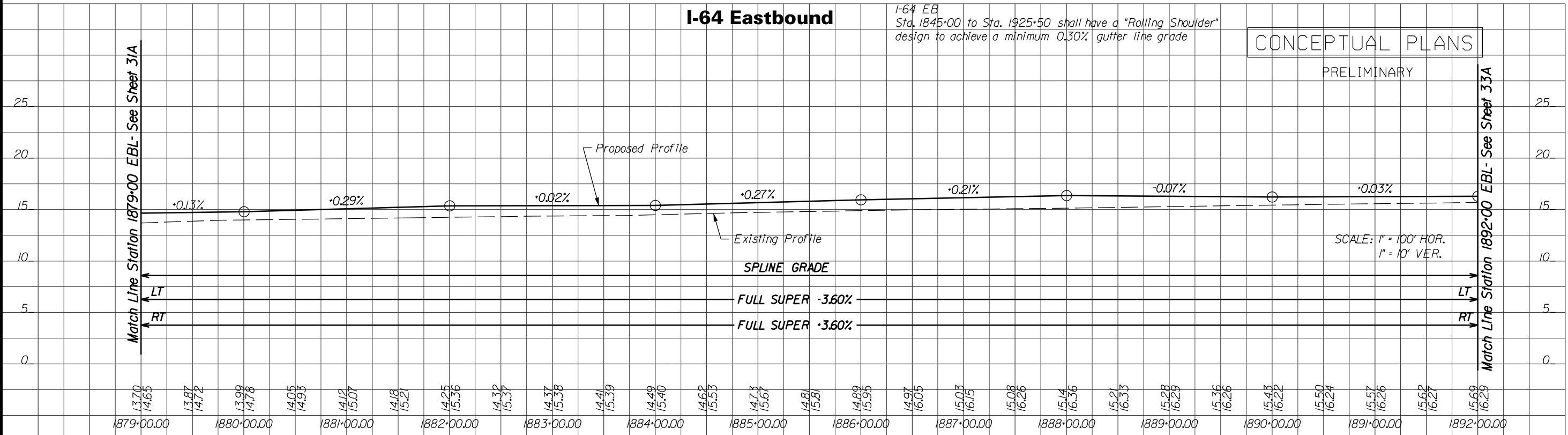
- | | | | |
|--------------------------------|--------------------------------------|---|---|
| Denotes Full Depth Pavement | Denotes Hard Shoulder Running | Proposed Pole-Mount Junction Box | Proposed Motor Vehicle Detection Sensor w/ Quantity |
| Denotes Mill & Overlay | Denotes Limits of Outside Grading | Proposed Communications Junction Box | Light Pole with LED Luminaire |
| Denotes Demolition of Pavement | Denotes Travel Lanes | Proposed Lane Control Signal on Mast Arm | Light Pole with Twin LED Luminaires |
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| Denotes Prop. Bridge Limits | Denotes Construction Limits in Cuts | Proposed Camera with Pole | Proposed Linear BMP |
| Denotes Exist. Bridge Limits | Denotes Construction Limits in Fills | Proposed ITS Cabinet | Proposed Drainage Ditch |

REFERENCES (PROFILES)

EB I-64 Profile	32A
WB I-64 Profile	32A
I-64WB to I68SB Ramp Profile	33B
I-464SB to I-64EB Ramp Profile	33B



8/1/2017 5:28:32 PM Plotted By: turkm D:\4366032A.dgn



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DESIGN BUILDER

STATE PROJECT

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B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION

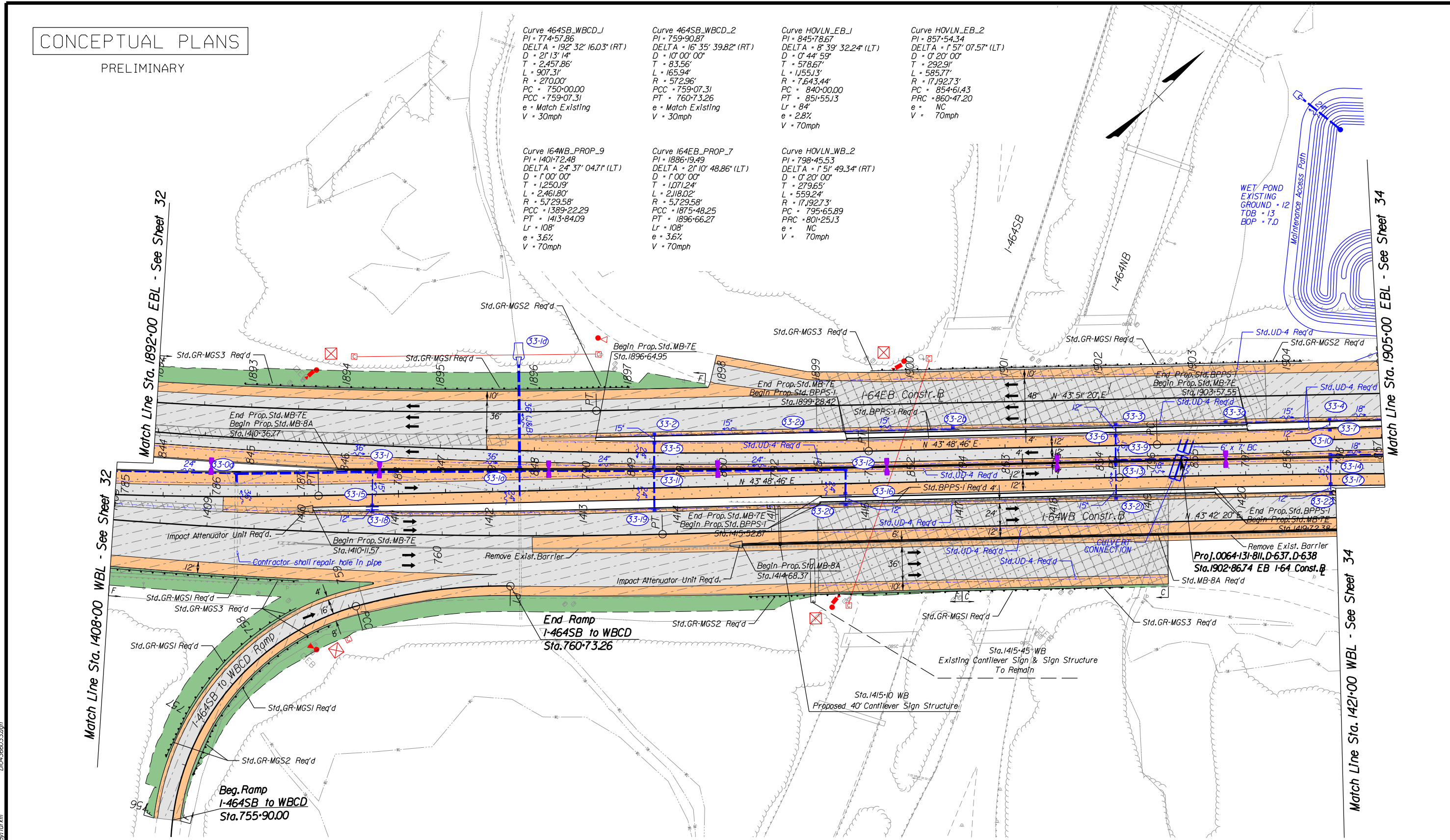
I-64 SOUTH SIDE WIDENING AND
HIGH RISE BRIDGE, PHASE I

SHEET NO.
32A

PAGE NO.
135

CONCEPTUAL PLANS

PRELIMINARY

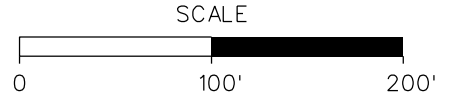


Legend

Denotes Full Depth Pavement	Denotes Hard Shoulder Running	Proposed Pole-Mount Junction Box	Proposed Motor Vehicle Detection Sensor w/ Quantity
Denotes Mill & Overlay	Denotes Limits of Outside Grading	Proposed Communications Junction Box	Light Pole with LED Luminaire
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REFERENCES (PROFILES)

WB I-64 Profile	33A
WB I-64 Profile	33A
I-64SB to WBCD Rd. Ramp Profile	33B
I-64SB to I-64EB Ramp Profile	33B
I-64WB to I68SB Ramp Profile	33B



DESIGN BUILDER
LMB

DESIGNED BY
JMT

DESIGNED BY
STV Incorporated

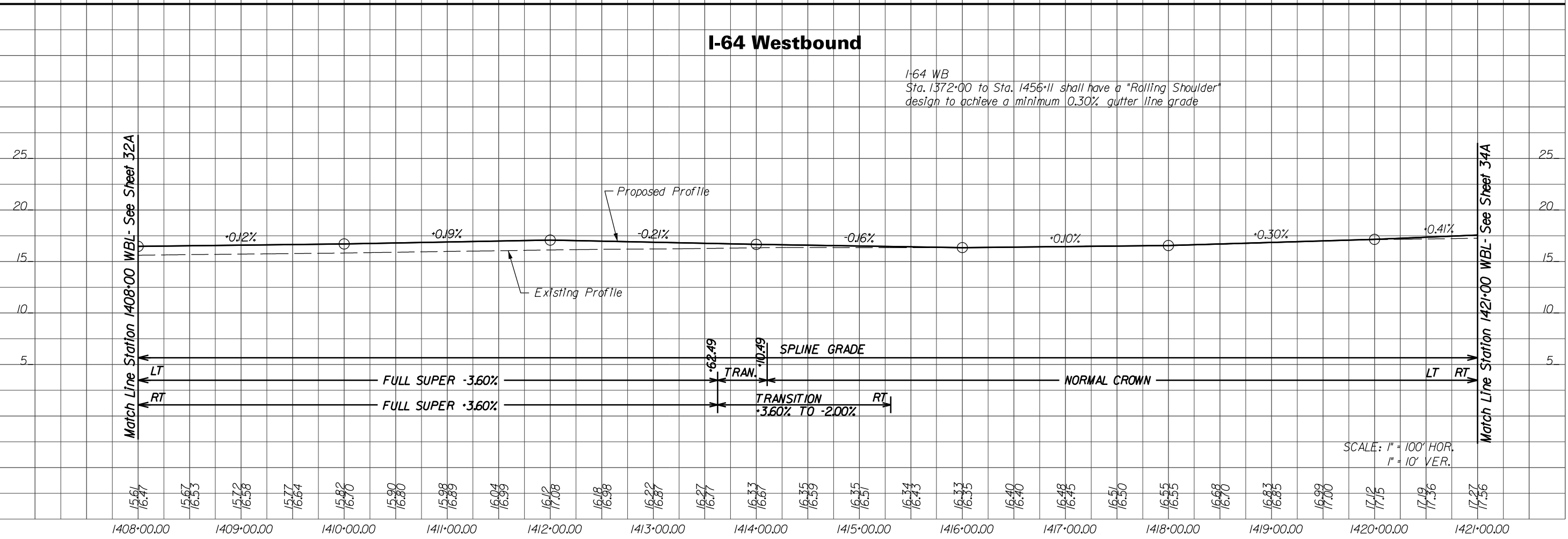
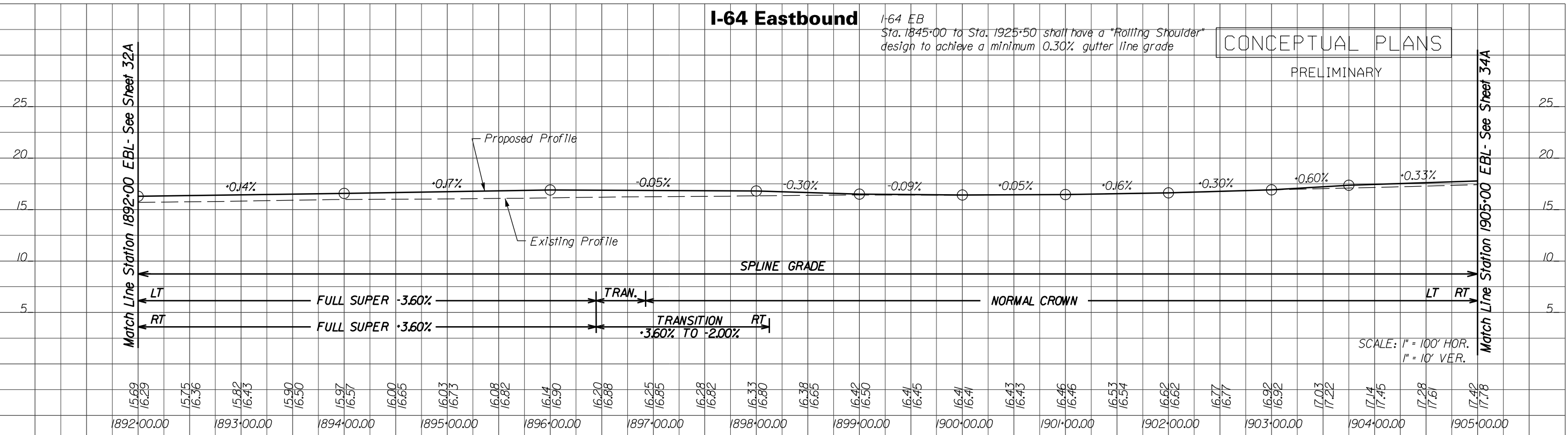
STATE PROJECT
 0064-131-811, P101, R201, C501
 B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO.
33

PAGE NO.
136

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B662-B670, D637, D638

VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTH SIDE WIDENING AND
HIGH RISE BRIDGE, PHASE I

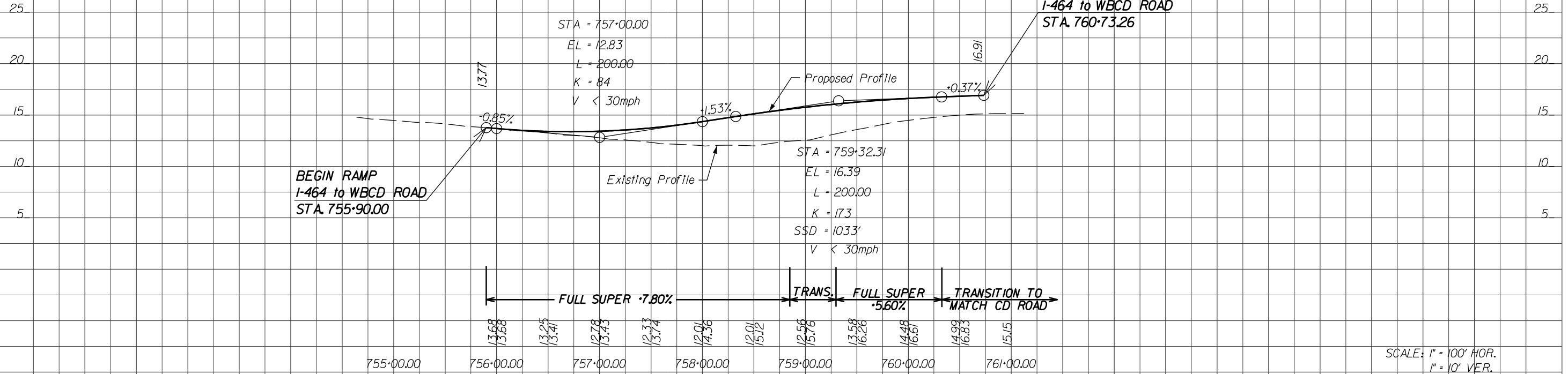
SHEET NO.
33A

PAGE NO.
137

I-464SB to WBCD Ramp

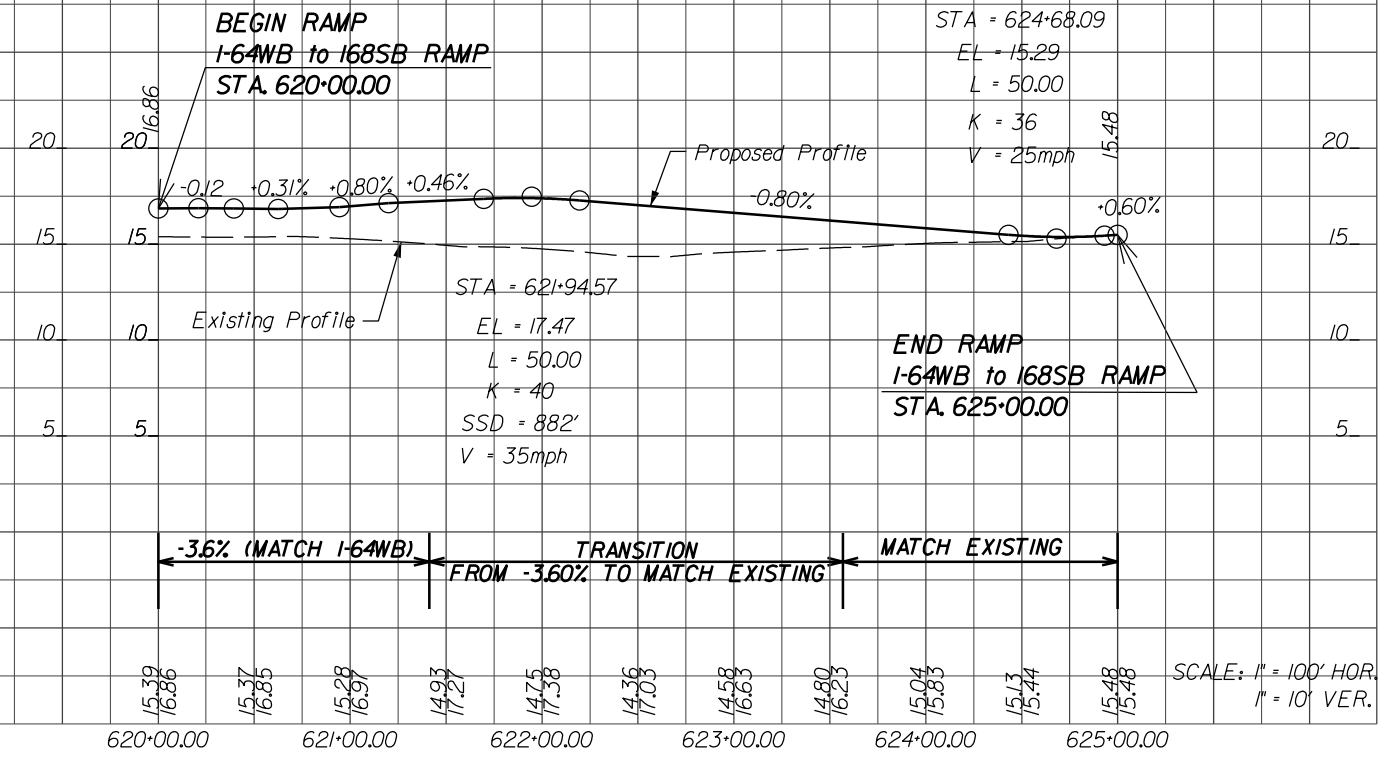
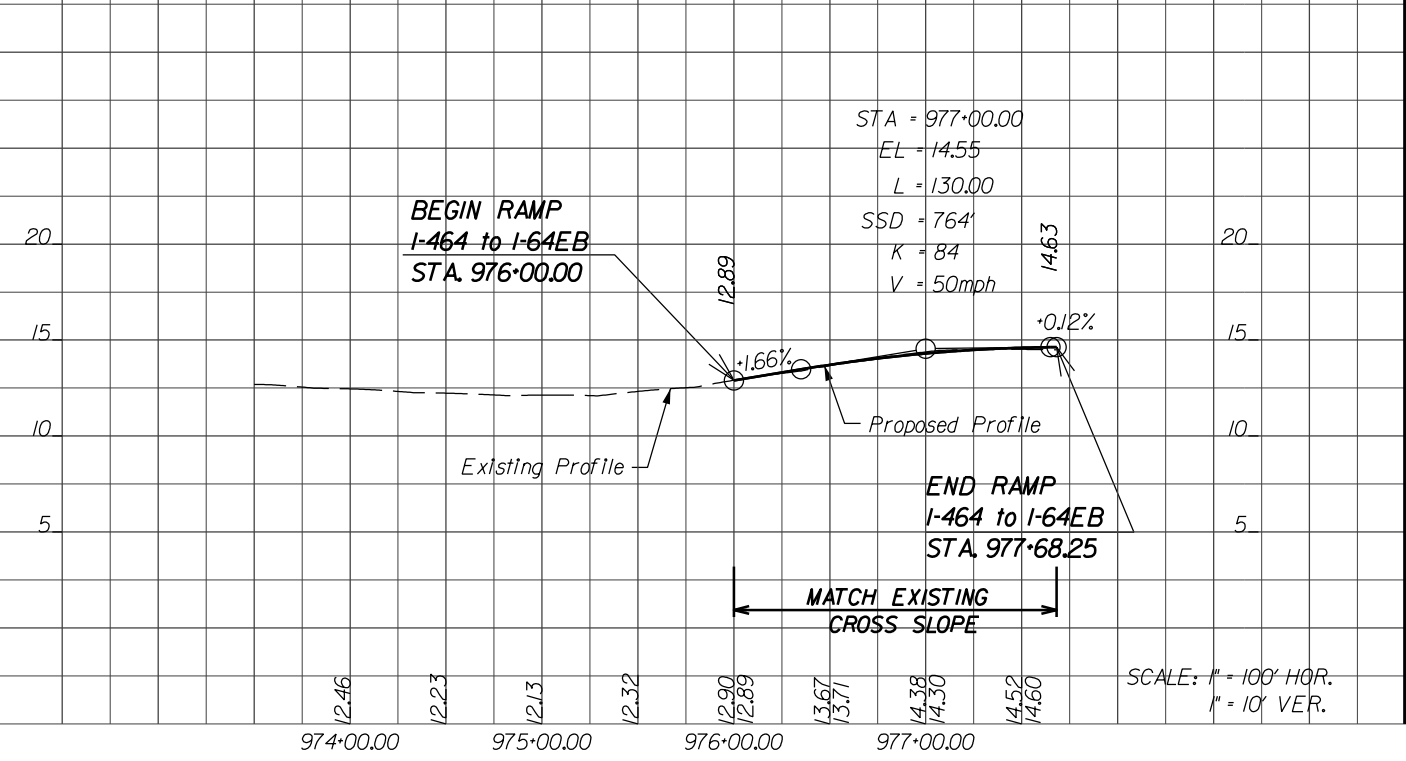
CONCEPTUAL PLANS

PRELIMINARY



I-464SB to I-64EB Ramp

I-64WB to 168SB Ramp



8/1/2017 5:29:26 PM Plotted By: turkm D:\436603\3D.dgn

CONCEPTUAL PLANS

PRELIMINARY

Curve I64WB_PROP_10
 PI = 1436+32.73
 DELTA = 1°10' 33.54" (LT)
 D = 0' 20' 00"
 T = 176.40'
 L = 352.79'
 R = 17,188.73'
 PC = 1434+56.33
 PRC = 1438+09.12
 e = NC
 V = 70mph

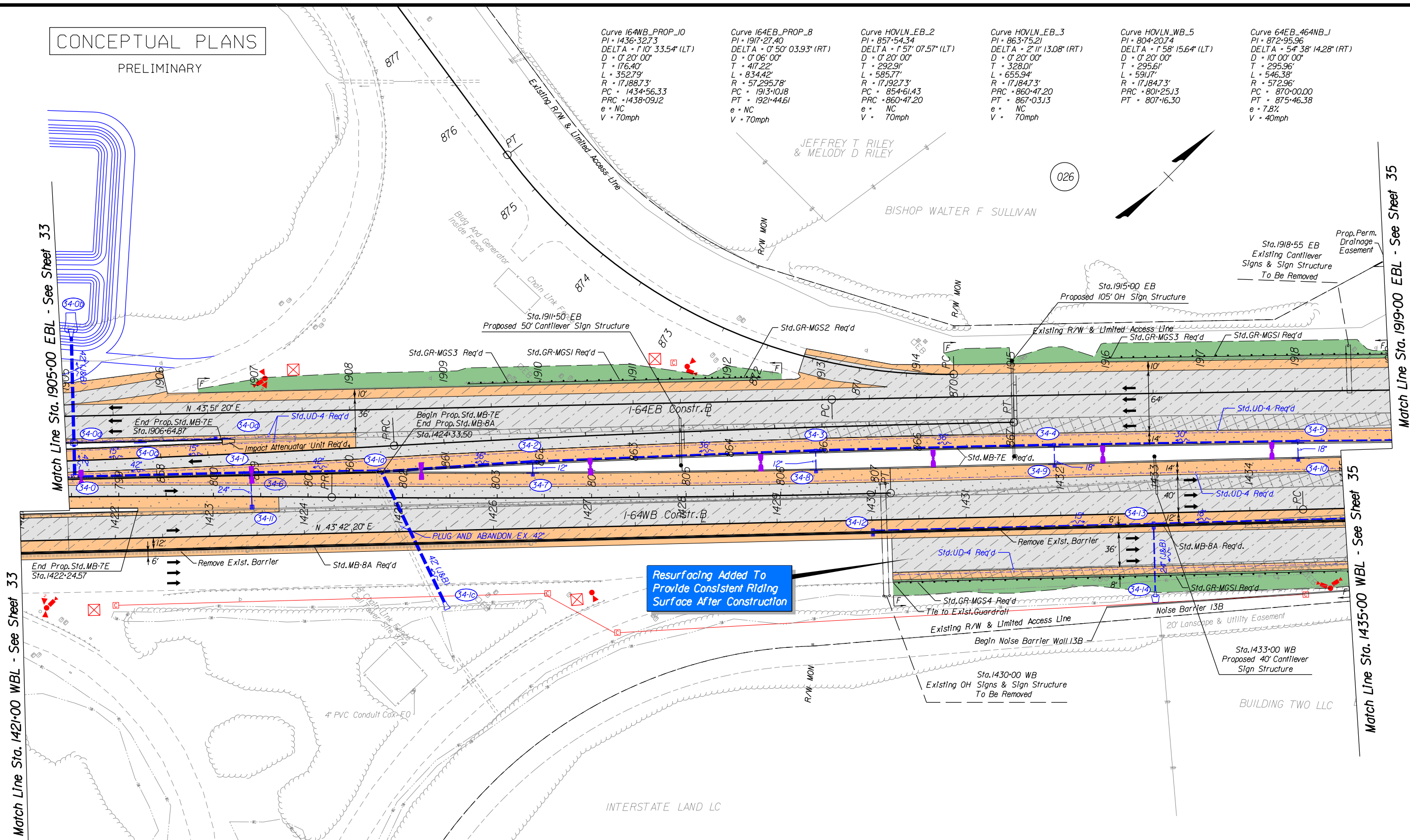
Curve I64EB_PROP_8
 PI = 1917+27.40
 DELTA = 0°50' 03.93" (RT)
 D = 0' 06' 00"
 T = 417.22'
 L = 834.42'
 R = 57,295.78'
 PC = 1913+10.18
 PT = 1921+44.61
 e = NC
 V = 70mph

Curve HOVLN_EB_2
 PI = 857+54.34
 DELTA = 1°57' 07.57" (LT)
 D = 0' 20' 00"
 T = 292.91'
 L = 585.77'
 R = 17,192.73'
 PC = 854+61.43
 PRC = 860+47.20
 e = NC
 V = 70mph

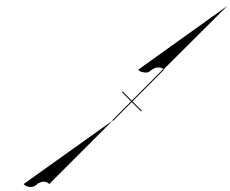
Curve HOVLN_EB_3
 PI = 863+75.21
 DELTA = 2°11' 13.08" (RT)
 D = 0' 20' 00"
 T = 328.01'
 L = 655.94'
 R = 17,184.73'
 PC = 860+47.20
 PRC = 801+25.13
 PT = 807+16.30
 e = NC
 V = 70mph

Curve HOVLN_WB_5
 PI = 804+20.74
 DELTA = 1°58' 15.64" (LT)
 D = 0' 20' 00"
 T = 295.61'
 L = 591.17'
 R = 17,184.73'
 PC = 801+25.13
 PRC = 807+16.30
 PT = 807+16.30
 e = 7.8%
 V = 40mph

Curve 64EB_464NB_1
 PI = 872+95.96
 DELTA = 5°43' 14.28" (RT)
 D = 10' 00' 00"
 T = 295.96'
 L = 546.38'
 R = 572.96'
 PC = 870+00.00
 PT = 875+46.38
 e = 7.8%
 V = 40mph

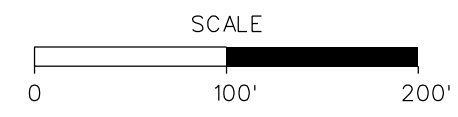


026



- Legend**
- Denotes Full Depth Pavement
 - Denotes Mill & Overlay
 - Denotes Demolition of Pavement
 - Denotes Bridge Approach Slab
 - Denotes Prop. Bridge Limits
 - Denotes Exst. Bridge Limits
 - Denotes Hard Shoulder Running
 - Denotes Limits of Outside Grading
 - Denotes Travel Lanes
 - Denotes Paved Shoulder
 - Denotes Construction Limits in Cuts
 - Denotes Construction Limits in Fills
 - Proposed Pole-Mount Junction Box
 - Proposed Communications Junction Box
 - Proposed Lane Control Signal on Mast Arm
 - Proposed Lane Control Signal on Overhead Sign Structure
 - Proposed Camera with Pole
 - Proposed ITS Cabinet
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 - Light Pole with LED Luminaire
 - Light Pole with Twin LED Luminaires
 - Existing Light Pole and Luminaire to be Removed
 - Proposed Linear BMP
 - Proposed Drainage Ditch

REFERENCES (PROFILES)	
EB I-64 Profile	34A
WB I-64 Profile	34A



DESIGN BUILDER

DESIGNED BY

STV Incorporated

STATE PROJECT

0064-131-811, P101, R201, C501
B662-B670, D637, D638

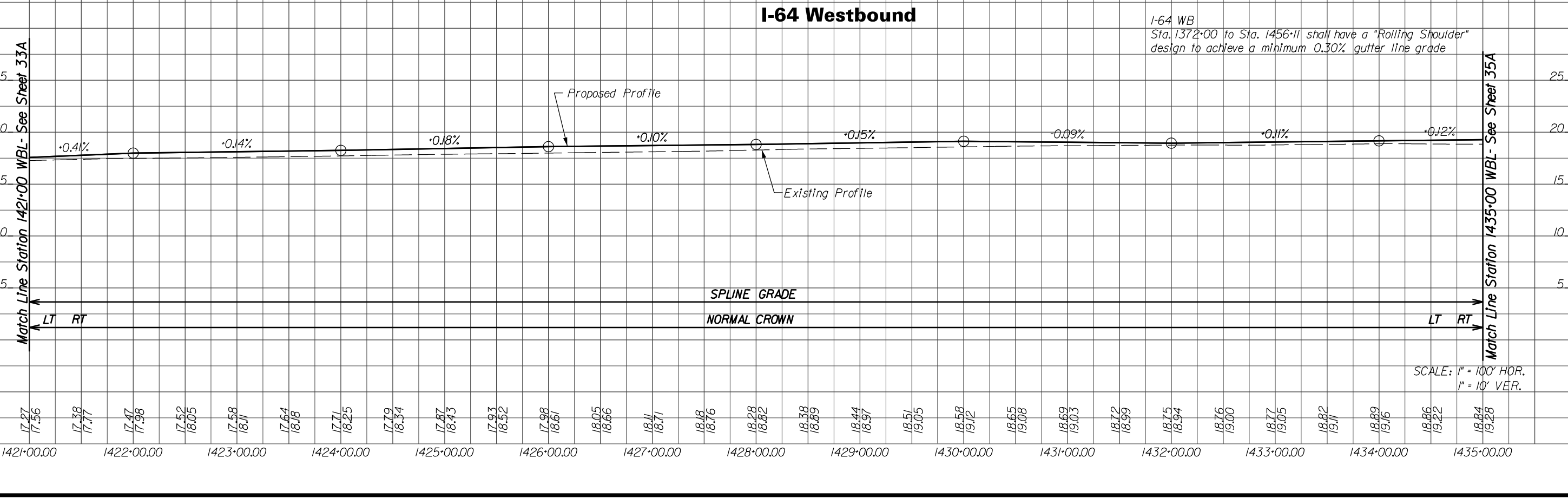
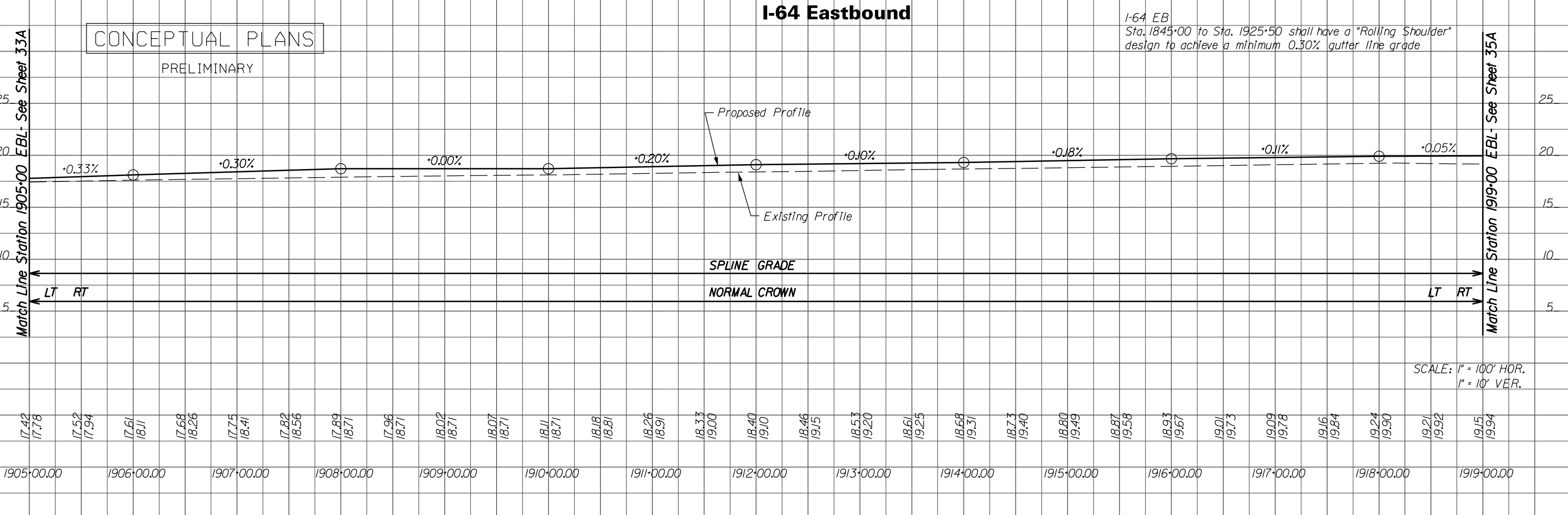
VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO. 34

PAGE NO. 139

8/1/2017 5:30:05 PM Plotted By: turkm DIC:\366034.dgn



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DESIGN BUILDER

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VIRGINIA DEPARTMENT OF TRANSPORTATION

0064-131-811, P101, R201, C501
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I-64 SOUTH SIDE WIDENING AND
HIGH RISE BRIDGE, PHASE I

SHEET NO.
34A

PAGE NO.
140

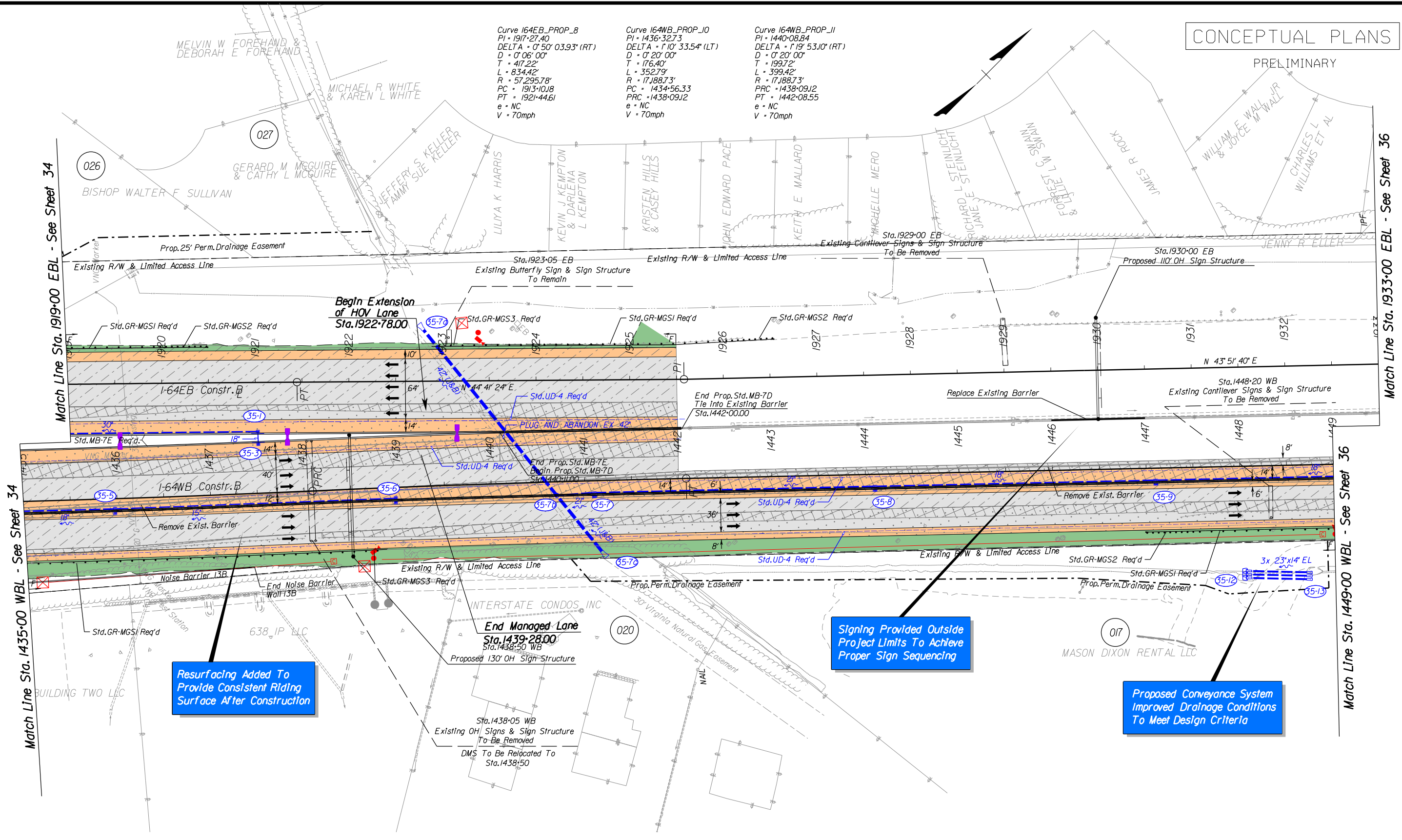
CONCEPTUAL PLANS

PRELIMINARY

Curve I64EB_PROP_8
 PI = 1917-27.40
 DELTA = 0° 50' 03.93" (RT)
 D = 0' 06' 00"
 T = 417.22'
 L = 834.42'
 R = 57,295.78'
 PC = 1913+10.18
 PT = 1921+44.61
 e = NC
 V = 70mph

Curve I64WB_PROP_10
 PI = 1436-32.73
 DELTA = 1° 10' 33.54" (LT)
 D = 0' 20' 00"
 T = 176.40'
 L = 352.79'
 R = 17,188.73'
 PC = 1434-56.33
 PRC = 1438-09.12
 e = NC
 V = 70mph

Curve I64WB_PROP_11
 PI = 1440-08.84
 DELTA = 1° 19' 53.10" (RT)
 D = 0' 20' 00"
 T = 199.72'
 L = 399.42'
 R = 17,188.73'
 PRC = 1438-09.12
 PT = 1442-08.55
 e = NC
 V = 70mph



Resurfacing Added To Provide Consistent Riding Surface After Construction

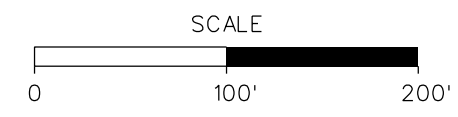
Signing Provided Outside Project Limits To Achieve Proper Sign Sequencing

Proposed Conveyance System Improved Drainage Conditions To Meet Design Criteria

- Legend
- Denotes Full Depth Pavement
 - Denotes Mill & Overlay
 - Denotes Demolition of Pavement
 - Denotes Bridge Approach Slab
 - Denotes Prop. Bridge Limits
 - Denotes Exist. Bridge Limits
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 - Proposed ITS Cabinet
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 - Light Pole with Twin LED Luminaires
 - Existing Light Pole and Luminaire to be Removed
 - Proposed Linear BMP
 - Proposed Drainage Ditch

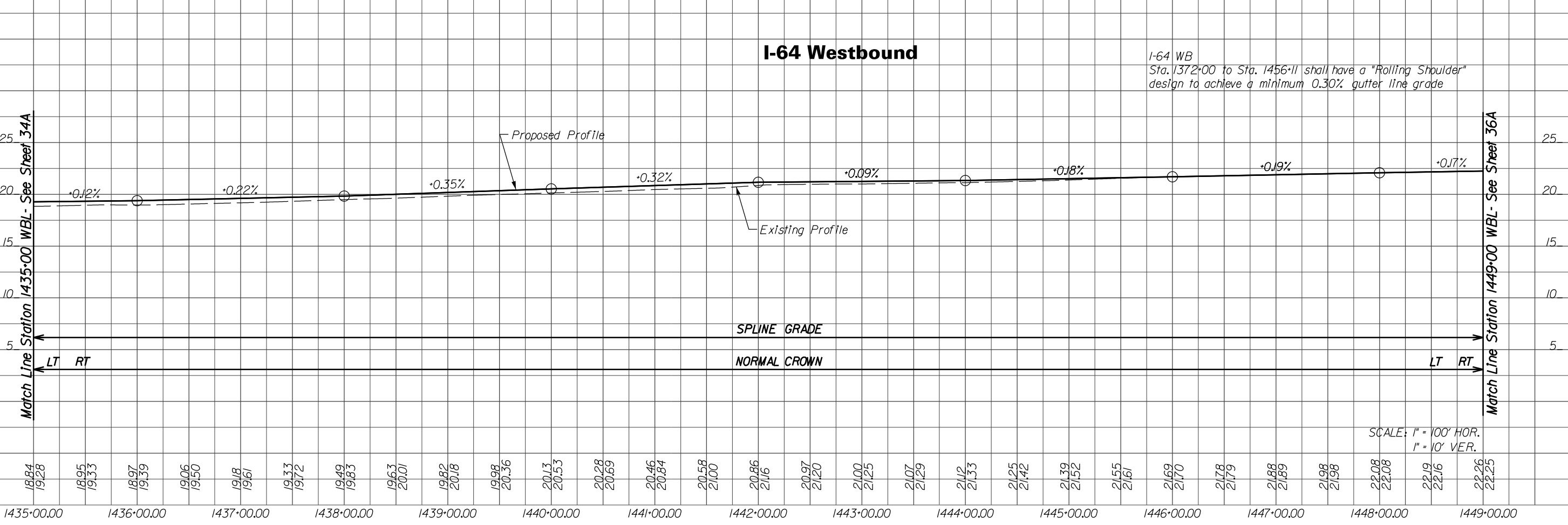
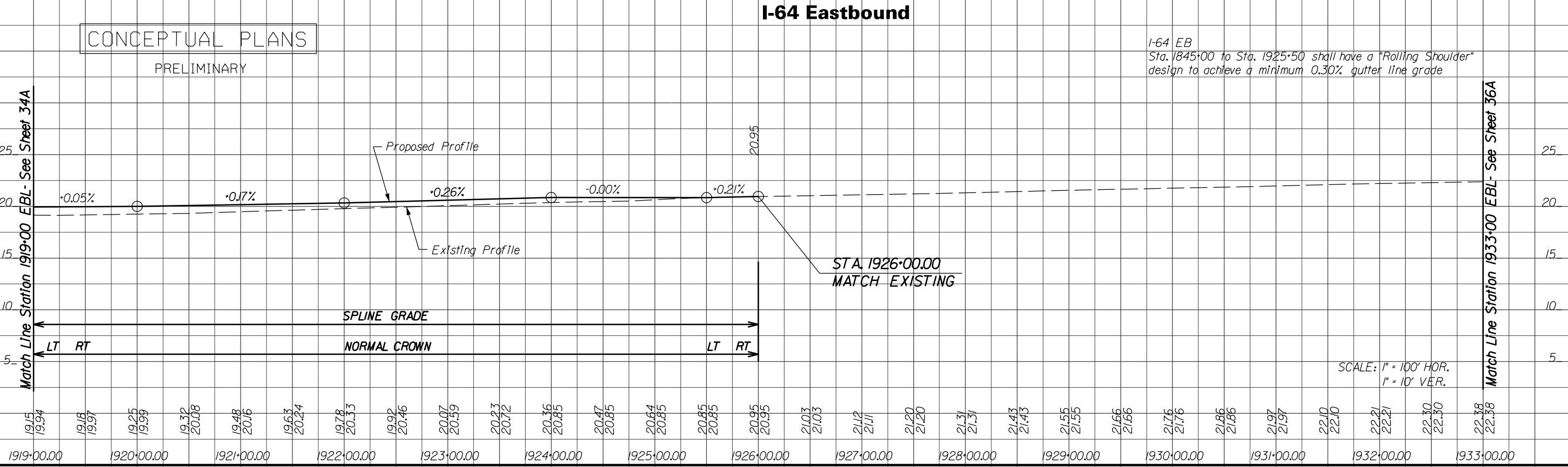
REFERENCES (PROFILES)

EB I-64 Profile	35A
WB I-64 Profile	35A



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DESIGN BUILDER

DESIGNED BY

STATE PROJECT

SHEET NO.

PAGE NO.

0064-131-811, P101, R201, C501
B662-B670, D637, D638

I-64 SOUTH SIDE WIDENING AND
HIGH RISE BRIDGE, PHASE I

VIRGINIA DEPARTMENT OF TRANSPORTATION

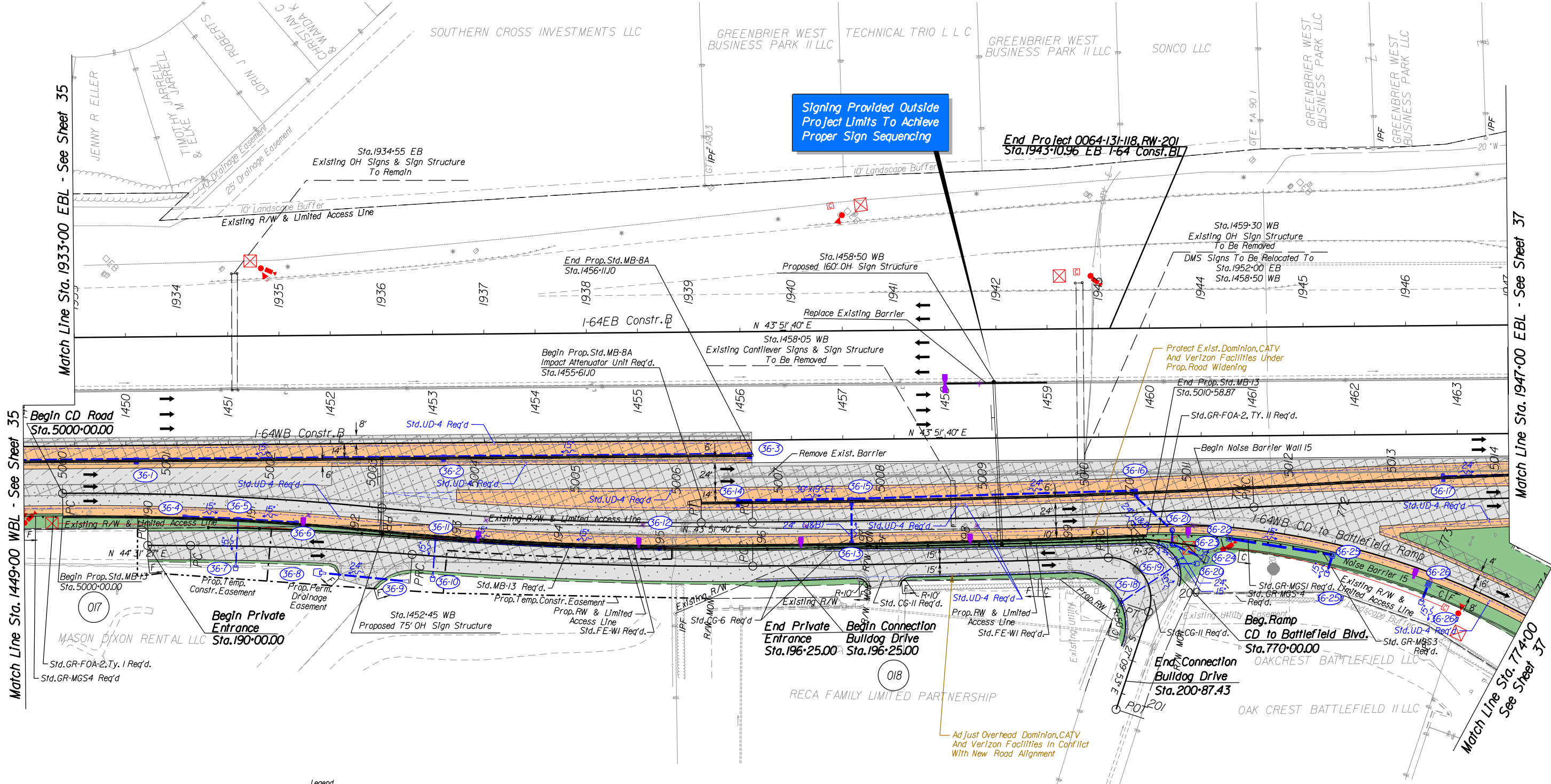
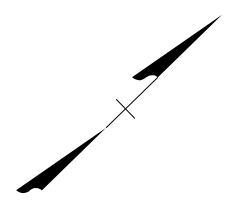
STV Incorporated

JMT.

LMB



Curve CD_1 PI = 5001+56.28 DELTA = 6' 14" 41.9" (RT) D = 2' 00' 00" T = 156.28' L = 312.25' R = 2,864.79' PC = 5000+00.00 PRC = 5003+12.25 e = 5.2% V = 60mph	Curve CD_2 PI = 5004+68.53 DELTA = 6' 14" 41.9" (LT) D = 2' 00' 00" T = 156.28' L = 312.25' R = 2,864.79' PC = 5003+12.25 PRC = 5006+24.50 e = 5.2% V = 60mph	Curve CD_3 PI = 5009+19.50 DELTA = 2' 25" 43.28" (LT) D = 0' 29' 45" T = 245.00' L = 489.93' R = 11,558.00' PC = 5006+74.50 PRC = 5011+64.43 e = NC V = 60mph	Curve CD_4 PI = 5014+78.88 DELTA = 4' 42" 51.6" (RT) D = 0' 45' 00" T = 314.46' L = 628.56' R = 7,639.44' PC = 5011+64.43 PRC = 5017+92.99 e = 2.3% V = 60mph	Curve CD_BATTLE_1 PI = 773+68.41 DELTA = 52' 19" 17.28" (RT) D = 7' 38" 22" T = 368.41' L = 684.89' R = 750.00' PC = 770+00.00 PRC = 776+84.89 e = 7.8% V = 45mph	Curve BULLDOG_1 PI = 191+50.19 DELTA = 4' 16" 42.44" (RT) D = 1' 58' 33" T = 108.33' L = 216.55' R = 2,900.00' PC = 190+41.86 PRC = 192+58.42 e = NC V = 25mph	Curve BULLDOG_2 PI = 194+24.98 DELTA = 4' 56" 30.32" (LT) D = 1' 29' 04" T = 166.57' L = 332.92' R = 3,860.00' PC = 192+58.42 PRC = 195+91.34 e = NC V = 25mph	Curve BULLDOG_3 PI = 197+64.96 DELTA = 1' 42" 53.55" (LT) D = 0' 29' 38" T = 173.62' L = 347.22' R = 11,601.00' PC = 195+91.34 PRC = 199+38.56 e = NC V = 25mph	Curve BULLDOG_4 PI = 199+96.43 DELTA = 10' 41" 20.53" (RT) D = 143' 14" 22" T = 57.86' L = 77.28' R = 40.00' PC = 199+38.56 PT = 200+15.84 e = NC V = 15mph
---	---	---	---	---	--	--	---	---

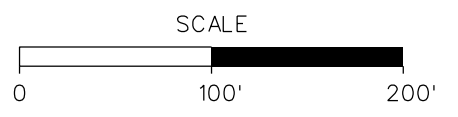


Signing Provided Outside Project Limits To Achieve Proper Sign Sequencing

End Project 0064-131-118, RW-201
Sta. 1943+10.96 EB I-64 Const. Bl

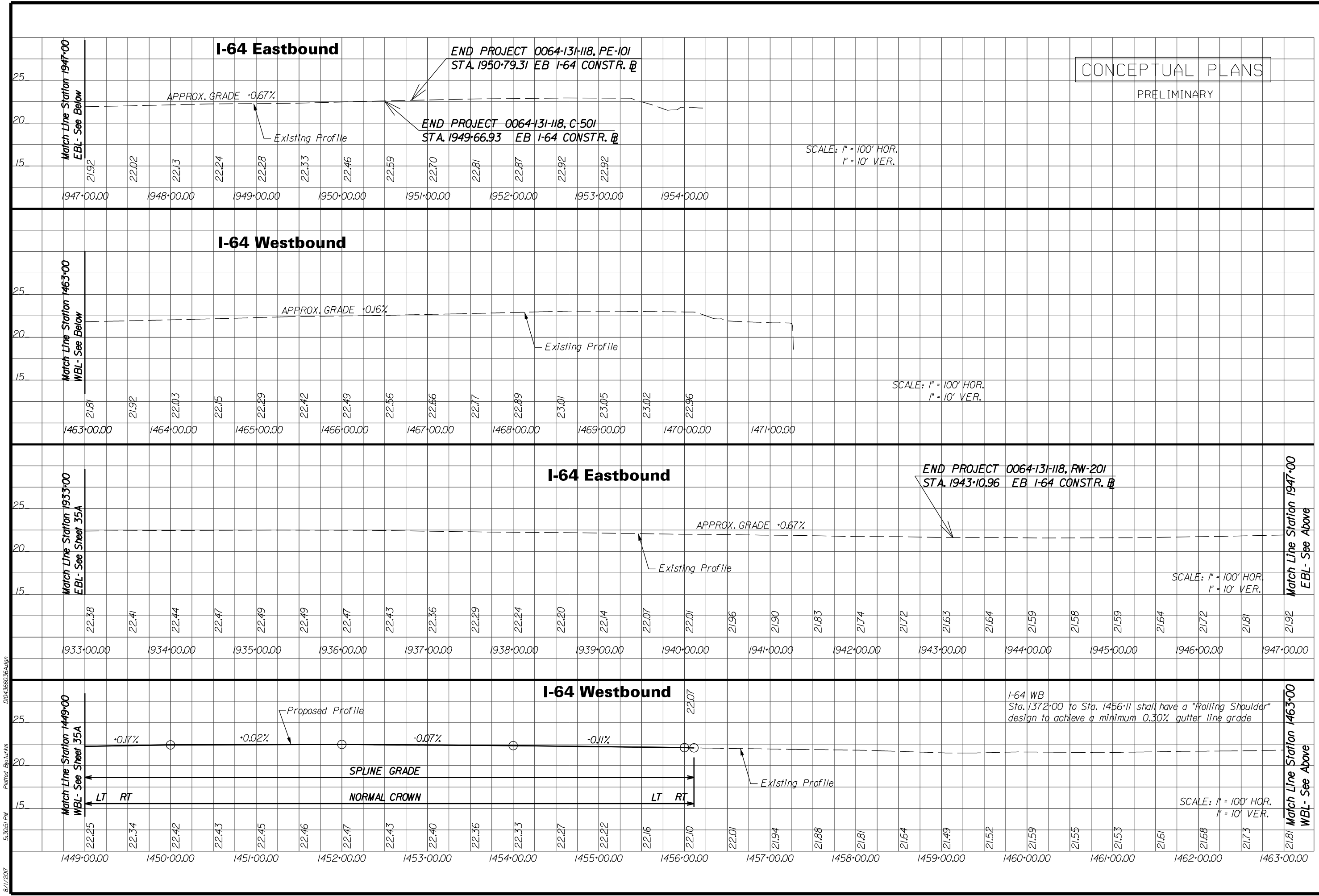
Legend	
Denotes Full Depth Pavement	Denotes Hard Shoulder Running
Denotes Mill & Overlay	Denotes Limits of Outside Grading
Denotes Demolition of Pavement	Denotes Travel Lanes
Denotes Bridge Approach Slab	Denotes Paved Shoulder
Denotes Prop. Bridge Limits	Denotes Construction Limits in Cuts
Denotes Exist. Bridge Limits	Denotes Construction Limits in Fills
Proposed Pole-Mount Junction Box	Proposed Motor Vehicle Detection Sensor w/ Quantity
Proposed Communications Junction Box	Light Pole with LED Luminaire
Proposed Lane Control Signal on Mast Arm	Light Pole with Twin LED Luminaires
Proposed Lane Control Signal on Overhead Sign Structure	Existing Light Pole and Luminaire to be Removed
Proposed Camera with Pole	Proposed Linear BMP
Proposed ITS Cabinet	Proposed Drainage Ditch

REFERENCES (PROFILES)	
EB I-64 Profile	36A
WB I-64 Profile	36A
CD Road Profile	36B
CD to Battlefield Blvd. Ramp Profile	36C
Bulldog Drive Profile	36C



CONCEPTUAL PLANS
PRELIMINARY

5/30/2017
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 Plotted By: turkm



8/11/2017 5:30:51 PM Plotted By: turkm D:\04366036A.dgn

CONCEPTUAL PLANS
 PRELIMINARY

DESIGNED BY
STV Incorporated
 STATE PROJECT
 0064-131-811, P101, R201, C501
 B662-B670, D637, D638

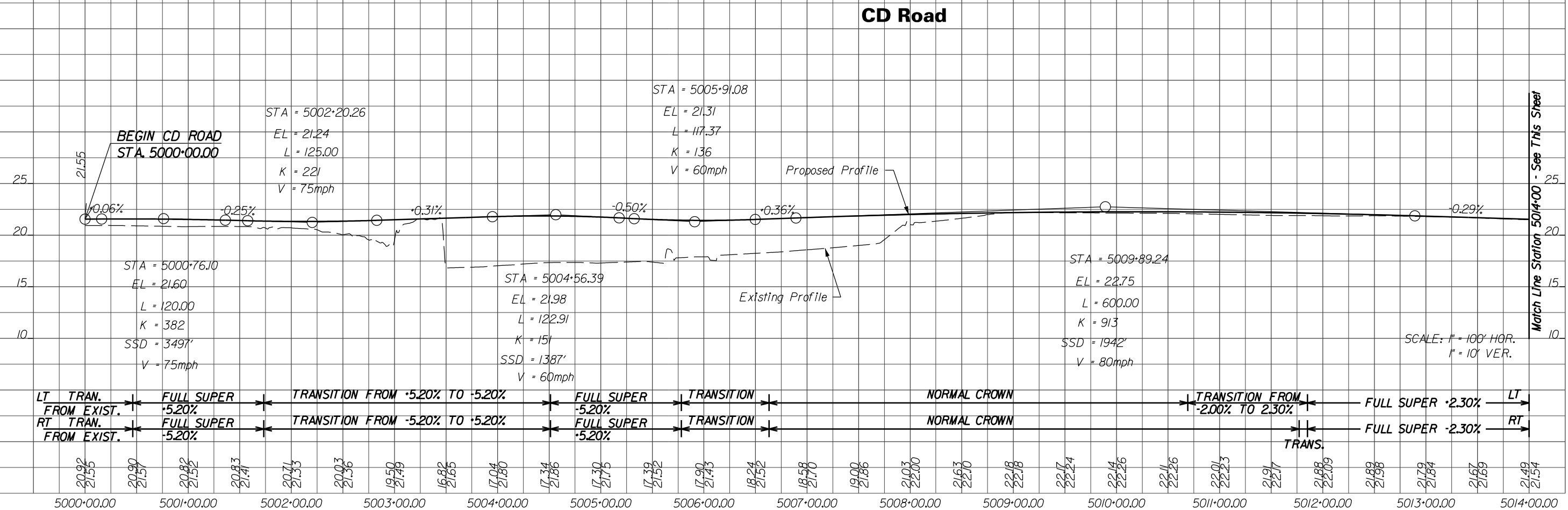
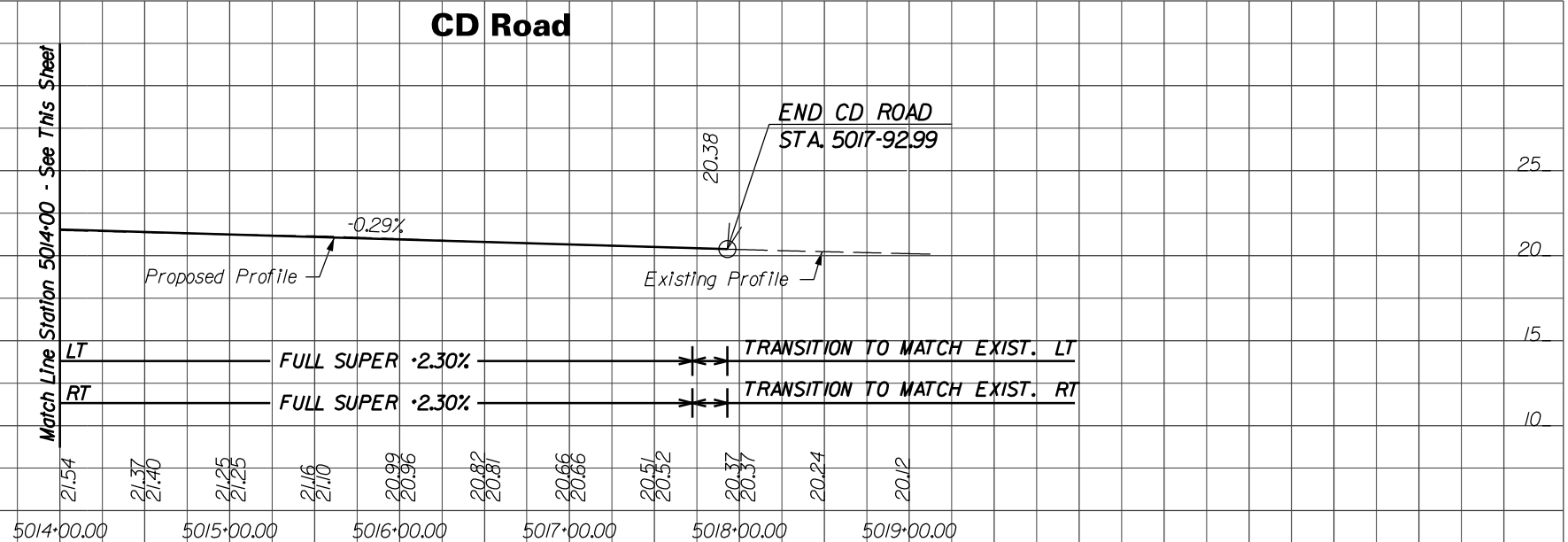
DESIGN BUILDER
LMB

SHEET NO.
36A

PAGE NO.
144

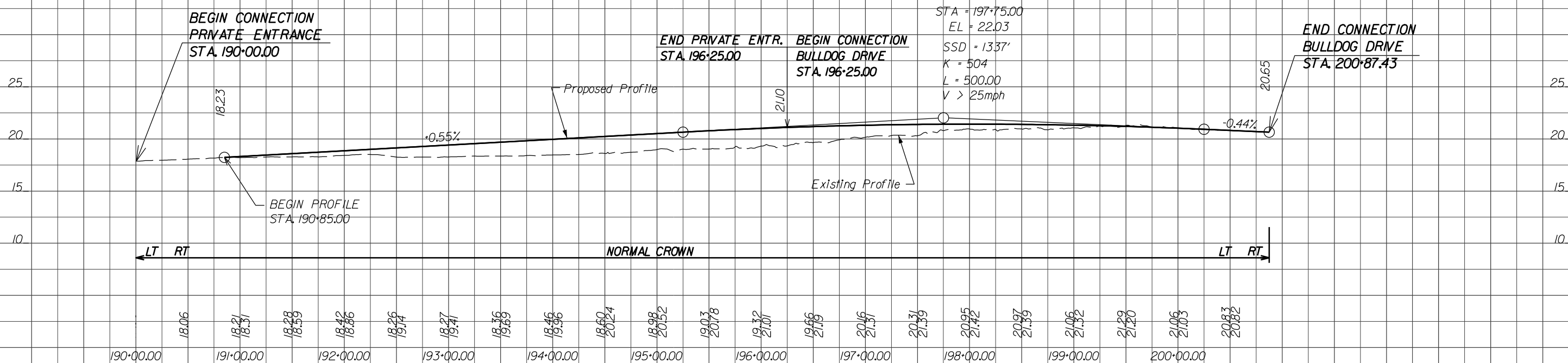
CONCEPTUAL PLANS

PRELIMINARY

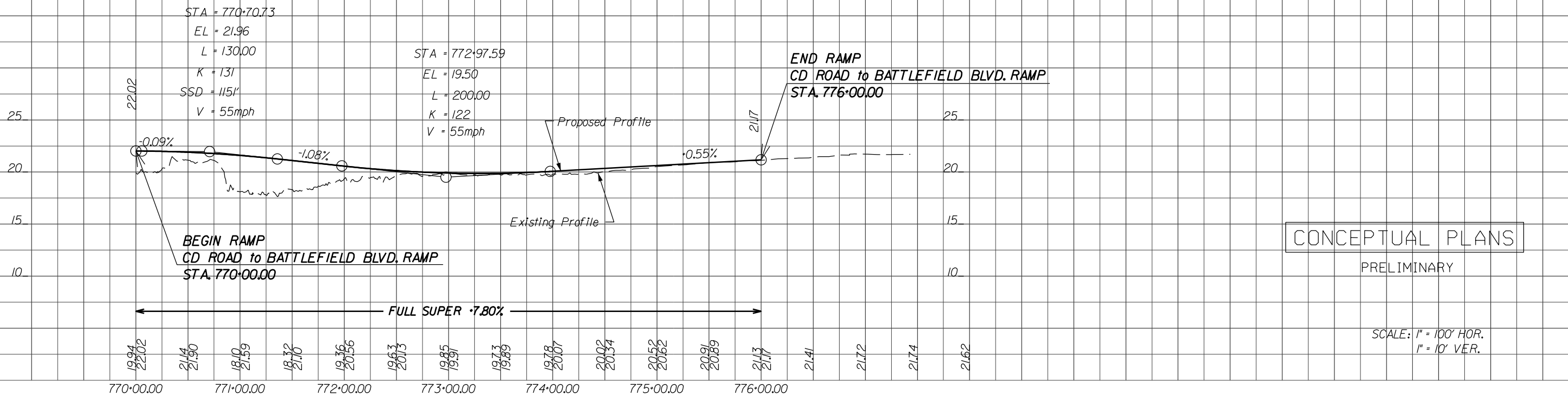


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Bulldog Drive



CD Road to Battlefield Blvd. Ramp



CONCEPTUAL PLANS
PRELIMINARY

SCALE: 1" = 100' HOR.
1" = 10' VER.

8/11/2017 5:30:53 PM Plotted By: turkm DIC4366036C.dgn

DESIGNED BY: **STV Incorporated**

DESIGN BUILDER: **LMB**

STATE PROJECT: 0064-131-811, P101, R201, C501
B662-B670, D637, D638

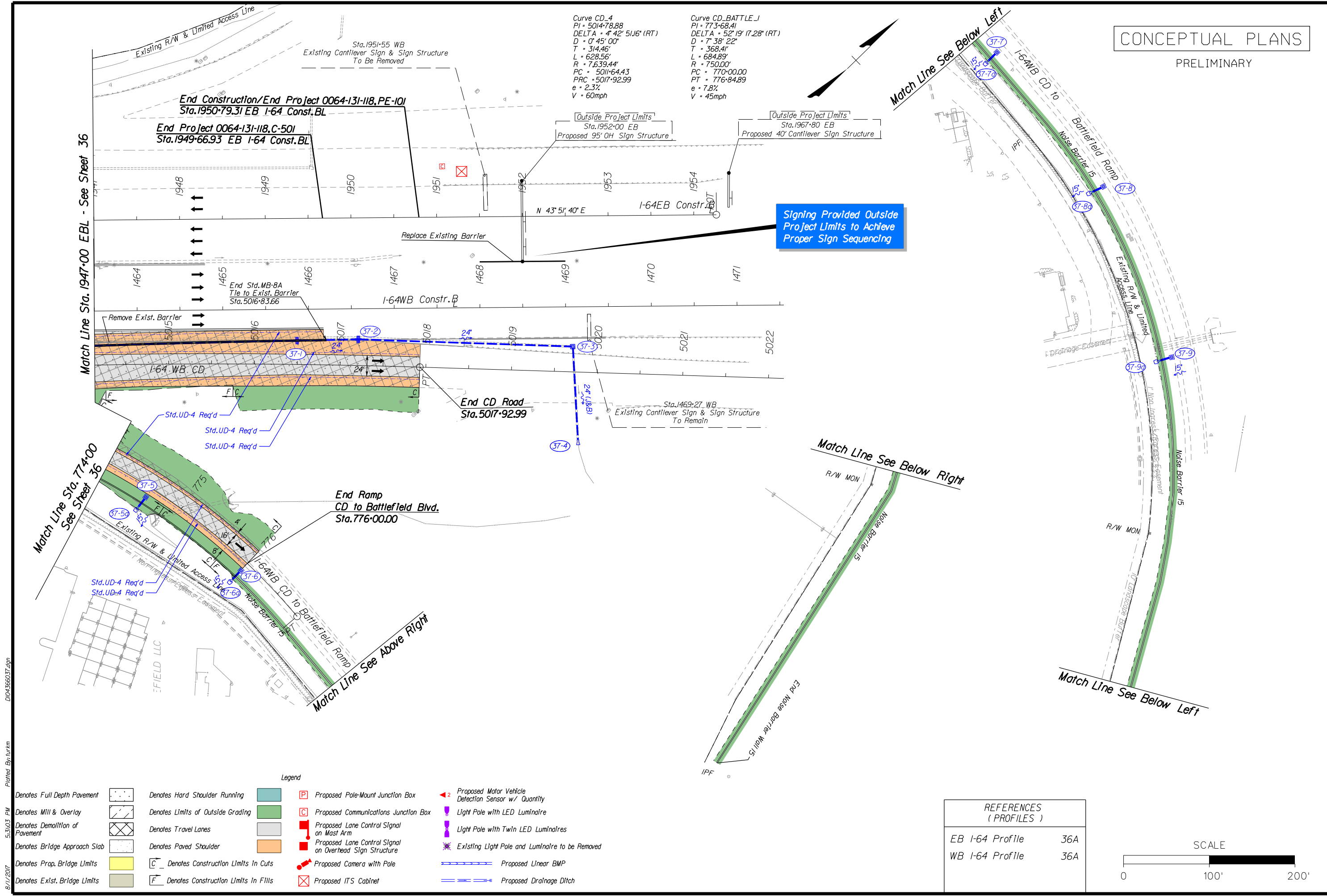
VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I

SHEET NO. **36C**

PAGE NO. **146**

CONCEPTUAL PLANS
PRELIMINARY



Curve CD_4
PI = 5014+78.88
DELTA = 4° 42' 51.6" (RT)
D = 0° 45' 00"
T = 314.46'
L = 628.56'
R = 7,639.44'
PC = 5011+64.43
PRC = 5017+92.99
e = 2.3%
V = 60mph

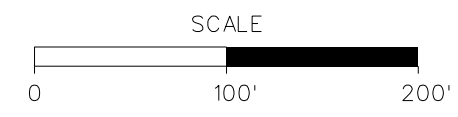
Curve CD_BATTLE_J
PI = 773+68.41
DELTA = 52° 19' 17.28" (RT)
D = 7° 38' 22"
T = 368.41'
L = 684.89'
R = 750.00'
PC = 770+00.00
PT = 776+84.89
e = 7.8%
V = 45mph

Signing Provided Outside Project Limits to Achieve Proper Sign Sequencing

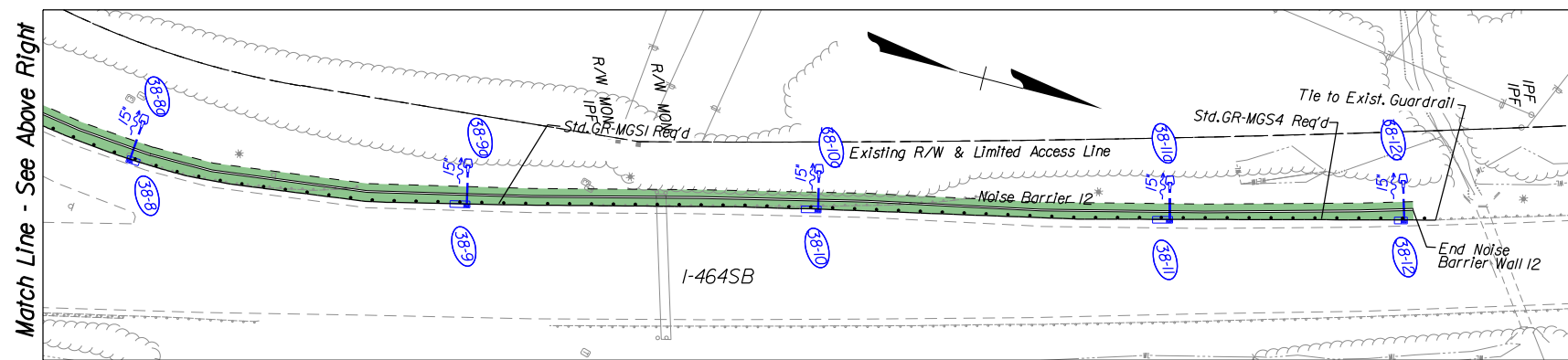
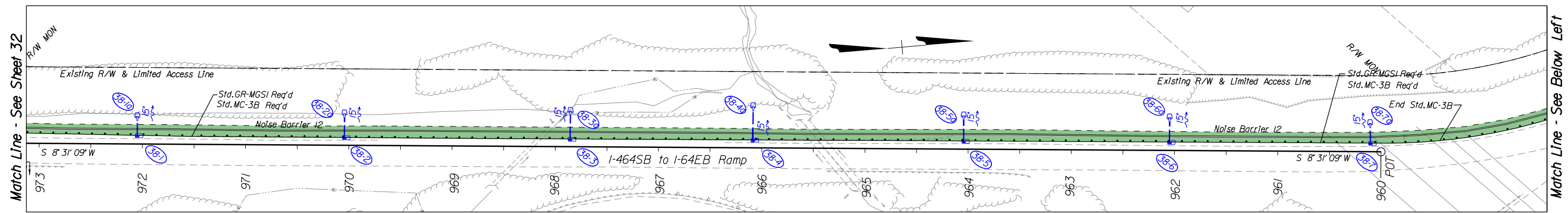
Legend

- Denotes Full Depth Pavement
- Denotes Mill & Overlay
- Denotes Demolition of Pavement
- Denotes Bridge Approach Slab
- Denotes Prop. Bridge Limits
- Denotes Exist. Bridge Limits
- Denotes Hard Shoulder Running
- Denotes Limits of Outside Grading
- Denotes Travel Lanes
- Denotes Paved Shoulder
- Denotes Construction Limits in Cuts
- Denotes Construction Limits in Fills
- Proposed Pole-Mount Junction Box
- Proposed Communications Junction Box
- Proposed Lane Control Signal on Mast Arm
- Proposed Lane Control Signal on Overhead Sign Structure
- Proposed Camera with Pole
- Proposed ITS Cabinet
- Proposed Motor Vehicle Detection Sensor w/ Quantity
- Light Pole with LED Luminaire
- Light Pole with Twin LED Luminaires
- Existing Light Pole and Luminaire to be Removed
- Proposed Linear BMP
- Proposed Drainage Ditch

REFERENCES (PROFILES)	
EB I-64 Profile	36A
WB I-64 Profile	36A



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 8/1/2007

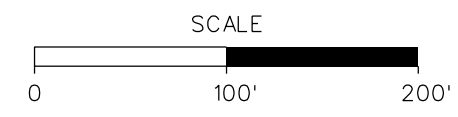


CONCEPTUAL PLANS
PRELIMINARY

- Legend
- | | | | |
|--------------------------------|--------------------------------------|---|---|
| Denotes Full Depth Pavement | Denotes Hard Shoulder Running | Proposed Pole-Mount Junction Box | Proposed Motor Vehicle Detection Sensor w/ Quantity |
| Denotes Mill & Overlay | Denotes Limits of Outside Grading | Proposed Communications Junction Box | Light Pole with LED Luminaire |
| Denotes Demolition of Pavement | Denotes Travel Lanes | Proposed Lane Control Signal on Mast Arm | Light Pole with Twin LED Luminaires |
| Denotes Bridge Approach Slab | Denotes Paved Shoulder | Proposed Lane Control Signal on Overhead Sign Structure | Existing Light Pole and Luminaire to be Removed |
| Denotes Prop. Bridge Limits | Denotes Construction Limits in Cuts | Proposed Camera with Pole | Proposed Linear BMP |
| Denotes Exist. Bridge Limits | Denotes Construction Limits in Fills | Proposed ITS Cabinet | Proposed Drainage Ditch |

REFERENCES (PROFILES)

Great Bridge Blvd. Profile	31D
I-64WB to GBB Ramp Profile	29B

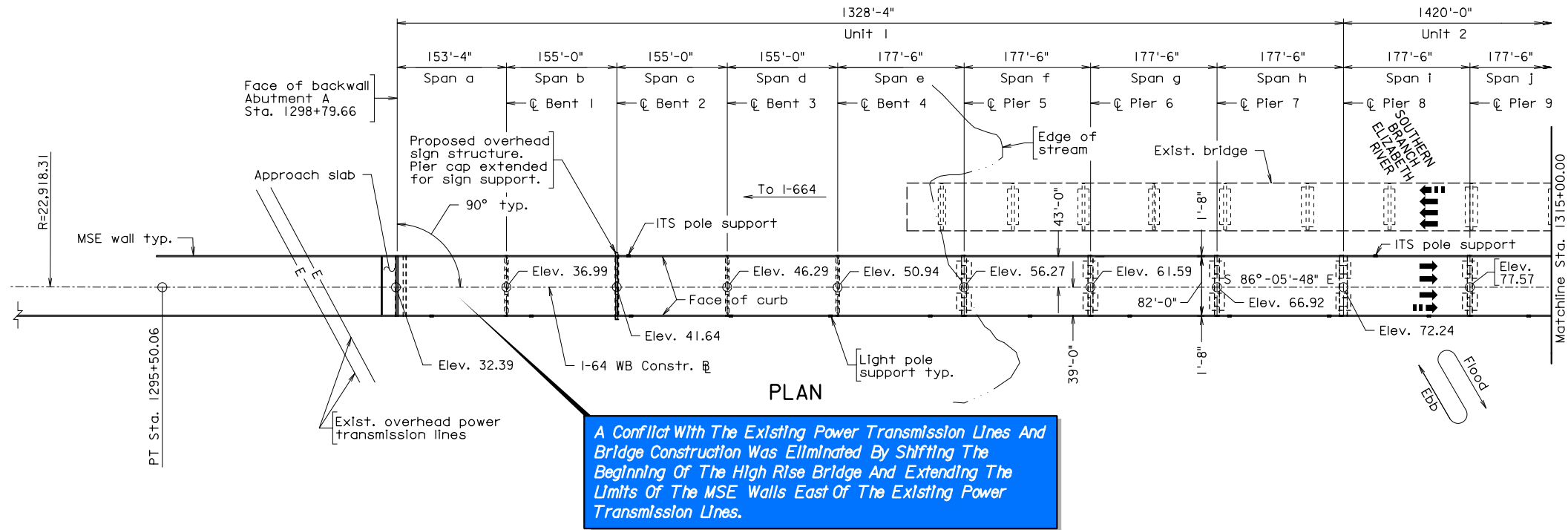


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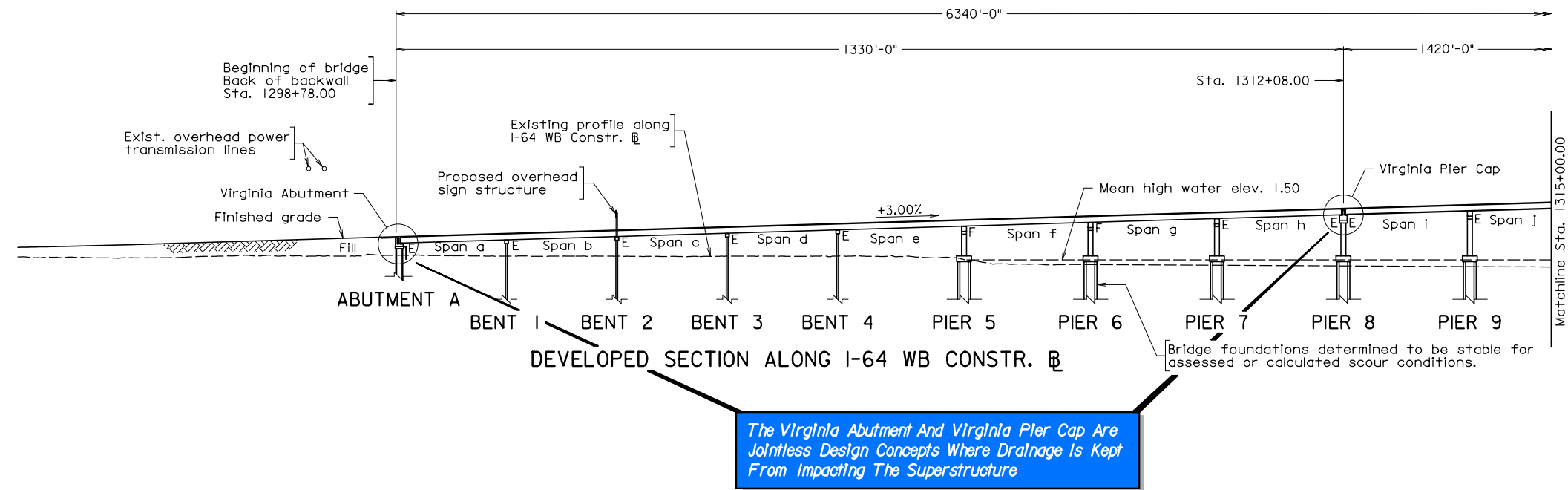
DESIGN BUILDER
LMB
 DESIGNED BY
JMT.
STV Incorporated
 STATE PROJECT
 0064-131-811, P101, R201, C501
 B662-B670, D637, D638
 VIRGINIA DEPARTMENT OF TRANSPORTATION
I-64 SOUTHSIDE WIDENING AND HIGH RISE BRIDGE, PHASE I
 SHEET NO.
38
 PAGE NO.
148



4.3.2 - CONCEPTUAL BRIDGE PLANS



A Conflict With The Existing Power Transmission Lines And Bridge Construction Was Eliminated By Shifting The Beginning Of The High Rise Bridge And Extending The Limits Of The MSE Walls East Of The Existing Power Transmission Lines.



The Virginia Abutment And Virginia Pier Cap Are Jointless Design Concepts Where Drainage Is Kept From Impacting The Superstructure

DESIGN EXCEPTION(S):

None required. Design concept presented minimizes the use of approved Design Waivers.

GENERAL NOTES:

Width: 82'-0" face-to-face of curb.

- Span layout: Unit 1: 1-153'-4", 3-155'-0", 4-177'-6" prestressed concrete 95" deep bulb-T beam spans continuous for live load.
- Unit 2: 8-177'-6" prestressed concrete 95" deep bulb-T beam spans continuous for live load.
- Unit 3: 240'-300'-240' continuous steel plate girder spans.
- Unit 4: 4-180'-0", 2-145'-0", 2-180'-0" prestressed concrete 95" deep bulb-T beam spans continuous for live load.
- Unit 5: 7-180'-0", 1-178'-4" prestressed concrete 95" deep bulb-T beam spans continuous for live load.

Capacity: HL-93.

Drainage area: Tidal.

Specifications:

Construction: Virginia Department of Transportation Road and Bridge Specifications, 2016.

Design: AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014; and VDOT Modifications.

Standards: Virginia Department of Transportation Road and Bridge Standards, 2016; including all current revisions.

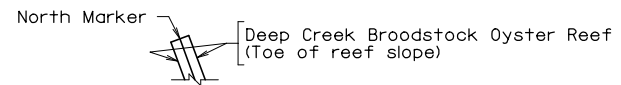
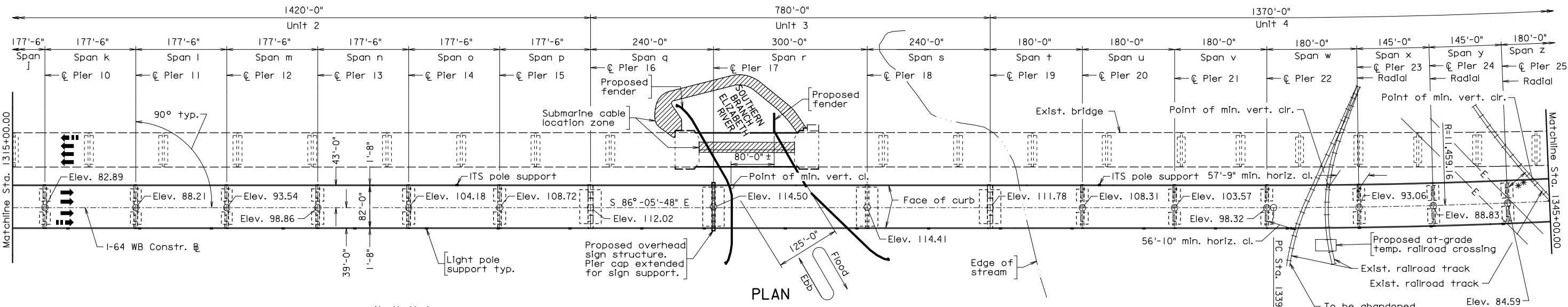
These plans are incomplete unless accompanied by the Supplemental Specifications and Special Provisions included in the contract documents.

Structural steel in flanges as designated in the plans shall be ASTM A709 Grade HPS70W. Additional fabrication requirements shall be in accordance with AASHTO Guide Specifications for Highway Bridge Fabrication with HPS. Structural steel in bearings, channels, and angles shall be ASTM A709 Grade 50W. All other structural steel shall be ASTM A709 Grade 50W. All structural steel shall be unpainted.

Bridge No. of existing bridge is 2527. Plan No. is 174-09.

E denotes expansion bearing
F denotes fixed bearing



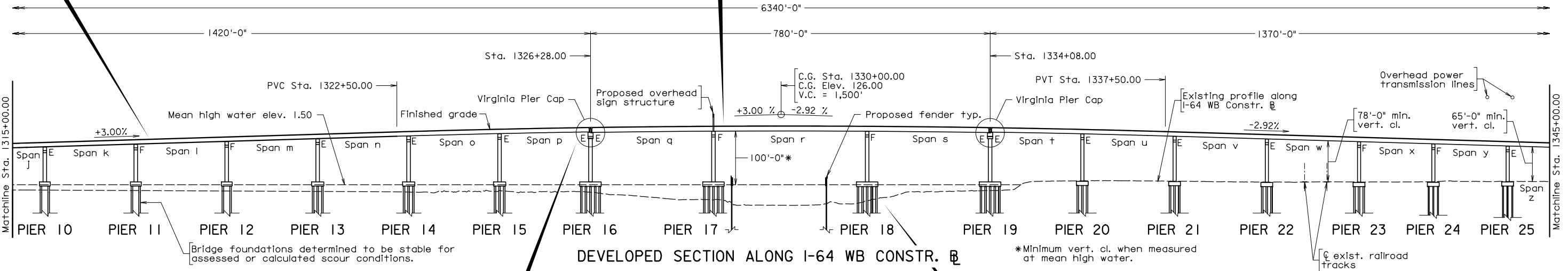


Standard Prestressed Concrete Beam Construction Provides Durable Solution With Minimal Inspection/Maintenance Requirements

Low Maintenance Bridge - Jointless Bridge, Uncoated Weathering Steel Girders, Prestressed Concrete Bulb-T Beams, Class III CRR Steel (Solid Stainless) In Deck Slab, Low Permeability Concrete

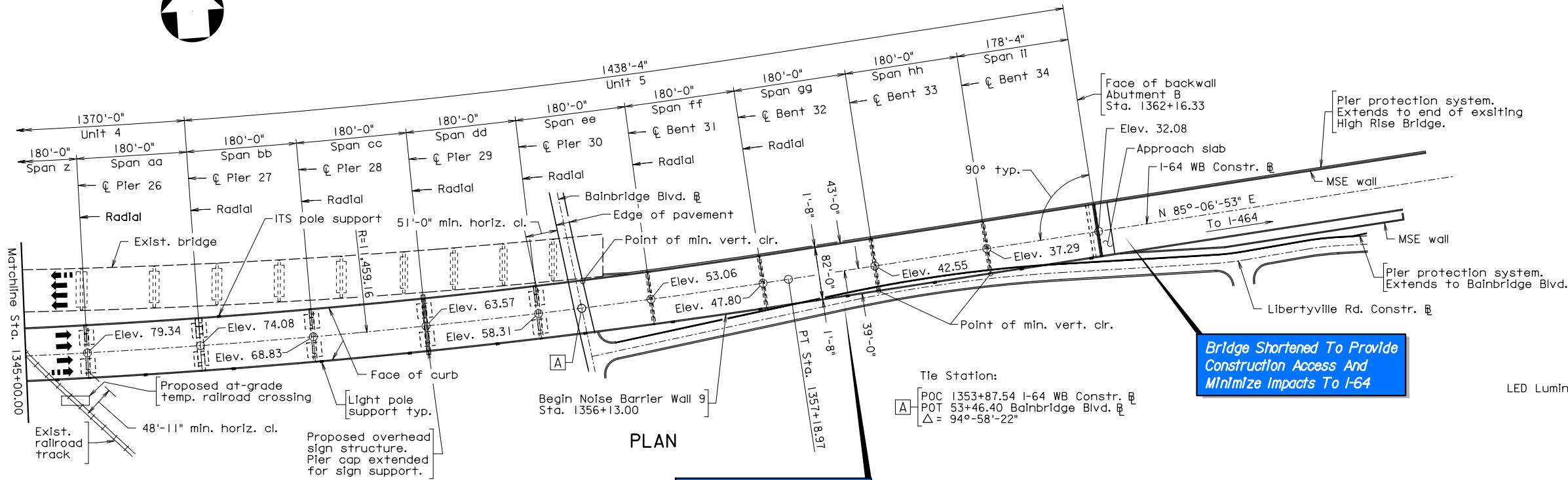
The Virginia Pier Cap Is A Jointless Design Concept Where Drainage Is Kept From Impacting The Superstructure

Advanced Method II Vessel Collision Analysis Used To Determine Foundation Sizes In Southern Branch Elizabeth River



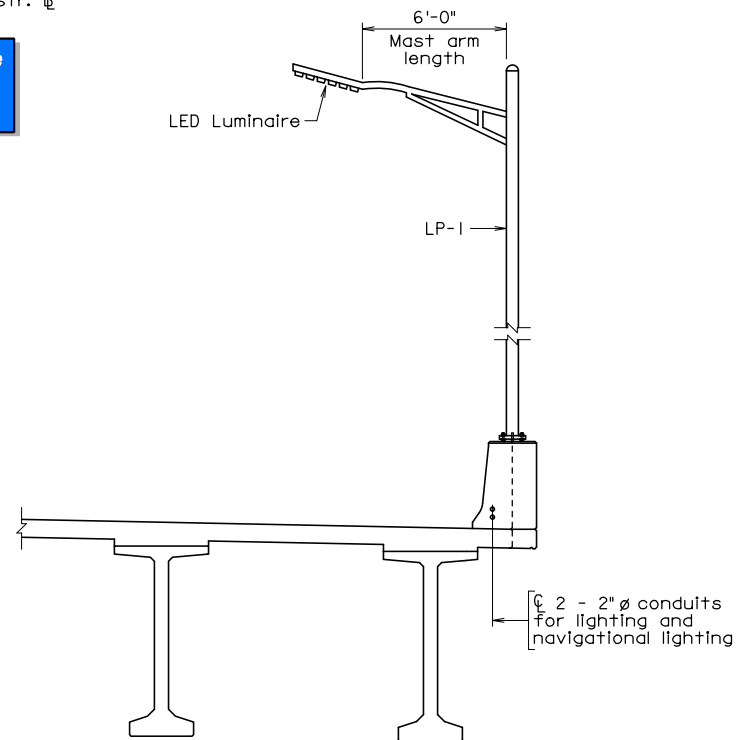
8/12/2017 High Rise - 102) P&E: JET/MLD/gp Plotted By: J. Jackson



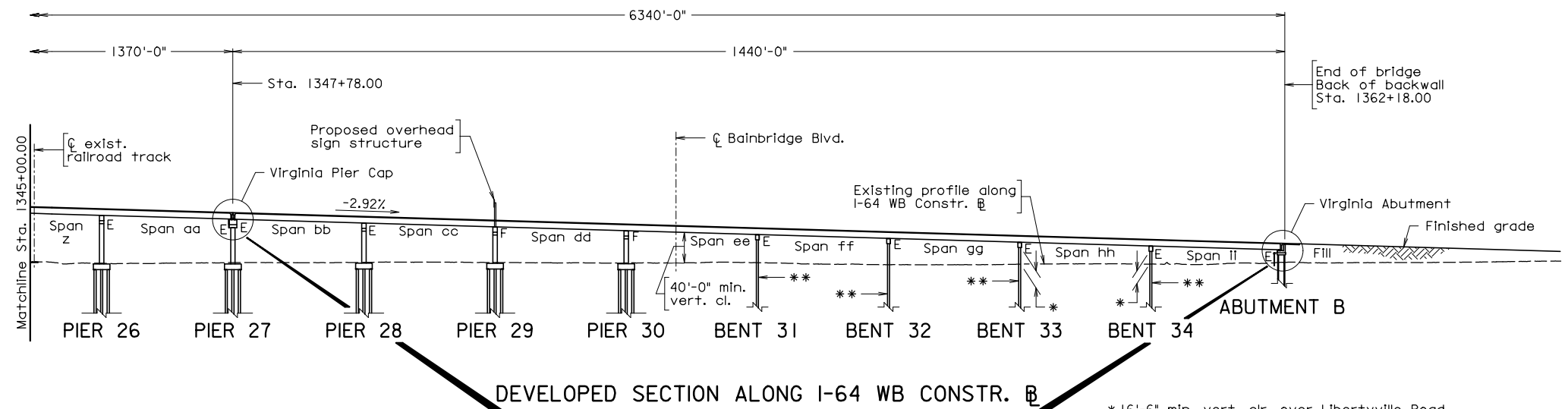


Tie Station:
 [A] POC 1353+87.54 I-64 WB Constr. \square
 POT 53+46.40 Bainbridge Blvd. \square
 $\Delta = 94^\circ-58'-22''$

Bridge Shortened To Provide Construction Access And Minimize Impacts To I-64



PART TRANSVERSE SECTION SHOWING TYPICAL LIGHT POLE AND ITS POLE SUPPORT
 Light pole support shown. ITS pole support similar. Section with structural steel plate girders similar.

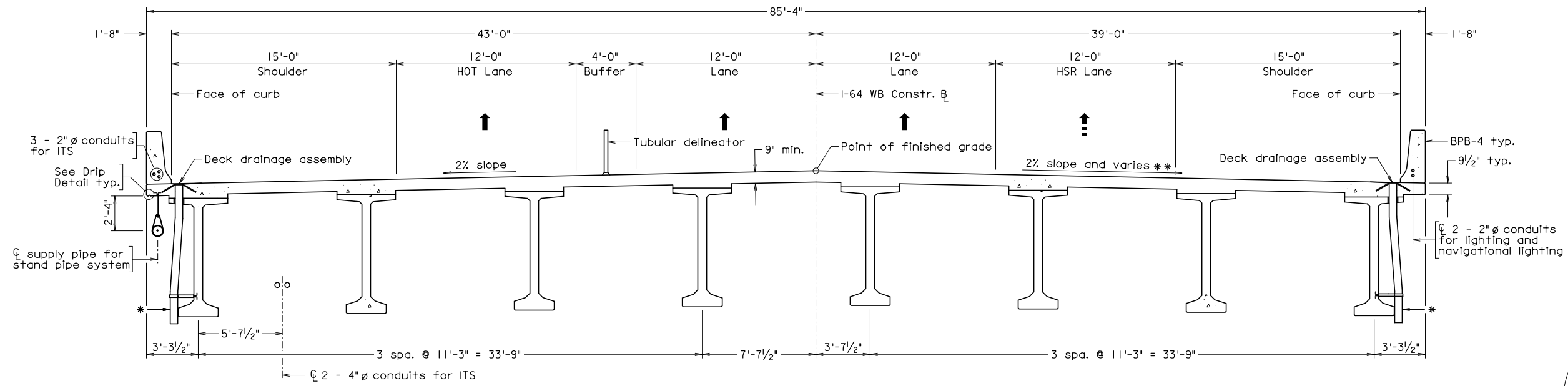


* 16'-6" min. vert. clr. over Libertyville Road.
 ** Piles for Bents 31-34 have a minimum dimension of 3'-0" in accordance with the RFP.

The Virginia Abutment And Virginia Pier Cap Are Jointless Design Concepts Where Drainage Is Kept From Impacting The Superstructure

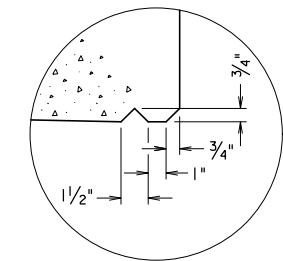
High Rise - 1031 PRELIMINARY PLANS - Plotted By: Jackson 8/12/2017

Note:
HSR denotes Hard Shoulder Running with high friction surface treatment.

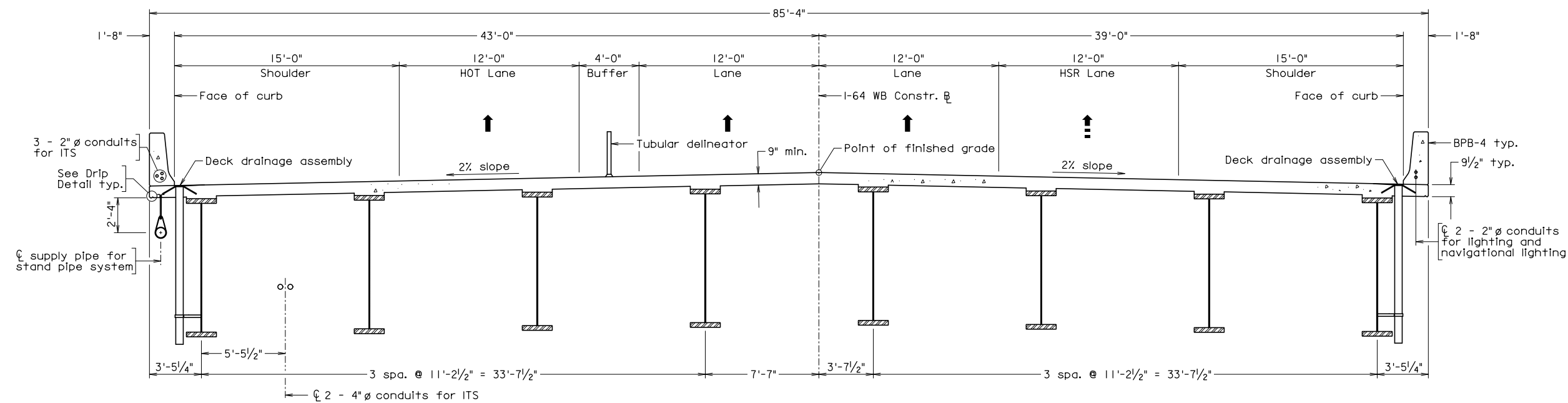


TRANSVERSE SECTION
STA. 1298+79.66 TO STA. 1326+28.00
STA. 1334+08.00 TO STA. 1338+41.25

* Between Sta. 1298+79.66 to Sta. 1306+50.00 collector pipes and collector downspouts will be required to convey drainage to the existing ground. No drainage will be discharged to air when the bridge is not located over the waterway (Approx. Sta. 1298+79.66 to Sta. 1306+50.00).
** Varies from 2% at Sta. 1337+51.25 to 0% at Sta. 1338+41.25.



DRIP DETAIL

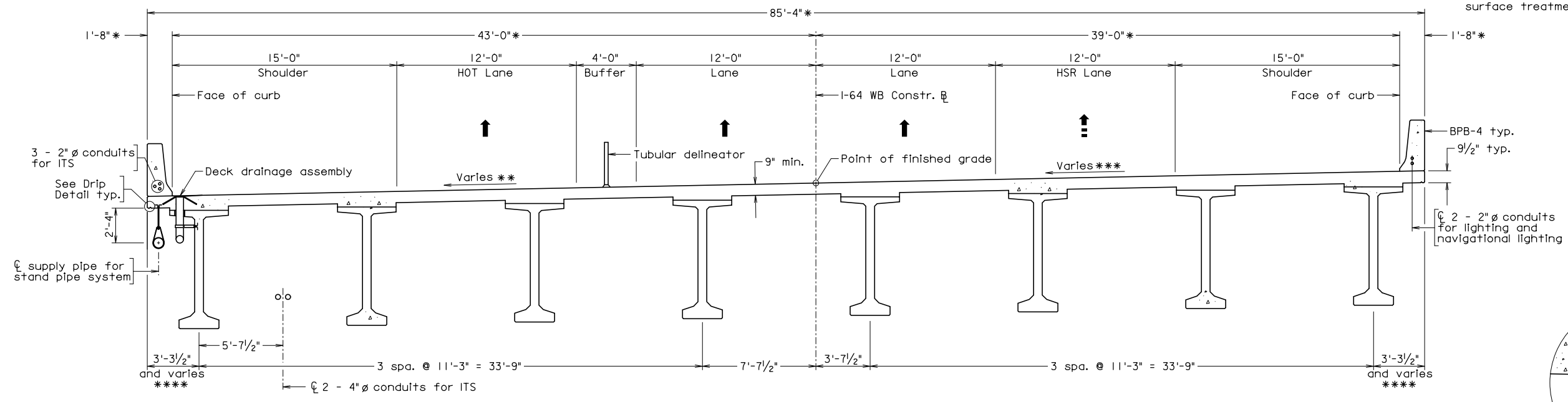


TRANSVERSE SECTION
STA. 1326+28.00 TO STA. 1334+08.00

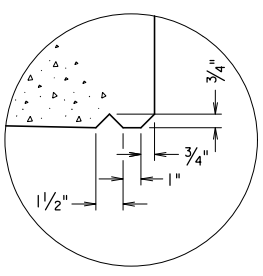
High Rise - (04) Type 156-215-11 of 10/11/2017 By: Jackson

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED
FOR CONSTRUCTION

Note:
HSR denotes Hard Shoulder Running with high friction surface treatment.

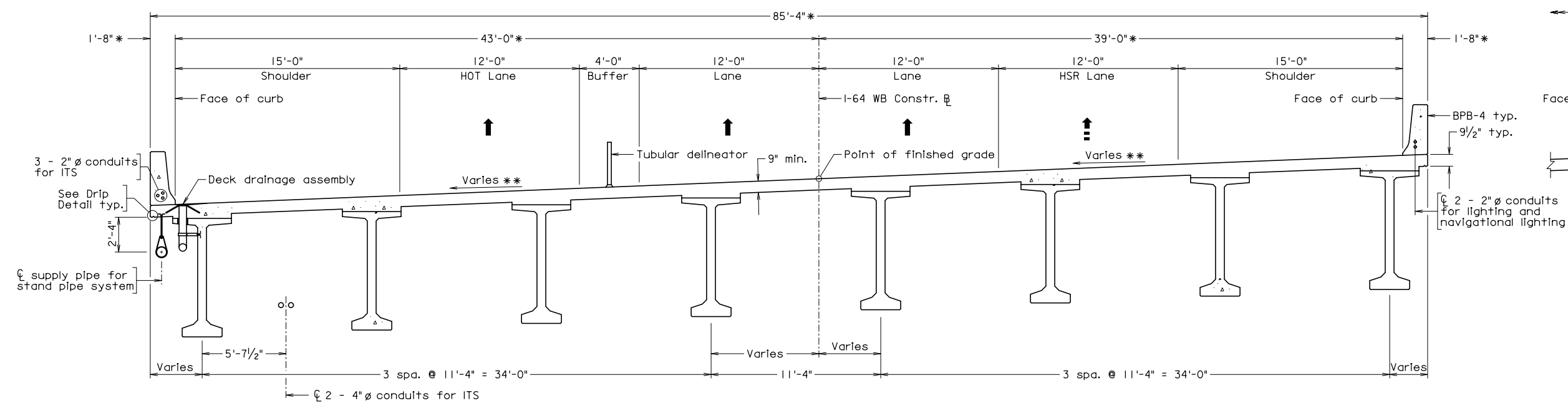


**TRANSVERSE SECTION
STA. 1338+41.25 TO 1347+78.00**



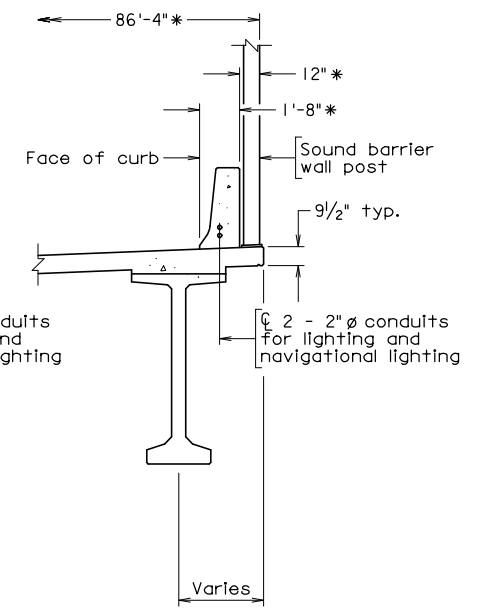
DRIP DETAIL

* Denotes radial dimension (Sta. 1339+63.25 to Sta. 1347+78.00)
 ** 2% from Sta. 1338+41.25 to Sta. 1339+31.25
 Varies from 2% at Sta. 1339+31.25 to 4% at Sta. 1340+21.25
 4% from Sta. 1340+21.25 to Sta. 1347+78.00
 *** Varies from 0% at Sta. 1338+41.25 to 4% at Sta. 1340+21.25
 4% from Sta. 1340+21.25 to Sta. 1347+78.00
 **** Varies from Sta. 1339+63.25 to Sta. 1347+78.00

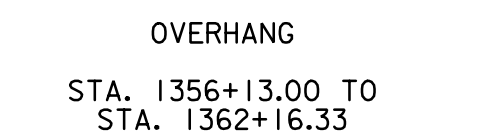


**TRANSVERSE SECTION
STA. 1347+78.00 TO 1362+16.33**

* Denotes radial dimension (Sta. 1347+78.00 to Sta. 1357+18.97)
 ** 4% from Sta. 1347+78.00 to Sta. 1356+58.97
 Varies from 4% at Sta. 1356+58.97 to 2% at Sta. 1357+48.97
 2% from Sta. 1357+48.97 to Sta. 1362+16.33



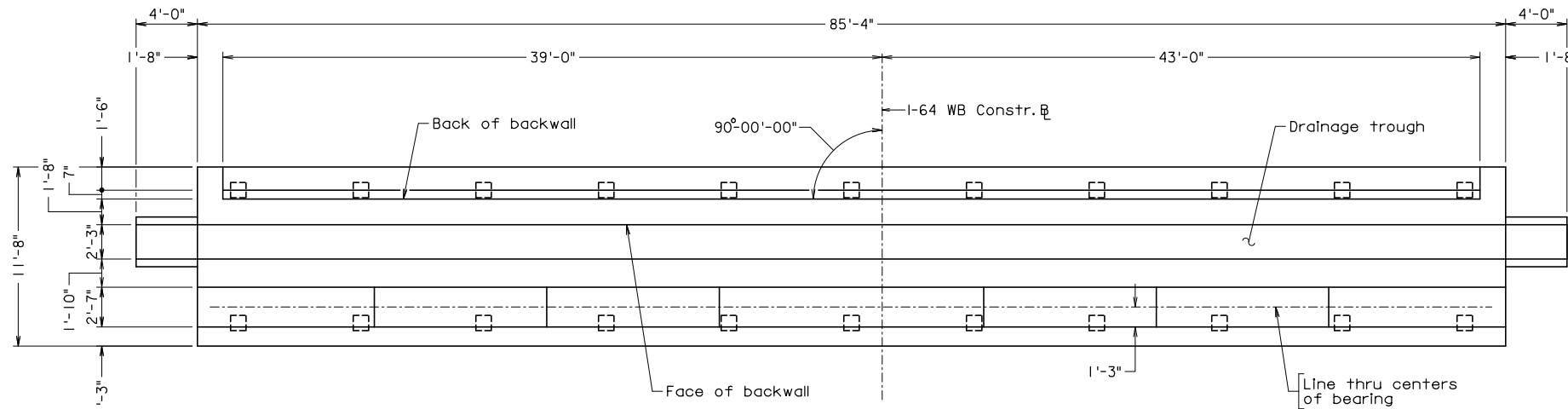
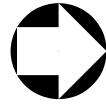
**OVERHANG
STA. 1347+78.00 TO
STA. 1356+13.00**



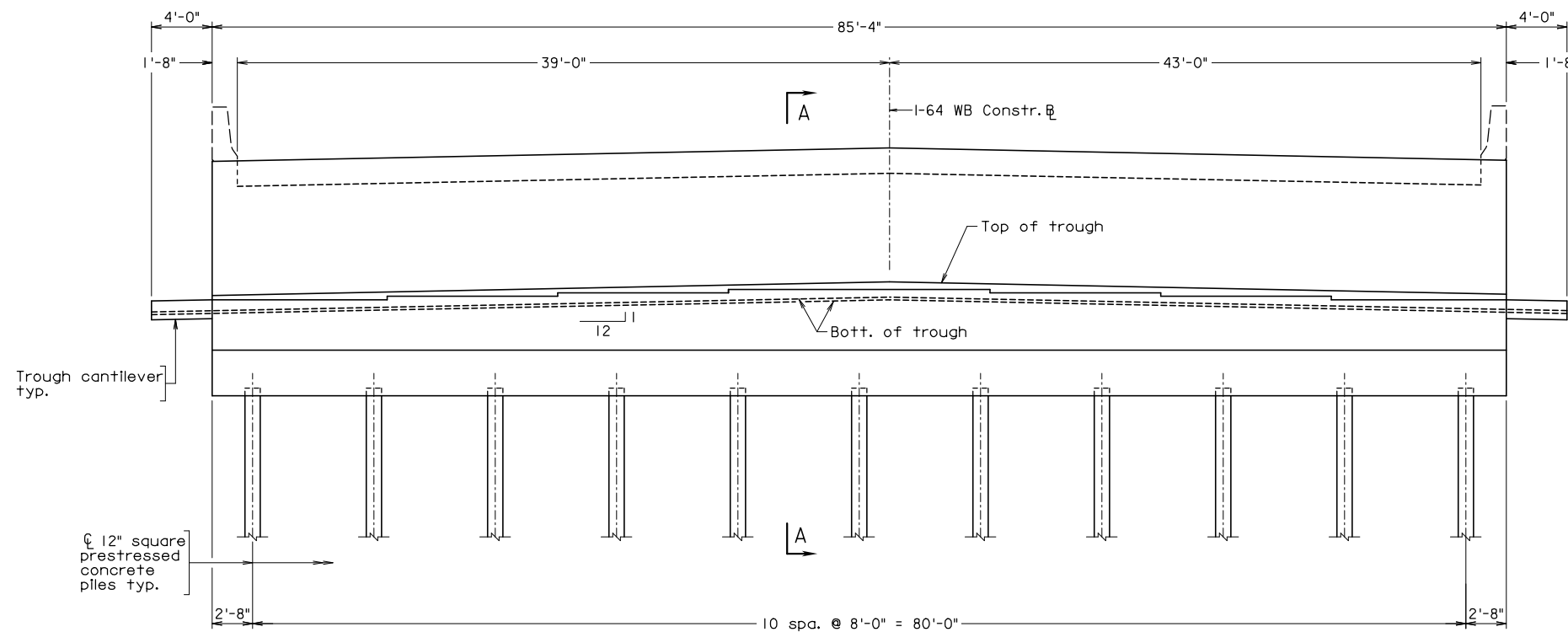
**OVERHANG
STA. 1356+13.00 TO
STA. 1362+16.33**

**PRELIMINARY PLANS
THESE PLANS NOT TO BE USED
FOR CONSTRUCTION**

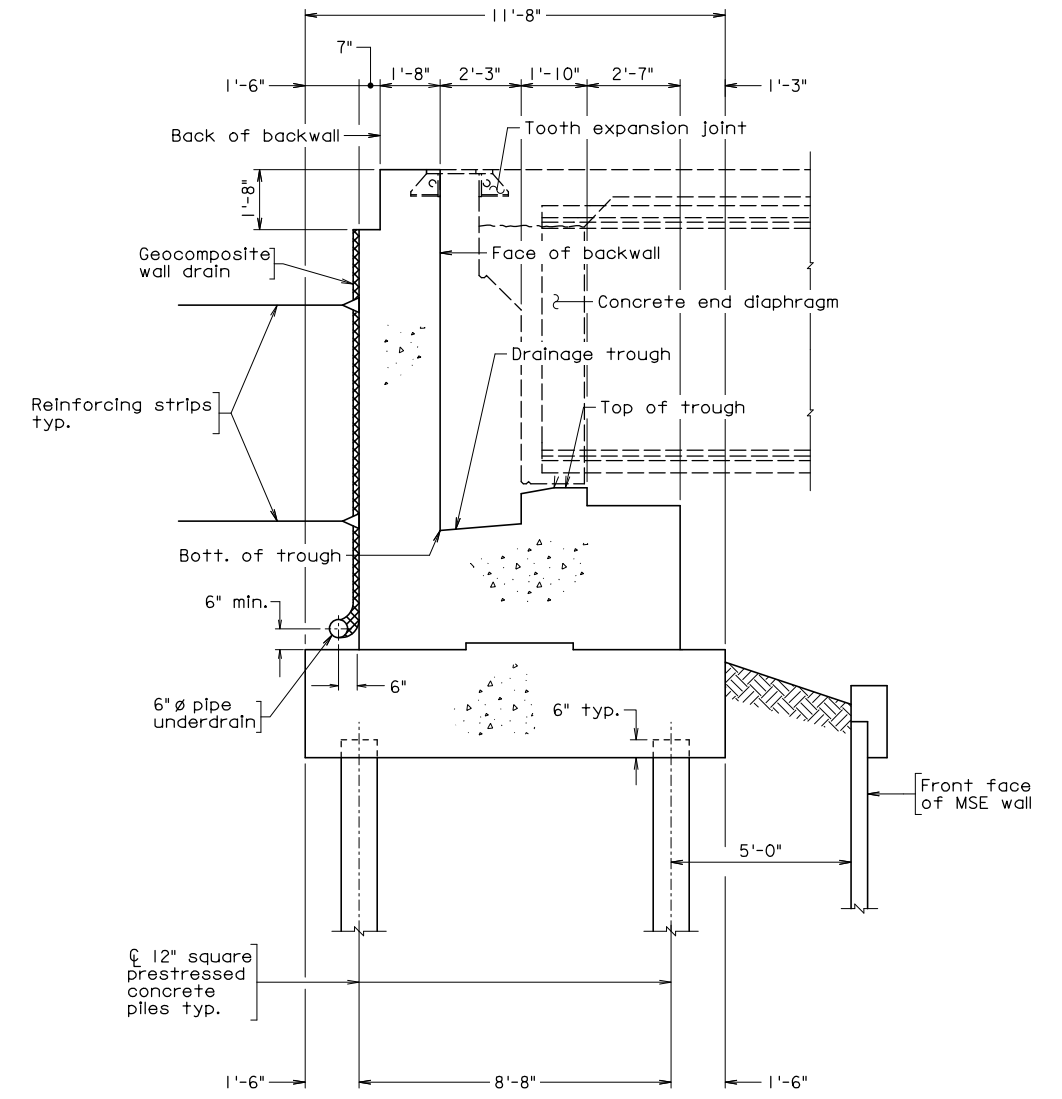
8/11/2017
High Rise - (05) Typeset Sections (2 of 8) Design By: J. Jackson



ABUTMENT PLAN
Abutment A shown. Abutment B similar.



ABUTMENT ELEVATION
Abutment A shown. Abutment B similar.

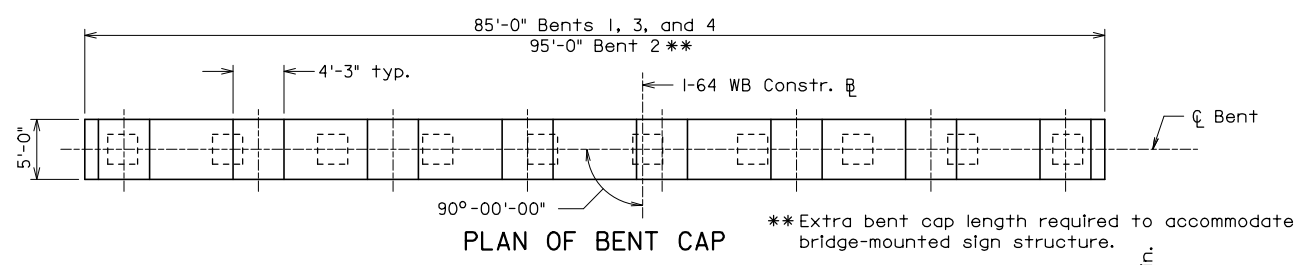


SECTION A-A
Virginia Abutment

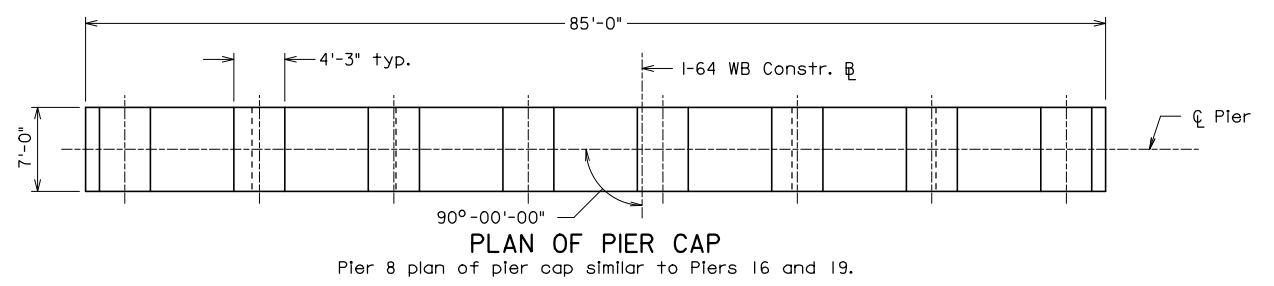
High Rise - (06) Abutment.dwg, Plotted By: Jackson, 8/11/2017



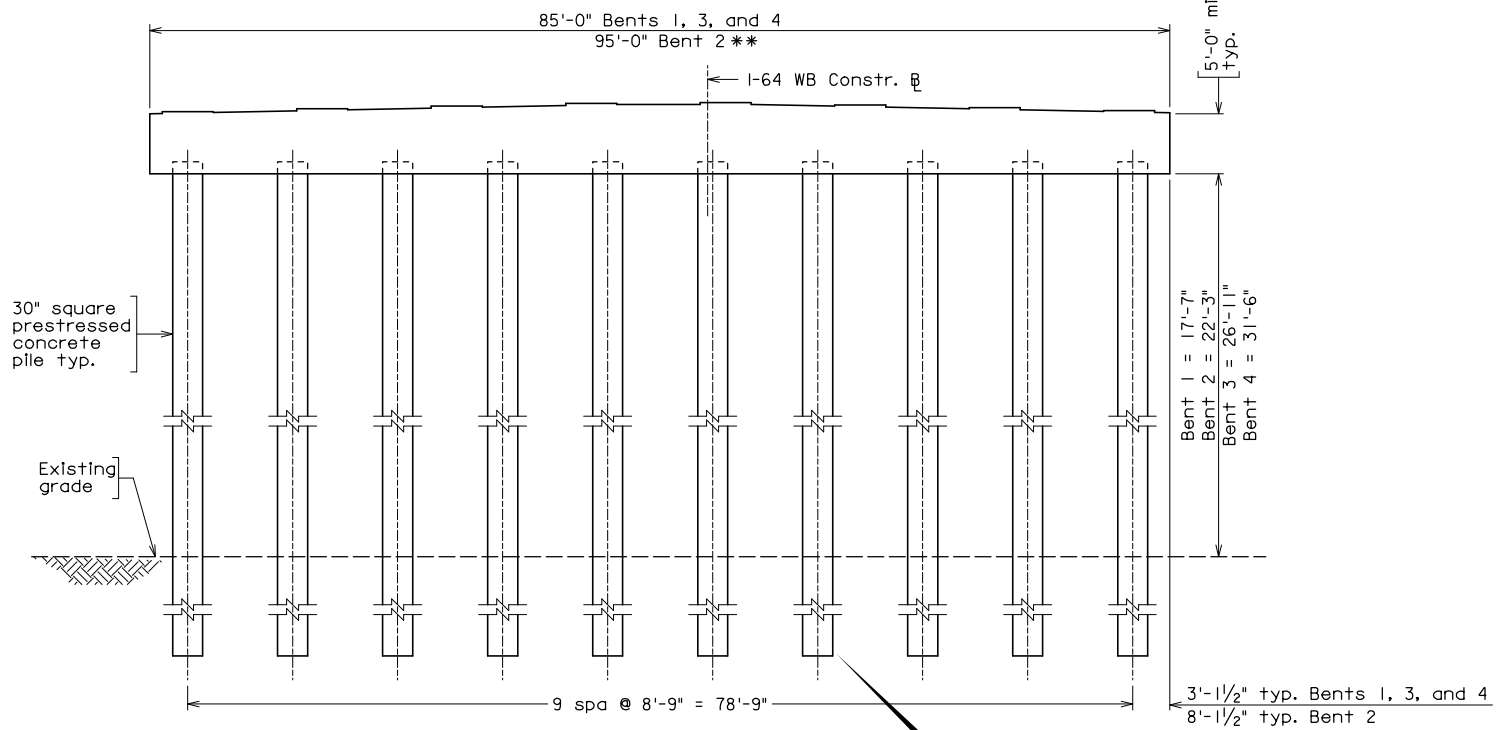
PRELIMINARY PLANS
THESE PLANS NOT TO BE USED
FOR CONSTRUCTION



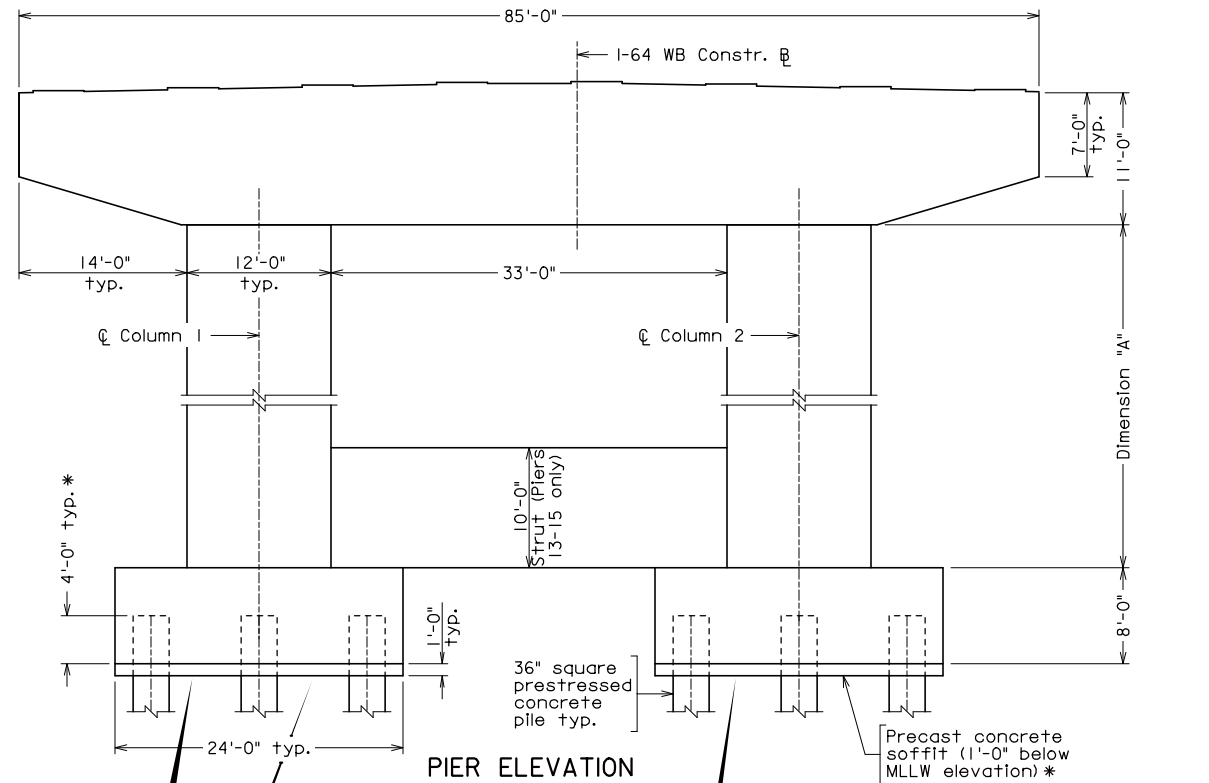
PLAN OF BENT CAP



PLAN OF PIER CAP



BENT ELEVATION



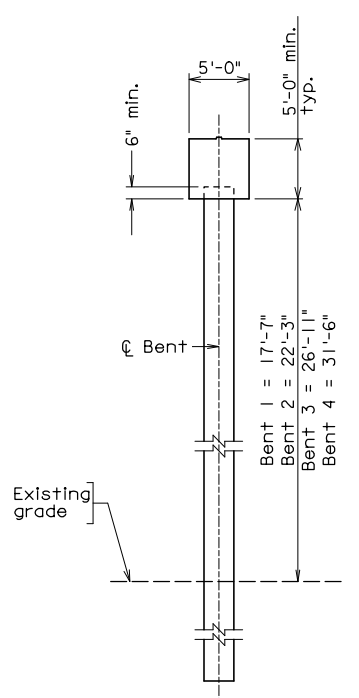
PIER ELEVATION

Prestressed Concrete Piles Are Fabricated In Controlled Environment Which Minimizes Quality Concerns

The Precast Concrete Soffit Is Not Used As A Structural Portion Of The Cast-In-Place Pile Footing

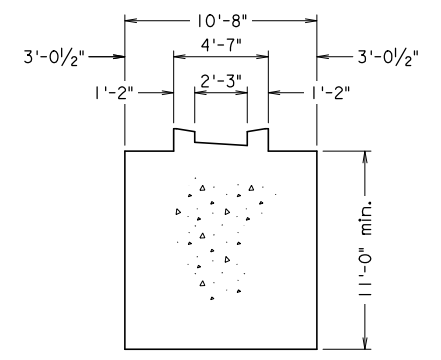
Materials In The Precast Concrete Soffit Meet The Same Corrosion Requirements As The Cast-In-Place Pile Footing

Precast Concrete Soffit Improves Construction Schedule And Adds An Additional Level Of Protection To Cast-In-Place Pile Footings

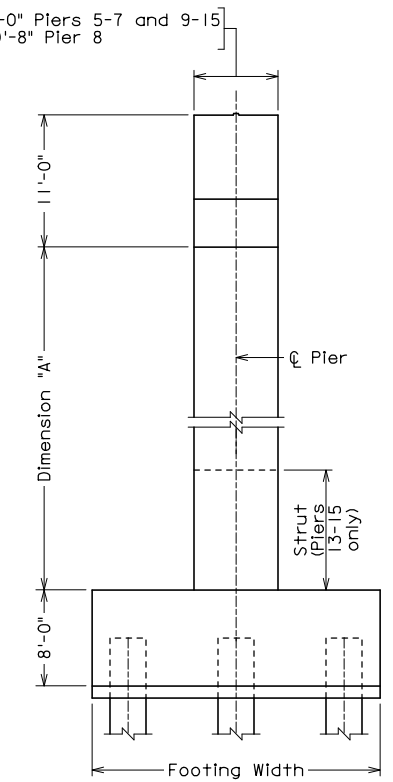


BENT END VIEW

BENTS 1-4



**PIER 8
CAP SECTION DETAIL**
Virginia Pier Cap



PIER END VIEW

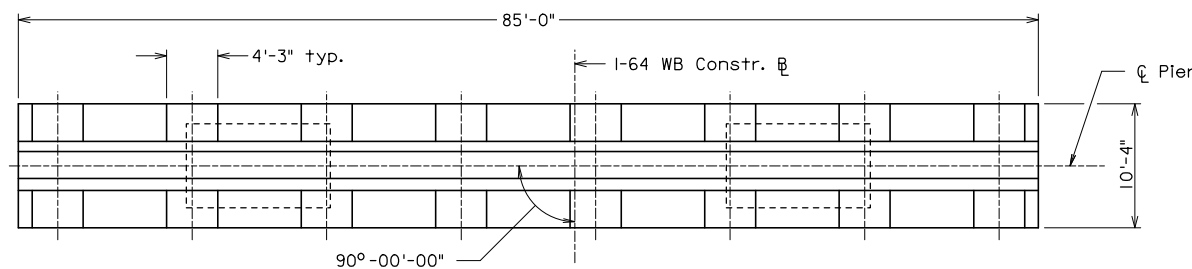
PIERS 5-15

Pier	Dimension "A"	Footing Width	# Piles per Footing
5	30'-0"	21'-0"	6
6	35'-4"	21'-0"	6
7	40'-8"	21'-0"	6
8	45'-11"	21'-0"	6
9	51'-3"	21'-0"	6
10	56'-7"	21'-0"	6
11	61'-11"	21'-0"	6
12	67'-3"	21'-0"	6
13	72'-7"	24'-0"	9
14	77'-11"	24'-0"	9
15	82'-5"	24'-0"	9

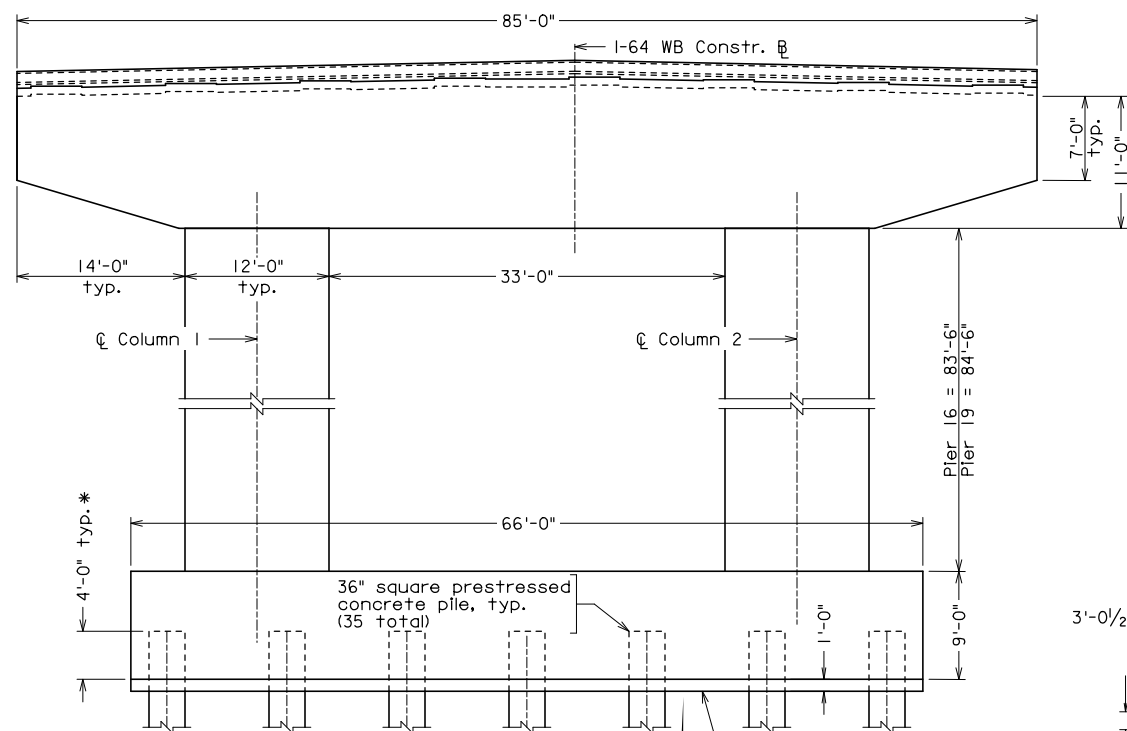
PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

High Rise - 1071 Pile#64618M of 4, updated By: Jackson 8/11/2017

High Rise - (08) Pile-Cap Detail AM2 of 4 Prepared By: J. Jackson 8/11/2017



PLAN OF PIER CAP

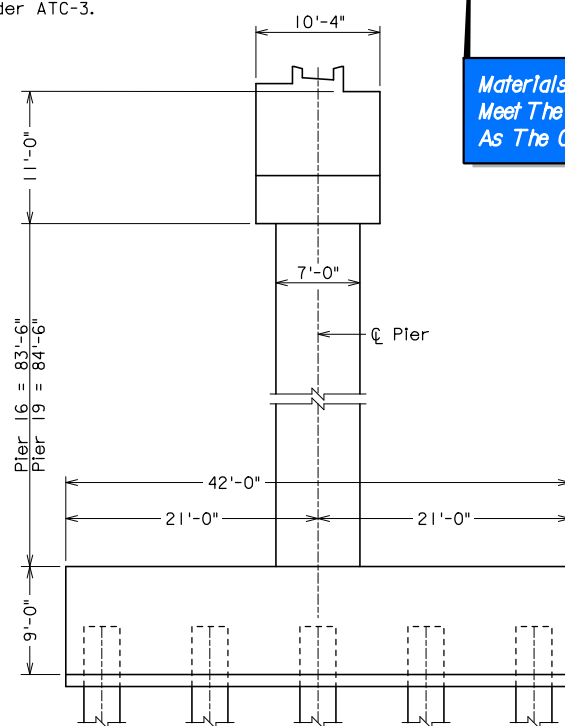


PIER ELEVATION

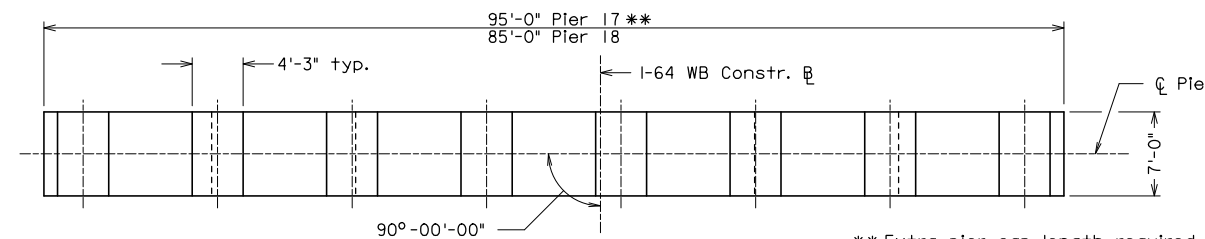
* Alternate pile embedment and precast concrete soffit approved under ATC-3.

Precast concrete soffit (1'-0" below MLLW elevation) *

Materials In The Precast Concrete Soffit Meet The Same Corrosion Requirements As The Cast-In-Place Pile Footing

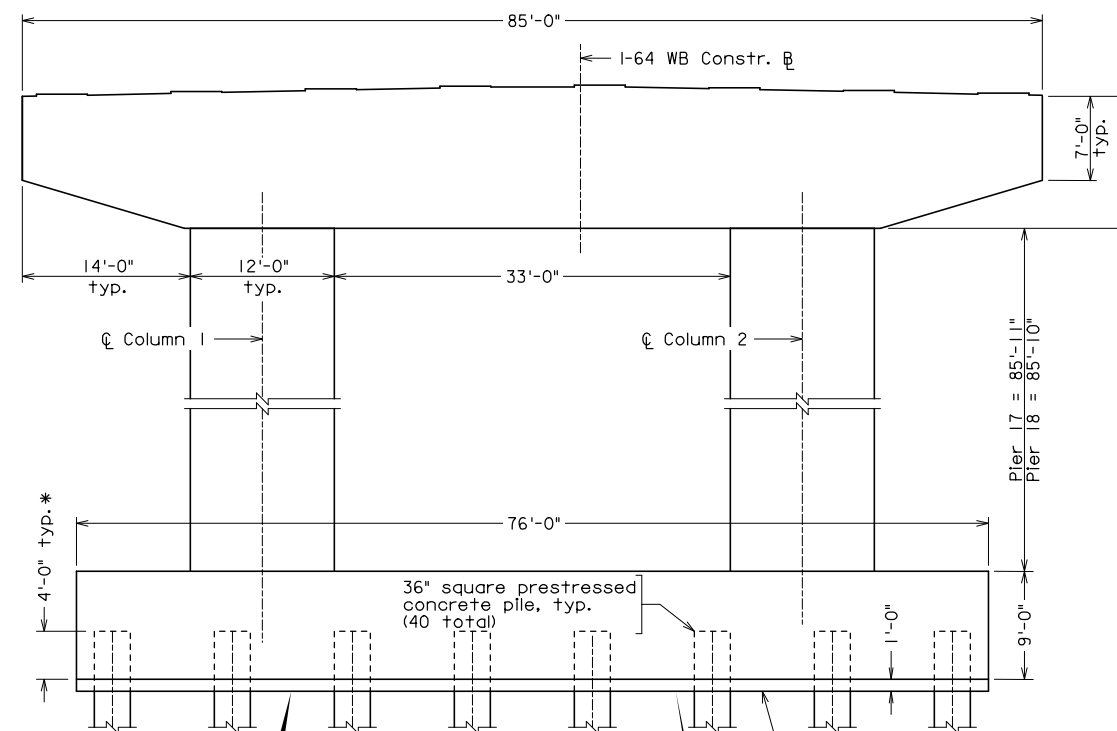


PIER END VIEW
PIERS 16 AND 19



PLAN OF PIER CAP

** Extra pier cap length required to accommodate bridge-mounted sign structure.



PIER ELEVATION

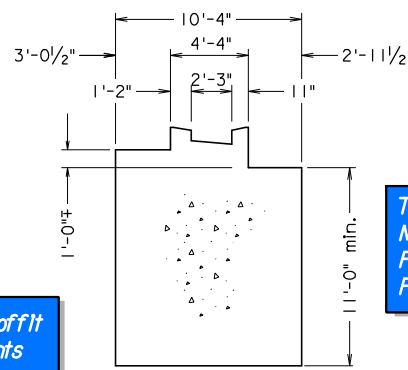
Pier 18 shown. Pier 17 similar.

Precast concrete soffit (1'-0" below MLLW elevation) *

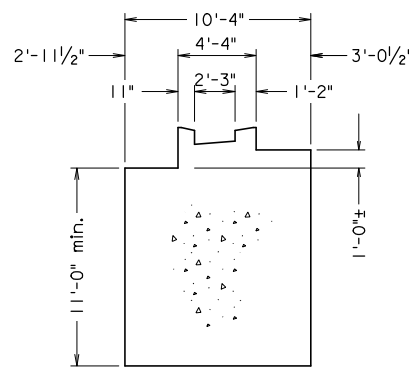
* Alternate pile embedment and precast concrete soffit approved under ATC-3.

Precast Concrete Soffit Improves Construction Schedule And Adds An Additional Level Of Protection To Cast-In-Place Pile Footings

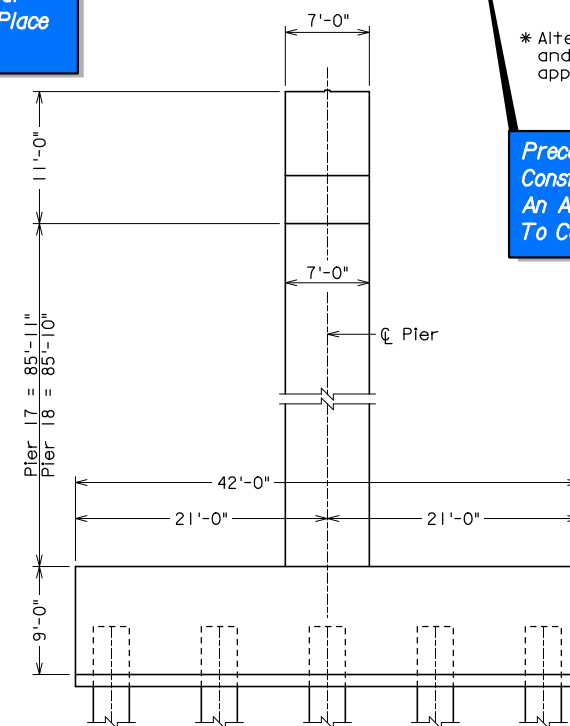
The Precast Concrete Soffit Is Not Used As A Structural Portion Of The Cast-In-Place Pile Footing



PIER 16
CAP SECTION DETAIL
Virginia Pier Cap

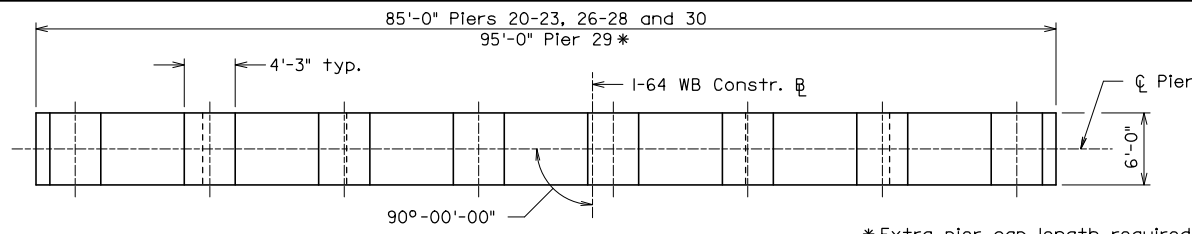


PIER 19
CAP SECTION DETAIL
Virginia Pier Cap



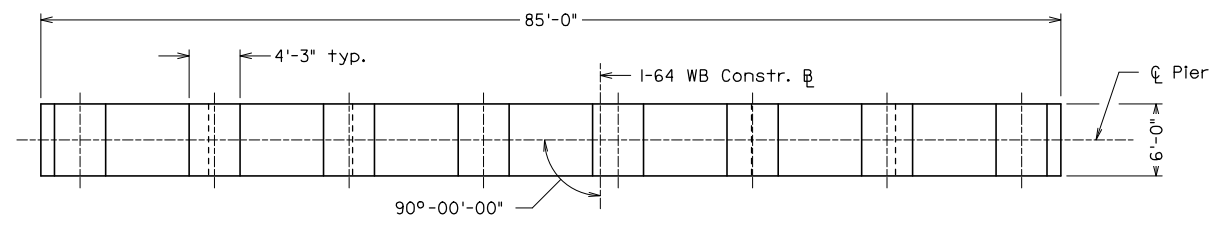
PIER END VIEW
PIERS 17 AND 18

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

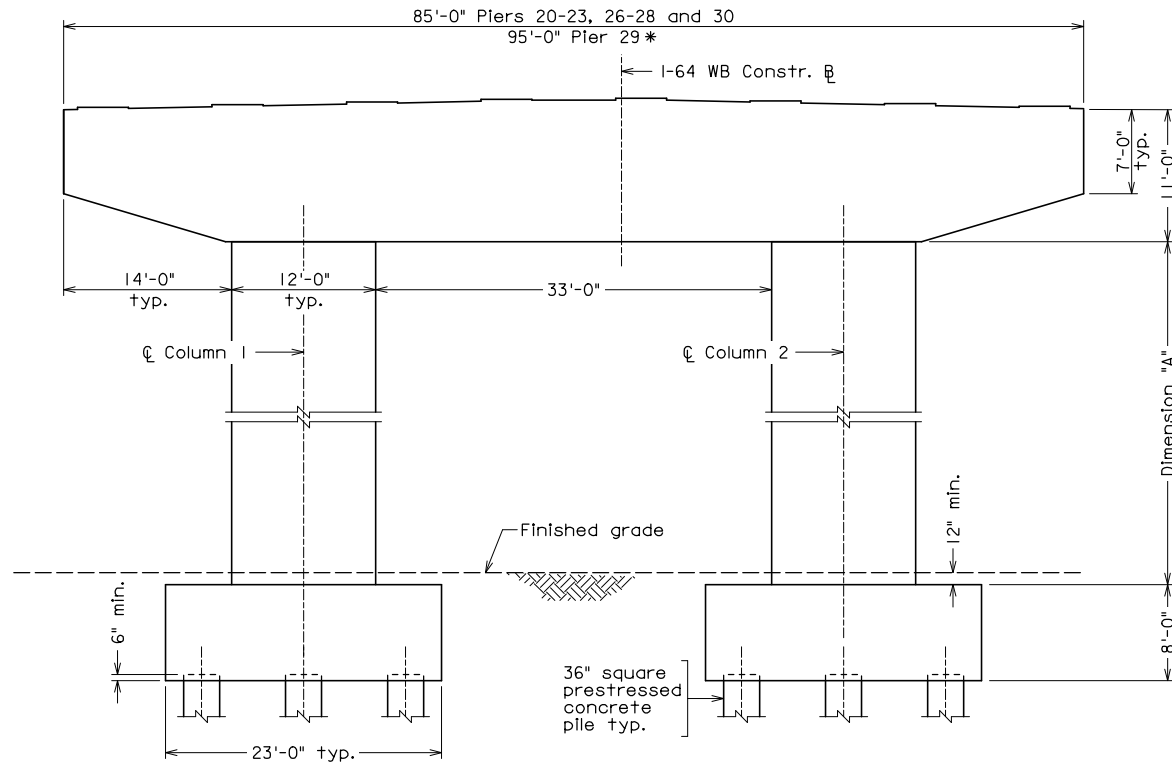


PLAN OF PIER CAP
Pier 27 plan of pier cap similar to Piers 16 and 19.

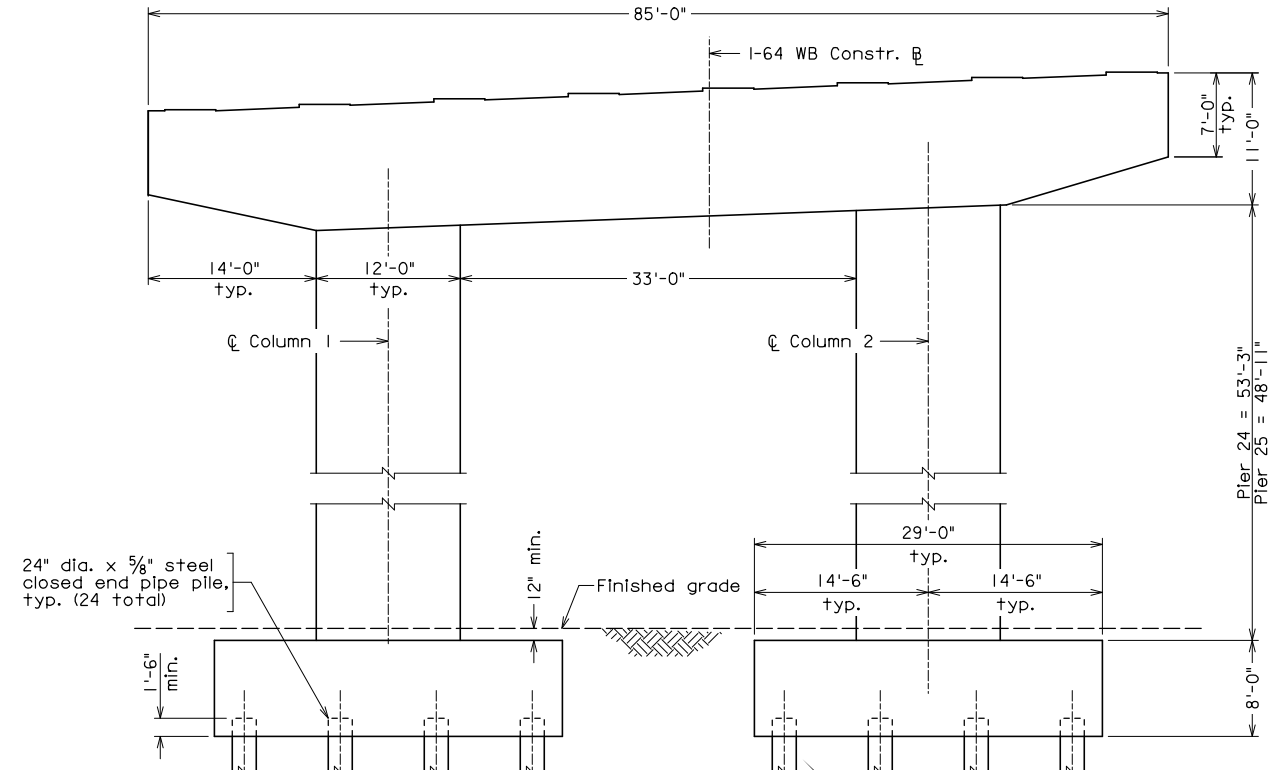
*Extra pier cap length required to accommodate bridge-mounted sign structure.



PLAN OF PIER CAP

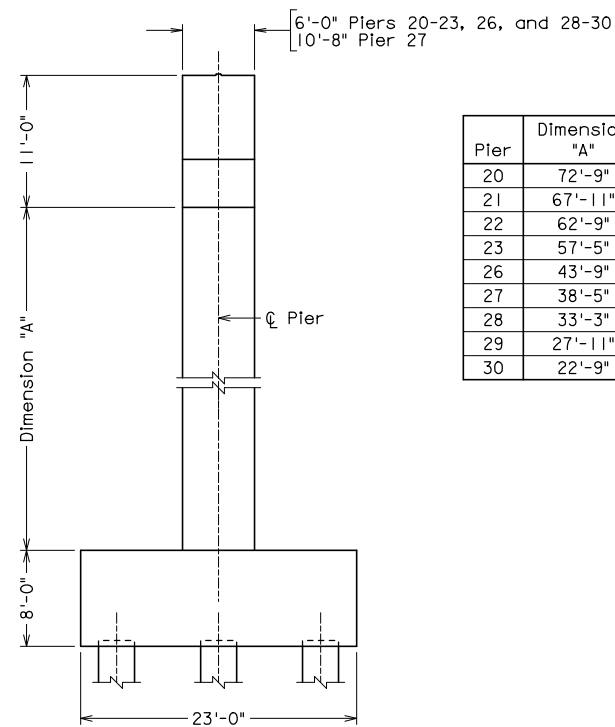


PIER ELEVATION
Elevation of Virginia Pier Cap for Pier 27 similar to Piers 16 and 19.



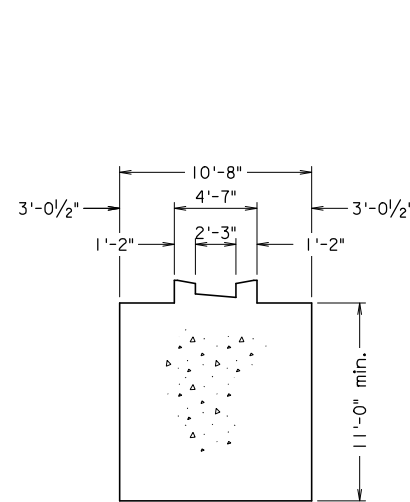
PIER ELEVATION

Steel Pipe Piles Used Under Power Transmission Lines To Avoid Utility Conflict During Pile Installation

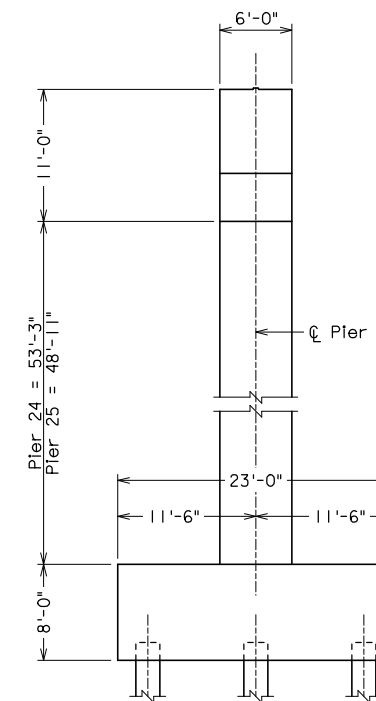


PIER END VIEW
PIERS 20-23, 26-30

Pier	Dimension "A"	No. Piles per Footing
20	72'-9"	5
21	67'-11"	5
22	62'-9"	5
23	57'-5"	5
26	43'-9"	5
27	38'-5"	5
28	33'-3"	5
29	27'-11"	5
30	22'-9"	5



PIER 27
CAP SECTION DETAIL
Virginia Pier Cap

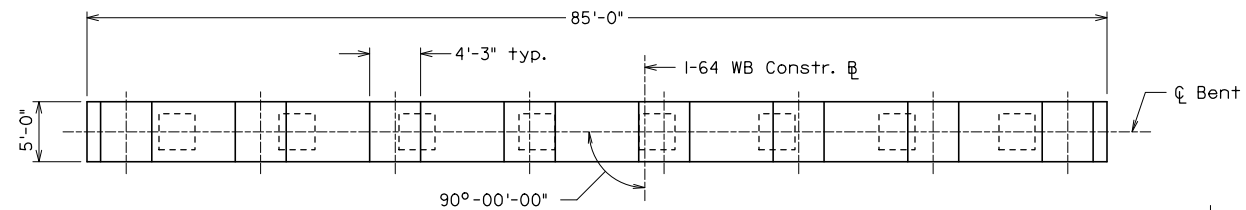


PIER END VIEW
PIERS 24 AND 25

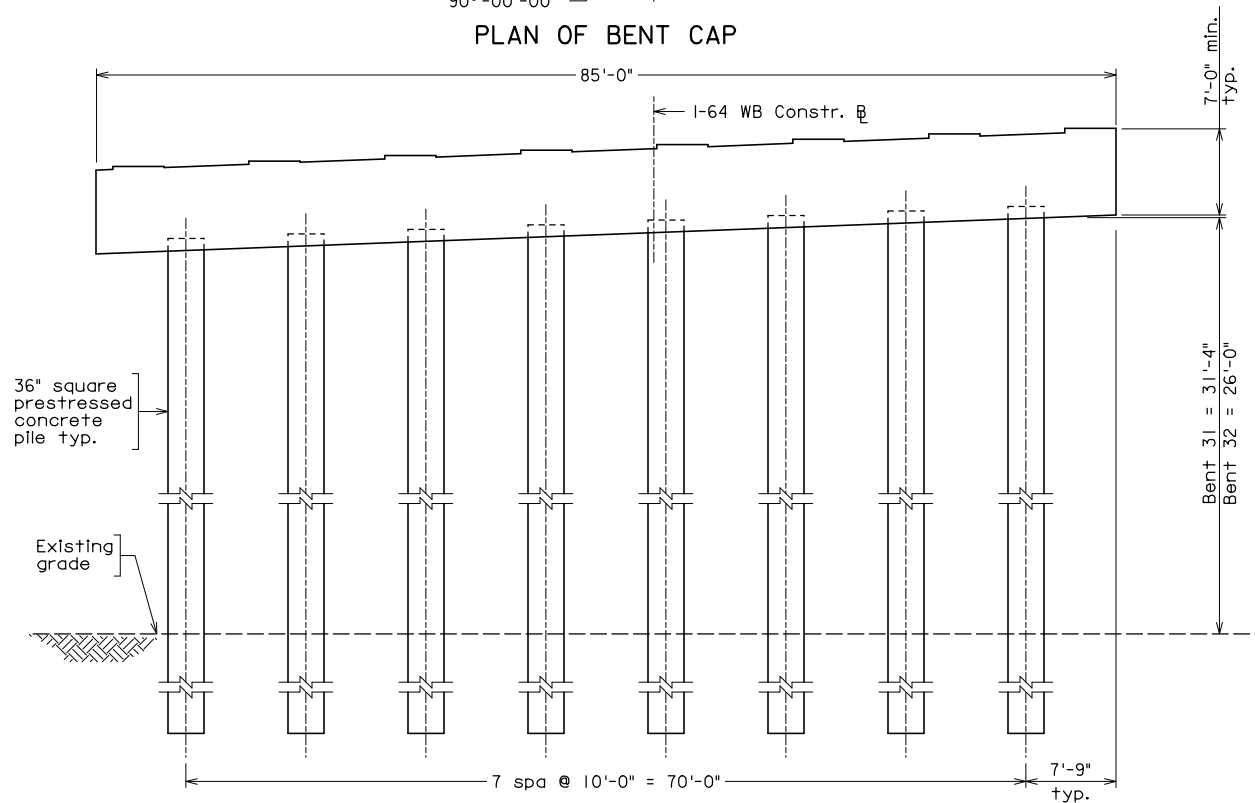
PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

High Rise - (09) Piers 20-23, 26-30, 27, 24, 25
8/11/2017
Designed By: Jackson

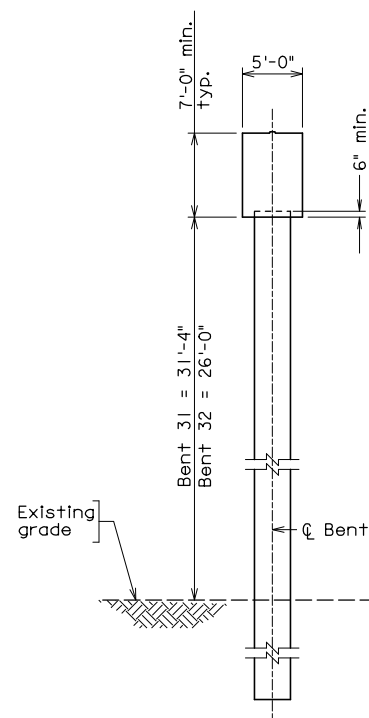
High Rise - (10) Piers/50151611 of 4/Supports By: Jackson 8/11/2017



PLAN OF BENT CAP

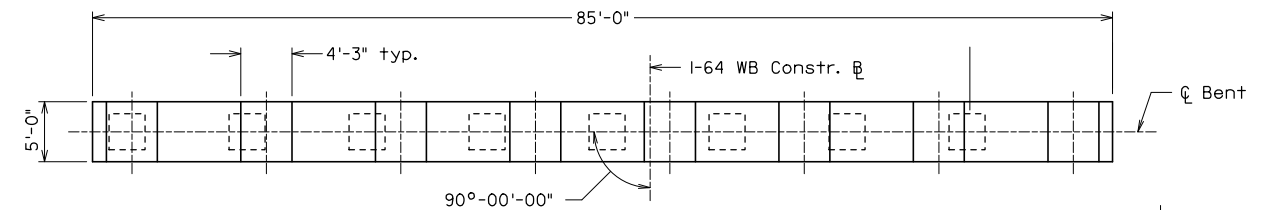


BENT ELEVATION

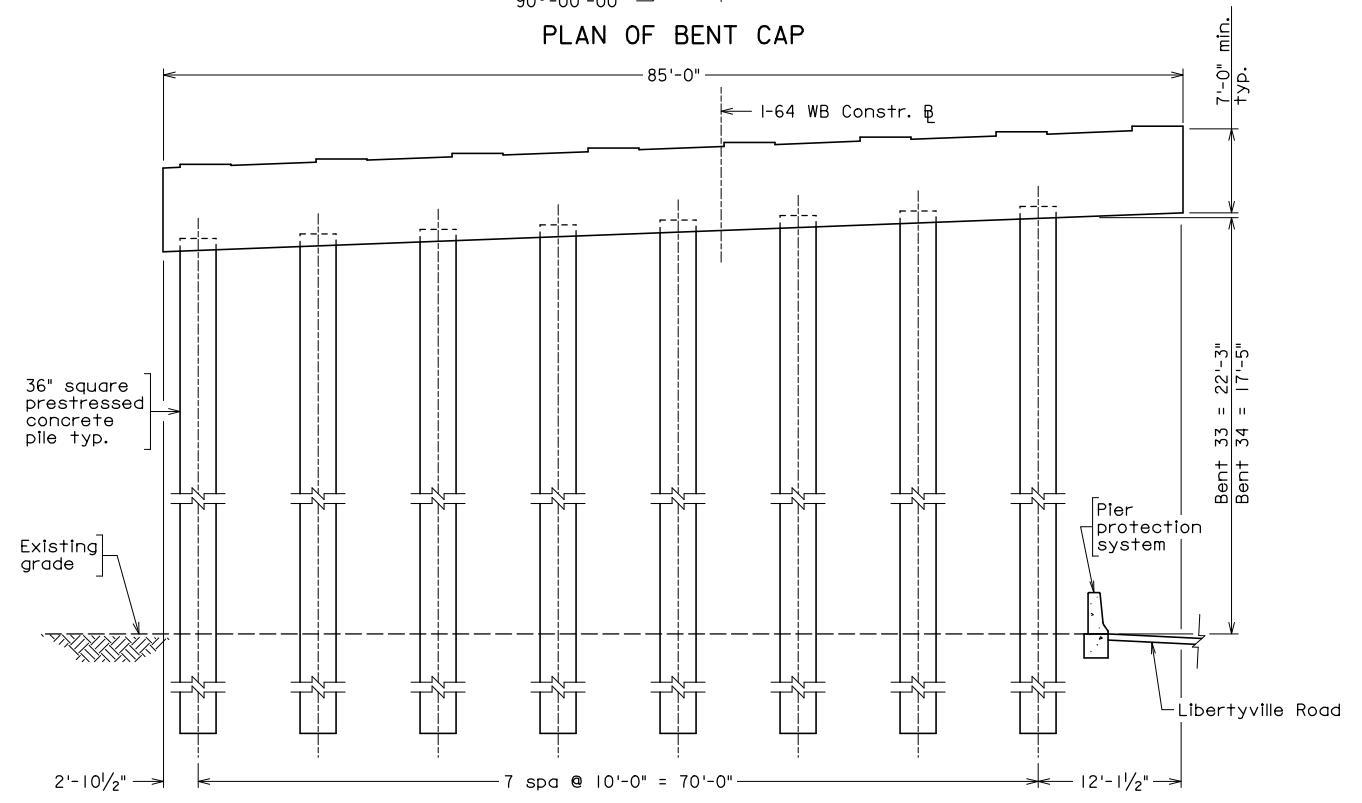


BENT END VIEW

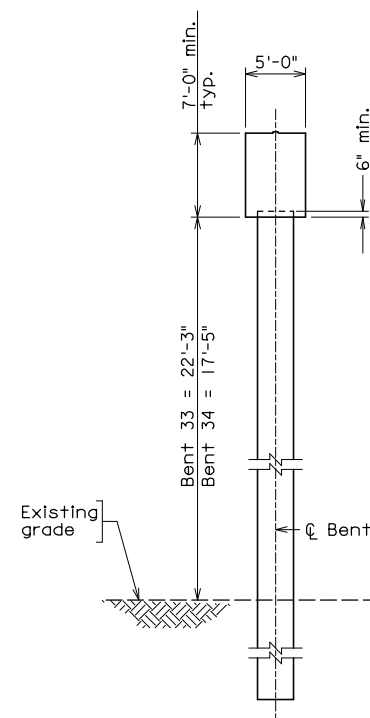
BENTS 31 & 32



PLAN OF BENT CAP



BENT ELEVATION



BENT END VIEW

BENTS 33 & 34

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED
FOR CONSTRUCTION

DESIGN BUILDER



DESIGNED BY
STV Incorporated



TITLE
PIER DETAILS
SHEET 4 OF 4

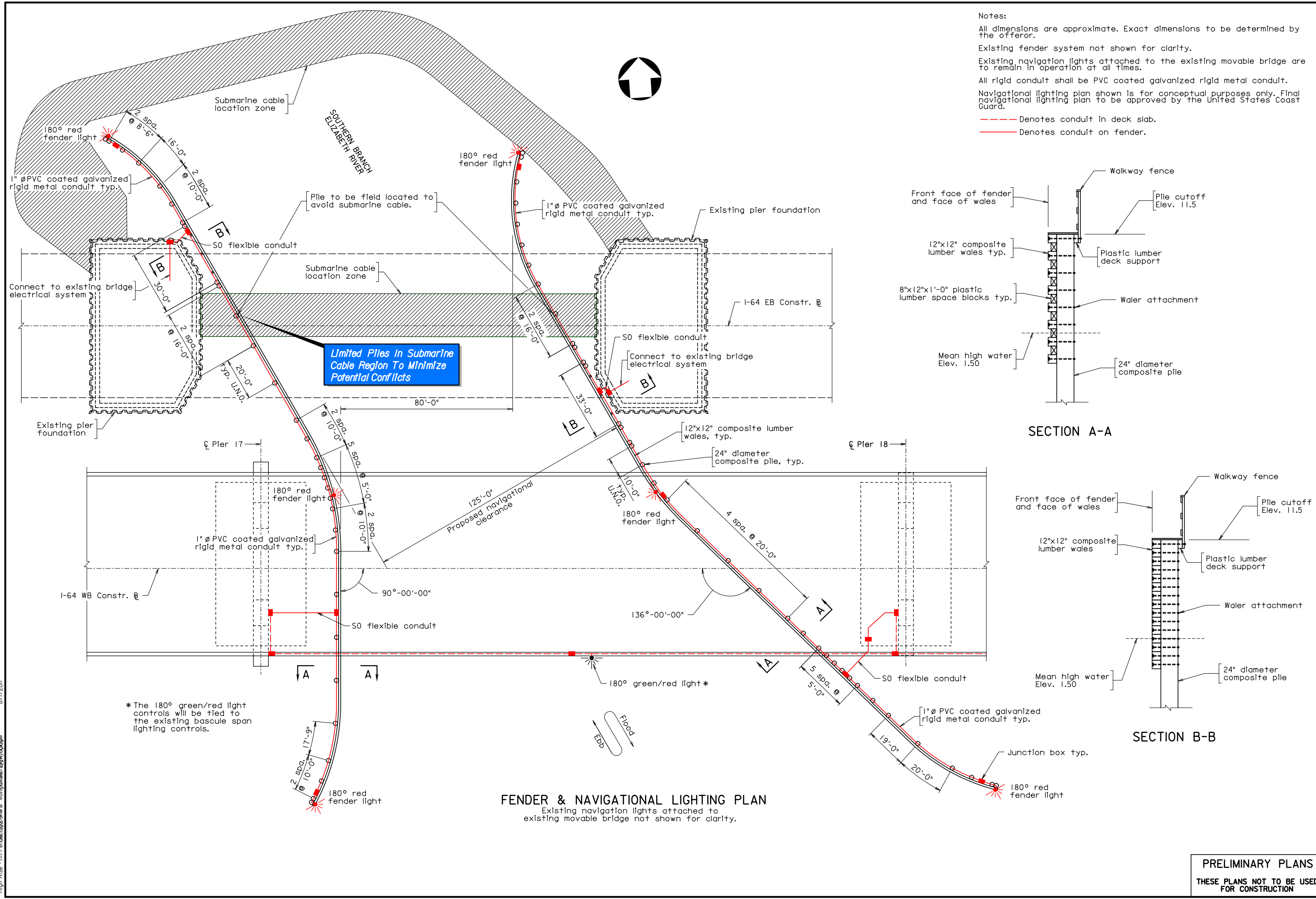
VIRGINIA DEPARTMENT OF TRANSPORTATION

HIGH RISE BRIDGE
PROJ.0064-131-811, B662

SHEET NO.
S-10

PAGE NO.
158

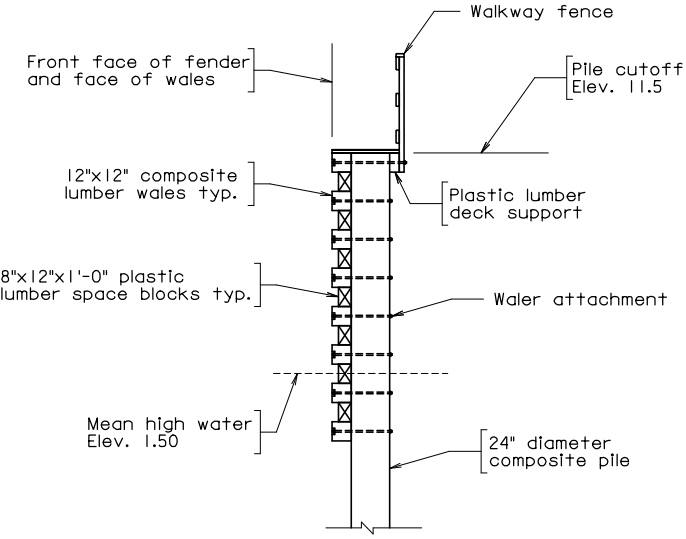
High Rise - (1) Fender & Navigational Lighting Plan
8/11/2017



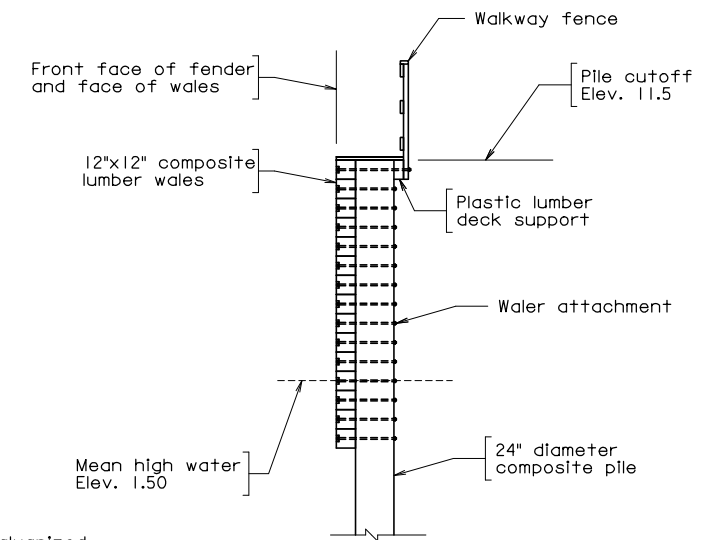
FENDER & NAVIGATIONAL LIGHTING PLAN
Existing navigation lights attached to existing movable bridge not shown for clarity.

Notes:
 All dimensions are approximate. Exact dimensions to be determined by the offeror.
 Existing fender system not shown for clarity.
 Existing navigation lights attached to the existing movable bridge are to remain in operation at all times.
 All rigid conduit shall be PVC coated galvanized rigid metal conduit.
 Navigational lighting plan shown is for conceptual purposes only. Final navigational lighting plan to be approved by the United States Coast Guard.

--- Denotes conduit in deck slab.
 --- Denotes conduit on fender.



SECTION A-A



SECTION B-B

* The 180° green/red light controls will be tied to the existing bascule span lighting controls.

DESIGN BUILDER
LMB

DESIGNED BY
JMT
STV Incorporated

TITLE
FENDER & NAVIGATIONAL LIGHTING PLAN

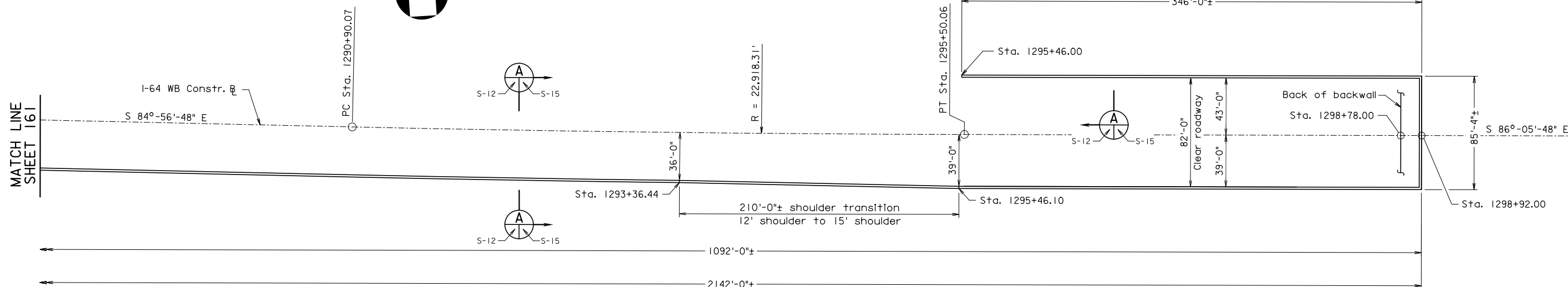
VIRGINIA DEPARTMENT OF TRANSPORTATION
HIGH RISE BRIDGE
PROJ.0064-131-811, B662

SHEET NO.
S-11

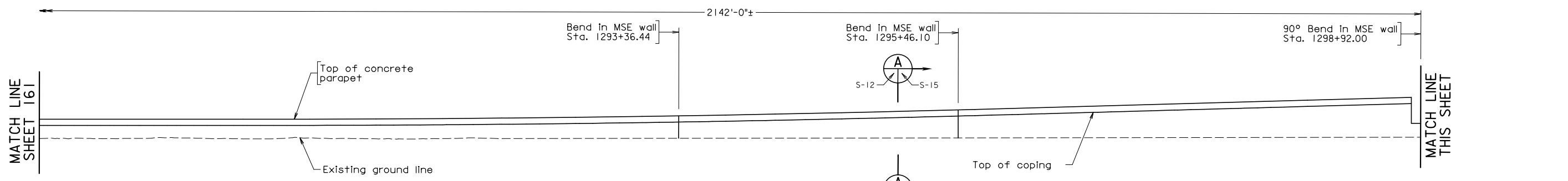
PAGE NO.
159

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

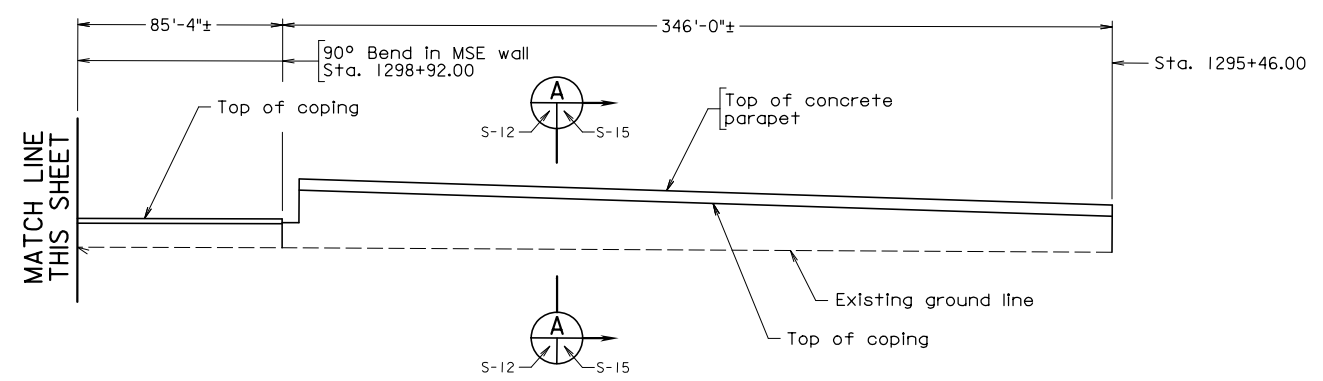
High Rise - (12) Redesign V&M Details (Randy Leger, Jackson 8/11/2017)



ABUTMENT A MSE WALL PLAN



DEVELOPED ELEVATION MSE WALL ABUTMENT A
Exposed face of MSE wall.



DEVELOPED ELEVATION MSE WALL ABUTMENT A
Exposed face of MSE wall.

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

DESIGN BUILDER **LMB**

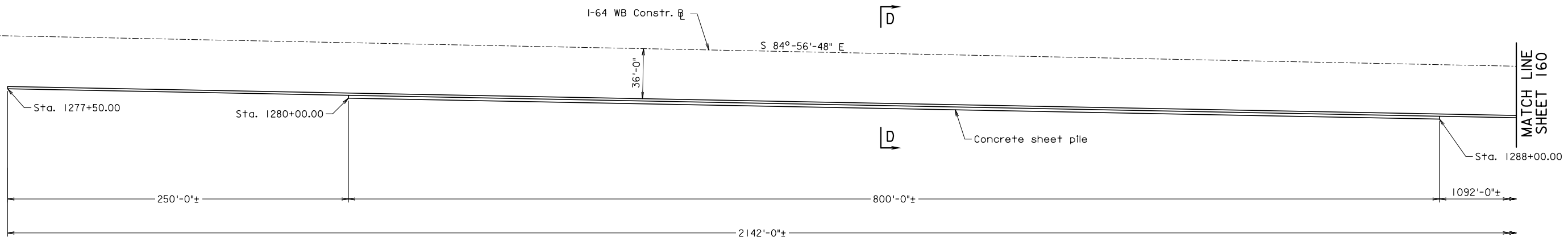
DESIGNED BY **JMT.**

STV Incorporated

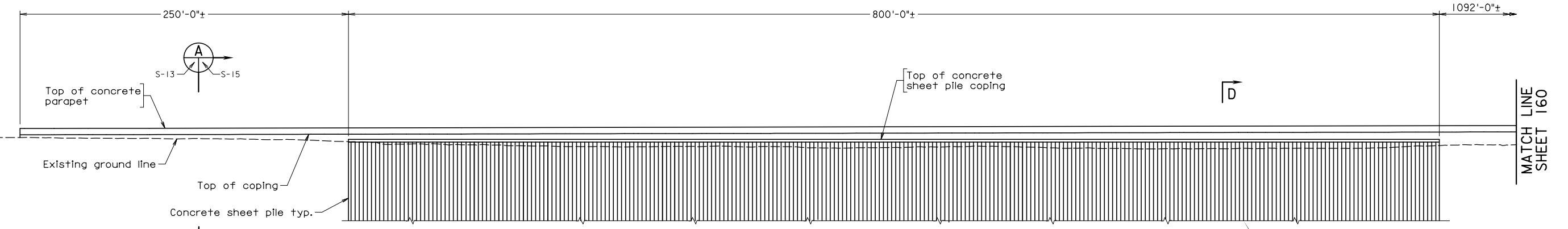
TITLE **ABUTMENT A MSE WALL**

VIRGINIA DEPARTMENT OF TRANSPORTATION
HIGH RISE BRIDGE
PROJ.0064-131-811, B662

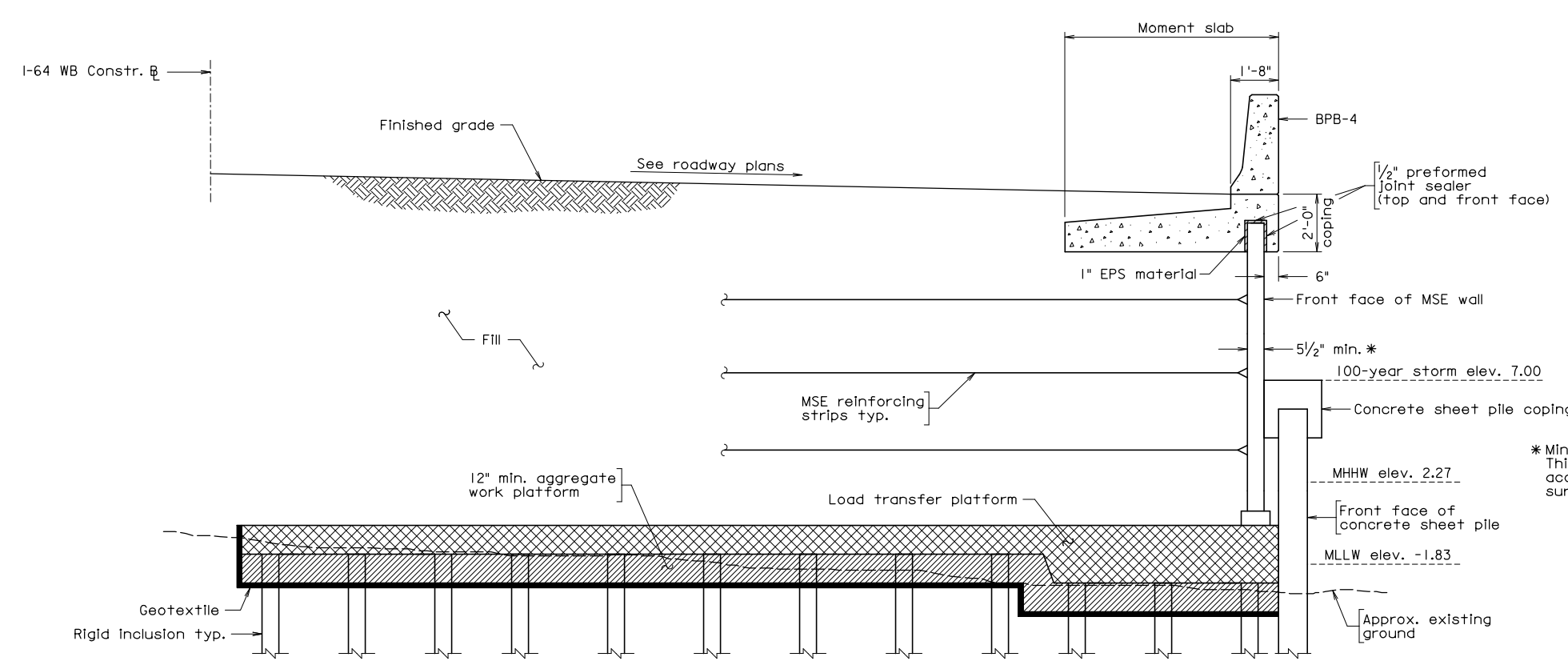
SHEET NO. S-12
PAGE NO. 160



ABUTMENT A MSE WALL PLAN



DEVELOPED ELEVATION
MSE WALL ABUTMENT A
Exposed face of MSE wall.



SECTION D-D

Concrete Sheet Pile Enhances Constructability And Minimizes Environmental Impacts

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

High Rise - (13) Reinforcing Steel Details (Banded) (Banded) Jackson 8/13/2017

DESIGN BUILDER

DESIGNED BY

TITLE

SHEET NO.

PAGE NO.

VIRGINIA DEPARTMENT OF TRANSPORTATION

HIGH RISE BRIDGE

PROJ.0064-131-811, B662

ABUTMENT A
MSE WALL CONT.

LMB

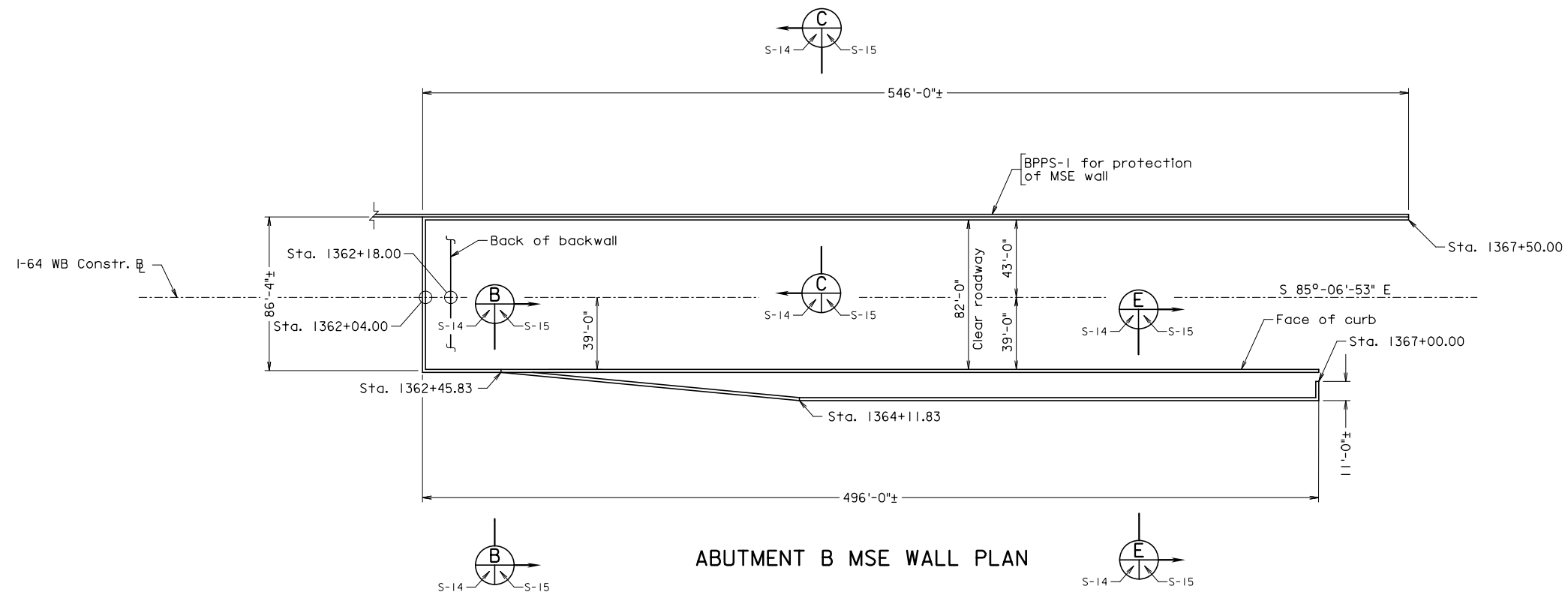
JMT.

STV Incorporated

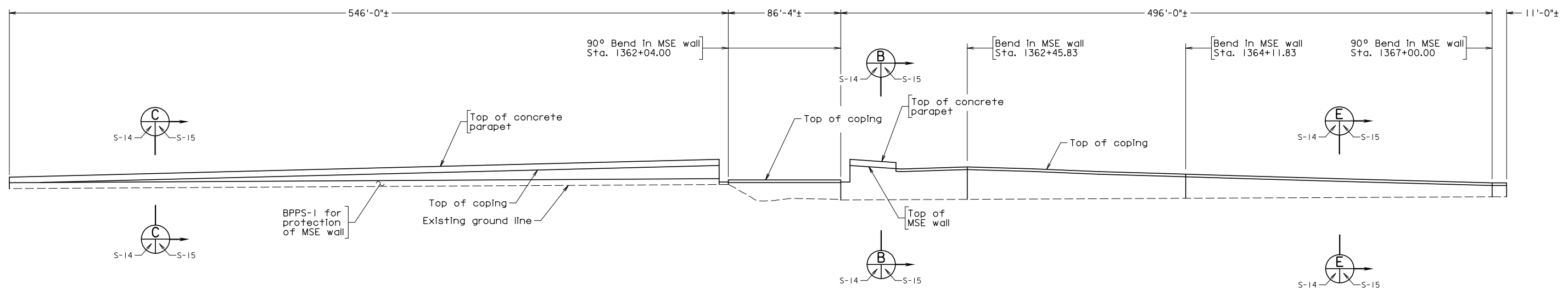
S-13

161

High Rise - (14) Ref 5054-41/MD/Details EB0614/BJG/jackson 8/11/2017

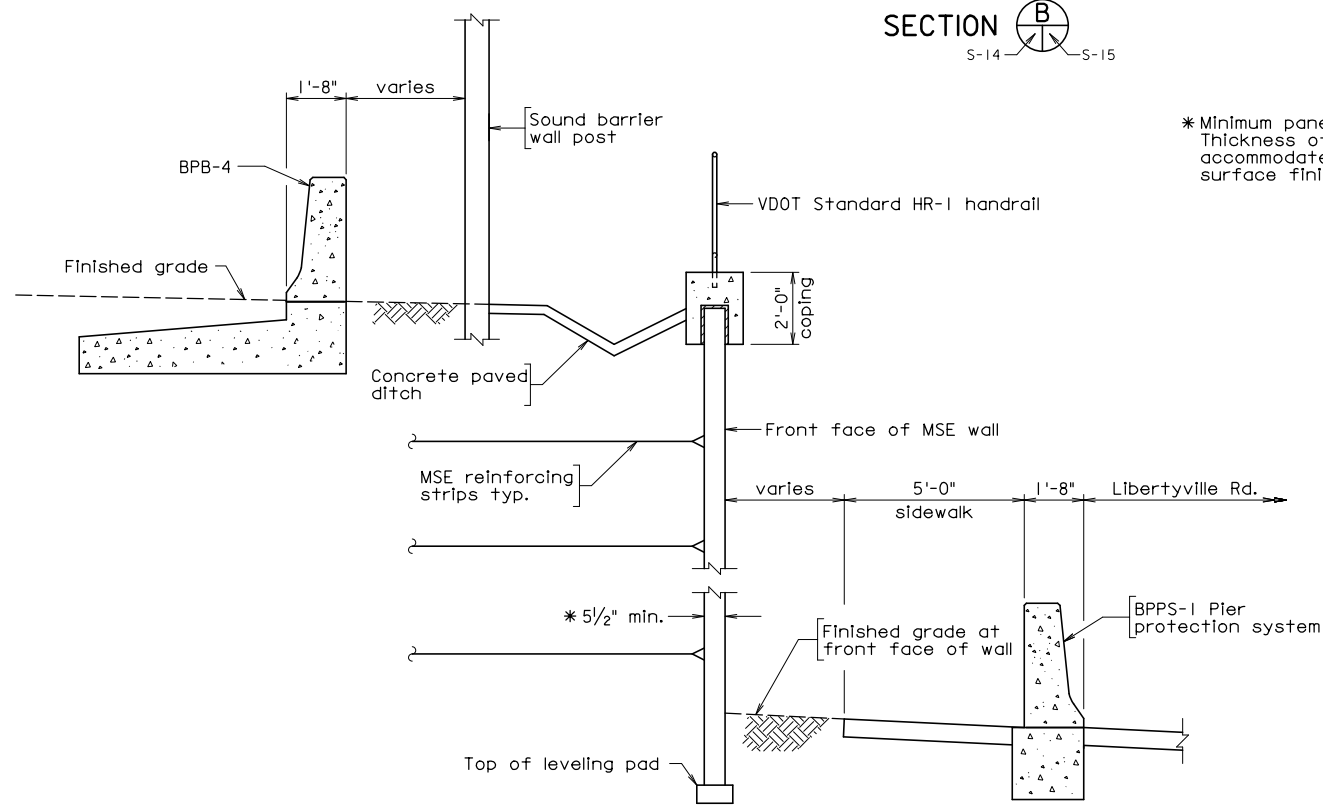
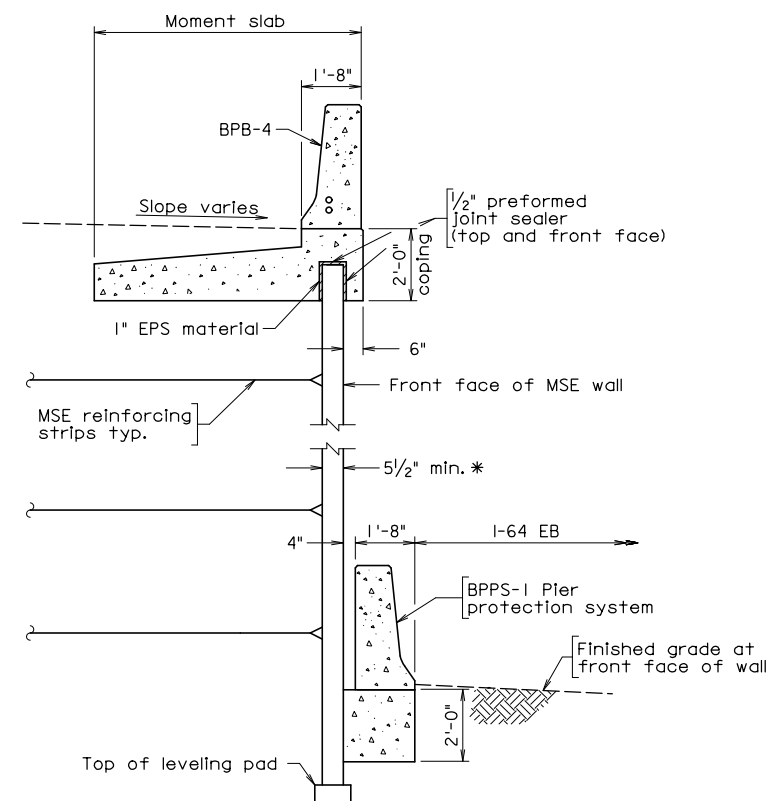
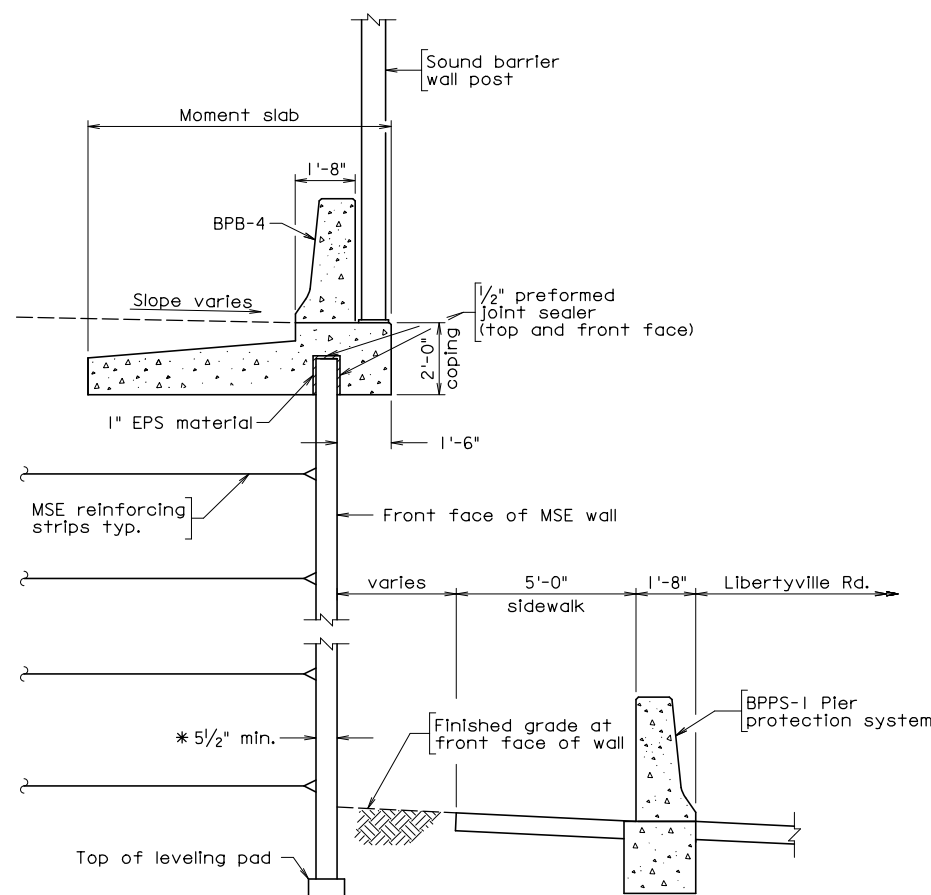
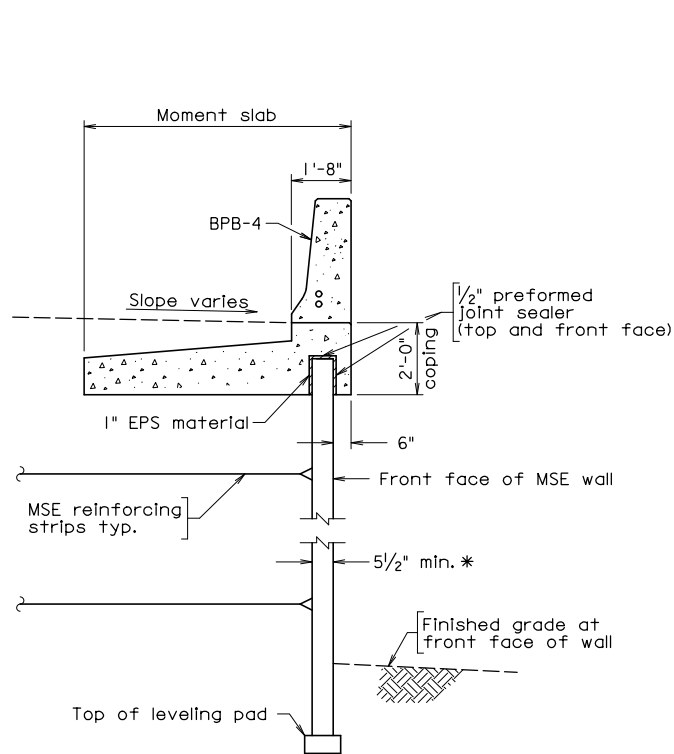


ABUTMENT B MSE WALL PLAN

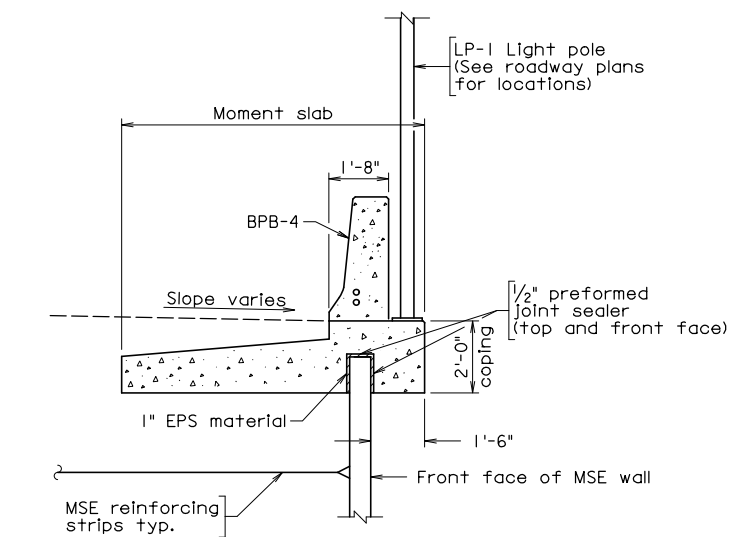


DEVELOPED ELEVATION MSE WALL ABUTMENT B
Exposed face of MSE wall.

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION



* Minimum panel design thickness is 5 1/2 inches. Thickness of concrete must increase to accommodate the specified architectural surface finish.

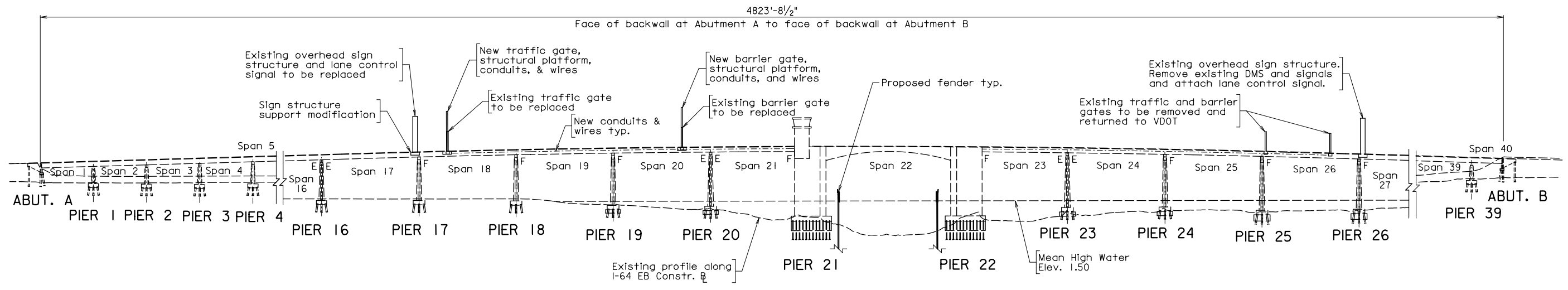


PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

High Rise - (15) Reinforcing Steel Details Rev 06/14/2017

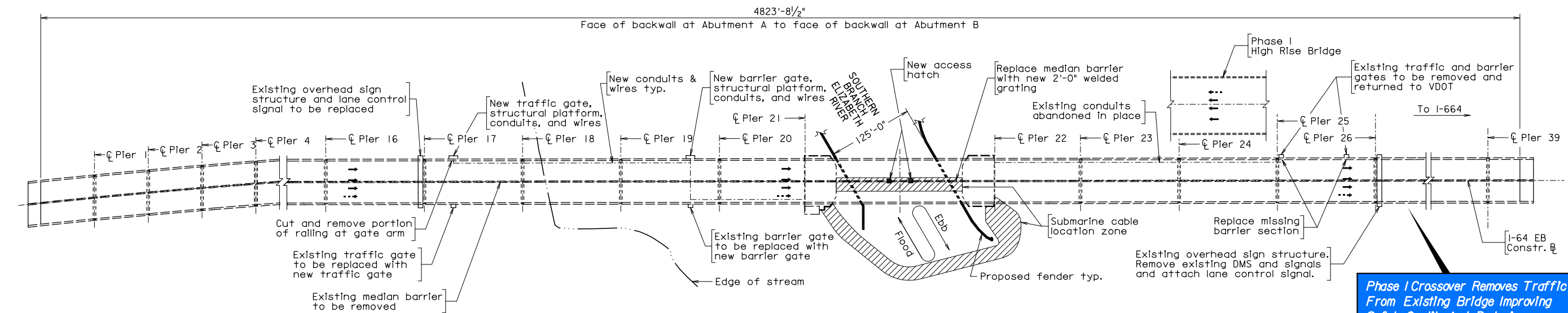


4.3.3 - EXISTING BRIDGE MODIFICATION CONCEPTUAL PLANS



PART ELEVATION

Plan and elevation is oriented to match existing bridge plans.
 Note: Existing HRB stationing is from east to west. RFP provided plans stationing is from west to east.



PART PLAN

Proposed High Rise Bridge not shown for clarity.

→ Lane
 → HSR Lane

Phase I Crossover Removes Traffic From Existing Bridge Improving Safety, Quality, And Reducing Congestion During Construction, See Roadway Plan Sheet 25

DESIGN EXCEPTION(S):

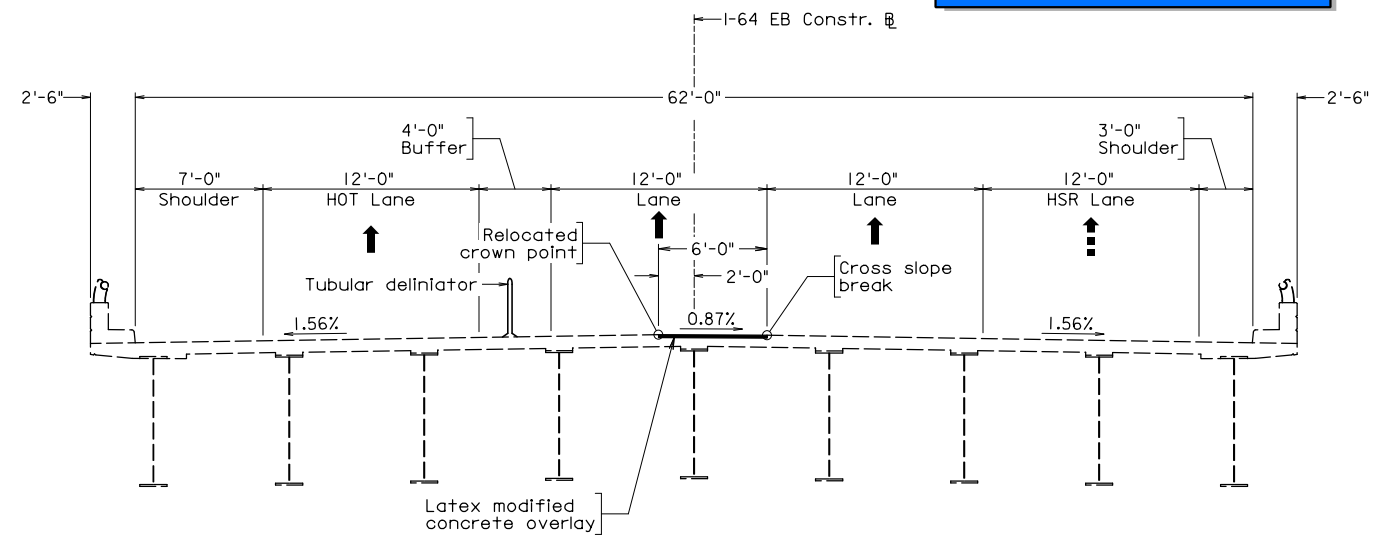
None

GENERAL NOTES:

- Width: 62'-0" face-to-face of curbs.
- Span layout: 4-79', 4-99', 8-115', 4-145', and 1-126' steel beam spans, 1-28' double leaf trunnion bascule span, 1-126', 8-145', 4-115', 1-79', 4-99', and 1-49' steel beam spans.
- Capacity: HL-93 loading for new deck elements. HS20-44 loading and alternate military loading for all other existing elements.
- Drainage area: Tidal.
- Specifications: Construction: Virginia Department of Transportation Road and Bridge Specifications, 2016. Design: AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014; and VDOT Modifications. Standards: Virginia Department of Transportation Road and Bridge Standards, 2016; including all current revisions.

NOTES:

- All traffic and barrier gates that are removed are to be returned to VDOT.
- HSR denotes Hard Shoulder Running with high friction surface treatment.
- Bascule span counterweight balance blocks will be adjusted in conjunction with median barrier removal and steel grid deck installation to maintain span balance during construction.

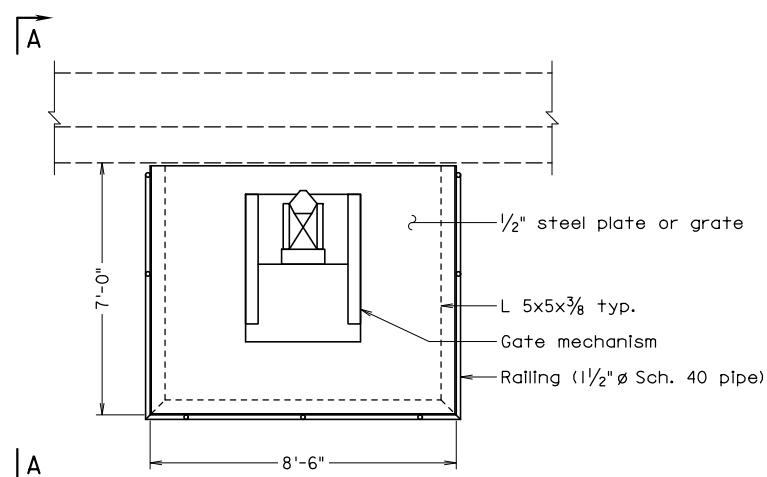


TRANSVERSE SECTION
 Looking back station

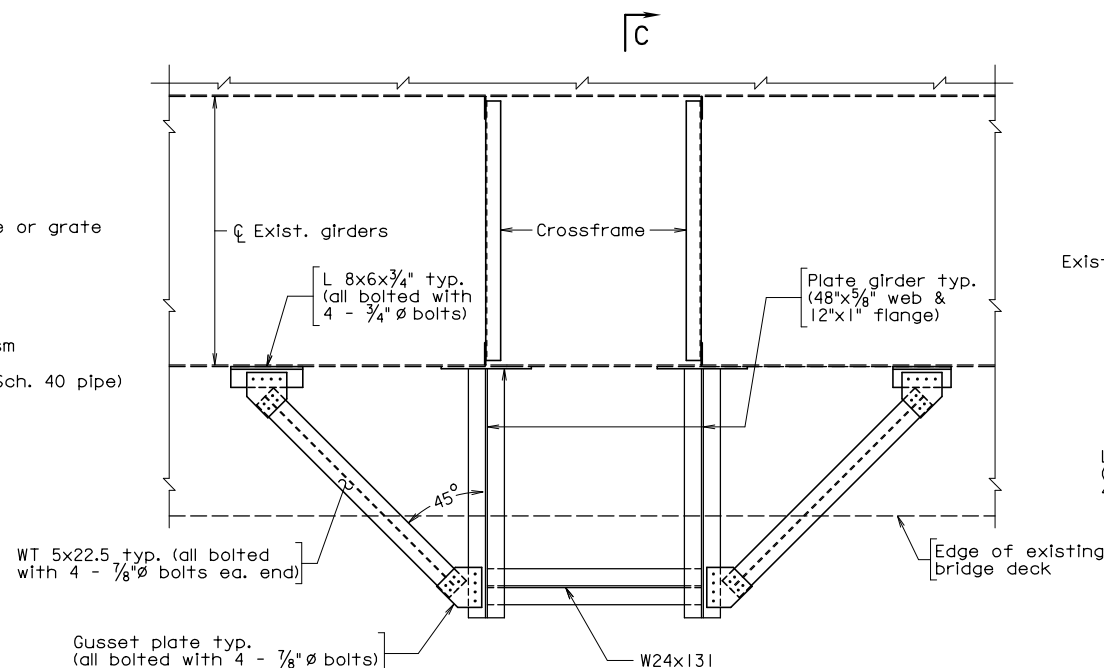
PRELIMINARY PLANS
 THESE PLANS NOT TO BE USED FOR CONSTRUCTION

Exist High Rise - 005-100817-10-10-2017 - 8/11/2017

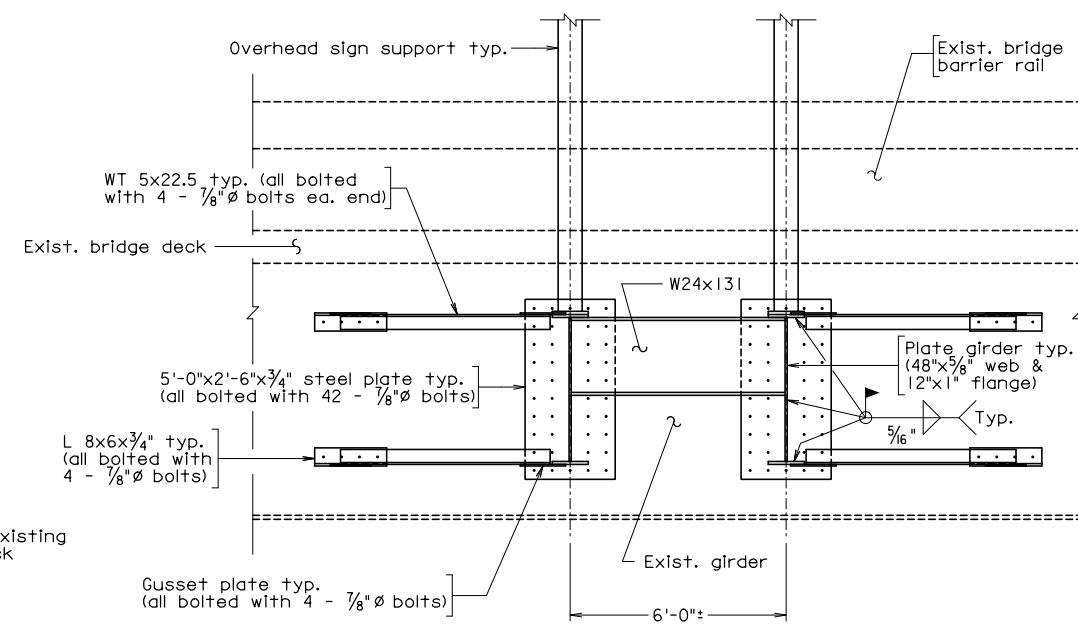




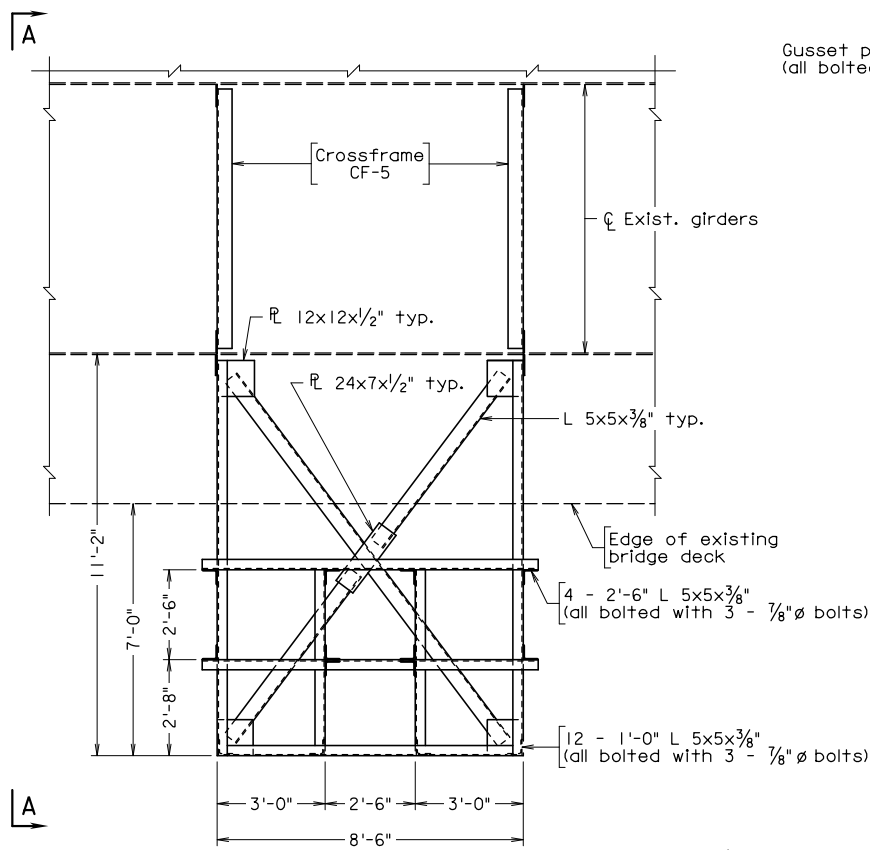
PARTIAL PLAN AT TRAFFIC AND BARRIER GATE PLATFORMS
(2 locations)



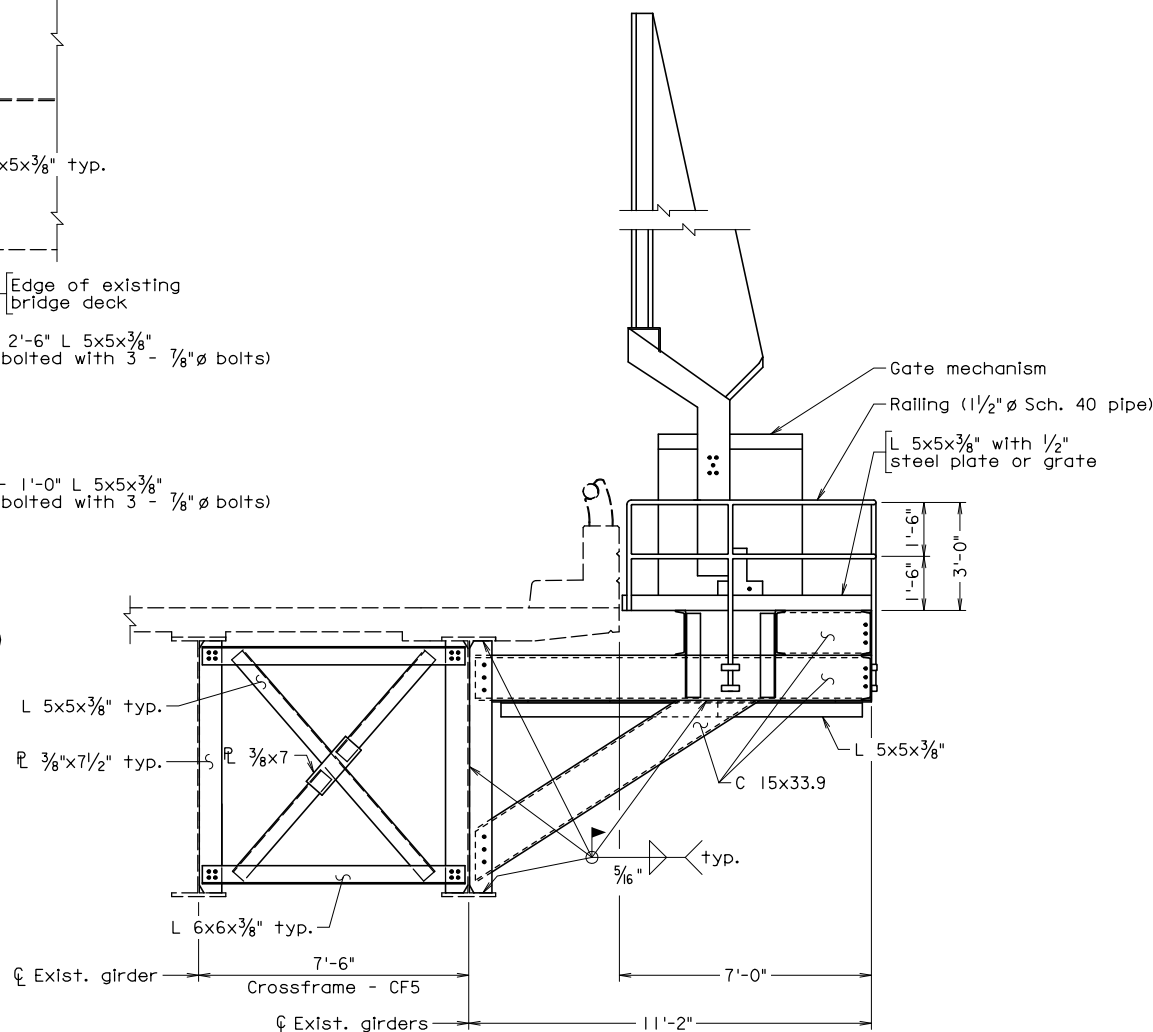
FRAMING PLAN AT OVERHEAD SIGN SUPPORT
(4 locations)



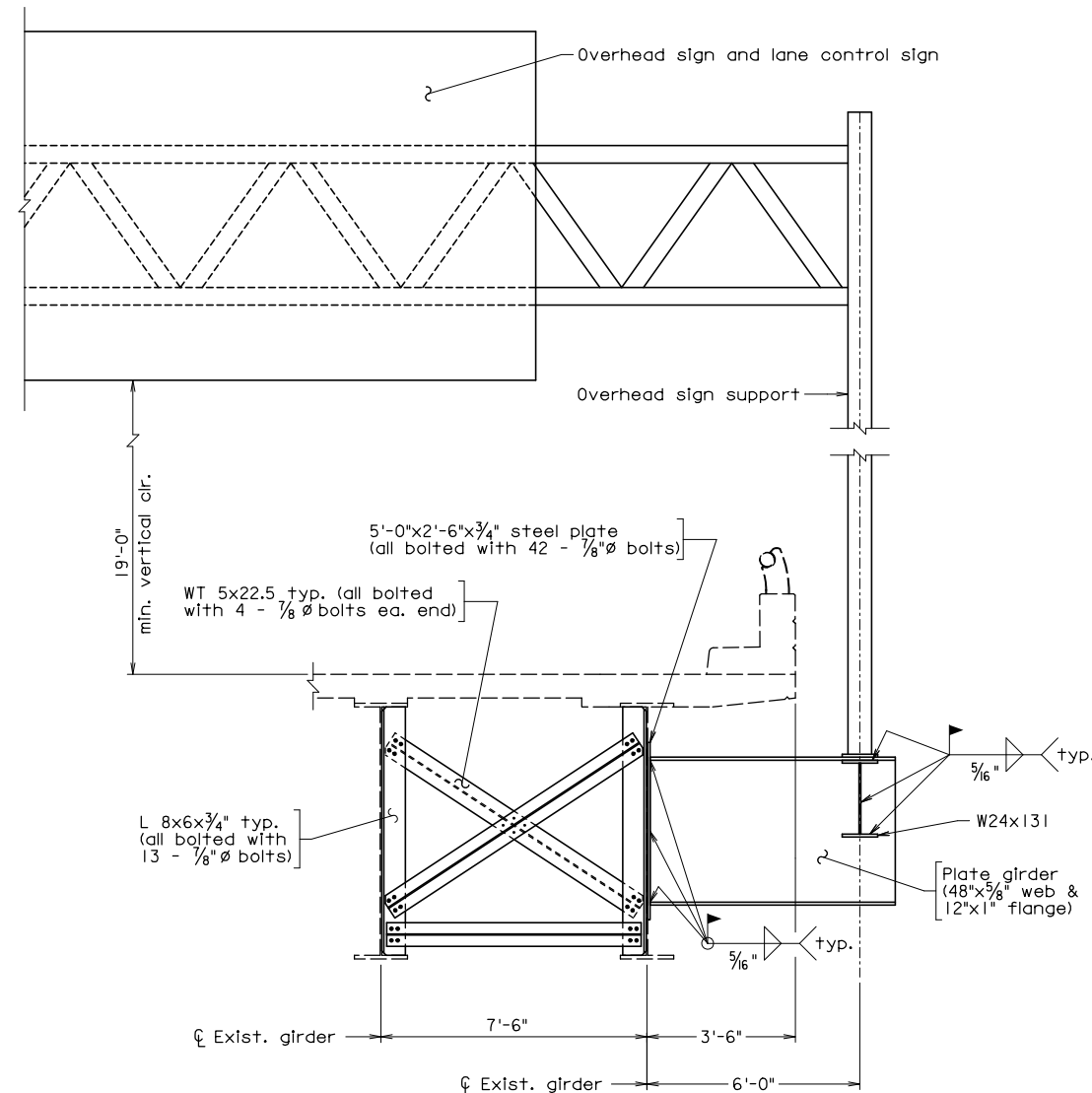
OVERHEAD SIGN SUPPORT VIEW B-B



FRAMING PLAN AT TRAFFIC AND BARRIER GATE PLATFORMS
(2 locations)



TRAFFIC AND BARRIER GATE PLATFORMS VIEW A-A



OVERHEAD SIGN SUPPORT SECTION C-C

Note:
Vibration dampening to be provided in sign mount.

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

Exist. High Rise - (22) Existing Bridge Raising Platform Sign Support Details.dgn



4.3.4 - CONCEPTUAL BRIDGE REPLACEMENT PLANS

DESIGN EXCEPTION(S):

None

GENERAL NOTES:

Widths: 36'-0" roadway, 6'-6" sidewalk. Overall width 42'-6" face-to-face of rails.

Span layout: 151' - 151' prestressed concrete 85" deep bulb-T beam spans continuous for live load.

Capacity: HL-93 loading.

Specifications:

Construction: Virginia Department of Transportation Road and Bridge Specifications, 2016.

Design: AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014; and VDOT Modifications.

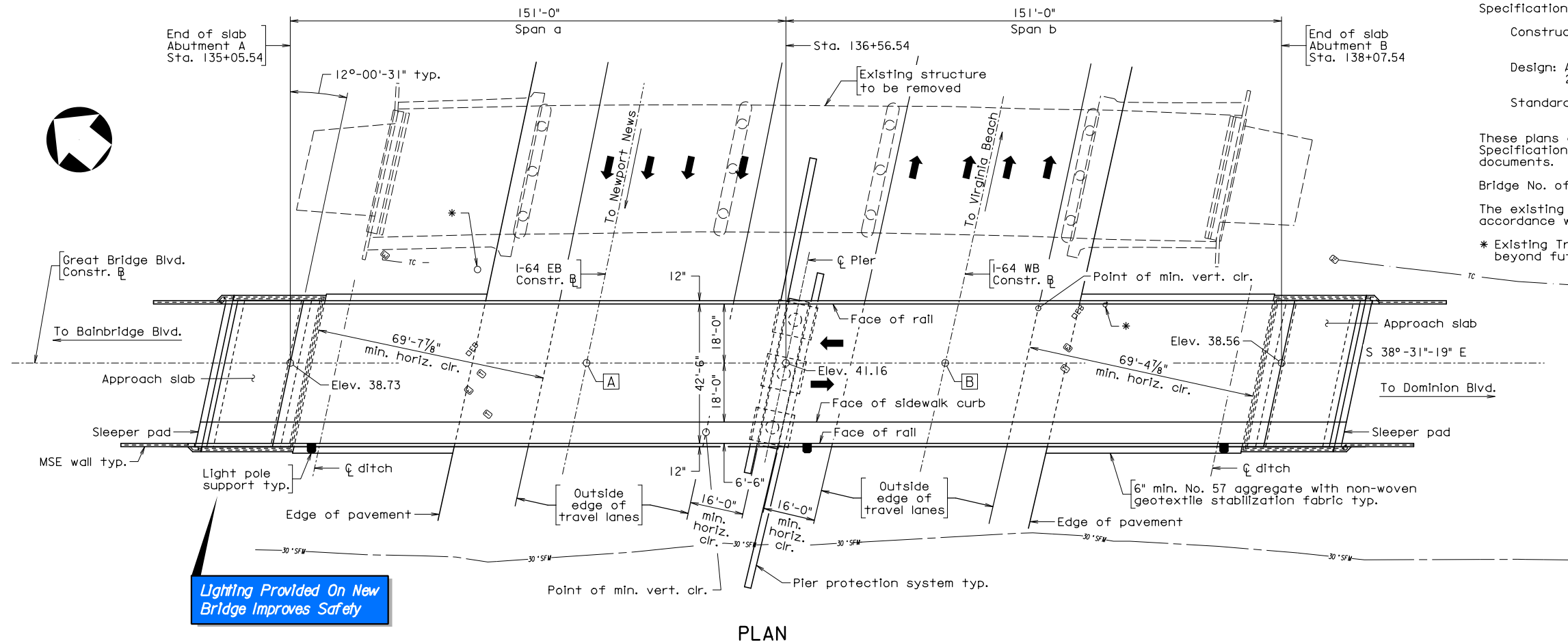
Standards: Virginia Department of Transportation Road and Bridge Standards, 2016; including all current revisions.

These plans are incomplete unless accompanied by the Supplemental Specifications and Special Provisions included in the contract documents.

Bridge No. of existing bridge is 2544. Plan No. is 174-08.

The existing structure is designated a Type B structure in accordance with Section 411 of the Specifications.

* Existing Traffic Control camera and sensors to be relocated beyond future proposed widening.

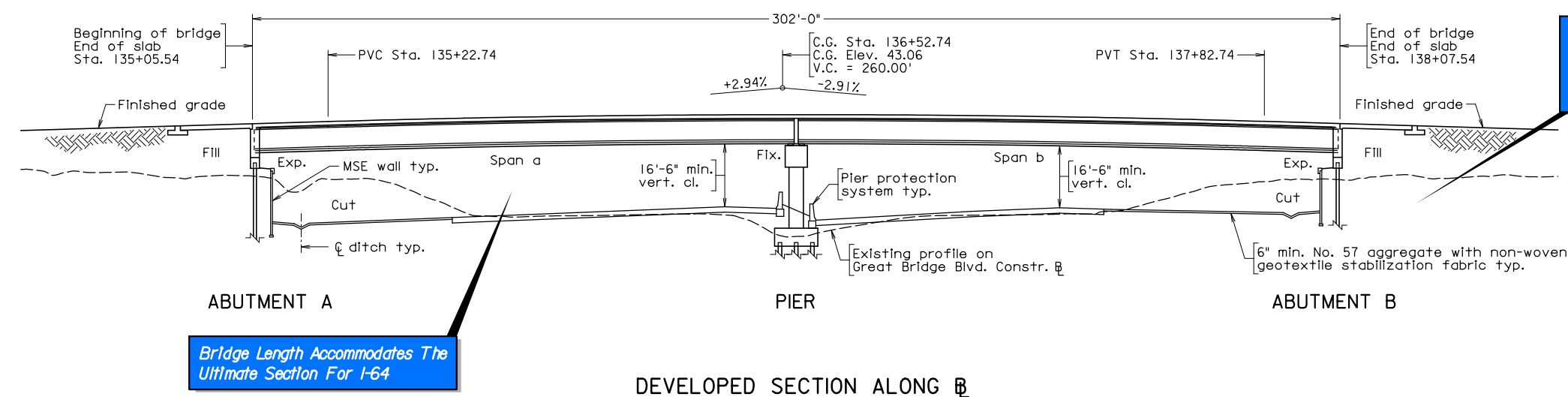


Lighting Provided On New Bridge Improves Safety

Tie Stations:

A	POT 135+95.82 Great Bridge Blvd. Constr. B
	POC 1876+97.76 I-64 EB Constr. B
	Δ = 102°-03'-46" Rt.
B	POT 137+05.08 Great Bridge Blvd. Constr. B
	POC 1393+29.40 I-64 WB Constr. B
	Δ = 102°-46'-28" Rt.

PLAN

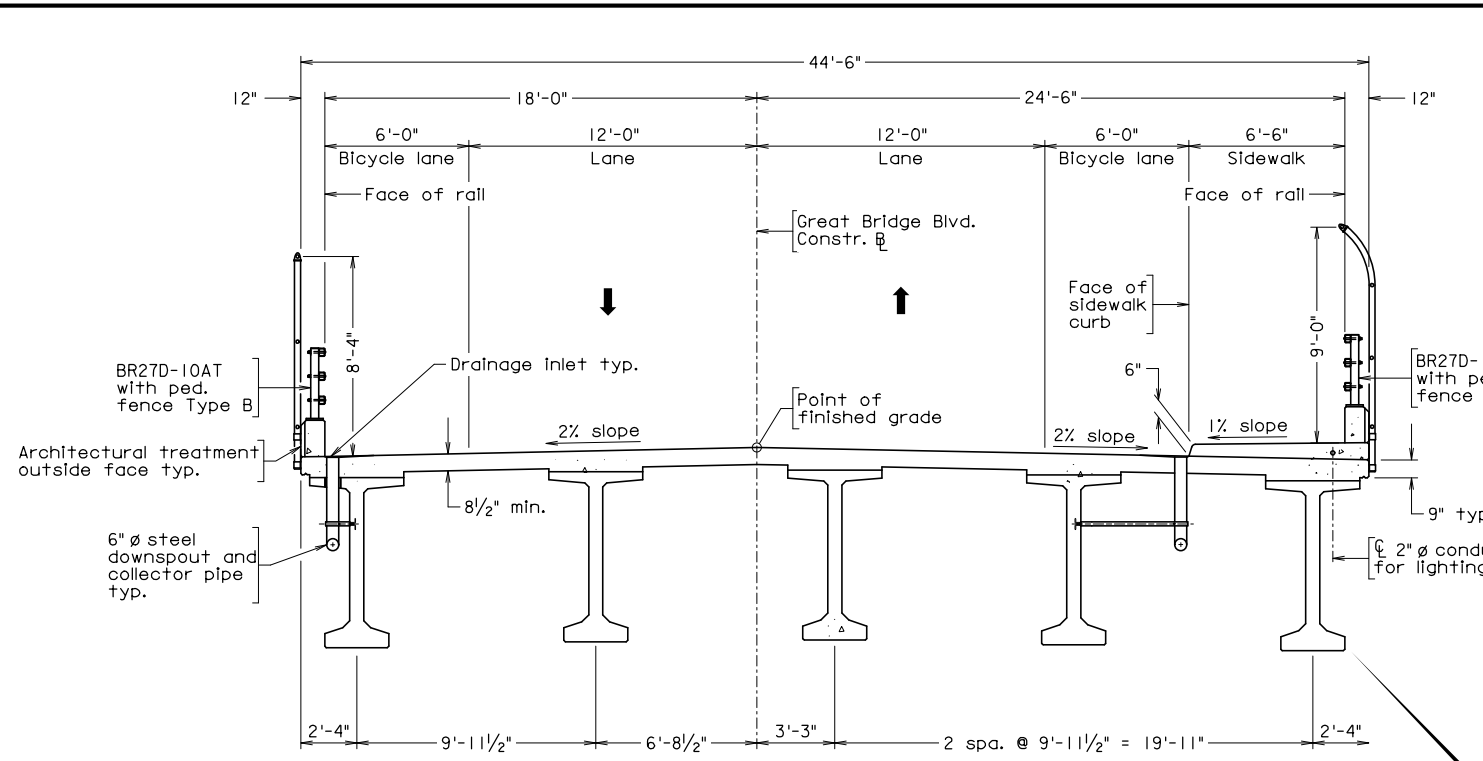


Bridge Length Accommodates The Ultimate Section For I-64

Low Maintenance Bridge - Jointless Bridge, Prestressed Concrete Bulb-T Beams, Class II CRR Steel in Deck Slab, Low Permeability Concrete

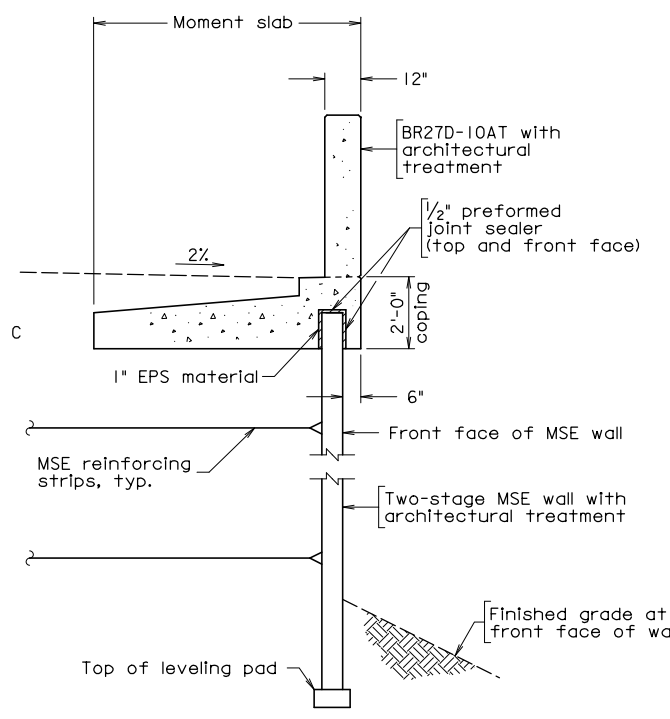
DEVELOPED SECTION ALONG B

8/11/2017
Plotted By: Jackson
GB - (01) Plan and Section

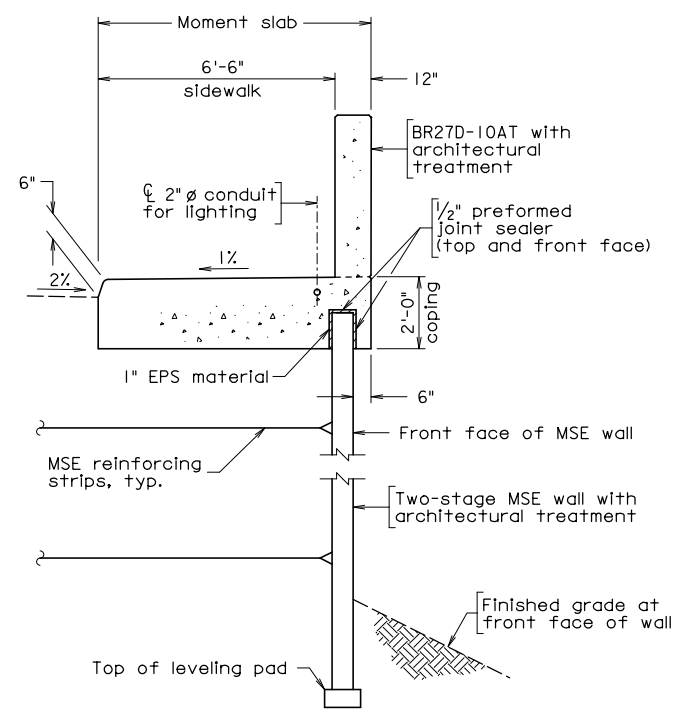


TRANSVERSE SECTION

Bridge light pole supports not shown for clarity.

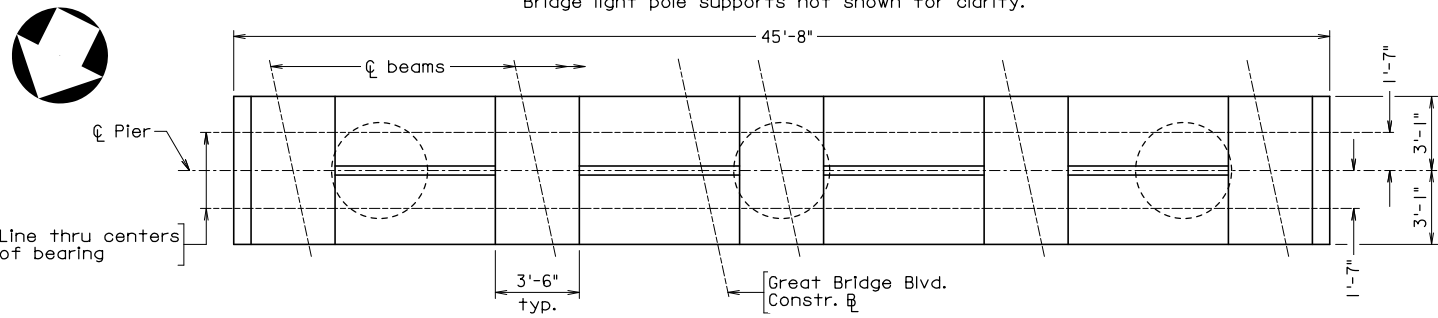


TYPICAL MSE WALL SECTION

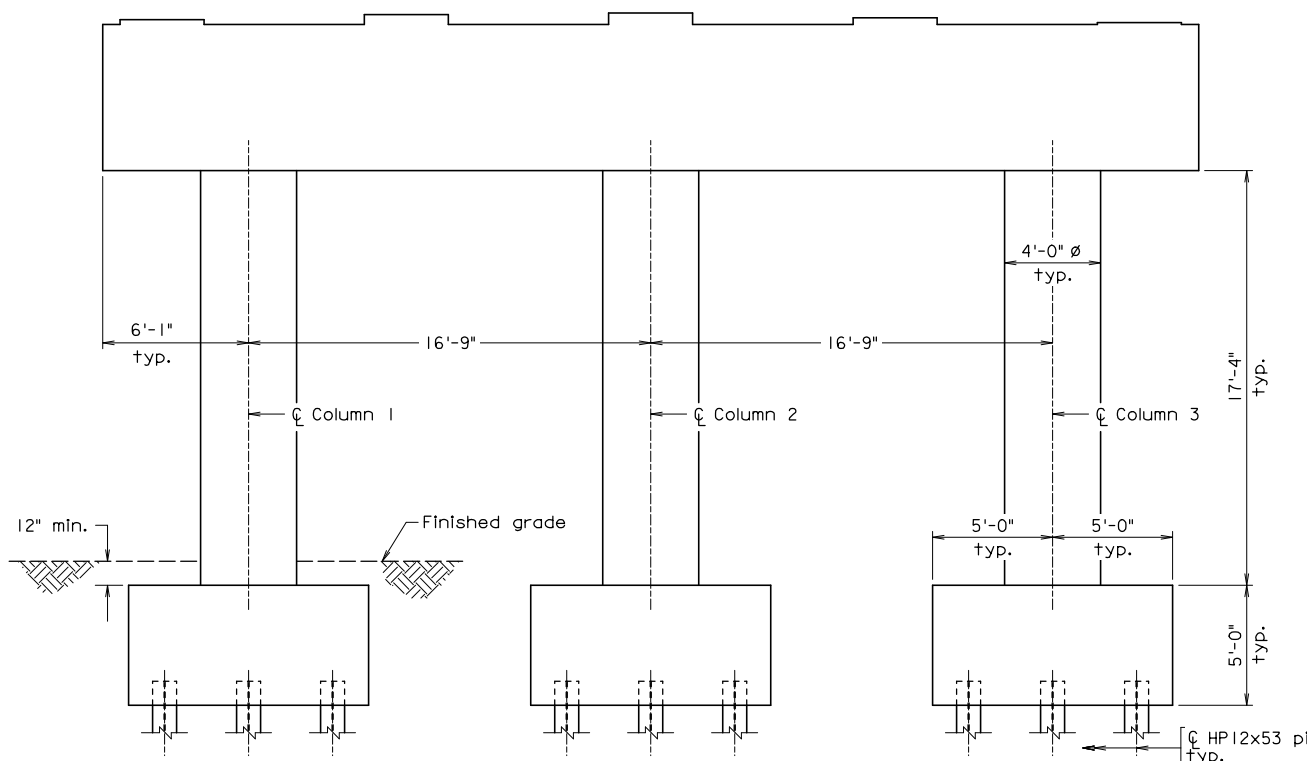


TYPICAL MSE WALL SECTION AT SIDEWALK

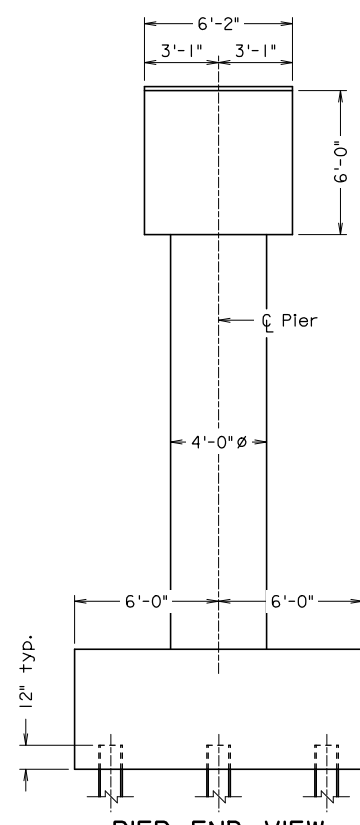
Low Maintenance Bridge - Jointless Bridge, Prestressed Concrete Bulb-T Beams, Class II CRR Steel in Deck Slab, Low Permeability Concrete



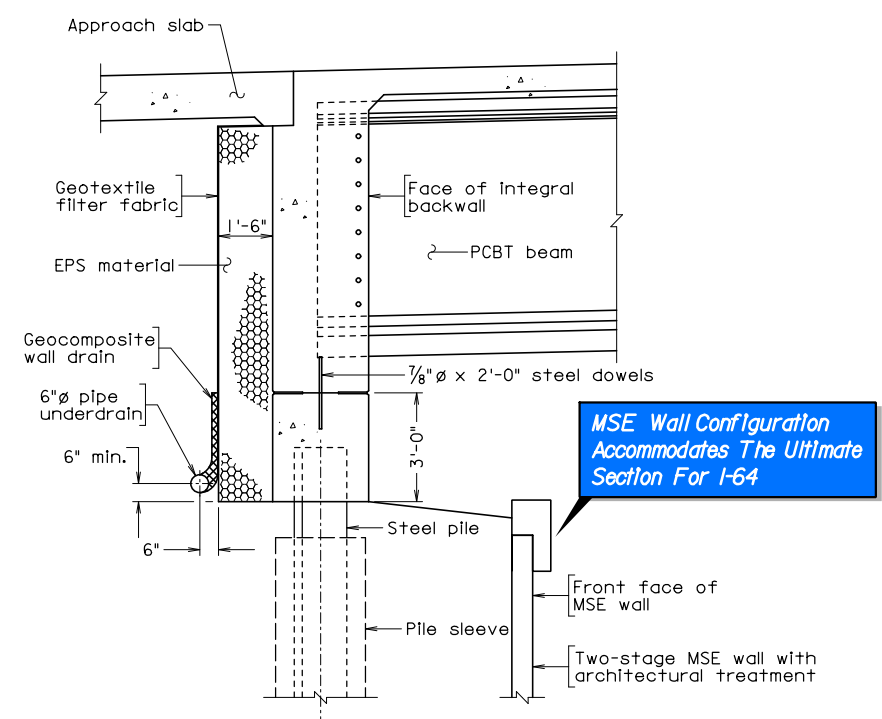
PLAN OF PIER CAP



PIER ELEVATION



PIER END VIEW



TYPICAL ABUTMENT SECTION

MSE Wall Configuration Accommodates The Ultimate Section For I-64

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

GB - 1021 Sections 06-33 AM 8/13/2017 Plotted By: Jackson

DESIGN BUILDER **LMB**

DESIGNED BY **JMT**

DESIGNED BY **STV Incorporated**

TITLE **TRANSVERSE SECTION AND SUBSTRUCTURE DETAILS**

VIRGINIA DEPARTMENT OF TRANSPORTATION
RTE.190 (GREAT BRIDGE BLVD) OVER I-64
PROJ.0064-131-811, B663

SHEET NO. S-19

PAGE NO. 167



4.3.5 - CONCEPTUAL BRIDGE PLANS

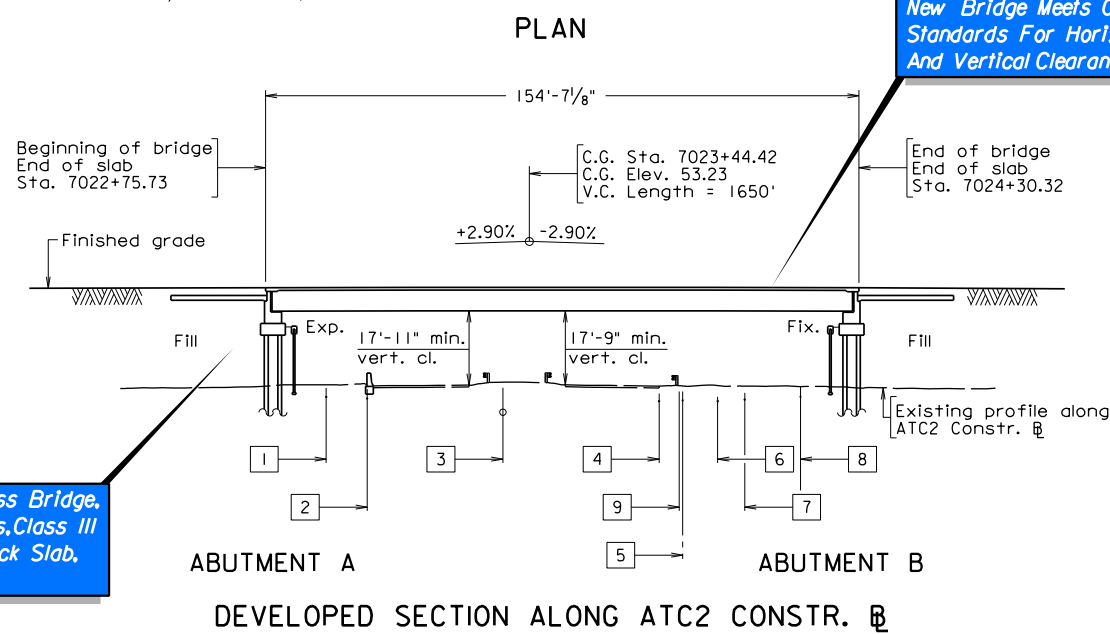
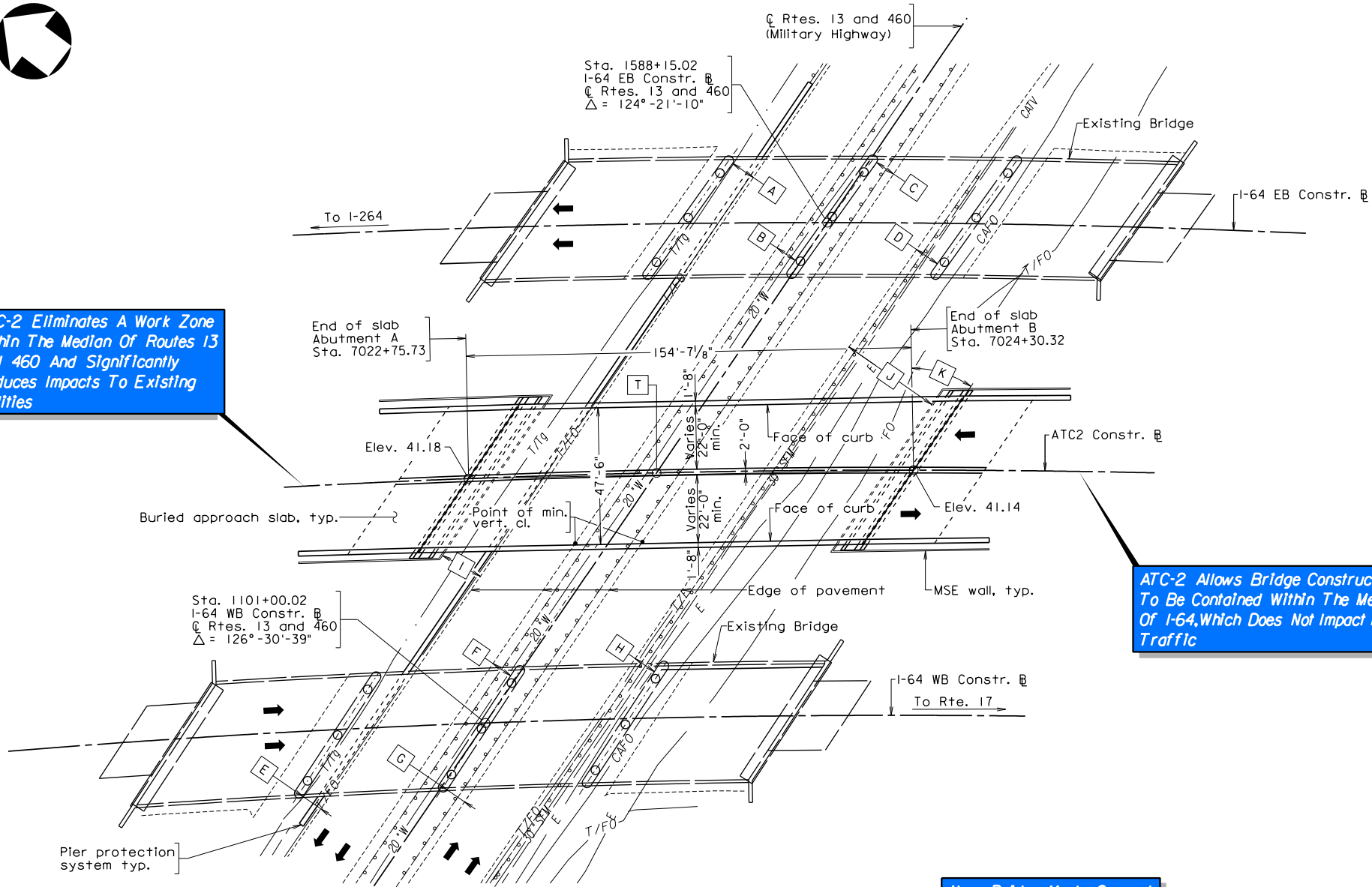


ATC-2 Eliminates A Work Zone Within The Median Of Routes 13 and 460 And Significantly Reduces Impacts To Existing Utilities

ATC-2 Allows Bridge Construction To Be Contained Within The Median Of I-64, Which Does Not Impact I-64 Traffic

New Bridge Meets Current Standards For Horizontal And Vertical Clearances

Low Maintenance Bridge - Jointless Bridge, Uncoated Weathering Steel Girders, Class III CRR Steel (Solid Stainless) In Deck Slab, Low Permeability Concrete



DESIGN EXCEPTION(S):

None

GENERAL NOTES:

Widths: 22'-0" min. roadway, 2'-0" median, 22'-0" min. roadway. Overall width 47'-6" face-to-face of curbs.

Span layout: 154'-7" steel plate girder span.

Capacity: HL-93 loading.

Specifications:

Construction: Virginia Department of Transportation Road and Bridge Specifications, 2016.

Design: AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014; and VDOT Modifications.

Standards: Virginia Department of Transportation Road and Bridge Standards, 2016; including all current revisions.

These plans are incomplete unless accompanied by the Supplemental Specifications and Special Provisions included in the contract documents.

All structural steel, including bearings, shall be ASTM A709 Grade 50W and shall be unpainted.

Bridge Nos. of existing bridges are 2517 (EBL) and 2518 (WBL). Plan No. is 174-13. The span, substructure and directional labels for each bridge shown herein differ from those shown in Plan No. 174-13.

See Sheet S-24 For Additional Details Illustrating How The Phase I Bridge Design Will Not Preclude The Phase 2 Bridge Widening And How The Bridge Length Will Not Preclude Future Improvements Along Routes 13 and 460 (Military Highway)

- A 8'-6" min. horiz. cl.
- B 6'-11 7/8" min. horiz. cl.
- C 7'-1 1/2" min. horiz. cl.
- D 8'-8 1/4" min. horiz. cl.
- E 7'-6 1/2" min. horiz. cl.
- F 6'-9 1/2" min. horiz. cl.
- G 7'-4 1/4" min. horiz. cl.
- H 7'-4 7/8" min. horiz. cl.
- I 14'-11 3/8" min. horiz. cl.
- J 34'-11 7/8" min. horiz. cl.
- K 35°-29'-59"

- 1 ☉ exist. telephone
- 2 ☉ exist. telephone
- 3 ☉ exist. 20" water
- 4 ☉ exist. fiber optic
- 5 ☉ exist. cable tv
- 6 ☉ exist. power line
- 7 ☉ exist. cable tv
- 8 ☉ exist. fiber optic
- 9 ☉ exist. 30" sanitary force main

T Sta. 7023+41.04
ATC2 Constr. ☉
☉ Rtes. 13 and 460
Δ = 124°-15'-38"

D:\06692-M11\PE_NEW\098.Plotter: E:\sloan

DESIGN BUILDER **LMB**

DESIGNED BY **JMT.**

DESIGNED BY **STV Incorporated**

TITLE **PLAN AND DEVELOPED SECTION**

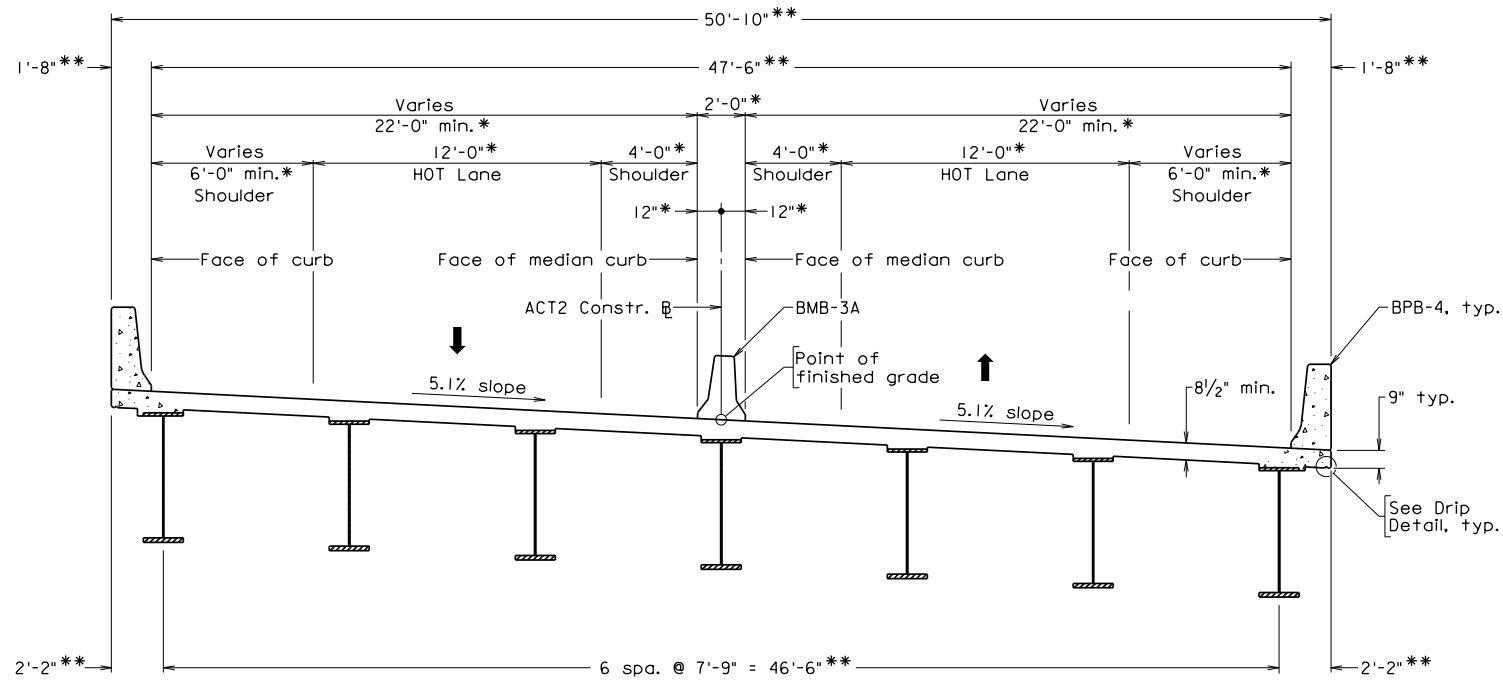
VIRGINIA DEPARTMENT OF TRANSPORTATION

I-64 HOT LANES OVER RTES. 13 AND 460
PROJ.0064-13I-811,BXX

SHEET NO. S-20

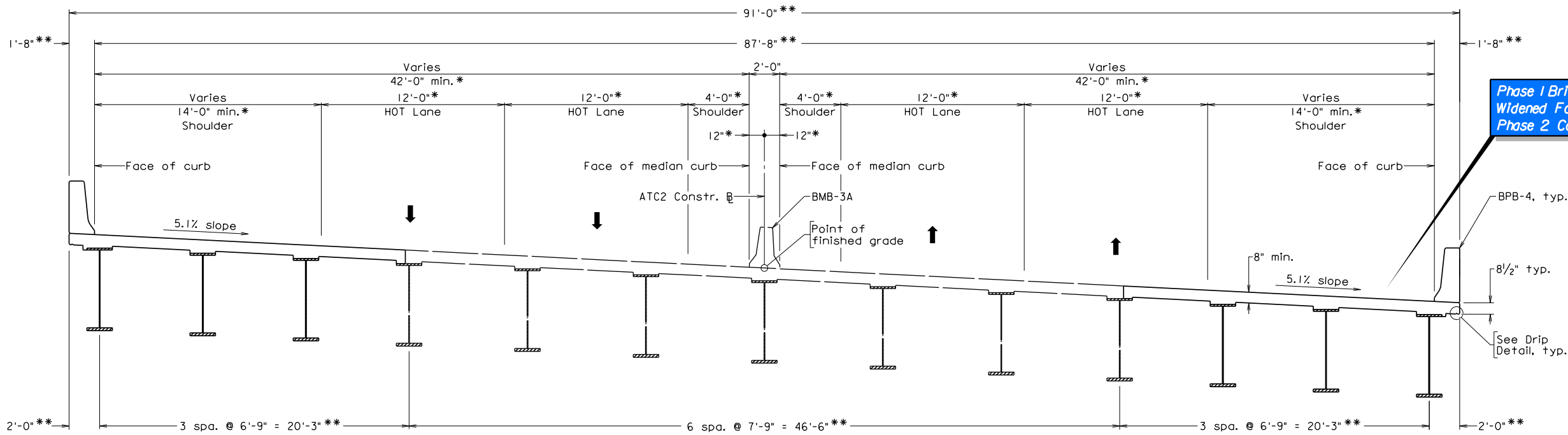
PAGE NO. 168

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION



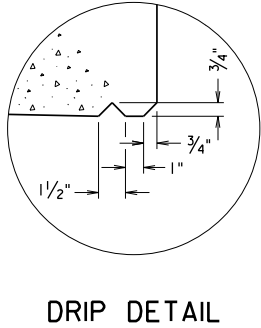
TRANSVERSE SECTION FOR PHASE I

* Denotes radial dimension
 ** Denotes dimension perpendicular to long chord.



ULTIMATE TRANSVERSE SECTION FOR PHASE 2

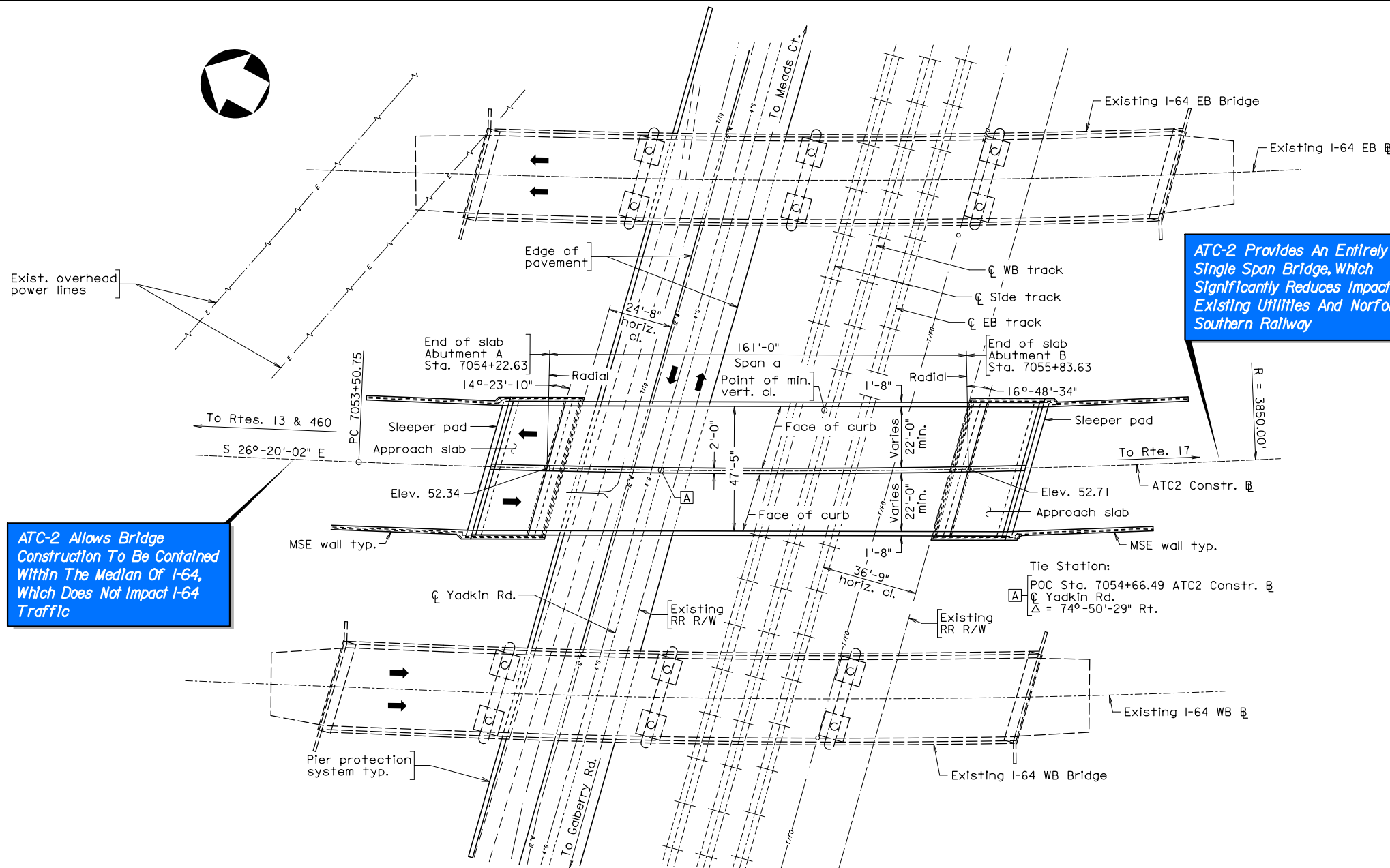
* Denotes radial dimension
 ** Denotes dimension perpendicular to long chord.



DRIP DETAIL

Phase I Bridge Easily Widened For Ultimate Phase 2 Configuration

D:\06692-MI_Transverse\02_NEW.dgn By: sloan



ATC-2 Allows Bridge Construction To Be Contained Within The Median Of I-64, Which Does Not Impact I-64 Traffic

ATC-2 Provides An Entirely New Single Span Bridge, Which Significantly Reduces Impacts To Existing Utilities And Norfolk Southern Railway

New Bridge Meets Current Standards For Horizontal And Vertical Clearances

Low Maintenance Bridge - Jointless Bridge, Uncoated Weathering Steel Girders, Class III CRR Steel (Solid Stainless) In Deck Slab, Low Permeability Concrete

DESIGN EXCEPTION(S):

None

GENERAL NOTES:

Widths: 22'-0" min. roadway, 2'-0" median, 22'-0" min. roadway. Overall width 47'-5" face-to-face of curbs.

Span layout: 161'-0" steel plate girder span.

Capacity: HL-93 loading.

Specifications:

Construction: Virginia Department of Transportation Road and Bridge Specifications, 2016.

Design: AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014; and VDOT Modifications.

Standards: Virginia Department of Transportation Road and Bridge Standards, 2016; Including all current revisions.

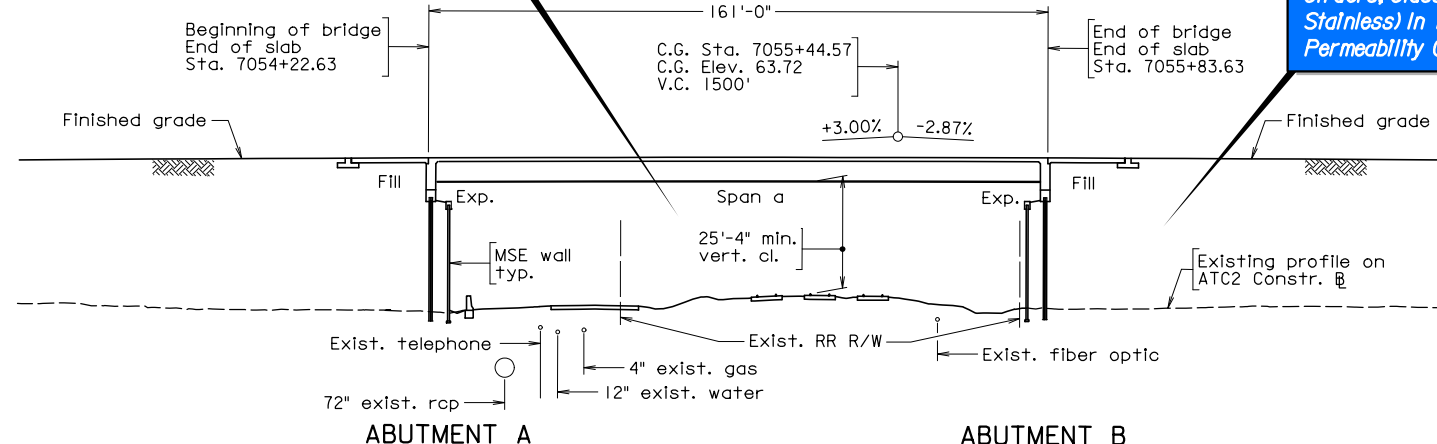
These plans are incomplete unless accompanied by the Supplemental Specifications and Special Provisions included in the contract documents.

All structural steel shall be ASTM A709 Grade 50W and shall be unpainted.

Bridge Nos. of existing bridges are 2515 (EBL) and 2516 (WBL). Plan No. is 174-12. The span, substructure and directional labels for each bridge shown herein differ from those shown in Plan No. 174-12.

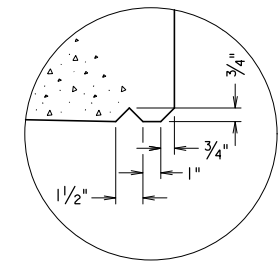
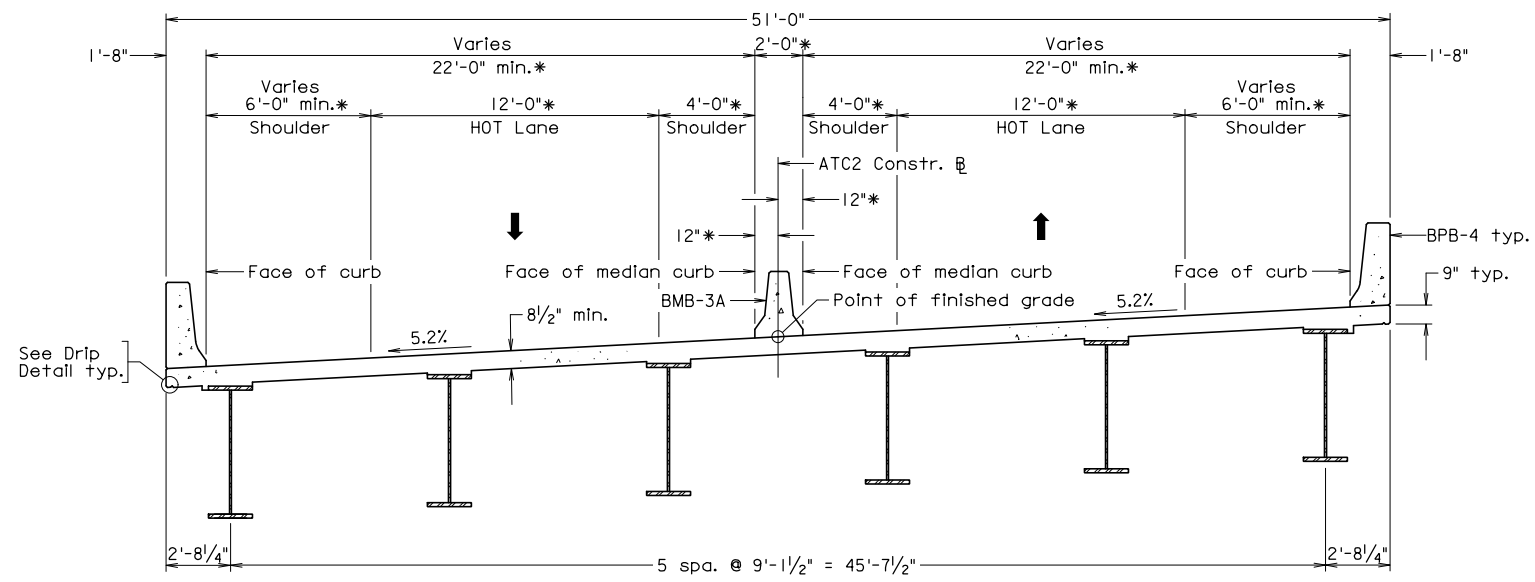
See Sheet S-24 For Additional Details Illustrating How The Phase I Bridge Design Will Not Preclude The Phase 2 Bridge Widening And How The Bridge Length Will Not Preclude Future Improvements Along Yadkin Road And Norfolk Southern Railway

PLAN - PHASE I



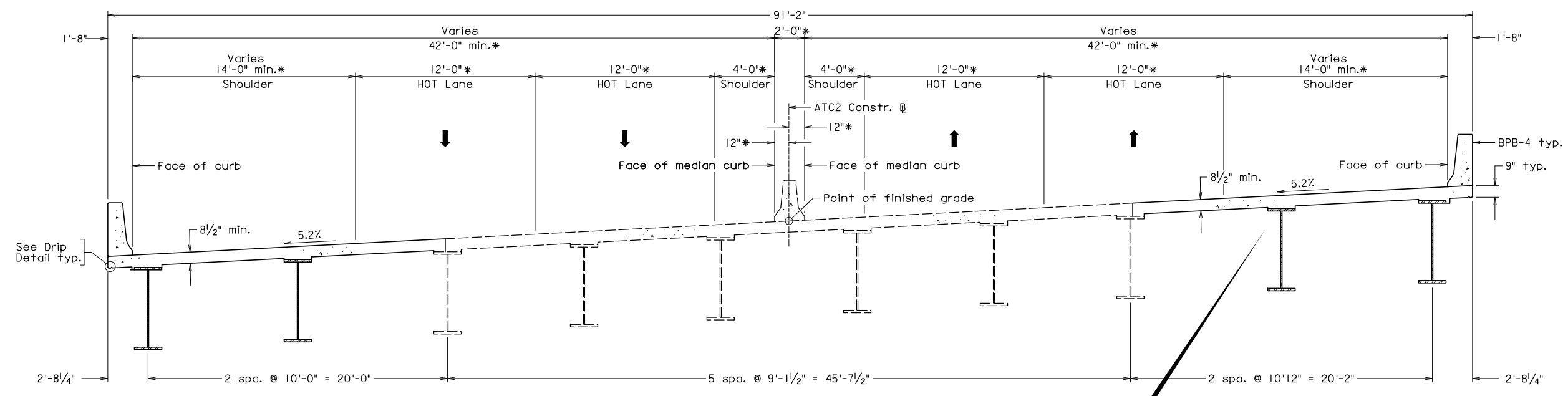
DEVELOPED SECTION ALONG ATC2 CONSTR. B

8/12/2017
YR - 101 ATC2 - Plan 5666 - Elevation - P:\17412\17412.dwg - J. Jackson



DRIP DETAIL

TRANSVERSE SECTION FOR PHASE I *Denotes radial dimension

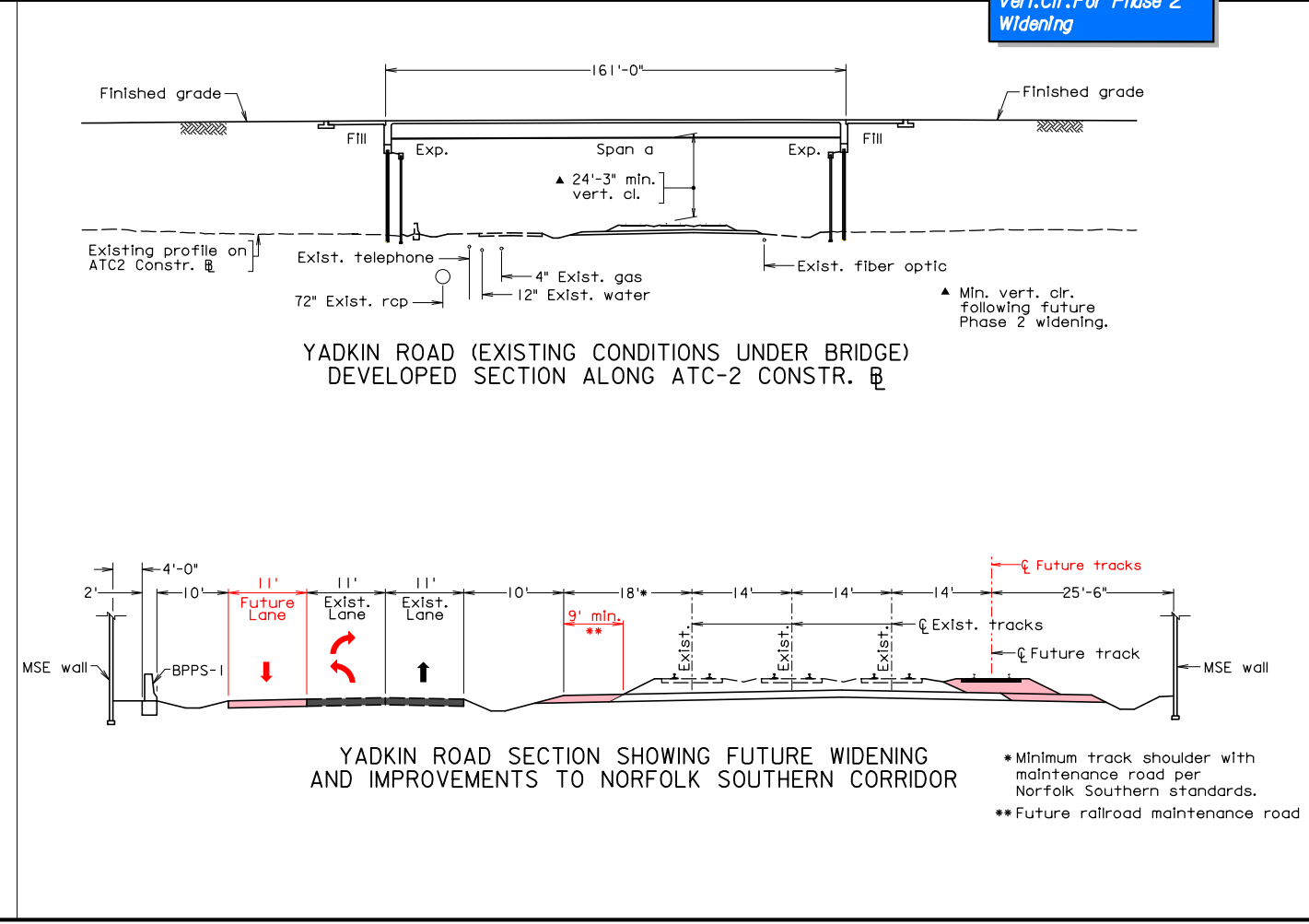
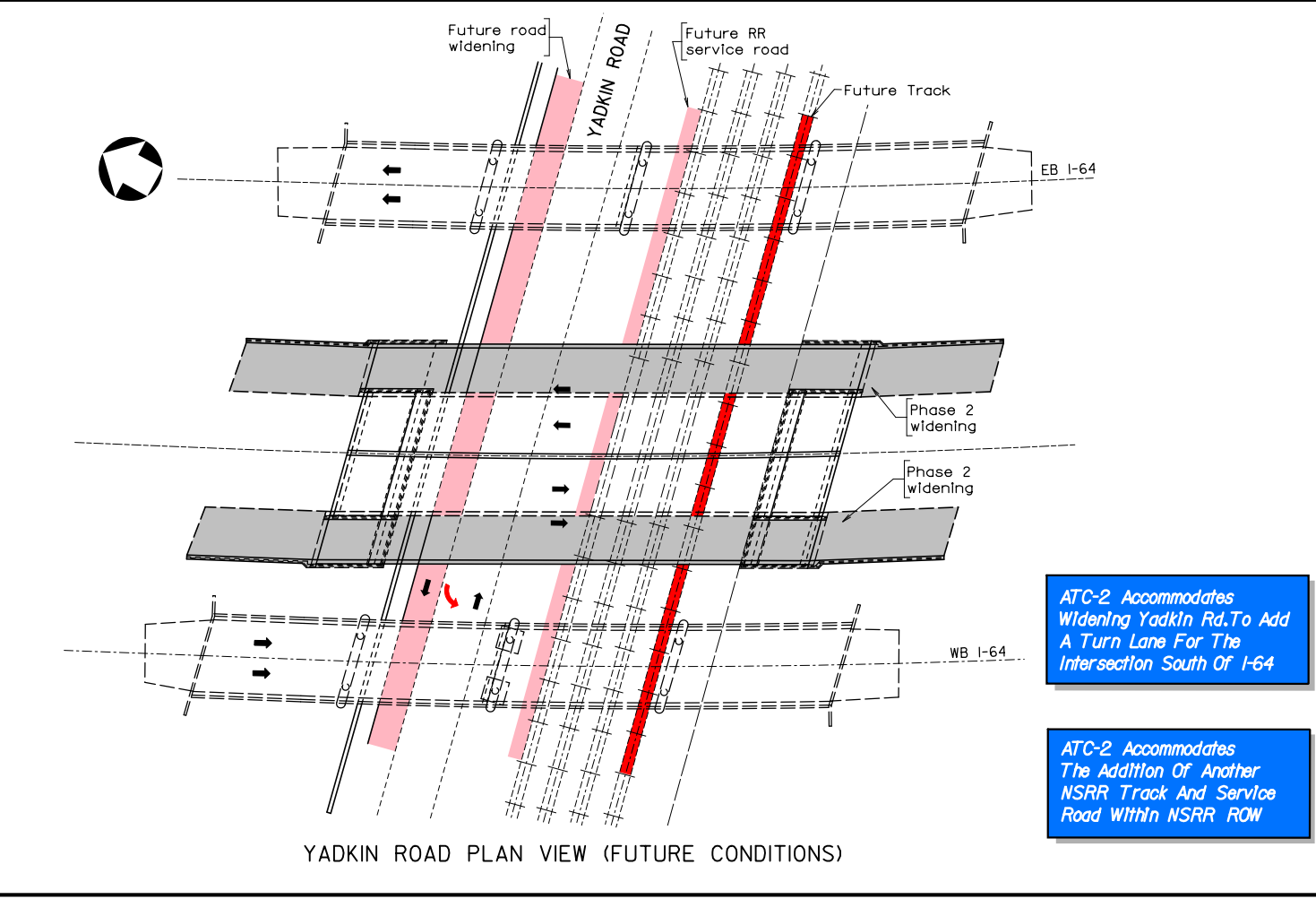
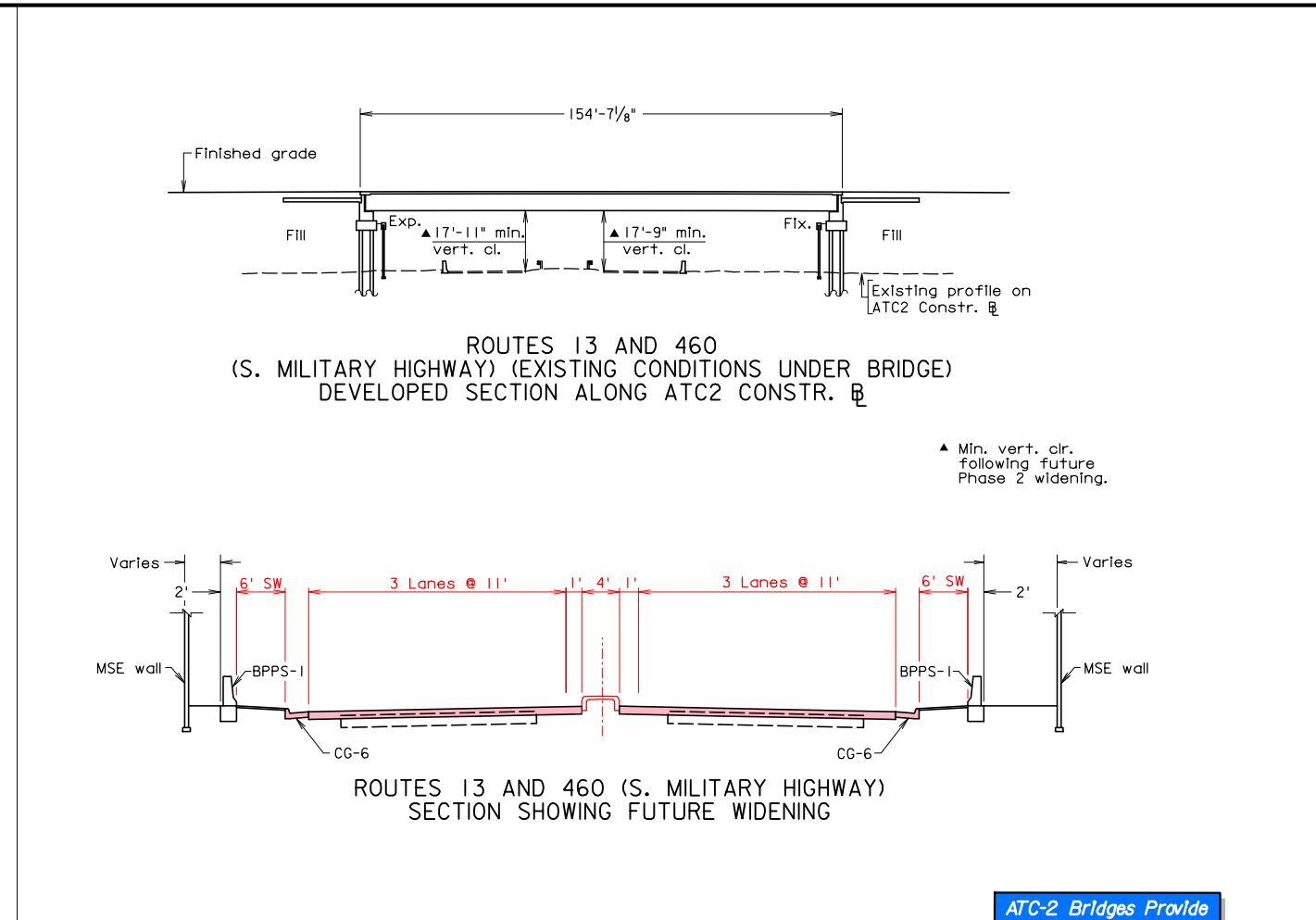
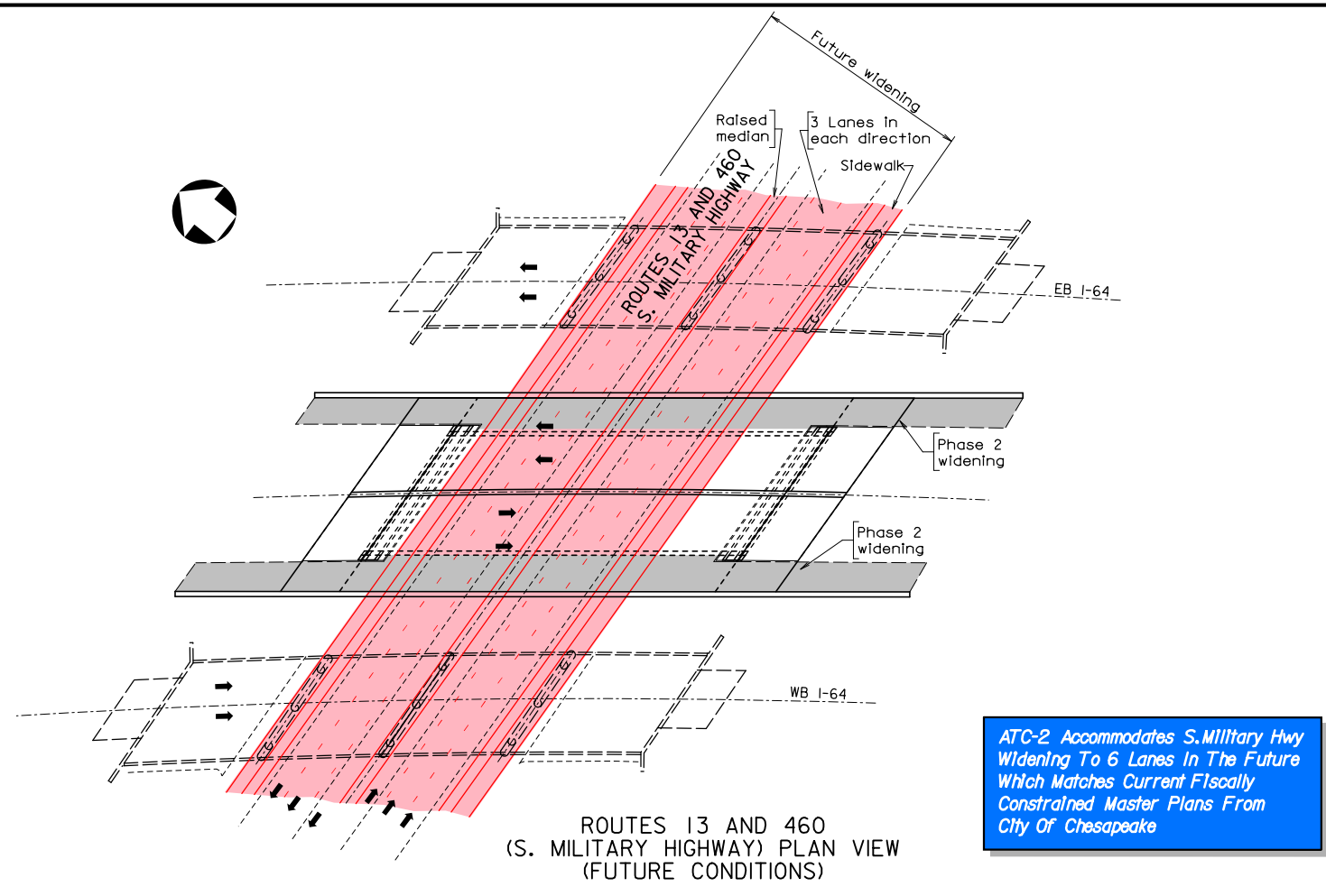


*Denotes radial dimension

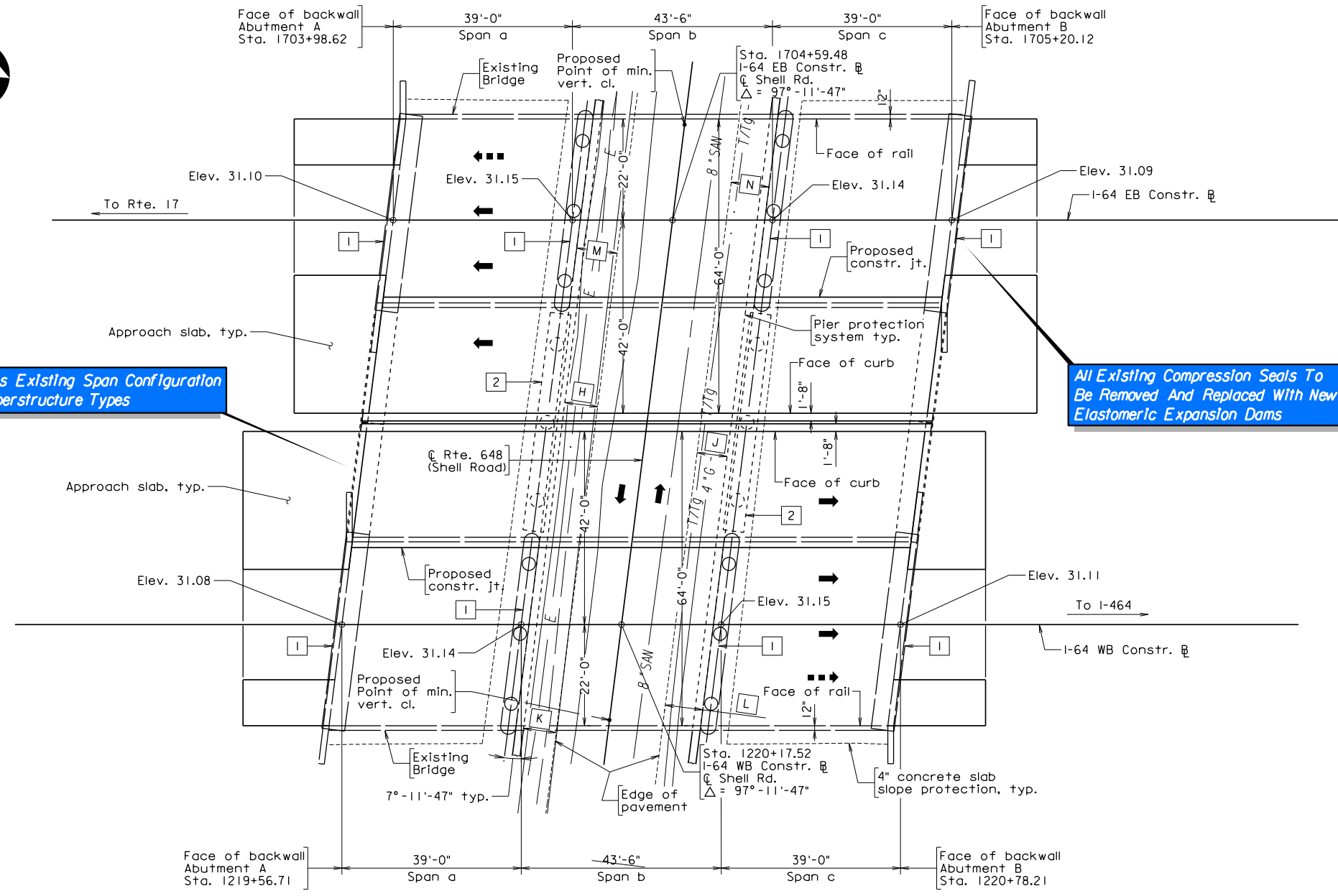
ULTIMATE TRANSVERSE SECTION FOR PHASE 2

Phase I Bridge Easily Widened For Ultimate Phase 2 Configuration

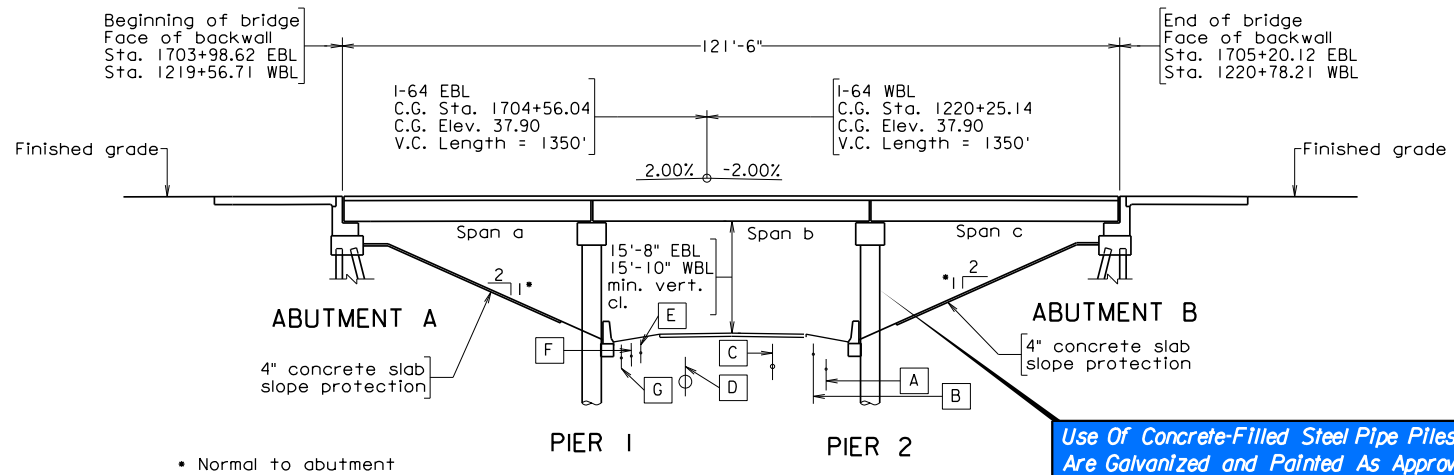
YR - (02) ATC2_TransverseSection_Phase1&2.dwg Jackson 8/12/2017



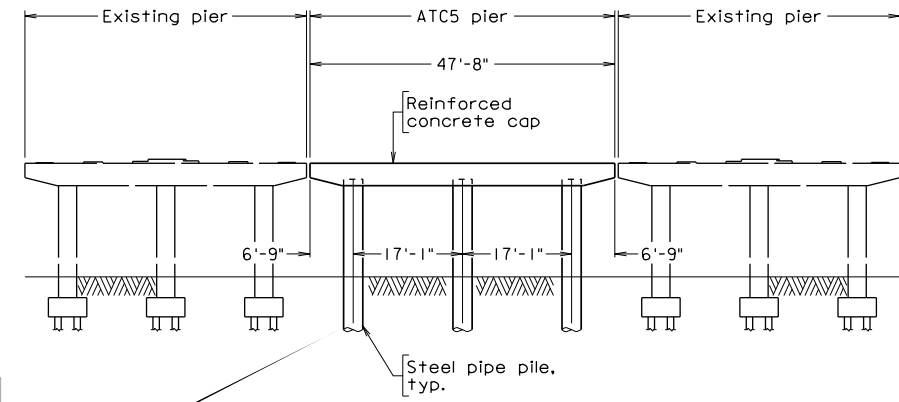
YR - MIL - Plan Provisions/Sections/Notes By: L. Jackson 8/12/2017



PLAN



DEVELOPED SECTION ALONG WIDENING



PROPOSED PIER ELEVATION

DESIGN EXCEPTION(S):
 Design Exception - Route I-64 EB and I-64 WB over Route 648 (Shell Road) - Shoulder Widths (Approval Pending).

GENERAL NOTES:
 Width: 64'-0" face of rail to face of curb.
 Span layout: 39'-0" - 43'-6" - 39'-0" prestressed concrete bulb-T beam spans.
 Capacity: HL-93 loading.
 Specifications:
 Construction: Virginia Department of Transportation Road and Bridge Specifications, 2016.
 Design: AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014; and VDOT Modifications.
 Standards: Virginia Department of Transportation Road and Bridge Standards, 2016; including all current revisions.

These plans are incomplete unless accompanied by the Supplemental Specifications and Special Provisions included in the contract documents.
 Bridge Nos. of existing bridges are 2514 (EBL) and 2513 (WBL). Plan No. is 174-10. The span, substructure and directional labels for each bridge shown herein differ from those shown in Plan No. 174-10.

- 1 Remove existing compression seals at joint locations and replace with new expansion dams (Type F2) installed full width of existing bridge plus new widened portion. Typical at all existing joint locations.
- 2 ATC5 Pier

- A ϕ exist. 4" gas
- B ϕ exist. telephone
- C ϕ exist. 8" sanitary
- D ϕ exist. 24" sanitary force main
- E ϕ exist. cable tv
- F ϕ exist. power line
- G ϕ exist. fiber optic
- H 7'-2" min. horiz. cl.
- J 6'-6 $\frac{3}{4}$ " min. horiz. cl.
- K 7'-2 $\frac{3}{8}$ " min. horiz. cl.
- L 6'-6 $\frac{1}{2}$ " min. horiz. cl.
- M 7'-2 $\frac{3}{8}$ " min. horiz. cl.
- N 7'-2 $\frac{3}{8}$ " min. horiz. cl.

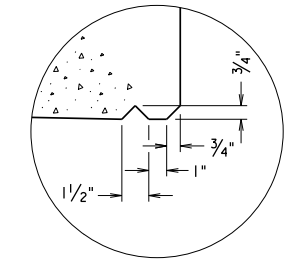
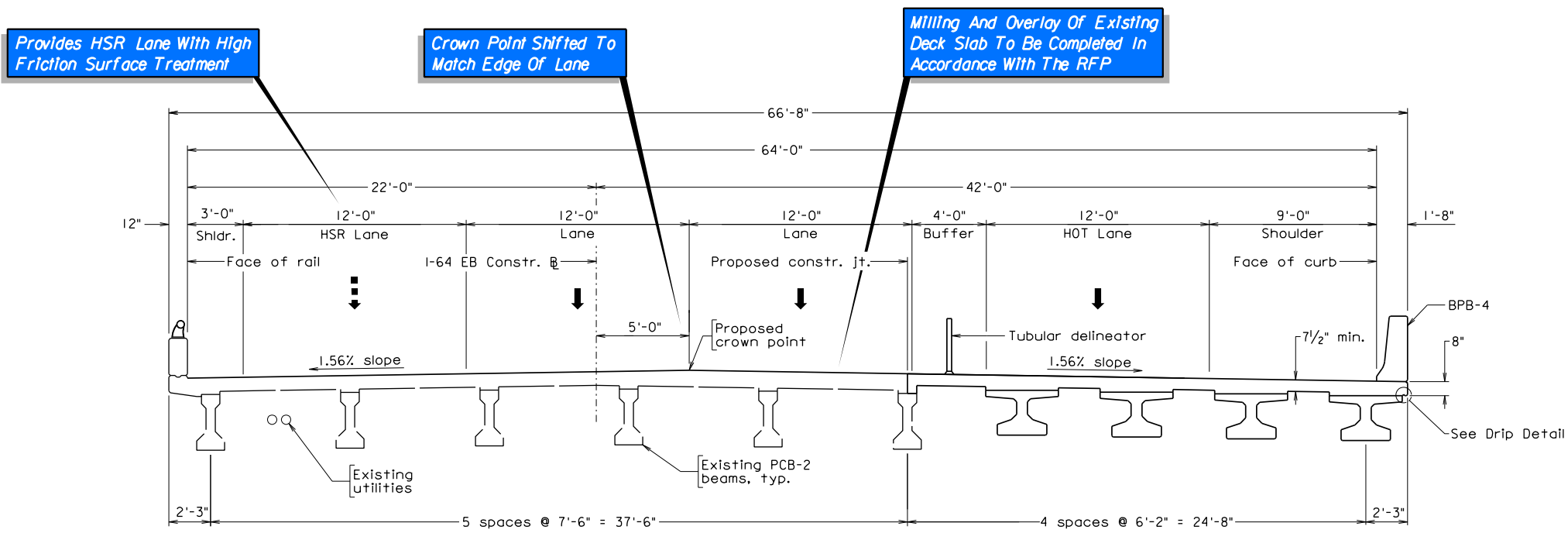
Measured to face of curb of pier protection barrier.

Use Of Concrete-Filled Steel Pipe Piles That Are Galvanized and Painted As Approved In ATC-5 For The Widened Piers Significantly Minimizes Impacts To Traffic On Shell Road And Minimizes Utility Conflicts

PRELIMINARY PLANS
 THESE PLANS NOT TO BE USED FOR CONSTRUCTION

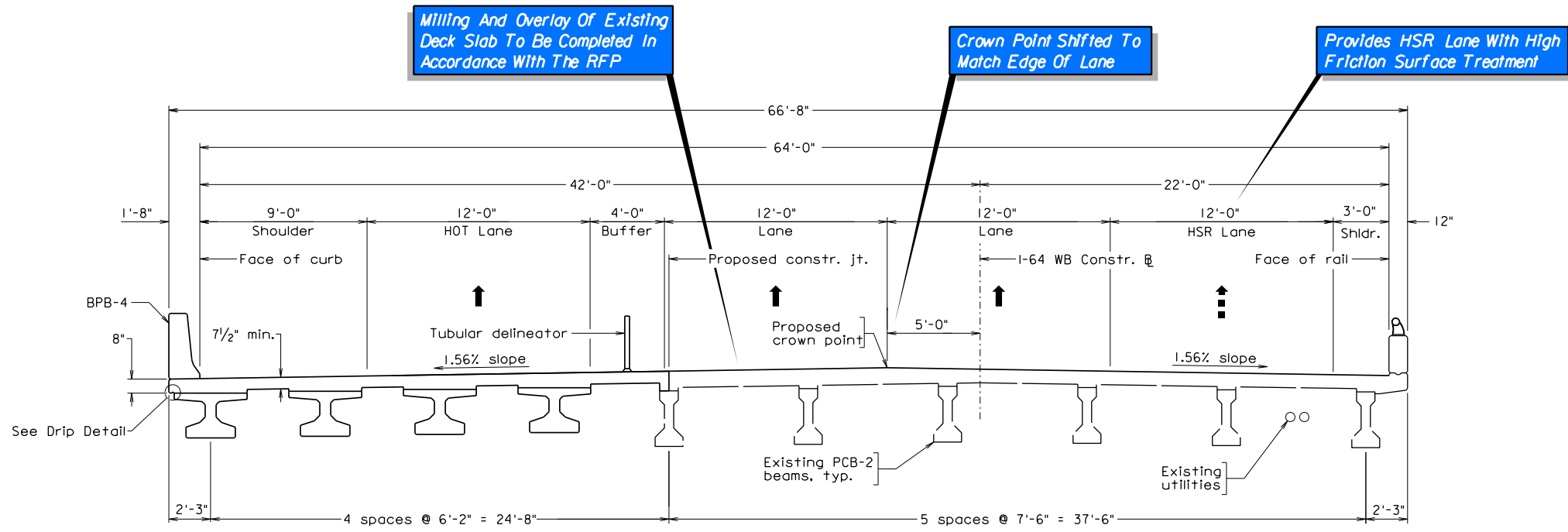
D:\06692-Shell P&E\21-REV.DWG Plotted By: sloan
 D:\06692-Shell P&E\21-REV.DWG

Note:
 HSR denotes Hard Shoulder Running
 with high friction surface treatment.



TRANSVERSE SECTION - EBL

DRIP DETAIL



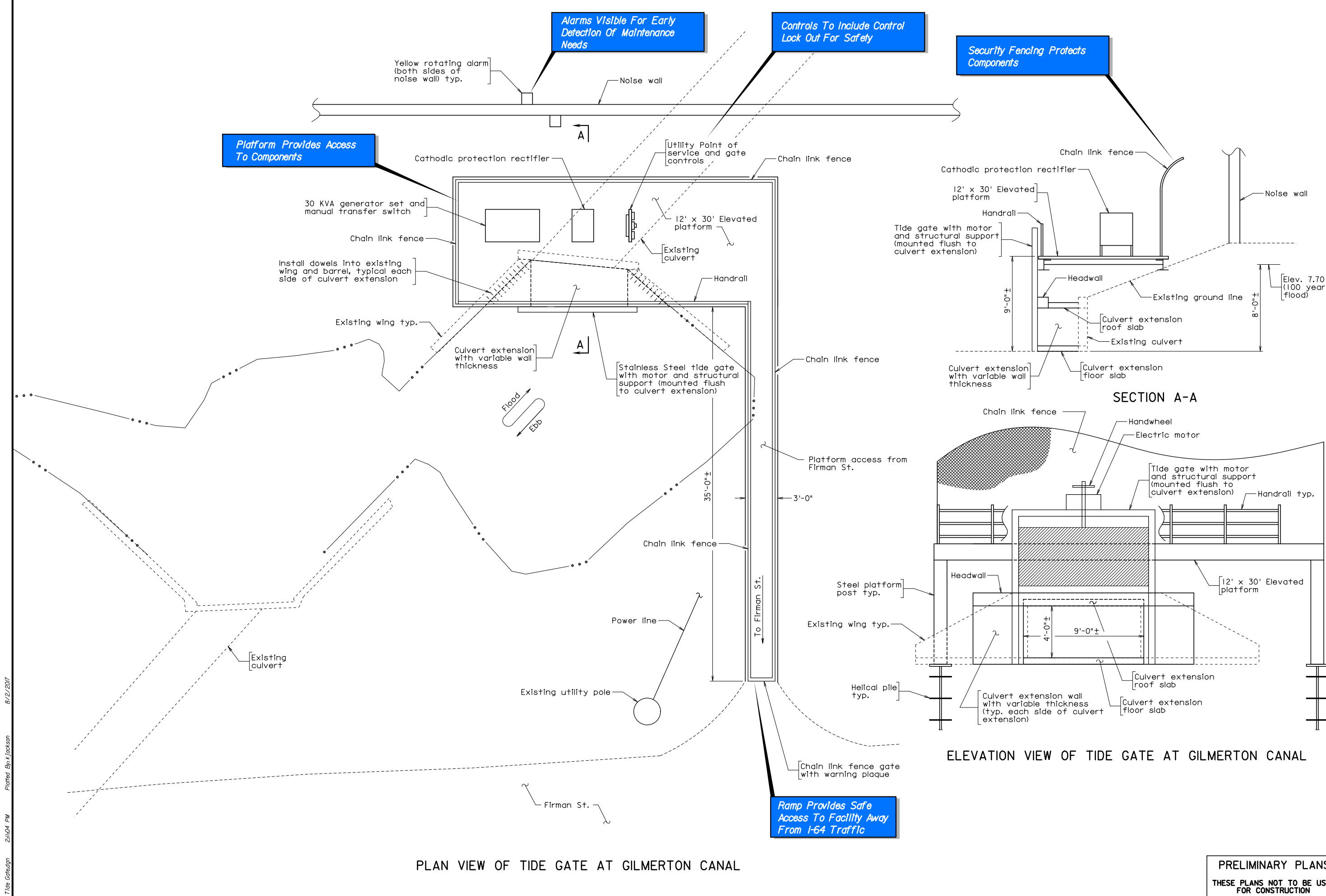
TRANSVERSE SECTION - WBL

D:\06692-Shell_TransverseSection_NEW.dgn



4.3.6 - CONCEPTUAL PLANS - TIDE GATE AT GILMERTON CANAL

Tide Gate.dgn 2/10/04 PM 8/12/2017 Plotted By: J. Jackson



DESIGN BUILDER **LMB**

DESIGNED BY **JMT**

STV Incorporated

TITLE **PLAN AND ELEVATION OF TIDE GATE**

VIRGINIA DEPARTMENT OF TRANSPORTATION

TIDE GATE AT GILMERTON CANAL
PROJ.0064-131-811.C501

SHEET NO. S-27

PAGE NO. 175

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION